

TABLE OF CONTENTS – CHAPTER SIX

CHAPTER 6.0 : CONSOLIDATED WATER CONSERVATION & DROUGHT MANAGEMENT RECOMMENDATIONS OF THE REGIONAL WATER PLAN ... 6-1

6.1 WATER CONSERVATION PLAN..... 6-1

6.2 EXAMPLES OF WATER CONSERVATION PLANS IMPLEMENTED IN REGION M..... 6-2

6.2.1 Laguna Madre Water District Water Conservation & Drought Contingency Plan 6-2

6.3 TEXAS DROUGHT MANAGEMENT STRATEGIES 6-3

6.4 MODEL WATER CONSERVATION PLANS FROM TCEQ..... 6-6

6.5 WATER CONSERVATION TIPS 6-6

6.6 POTENTIAL DROUGHT RELIEF PROGRAMS 6-6

ATTACHMENT 6-1 Model Drought Contingency Plan for Water Supply Corporations 6-9

ATTACHMENT 6-2 Model Water Conservation Plan FOR MUNICIPAL WATER USE 6-20

ATTACHMENT 6-3 Model Water Conservation & Drought Contingency Plan For A (Water User Group)..... 6-24

ATTACHMENT 6-4 Municipal Water Conservation Strategies 6-47

ATTACHMENT 6-5 Agricultural Water Conservation Template 6-67

CHAPTER 6.0 : CONSOLIDATED WATER CONSERVATION & DROUGHT MANAGEMENT RECOMMENDATIONS OF THE REGIONAL WATER PLAN

Until one occurs, people tend to ignore or forget the difficulties caused by severe drought. This chapter will aid in preparing for drought conditions and establishing water conservation methods.

“Drought is a complex physical and social process of widespread significance. Although drought affects the entire State, it frequently is a regional problem due to the vast geography and varying climatic conditions within the state. Despite the frequency and economic damage caused by drought, the term drought remains difficult to define” (State Drought Preparedness Plan).

In order to ensure a region’s water source(s), each town/city in the region should prepare its own drought management and water conservation plan by first identifying needs and establishing goals for water conservation.

6.1 WATER CONSERVATION PLAN

This chapter’s attachment section contains various drought management and water conservation plans that have been researched as effective strategies by state agencies such as TCEQ and TWDB.

The following strategies are referenced from TWDB’s *Water Conservation Best Management Practices Guide*, Report 362. Under Senate Bill 1094, the 78th Texas Legislature created the Texas Water Conservation Implementation Task Force and charged the group with reviewing, evaluating, and recommending optimum levels of water use efficiency and conservation for the state. Report 362 was prepared in partial fulfillment of this charge. The *Guide* is organized in three sections for municipal, industrial, and agricultural user groups and includes 55 Best Management Practices (BMPs). Each BMP describes efficiency measures, implementation techniques and schedules, program scope, cost considerations, water-savings estimating procedures, and other references to assist end-users in implementing the plan. This document can be accessed at TWDB’s web site:

<http://www.twdb.state.tx.us/assistance/conservation/TaskForceDocs/WCITFBMPGuide.pdf>

The objective of a specific water plan is reducing the quantity of water required within a given water entity’s service area through implementation of efficient water use procedures. The key to success is implementing and enforcing effective city ordinances. This policing approach has proved effective in various Texas communities.

These water conservation strategies from Report 362 to help reduce effects of drought in this region:

1. golf course conservation
2. metering all new connections & retrofitting existing connections
3. showerhead, aerator, and toilet flapper retrofitting
4. educating through schools
5. landscape irrigation conservation
6. water-wise landscape design
7. athletic field conservation
8. dissemination of public information
9. rainwater harvesting
10. parklands conservation
11. residential clothes washer incentives

Attachment 6-4 includes the Report 362's strategy descriptions.

6.2 EXAMPLES OF WATER CONSERVATION PLANS IMPLEMENTED IN REGION M

Several cities have taken precautions to conserve water with formal plans. Here is a brief descriptions of a conservation plans for a Region M WUG.

6.2.1 Laguna Madre Water District Water Conservation & Drought Contingency Plan

Water conservation goals for the Laguna Madre Water District (LMWD) are based on the entities utility profile and water practices. The LMWD's goals are:

1. Water Loss: Accounting for all water use is one of the first steps in establishing a goal for water losses
2. Per capita usage: The average daily customer use is currently 171 gpcd. The goal is to reduce this to 166 gpcd in 5 years and 153 gpcd in 10 years.
3. Water recycling: The LMWD is actively trying to reclaim at least 50% of its wastewater effluent and/or substitute potable water for raw water and effluent.
4. Alternative source: The LMWD is evaluating alternative sources of water to serve the needs of the customers.

The LMWD Water Conservation plan consists of certain key elements. The first element is a Public Education Campaign. The public education campaign will consist of brochures, website, media, school and media education, and a drought awareness campaign.

The second element of the plan is to implement a conservation based water rates structure. The proposed block rate structure will be aimed at reducing consumption and putting a high priority on water conservation.

The third element is a plumbing fixture and retrofit program. Building owners will be encouraged to replace old, leaky fixtures with new, high efficiency fixtures. As a long term goal, the LMWD will assist by providing retrofit kits to potential customers.

The fourth element is the implementation of water savings plumbing code. The LMWD has already passed a resolution that includes water conservation for new construction and renovations. Improved technology has made the effectiveness of this campaign a reality.

The fifth element is to implement universal metering, meter repair, and meter replacement. Currently, all customers of the LMWD are metered. However, a retrofit program will increase the efficiency of water measurements and reduce consumption. This element will also reduce the amount of unaccounted for water which can lead to system wide losses.

The sixth element is to reduce the overall quantity of unaccounted for water. Water leaks are a major source of unaccounted for water. This task will require the replacement of old, leaky lines with new lines. The water losses due to seepage will be significantly reduced.

The seventh element is the implementation of a leak detection and repair program. Currently, the LMWD does not have a leak detection program in place. Through the implementation of such a program, the District's goal is to reduce the amount of water lost due to leaking pipes, fittings, and valves. Further, the District will be implementing a line repair program.

The eighth element is the implementation of water conservative landscaping. An educational program aimed at notifying the public of potential water savings due to water conservative landscaping will be implemented.

The ninth element is to implement water conservation programs for industrial, commercial and institutional customers. A large portion of the water consumption is made up of such customers. By reducing operational costs due to a reduction in overall water consumption, both the District and it's users will benefit from such improvements.

A copy of the LMWD's Water Conservation and Drought Contingency Plan is included in the appendix.

6.3 TEXAS DROUGHT MANAGEMENT STRATEGIES

Without substantial rains, the next ten years may produce a severe drought worse for Texas agriculture than the disastrous drought of 1996. No amount of scientific knowledge can make up for lack of rain and the resultant water depletion in soil profiles and in ground and surface water supplies.

This information was gleaned from information provided by specialists with the Texas Agricultural Extension Service (TAES) and others to provide information that might reduce further losses to Texas' beleaguered agricultural industry. TAES has access to many resources helpful in reducing water usage and losses associated with drought. The text is provided also to help assemble the State Drought Preparedness Plan for the Texas Department of Safety. This information addresses water conservation measures suitable for urban residents as cities and municipalities face declining water supplies and are forced to implement rationing.

TAES recommends several drought strategies for this region. Although this paper presents a few of those strategies, the full report titled "Texas Drought Management Strategies" is found in the Appendix of this water plan. At least two names are listed for each of the 14 categories.

1. AG ECONOMICS AND MANAGEMENT
Summary of Weather-Related Sales Rules for Livestock
Crop Insurance and Disaster Payments
2. LIVESTOCK AND RANGE
Cattle Market Situation and Drought Strategies
Drought Feeding Management
3. MANAGEMENT OF IMPROVED PASTURES
Maximizing Limited Rainfall for Forage Growth
Protecting Plant Vigor during a Drought
4. CORN AND SORGHUM
Production Decisions
Economic Decisions
5. COTTON
Production Decisions
Economic Decisions
6. WILDLIFE AND FISHERIES
Wildlife and Fish in a Drought
7. DROUGHT STRATEGIES FOR DAIRY PRODUCERS
Guidelines for Use of Aflatoxin-containing Feeds in Dairy Rations
Feeding Whole Cottonseed to Dairy Cows and Replacements
8. MANAGEMENT OF RANGELAND
Livestock Management during Drought
Supplemental Feeding during Drought
9. DROUGHT MANAGEMENT FOR HORTICULTURAL CROPS

Tree Watering
Drought and Trees

10. HOME LAWN IRRIGATION DURING DROUGHT CONDITIONS

Stages of Water Rationing
Irrigation and Management Tips

11. NON-IRRIGATED TURF MAINTENANCE---LAWNS, PARKS, SCHOOL
GROUNDS, SPORTS FIELDS, AND GOLF COURSES

12. WATER-EFFICIENT PRACTICES FOR SAVING YOUR LANDSCAPE

Landscape Maintenance Practices Save Water
Irrigation Systems for Xeriscape Landscapes

13. IRRIGATION WATER-QUALITY STANDARDS AND SALINITY
MANAGEMENT

Water Analysis: Units, Terms and Sampling
Two Types of Salt Problems

14. FINDING FIRM FINANCIAL FOOTING

Spending Plans
Insurance Coverage

Texas has a Drought Preparedness Plan written by the Drought Preparedness Council, which was formed by Governor George W. Bush in May 1999 through HB 2550 to emphasize Texas' need for a proactive approach to drought planning. This law required that the State Drought Preparedness Council develop a comprehensive plan providing for (1) systematic data collection, analysis, and dissemination of drought-related information; (2) an organizational structure defining the duties, responsibilities, and information flow among all levels of government; (3) an inventory of state and federal programs related to drought emergencies; (4) a mechanism to improve the timely and accurate assessment of drought impact; and, (5) the provision of accurate and timely information to media.

The National Drought Mitigation Center outlines ten steps to drought planning.

- (1) Appoint a drought task force.
- (2) Determine the purpose and objectives of the drought plan.
- (3) Seek stakeholder participation and resolve conflict.
- (4) Inventory resources and identify at-risk groups.
- (5) Develop an organizational structure.
- (6) Prepare an actual drought plan; then integrate science and policy.
- (7) Close institutional gaps and publicize the proposed plan.
- (8) Solicit reactions from all parties.
- (9) Implement the plan and coordinate education programs.
- (10) Conduct a post-drought evaluation.

6.4 MODEL WATER CONSERVATION PLANS FROM TCEQ

Water Conservation Plan forms are available from TCEQ in WordPerfect and PDF formats. Forms for the following entity types are available at the links below. Print copies of forms may be obtained by calling 512-239-4691 or by emailing wras@tceq.state.tx.us. (http://www.tceq.state.tx.us/permitting/water_supply/water_rights/contingency.html)

Municipal Users - *Utility Profile and Water Conservation Plan Requirements for Municipal Water Use by Public Water Suppliers* (TCEQ-10218) (<http://www.tceq.state.tx.us/>)

Wholesale Public Water Suppliers - *Profile and Water Conservation Plan Requirements for Wholesale Public Water Suppliers* (TCEQ-20162) [WordPerfect](#) or [PDF](#) (<http://www.tceq.state.tx.us/>)

Industrial/Mining Users - *Industrial/Mining Water Conservation Plan* (TCEQ-10213) [WordPerfect](#) or [PDF](#) (<http://www.tceq.state.tx.us/>)

Agricultural Users – (<http://www.tceq.state.tx.us/>)

- *Agriculture Water Conservation Plan for Non-Irrigation System* (TCEQ-10541) [WordPerfect](#) or [PDF](#)
- *System Inventory and Water Conservation Plan for Individually-Operated Irrigation System* (TCEQ-10238) [WordPerfect](#) or [PDF](#)
- *System Inventory and Water Conservation Plan for Agricultural Water Suppliers Providing Water to More Than One User* (TCEQ-10244) [WordPerfect](#) or [PDF](#)

6.5 WATER CONSERVATION TIPS

The TWDB provides significant information and services about water conservation at <http://www.twdb.state.tx.us/assistance/conservation/consindex.asp>. Likewise, *Water Conservation Tips* was developed by the TCEQ's Clean Texas 2000. It is also recommended to use native plant species that will be more drought tolerant and require less water than non native pant species.

6.6 POTENTIAL DROUGHT RELIEF PROGRAMS

The State of Texas has prepared a report explaining various potential drought relief options. The U.S. Department of Agriculture (USDA) offers eight different programs through the Farm Service Agency (FSA).

(1) The Conservation Reserve Program (CRP) offers cost-sharing of up to 50 percent of expenses for specific new conservation practices on existing Conservation Reserve Program land.

(2) The Emergency Haying and Grazing Program provides help in approved counties to livestock producers when yield of hay and pastureland have been substantially reduced by widespread natural disaster (in this case, a drought). This program gives livestock producers authority to harvest hay and allows livestock to graze croplands devoted to the Conservation Reserve Program, from date of authorization through the date established by the federal agency. Currently, four million acres of conservation land in Texas are permitted for grazing or haying.

(3) Farm Operating Loans provides growers funds to pay expenses, refinance debts, purchase livestock and farm equipment, and make minor improvements to buildings and real estate. Assistance comes in the forms of direct loans, guaranteed/insured loans, and technical help.

(4) Farm Ownership Loans is meant to assist farmers with developing, constructing, improving, or repairing their farms, farm homes, and service buildings; it also assists with drilling wells, improving farm water supplies, and making other necessary improvements. Aid takes the forms of direct loans, guaranteed/insured loans, and technical assistance.

(5) The Environmental Quality Incentive Program (EQIP) provides assistance through cost-sharing of various practices such as livestock water wells, livestock watering facilities, and pasture reseeding. Recipients must be agricultural producers.

(6) The Non-insured Crop Disaster Assistance Program (NAP) targets losses in commercially grown food or fiber crops resulting from natural disasters (in this case, drought). When catastrophic risk protection is not otherwise available, the program pays producers directly for such yield losses.

(7) The Farm Labor Housing Loans and Grants Program offers project grants and/or guaranteed/insured loans to provide decent, safe, and sanitary low-rent housing and related facilities for domestic farm laborers.

Another program in this category, the Rural Housing Site Loan provides direct loans for purchasing and developing adequate sites for water and sewer facilities (if otherwise unavailable), including necessary equipment (which becomes a permanent part of the development) and money for legal fees and closing costs.

(8) Finally, the Natural Resources Conservation Service (NRCS) provides three programs. One, the Emergency Watershed Protection (EWP) program, assists sponsors who implement emergency recovery measures that relieve imminent hazards to life and property when a natural disaster causes sudden watershed impairment. Assistance comes in the form of direct payments and technical help. Secondly, the Resource Conservation and Development (RC&D) Program provides technical assistance and coordination of projects including land

and water conservation, water resource improvements, fire prevention, public recreational developments, and waste disposal projects. A third scheme is the Watershed Surveys and Investigations Program, offering technical and data services to help solve water and related land resource problems.

Another source of assistance is the U.S. Department of Commerce's Economic Development Administration Program (EDA), which provides grants to pay for developing strategies to alleviate long-term economic deterioration or sudden and severe economic dislocation, or to pay for a project to implement such a strategy.

Programs with official declaration are also available. For example, with a U.S. Declaration the Secretary of Agriculture offers emergency loans to assist established family farmers, ranchers, and aquaculture operators in covering losses from disasters such as drought. With an SBA Declaration, the Small Business Administration offers Economic Injury Disaster Loans (EIDL) to assist businesses suffering economic injury created by certain presidential-, Secretary of Agriculture-, and/or SBA-declared disasters.

Moreover, Special Agriculture Designation of the Emergency Conservation Program provides CIS assistance to agriculture producers who have suffered severe damage to farmland as a result of natural disasters such as drought. Damage must be of such magnitude that the producer cannot afford to rehabilitate without federal assistance; direct payments are made for specified uses. Alternatively, a Governor's Declaration offers two available programs. One, the Emergency Water Supply/Drought Assistance Program, is implemented by the U.S. Army Corps of Engineers (COE). The COE is authorized to construct wells and transport water for human consumption only during emergencies in drought-distressed areas (not including recreational uses). Another avenue of relief comes through the Reclamation State Emergency Drought Relief Act of 1991. The Act's Title I provides for construction, management, and conservation activities to minimize losses and damages resulting from drought conditions.

Finally, several programs to make drought more bearable may be offered in case of a Presidential Disaster Declaration. The Disaster Relief and Emergency Assistance Program, Workforce Investment Program, Disaster Unemployment Assistance (DUA), and Emergency Community Water Assistance Grants (ECWAGs) are only available when the President himself declares an official disaster.

ATTACHMENT 6-1 Model Drought Contingency Plan for Water Supply Corporations

Texas Commission on Environmental Quality

**DROUGHT CONTINGENCY PLAN
FOR**

(Name of Utility)

(Address, City, Zip Code)

(CCN#)

(PWS #s)

(Date)

Section 1 Declaration of Policy, Purpose, and Intent
of a public meeting to accept input on the Plan

The meeting took place at: _____.

In cases of extreme drought, periods of abnormally high usage, system contamination, or extended reduction in ability to supply water due to equipment failure, temporary restrictions may be instituted to limit nonessential water usage. The purpose of the Drought Contingency Plan (Plan) is to encourage customer conservation in order to maintain supply, storage, or pressure or to comply with the requirements of a court, government agency, or other authority.

Please note: Water restriction is not a legitimate alternative if a water system does not meet the Texas Commission on Environmental Quality (TCEQ) capacity requirements under normal conditions **or** if the utility fails to take all immediate and necessary steps to replace or repair malfunctioning equipment.

Section 2 Public Involvement

Opportunity for the public to provide input into the preparation of the Plan was provided by:
(check at least one of the following)

9 scheduling and providing public notice

Date: _____ Time: _____ Location: _____

9 mailed survey with summary of results (attach survey and results)

9 bill insert inviting comment (attach bill insert)

9 other method _____

Section 3 Public Education

The _____ (*name of utility*) 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.

Drought plan information will be provided by:
(check at least one of the following)

9 public meeting

9 press releases

9 utility bill inserts

9 other _____

Section 4 Coordination with Regional Water Planning Groups

The service area of the _____ (*name of your utility*) is located within Regional Water Planning Group (RWPG) _____.

_____ (*name of your utility*) has mailed a copy of this Plan to the RWPG.

Section 5 Notice Requirements

Written notice will be provided to each customer **prior to implementation or termination of each stage of the water restriction program**. Mailed notice must be given to each customer 72 hours prior to the start of water restriction. If notice is hand-delivered, the utility cannot enforce the provisions of the plan for 24 hours after notice is provided. The written notice to customers will contain the following information:

1. the date restrictions will begin;
2. the circumstances that triggered the restrictions;
3. the stages of response and explanation of the restrictions to be implemented; and,
4. an explanation of the consequences for violations.

The utility must notify the TCEQ by telephone at (512) 239-4691 or by electronic mail at watermon@tceq.state.tx.us prior to implementing Stage III and must notify, in writing, the Public Drinking Water Section at MC - 155, P.O. Box 13087, Austin, Texas 78711-3087 within five (5) working days of implementation, including a copy of the utility's restriction notice. The utility must file a status report of its restriction program with the TCEQ at the initiation and termination of mandatory water use restrictions (i.e., Stages III and IV).

Section 6 Violations

1. First violation: The customer will be notified by written notice of their specific violation.
2. Subsequent violations:
 - a. After written notice, the utility may install a flow restricting device in the line to limit the amount of water which will pass through the meter in a 24-hour period. The utility may charge the customer for the actual cost of installing and removing the flow restricting device, not to exceed \$50.00.
 - b. After written notice, the utility may discontinue service at the meter for a period of seven (7) days, or until the end of the calendar month, whichever is LESS. The normal reconnect fee of the utility will apply for restoration of service.

Section 7 Exemptions or Variances

The utility may grant any customer an exemption or variance from the drought contingency plan for good cause **upon written request**. A customer who is refused an exemption or variance may appeal such action of the utility, in writing, to the Texas Commission on Environmental Quality. The utility will treat all customers equally concerning exemptions and variances, and shall not discriminate in granting exemptions and variances. No exemption or variance shall be retroactive or otherwise justify any violation of this Plan occurring prior to the issuance of the variance.

Section 8 Response Stages

Unless there exists an immediate and extreme reduction in water production or some other absolute necessity to declare an emergency or severe condition, the utility will initially declare Stage I restrictions. If, after a reasonable period of time, demand is not reduced enough to alleviate outages, reduce the risk of outages, or comply with restrictions required by a court, government agency or other authority, Stage II may be implemented with Stage III to follow, if necessary.

STAGE I - CUSTOMER AWARENESS

Stage I will begin:

Every April 1st, the utility will mail a public announcement to its customers. No notice to TCEQ is required.

Stage I will end:

Every September 30th, the utility will mail a public announcement to its customers. No notice to TCEQ is required.

Utility Measures:

This announcement will be designed to increase customer awareness of water conservation and to encourage the most efficient use of water. A copy of the current public announcement on water conservation awareness shall be kept on file available for inspection by TCEQ.

Voluntary Water Use Restrictions:

Water customers are requested to voluntarily limit the use of water for nonessential purposes and to practice water conservation.

STAGE II - VOLUNTARY WATER CONSERVATION:

Target: Achieve a _____ percent reduction in _____ (example: total water use, daily water demand, etc.).

The water utility will implement Stage II when any one of the selected triggers is reached.

Region M Regional Water Plan

Supply-Based Triggers: (Check at least one and fill in the appropriate value.)

- 9 Well level reaches _____ ft. mean sea level (m.s.l.).
- a. Overnight recovery rate reaches _____ ft.
- b. Reservoir elevation reaches _____ ft. (m.s.l.).
- c. Stream flow reaches _____ cfs at USGS gauge # _____.
- d. Wholesale supplier's drought Stage II _____
- e. Annual water use equals _____ % of well permit/water right/purchased water contract amount.
- f. Other _____

Demand- or Capacity-Based Triggers: (Check at least one and fill in the appropriate value.)

- g. Drinking water treatment as % of capacity _____ %
- h. Total daily demand as % of pumping capacity _____ %
- i. Total daily demand as % of storage capacity _____ %
- j. Pump hours per day _____ hrs.
- k. Production or distribution limitations
- l. Other _____

Upon initiation and termination of Stage II, the utility will mail a public announcement to its customers. No notice to TCEQ is required.

Requirements for Termination:

Stage II of the Plan may end when all of the conditions listed as triggering events have ceased to exist for a period of three (3) consecutive days. Upon termination of Stage II, Stage I becomes operative.

Utility Measures:

Visually inspect lines and repair leaks on a daily basis. Review customer use records monthly, and follow up on any that have unusually high usage.

Describe additional measures, if any, to be implemented directly by the utility to manage limited water supplies and/or reduce water demand. Examples include reduced or discontinued flushing of water mains, activation and use of alternative supply source(s), and use of reclaimed water for non-potable purposes.

The second water source for _____ (name of utility) is: (check one)

- 9 other well
- 9 inter-connection with other system
- 9 purchased water
- 9 other _____

Voluntary Water Use Restrictions:

1. Restricted Hours: Outside watering is allowed daily, but only during periods specifically described in the customer notice (*between 10:00 pm and 5:00 am, for example*).
2. Restricted Days/Hours: Water customers are requested to voluntarily limit the irrigation of landscaped areas with hose-end sprinklers or automatic irrigation systems. Customers are requested to limit outdoor water use to **Mondays for water customers with a street address ending in 1, 2, or 3; Wednesdays for water customers with a street address ending in 4, 5, or 6; and Fridays for water customers with a street address ending in 7, 8, 9, or 0.** Irrigation of landscaped areas is further limited to the hours of 12:00 midnight until 10:00 am and between 8:00 pm and 12:00 midnight on designated watering days. However, irrigation of landscaped areas is permitted at any time by means of a hand-held hose, a faucet-filled bucket or watering can of five (5) gallons or less, or a drip irrigation system.
3. Other uses that waste water, such as water running down gutters.

STAGE III - MANDATORY WATER USE RESTRICTIONS:

Target: Achieve a _____ percent reduction in _____ (example: total water use, daily water demand, etc.)

The water utility will implement Stage III when any one of the selected triggers is reached.

Supply-Based Triggers: (Check at least one and fill in the appropriate value.)

1. Well level reaches _____ ft. (m.s.l.)
2. Overnight recovery rate reaches _____ ft.
3. Reservoir elevation reaches _____ ft. (m.s.l.)
4. Stream flow reaches _____ cfs at USGS gauge # _____
5. Wholesale supplier's drought Stage III _____
6. Annual water use equals _____ % of well permit/water right/purchased water contract amount
7. Other _____

Demand- or Capacity-Based Triggers: (check at least one and fill in the appropriate value)

8. Drinking water treatment as % of capacity _____ %
9. Total daily demand as % of pumping capacity _____ %
10. Total daily demand as % of storage capacity _____ %
11. Pump hours per day _____ hrs.

12. Production or distribution limitations
13. Other _____

Upon initiation and termination of Stage III, the utility will mail a public announcement to its customers. Notice to TCEQ is required.

Requirements for Termination:

Stage III of the Plan may end when all of the conditions listed as triggering events have ceased to exist for a period of three (3) consecutive days. Upon termination of Stage III, Stage II becomes operative.

Utility Measures:

Visually inspect lines and repair leaks on a regular basis. Flushing is prohibited except for dead end mains.

Describe additional measures, if any, to be implemented directly by the utility to manage limited water supplies and/or reduce water demand. Examples include activation and use of alternative supply source(s), use of reclaimed water for non-potable purposes, and offering low-flow fixtures and water restrictors.

Mandatory Water Use Restrictions

The following water use restrictions shall apply to all customers:

1. Irrigation of landscaped areas with hose-end sprinklers or automatic irrigation systems **shall be limited to Mondays for water customers with a street address ending in 1, 2, or 3; Wednesdays for water customers with a street address ending in 4, 5, or 6; and Fridays for water customers with a street address ending in 7, 8, 9, or 0.** Irrigation of landscaped areas is further limited to the hours of 12:00 midnight until 10:00 am and between 8:00 pm and 12:00 midnight on designated watering days. However, irrigation of landscaped areas is permitted at any time if it is by means of a hand-held hose, a faucet-filled bucket or watering can of five (5) gallons or less, or a drip irrigation system.
2. Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane, or other vehicle is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 am and between 8:00 pm and 12:00 midnight. Such washing, when allowed, shall be done with a hand-held bucket or a hand-held hose equipped with a positive shutoff nozzle for quick rinses. Vehicle washing may be done at any time on the immediate premises of a commercial car wash or commercial service station. Further, such washing may be exempted from these regulations if the health, safety, and welfare of the public are contingent upon frequent vehicle cleansing, such as garbage trucks and vehicles used to transport food and perishables.

3. Use of water to fill, refill, or add to any indoor or outdoor swimming pool, wading pool, or “jacuzzi” type pool is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 am and between 8:00 pm and 12:00 midnight.
4. Operation of any ornamental fountain or pond for aesthetic or scenic purposes is prohibited except where necessary to support aquatic life or where such fountains or ponds are equipped with a recirculation system.
5. Use of water from hydrants or flush valves shall be limited to maintaining public health, safety, and welfare.
6. Use of water for the irrigation of golf courses, parks, and green belt areas is prohibited except by hand-held hose, and then only on designated watering days between the hours of 12:00 midnight and 10:00 am and between 8:00 pm and 12:00 midnight.
7. The following uses of water are defined as nonessential and are prohibited:
 - a. washing down of any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;
 - b. use of water to wash down buildings or structures for purposes other than immediate fire protection;
 - c. use of water for dust control;
 - d. flushing gutters or permitting water to run or accumulate in any gutter or street;
 - e. failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s); and
 - f. any waste of water.

STAGE IV - CRITICAL WATER USE RESTRICTIONS:

Target: Achieve a _____ percent reduction in _____ (example: total water use, daily water demand, etc.) .

The water utility will implement Stage IV when any one of the selected triggers is reached.

Supply-Based Triggers: (Check at least one and fill in the appropriate value.)

14. Well level reaches _____ ft. (m.s.l.)
15. Overnight recovery rate reaches _____ ft.
16. Reservoir elevation reaches _____ ft. (m.s.l.)
17. Stream flow reaches _____ cfs at USGS gauge # _____

Region M Regional Water Plan

18. Wholesale supplier's drought Stage IV _____
19. Annual water use equals _____ % of well permit/water right/purchased water contract amount
20. Supply contamination
21. Other _____

Demand- or Capacity-Based Triggers: (Check at least one and fill in the appropriate value.)

22. Drinking water treatment as % of capacity _____ %
23. Total daily demand as % of pumping capacity _____ %
24. Total daily demand as % of storage capacity _____ %
25. Pump hours per day _____ hrs.
26. Production or distribution limitations
27. System outage
28. Other _____

Upon initiation and termination of Stage IV, the utility will mail a public announcement to its customers. Notice to TCEQ is required.

Requirements for Termination:

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

Operational Measures:

The utility shall visually inspect lines and repair leaks on a daily basis. Flushing is prohibited except for dead end mains and only between the hours of 9:00 pm and 3:00 am. Emergency interconnects or alternative supply arrangements shall be initiated. All meters shall be read as often as necessary to insure compliance with this program for the benefit of all customers. *Describe additional measures, if any, to be directly implemented to manage limited water supplies and/or reduce water demand.*

Mandatory Water Use Restrictions: (All outdoor use of water is prohibited.)

1. Irrigation of landscaped areas is absolutely prohibited.
2. Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane, or other vehicle is absolutely prohibited.

SYSTEM OUTAGE or SUPPLY CONTAMINATION

Notify the TCEQ Regional Office immediately.

**EXAMPLE RESOLUTION FOR ADOPTION OF A
DROUGHT CONTINGENCY PLAN**

RESOLUTION NO. _____

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE _____

(name of water user group) ADOPTING A DROUGHT CONTINGENCY PLAN.

WHEREAS, the Board recognizes that the amount of water available to the _____ (name of water supplier) and its water utility customers are limited and subject to depletion during periods of extended drought;

WHEREAS, the Board recognizes that natural limitations due to drought conditions and other acts of God cannot guarantee an uninterrupted water supply for all purposes;

WHEREAS, Section 11.1272 of the Texas Water Code and applicable rules of the Texas Commission on Environmental Quality require all public water supply systems in Texas to prepare a drought contingency plan; and

WHEREAS, as authorized under law, and in the best interests of the customers of the _____ (*name of water supply system*), the Board deems it expedient and necessary to establish certain rules and policies for the orderly and efficient management of limited water supplies during drought and other water supply emergencies;

NOW THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE _____ (*name of water user group*):

SECTION 1. That the Drought Contingency Plan attached hereto as Exhibit "A" and made a part hereof for all purposes be, and the same is hereby, adopted as the official policy of the _____ (*name of water supplier*).

SECTION 2. That the _____ (*e.g., general manager*) is hereby directed to implement, administer, and enforce the Drought Contingency Plan.

SECTION 3. That this resolution shall take effect immediately upon its passage.

DULY PASSED BY THE BOARD OF DIRECTORS OF THE _____ (*name of water user group*), ON THIS ___ day of _____, 20__.

President, Board of Directors

ATTESTED TO:

Secretary, Board of Director

**ATTACHMENT 6-2 Model Water Conservation
Plan FOR MUNICIPAL WATER USE**

Texas Commission on Environmental Quality



REQUIREMENTS FOR WATER CONSERVATION PLANS FOR MUNICIPAL WATER USE BY PUBLIC WATER SUPPLIERS

In addition to the utility profile, a water conservation plan for municipal use by a public water supplier must include, at a minimum, additional information as required by Title 30, Texas Administrative Code, §288.2. Note: If the water conservation plan does not provide information for each requirement, an explanation must be included as to why the requirement is not applicable.

Specific, Quantified 5 & 10-Year Targets

The water conservation plan must include specific, quantified five-year and ten-year targets for water savings to include goals for water loss programs and goals for *municipal use in gallons per capita per day* (see Appendix A). Note that the goals established by a public water supplier under this subparagraph are not enforceable.

Metering Devices

The water conservation plan must include a statement about the water supplier's metering device(s), within an accuracy of plus or minus five percent (5.0%), in order to measure and account for the amount of water diverted from the source of supply.

Universal Metering

The water conservation plan must include a program for universal metering of both customer and public uses of water, for meter testing and repair, and for periodic meter replacement.

Unaccounted-For Water Use

The water conservation plan must include measures to determine and control unaccounted-for uses of water. Examples are periodic visual inspections along distribution lines, annual or monthly audits of the water system to determine illegal connections, abandoned services; etc.).

Continuing Public Education & Information

The water conservation plan must include a description of the program of continuing public education and information regarding water conservation by the water supplier.

Non-Promotional Water Rate Structure

The water supplier must have a water rate structure which is not "promotional," i.e., a rate structure which is cost-based and which does not encourage the excessive use of water. This rate structure must be listed in the water conservation plan.

Reservoir Systems Operations Plan

The water conservation plan must include a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin in order to optimize available water supplies.

Enforcement Procedure & Plan Adoption

The water conservation plan must include a means of implementation and enforcement which shall be evidenced by 1) a copy of the ordinance, resolution, or tariff indicating **official adoption** of the water conservation plan by the water supplier; and, 2) a description of the authority by which the water supplier will implement and enforce the conservation plan.

Coordination with the Regional Water Planning Group(s)

The water conservation plan must include documentation of coordination with the regional water planning group(s) for the service area of the public water supplier in order to ensure consistency with the appropriate approved regional water plans.

Example statement to be included within the water conservation plan:

The service area of the _____ (name of water supplier) is located within the _____ (name of regional water planning area or areas) and _____ (name of water supplier) has provided a copy of this water conservation plan to the _____ (name of regional water planning group or groups).

Additional Requirements:

(for suppliers serving populations of 5,000 or more or a projected population of 5,000 or more within ten years)

1. Program for Leak Detection, Repair, and Water Loss Accounting

The plan must include a description of the program of leak detection, repair, and water loss accounting for the water transmission, delivery, and distribution system in order to control unaccounted for uses of water.

2. Record Management System

The plan must include a record management system (to record water pumped, water deliveries, water sales, and water losses) which allows for the desegregation of water sales and uses into the following user classes-- residential, commercial, public and institutional, and industrial.

Plan Review and Update

Beginning May 1, 2005, a public water supplier for municipal use shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. The public water supplier for municipal use shall review and update the next revision of its water conservation plan not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group. The revised plan must also include an implementation report.

Best Management Practices Guide

On November 2004, the Texas Water Development Board's (TWDB) Report 362 was completed by the Water Conservation Implementation Task Force. Report 362 is the Water Conservation Best Management Practices (BMP) Guide. The BMP Guide is a voluntary list of management practices that water users may implement in addition to the required components of Title 30, Texas Administrative Code, Chapter 288. The BMP Guide is available on the TWDB's website at the link below or by calling (512) 463-7847.

<http://www.twdb.state.tx.us/assistance/conservation/TaskForceDocs/WC>

**ATTACHMENT 6-3 Model Water Conservation
& Drought Contingency Plan For A (Water
User Group)**

**Water Conservation &
Model Drought Contingency Plan
For [WATER USER GROUP]**

Date

CONTENTS OF PLAN

1. Objectives for Water User Group
2. Texas Commission on Environmental Quality Rules (Texas Administrative Codes)
3. Water Conservation Plan
4. Public & School Education
5. Coordination with Region M Planning Group
6. Drought Contingency Plan
7. Review and Update of Drought Contingency Plan

1. Water Conservation Plan for [Public Water Supplier]

Objectives

- To reduce the loss and waste of water
- To reduce water consumption
- To improve the efficiency in the use of water

Model Drought Contingency Plan for [Public Water Supplier]

Objectives

This drought contingency plan (the Plan) is intended for use by [municipal water supplier]. The plan includes all current TCEQ requirements for a drought contingency plan.

This drought contingency plan serves to:

- To conserve available water supplies during times of drought and emergency.
- To reduce adverse impacts of water supply shortages.
- To reduce the adverse impacts of emergency water supply conditions.
- To preserve public health, welfare, and safety.

2. Texas Commission on Environmental Quality Rules

Water Conservation & Drought Contingency Plans

The TCEQ rules governing development of water conservation plans for public water suppliers are contained in Title 30 part 1, Chapter 288, Subchapter A, Rule 288.2 of the Texas Administrative Code. According to TCEQ rules, water conservation plans for public water suppliers must have a certain minimum content, Must have additional content for public water suppliers that are projected to supply 5,000 or more people in the next ten years and may have additional optional content.

The TCEQ rules governing development of drought contingency plans for public water suppliers are contained in Title 30, Part 1, Chapter 288, Subchapter B, Rule 288.20 of the Texas Administrative Code.

Minimum Conservation Plan Requirements

The minimum requirements in the Texas Administrative Code for Water Conservation

Region M Regional Water Plan

Plans for Public Water Suppliers are covered in this report as follows:

- 288.2(a)(1)(A) – Utility Profile,
- 288.2(a)(1)(B) – Specification of Goals,
- 288.2(a)(1)(C) – Accurate Metering ,
- 288.2(a)(1)(D) – Universal Metering,
- 288.2(a)(1)(E) – Determination and Control of Unaccounted Water,
- 288.2(a)(1)(F) – Public Education and Information Program,
- 288.2(a)(1)(G) – Non-Promotional Water Rate Structure,
- 288.2(a)(1)(H) – Reservoir System Operation Plan,
- 288.2(a)(1)(I) – Means of Implementation and Enforcement, and
- 288.2(a)(1)(J) – Coordination with Regional Water Planning Group

Additional Conservation Strategies

TCEQ rules also list additional optional but not required conservation strategies, which may be adopted by suppliers. The following optional strategies are included in this plan:

- 288.2(a)(3)(A) – Conservation Oriented Water Rates,
- 288.2(a)(3)(B) – Ordinances, Plumbing Codes or Rules on Water-Conserving
- 288.2(a)(3)(F) – Considerations for Landscape Water Management Regulations
- 288.2(a)(3)(G) – Monitoring Method

Conservation Additional Requirements (Population over 5,000)

The Texas Administrative Code includes additional requirements for water conservation plans for cities with a population over 5,000:

- 288.2(a)(2)(A) – Leak Detection, Repair, and Water Loss Accounting – Sections 5.3, 5.4, and 5.5,
- 288.2(a)(2)(B) – Record Management System – Sect. 5.2, and
- 288.2(a)(2)(C) – Requirement for Water Conservation Plans by Wholesale

3.

WATER CONSERVATION PLAN FOR THE (Name of Water User Group) (Date)

[Water User Group] will give customers the opportunity to provide public input into the preparation of the plan by one of the following methods:

- Holding a public meeting.
- Providing written notice of the proposed plan and the opportunity to comment on the plan by newspaper or posted notice.

Utility Profile

The utility profile will provide information which will include population and customer data, water use data, water supply system data, and wastewater system data.

Region M Regional Water Plan

Utility Profile	
Water Service Area	
Population	
Projected Population in 2060	
Projected Population in 2010	
Current Population	
Current Connections	
Total Increase in Connections in Last Ten Years	
Total Increase in Connections in Last Five Years	
Miles of Distribution Pipe	
Water Supply Sources	
Number of Water Treatment Plants	
Treatment Plant Capacity #1	
Treatment Plant Capacity #2	
Number of Ground Storage Tanks	
Ground Storage Tank Capacity #1	
Ground Storage Tank Capacity #2	
Number of Elevated Storage Tanks	
Elevated Storage Tank Capacity #1	
Elevated Storage Tank Capacity #2	
Current Total Annual Wastewater Flow	

Specification of Water Conservation Goals

Region M Regional Water Plan

This section must include 5, 10, & 20 year targets for water savings. This will include goals for water loss programs and goals for municipal use in gallons per capita per day.

1. The Water User Group's water conservation Goals for the ____ years:
2. Achieve ____ per capita municipal water use of ____ gpcd or less, as shown in following table. This will represent a reduction of ____ gpcd from TWDB's projected per capita municipal water use without low-flow plumbing fixtures or other conservation measures.
3. Implement and maintain a meter replacement program.
4. Keep the level of unaccounted water in the system less than ____ percent in ____ (Target year) and subsequent years.
5. Raise Public Awareness of water conservation and encourage responsible public behavior through a public/school education and information program.
6. Implement a Reservoir System Operation Plan
The _____ (WUG Name) has the following rights to divert water from _____ Reservoir.
*This plan must include a reservoir system operation plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin in order to optimize available water supplies.
7. (Optional) Decrease waste in lawn irrigation through implementation and enforcement of a landscape water management ordinance.
8. (Optional) Decrease outdoor water use by implementing; residential customer water audit, landscape irrigation systems rebate program, and landscape design and conversion program.
9. (Optional) Create a non-promotional water rate structure
Must include a water rate structure that is not "promotional" i.e, a rate structure which is cost based and which does not encourage excessive use of water with the intent of encouraging water conservation.

***Attachment 6-4 of Chapter Six of this Water plan has several Best Management Practices that can be used for water conservation.**

4. Public Education & School Education

[Public water supplier] will notify the public & public Schools about the drought contingency plan, including changes in Stage and drought measures to be implemented, by one or more of the following methods:

- Prepare a description of the Plan and make it available to customers at appropriate locations.

Region M Regional Water Plan

- Include utility bill inserts that detail the Plan
- Provide radio announcements that inform customers of stages to be initiated or terminated and drought measures to be taken
- Include an ad in a newspaper of general circulation to inform customers of stages to be initiated or terminated and drought measures to be taken

5. Coordination with the Region M Water Planning Group

This drought contingency plan will be sent to the Chair of the Region M Water Planning Group in order to ensure consistency with the Region M Water Plan. If any changes are made to the model conservation plan, a copy of the newly adopted plan will be sent to the Regional Water Planning Group.

6.

**DROUGHT CONTINGENCY PLAN
FOR THE
(Name of Water User Group)
(Date)**

Section I: Declaration of Purpose, Policy, 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 _____ (*name of water user group*) hereby adopts the following regulations and restrictions on the delivery and consumption of water through an ordinance/or resolution. (see Appendix C for an example.)

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 conditions 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 _____ (*name of wateruser group*) by means of _____ (*describe methods used to inform the public about the preparation of the plan and provide opportunities for input; for example, scheduling and providing public notice of a public meeting to accept input on the Plan*).

Section III: Public Education

The _____ (*name of water user group*) will periodically provide the public with information about the Plan, including the conditions under which each stage is to be

Region M Regional Water Plan

initiated or terminated and the drought response measures to be implemented in each stage. This information will be provided by means of _____ (*describe methods to be used to provide information to the public about the Plan; for example, public events, press releases, or utility bill inserts*).

Section IV: Coordination with Regional Water Planning Groups

The service area of the _____ (*name of water user group*) is located within the _____ (*name of regional water planning area or areas*) and _____ (*name of water user group*) has provided a copy of this Plan to the _____ (*name of regional water planning group or groups*).

Section V: Authorization

The _____ (*designated official; for example, the mayor, city manager, utility director, general manager, etc.*) 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 _____ (*designated official*) 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 _____ (*name of supplier*). 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

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: practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficient 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

Region M Regional Water Plan

Customer: any person, company, or organization using water supplied by _____ (*name of water user group*)

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 of greater value and usability

Landscape irrigation use: water used for 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 or 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;
 - use of water to wash down buildings or structures for purposes other than immediate fire protection
 - flushing gutters or permitting water to run or accumulate in any gutter or street
 - use of water to fill, refill, or add to any indoor or outdoor swimming pool or jacuzzi-type pool
 - use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life
 - failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s)
 - use of water from hydrants for construction purposes or any purposes other than fire-fighting

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 _____ (*designated official*) or his/her designee shall monitor water supply and/or demand conditions on a _____ (*e.g., daily, weekly, monthly*) basis and shall

Region M Regional Water Plan

determine when conditions warrant initiation or termination of each stage of the Plan; that is, when the specified “triggers” are reached.

The triggering criteria described below are based on

(Provide a brief description of the rationale for the triggering criteria; for example, statistical analysis of the vulnerability of the water source under drought of record conditions, or known system capacity limits.)

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 VII–Definitions, when

(Describe triggering criteria / trigger levels; see examples below.)

Following are examples of the types of triggering criteria that might be used in one or more successive stages of a drought contingency plan. One or a combination of such criteria must be defined for each drought response stage, but usually not all will apply. Select those appropriate to your system:

Example 1: Annually, beginning on May 1 through September 30.

Example 2: When the water supply available to the _____ (*name of water user group*) is equal to or less than _____ (*acre-feet, percentage of storage, etc.*).

Example 3: When, pursuant to requirements specified in the _____ (*name of water user group's*) wholesale water purchase contract with _____ (*name of wholesale water user group*), notification is received requesting initiation of Stage 1 of the Drought Contingency Plan.

Example 4: When flows in the _____ (*name of stream or river*) are equal to or less than _____ cubic feet per second.

Example 5: When the static water level in the _____ (*name of water user group's*) well(s) is equal to or less than _____ feet above/below mean sea level.

Example 6: When the specific capacity of the _____ (*name of water user group's*) well(s) is equal to or less than _____ percent of the well's original specific capacity.

Region M Regional Water Plan

Example 7: When total daily water demand equals or exceeds _____ million gallons for ___ consecutive days of _____ million gallons on a single day (e.g., based on the “safe” operating capacity of water supply facilities).

Example 8: Continually falling treated water reservoir levels which do not refill above ___ percent overnight (e.g., based on an evaluation of minimum treated water storage required to avoid system outage).

The public water user group may also devise other triggering criteria which are tailored to its system.

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 ___ (e.g., 3) consecutive days.

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 _____ (describe triggering criteria; see examples in Stage 1).

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 _____ (e.g., 3) 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 of this Plan when _____ (describe triggering criteria; see examples in Stage 1).

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 _____ (e.g., 3) consecutive days. Upon termination of Stage 3, Stage 2 becomes operative.

Stage 4 Triggers -- CRITICAL Water Shortage Conditions

Requirements for Initiation

Region M Regional Water Plan

Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 4 of this Plan when _____ (*describe triggering criteria; see examples in Stage 1*).

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 ____ (*e.g., 3*) consecutive days. Upon termination of Stage 4, Stage 3 becomes operative.

Stage 5 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 _____ (*designated official*) or his/her designee determines that a water supply emergency exists based on:

1. major water line breaks or pump or system failures, 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 for a period of ____ (*e.g., 3*) consecutive days.

Stage 6 Triggers -- WATER ALLOCATION

Requirements for Initiation

Customers shall be required to comply with the water allocation plan prescribed in Section IX of this Plan and to comply with the requirements and restrictions for Stage 5 of this Plan when _____ (*describe triggering criteria, see examples in Stage 1*).

Requirements for Termination --- Water allocation may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of ____ (*e.g., 3*) consecutive days.

Note: The inclusion of WATER ALLOCATION as part of a drought contingency plan may not be required in all cases. For example, for a given water user group, an analysis of water supply availability under drought-of-record conditions may indicate essentially no risk of water supply shortage. Hence, a drought contingency plan for such a water user group might only address facility capacity limitations and emergency conditions (*e.g., supply source contamination and system capacity limitations*).

Section IX: Drought Response Stages

The _____ (*designated official*) 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 _____ (*designated official*) or his/ her designee shall notify the public by means of:

Examples:
publication in a newspaper of general circulation
direct mail to each customer
public service announcements
signs posted in public places
take-home fliers at schools

Additional Notification:

The _____ (*designated official*) or his/ her designee shall notify directly, or cause to be notified directly, the following individuals and entities:

Examples:
mayor / chairman and members of the city council / utility board
fire chief(s)
city and/or county emergency management coordinator(s)
county judge and commissioner(s)
state disaster district / Department of Public Safety
TCEQ (*required when mandatory restrictions are imposed*)
major water users
critical water users (*i.e. hospitals*)
parks / streets superintendents & public facilities managers

Note: The plan should specify direct notice only as appropriate to respective drought stages.

Stage 1 Response -- MILD Water Shortage Conditions

Target: Achieve a voluntary ____ percent reduction in _____ (*e.g., total water use, daily water demand, etc.*).

Region M Regional Water Plan

Best Management Practices for Supply Management:

Describe measures, if any, to be implemented directly by _____ (*name of water user group*) to manage limited water supplies and/or reduce water demand. Examples include reduced or discontinued flushing of water mains, activation and use of an alternative supply source(s), and use of reclaimed water for non-potable purposes.

Voluntary Water Use Restrictions for Reducing Demand:

- (a) Water customers with a street address ending in even numbers (0, 2, 4, 6 or 8) are requested to voluntarily limit the irrigation of landscaped areas to Sundays and Thursdays. Water customers with a street address ending in odd numbers (1, 3, 5, 7 or 9) are requested to limit the irrigation of landscaped areas to Saturdays and Wednesdays. All water customers are to irrigate only between the hours of midnight and 10:00 am and 8:00 pm to midnight on designated days.
- (b) All operations of the _____ (name of water user group) shall adhere to water use restrictions prescribed for Stage 2 of the Plan.
- (c) Water customers are requested to practice water conservation and to minimize or discontinue water use for non-essential purposes.

Stage 2 Response -- MODERATE Water Shortage Conditions

Target: Achieve a ___ percent reduction in _____ (*e.g., total water use, daily water demand, etc.*).

Best Management Practices for Supply Management:

Describe measures, if any, to be implemented directly by _____ (*name of water user group*) to manage limited water supplies and/or reduce water demand. Examples include reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas, use of alternative supply source(s), and use of reclaimed water for non-potable purposes.

Water Use Restrictions for Demand Reduction:

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

- Irrigation of landscaped areas with hose-end sprinklers or automatic irrigation systems shall be limited to Sundays and Thursdays for customers with a street address ending in an even number (0, 2, 4, 6 or 8), and

Region M Regional Water Plan

Saturdays and Wednesdays for water customers with a street address ending in an odd number (1, 3, 5, 7 or 9). Irrigation of landscaped areas is further limited to the hours of 12:00 midnight until 10:00 am and between 8:00 pm and 12:00 midnight on designated watering days. However, irrigation of landscaped areas is permitted at any time by means of a hand-held hose, a faucet-filled bucket or watering can of five (5) gallons or less, or a drip irrigation system.

- Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane, or other vehicle is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 am and between 8:00 pm and 12:00 midnight. Such washing, when allowed, shall be done with a hand-held bucket or a hand-held hose equipped with a positive shutoff nozzle for quick rinses. Vehicle washing may be done at any time on the immediate premises of a commercial car wash or commercial service station. Further, such washing may be exempted from these regulations if the health, safety, and welfare of the public are contingent upon frequent vehicle cleansing, such as garbage trucks and vehicles used to transport food and perishables.
- Use of water to fill, refill, or add to any indoor or outdoor swimming pool, wading pool, or jacuzzi-type pool is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 am and between 8 pm and 12:00 midnight.
- Operation of any ornamental fountain or pond for aesthetic or scenic purposes is prohibited except where necessary to support aquatic life or where such fountain or pond is equipped with a recirculation system.
- Use of water from hydrants shall be limited to fire-fighting, related activities, or other actions 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 _____ (*name of water user group*).
- Use of water to irrigate golf course greens, tees, and fairways is prohibited except on designated watering days between the hours 12:00 midnight and 10:00 am and between 8 pm and 12:00 midnight. However, if the golf course utilizes a water source other than that provided by the _____ (*name of water user group*), the facility shall not be subject to these regulations.
- All restaurants are prohibited from serving water to patrons except upon request of the patron.
- The following uses of water are defined as non-essential and are prohibited:

Region M Regional Water Plan

- wash down of any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas
- 9 use of water to wash down buildings or structures for purposes other than immediate fire protection
- 9 use of water for dust control
- flushing gutters or permitting water to run or accumulate in any gutter or street
- failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s)

Stage 3 Response -- SEVERE Water Shortage Conditions

Target: Achieve a ___ percent reduction in _____ (e.g., total water use, daily water demand, etc.).

Best Management Practices for Supply Management:

Describe measures, if any, to be implemented directly by _____ (name of water user group) to manage limited water supplies and/or reduce water demand. Examples include reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas, use of alternative supply source(s), and use of reclaimed water for non-potable purposes.

Water Use Restrictions for Demand Reduction:

All requirements of Stage 2 shall remain in effect during Stage 3 except:

- Irrigation of landscaped areas shall be limited to designated watering days between the hours of 12:00 midnight and 10:00 am and between 8 pm and 12:00 midnight, and shall be by means of hand-held hoses, hand-held buckets, drip irrigation, or permanently installed automatic sprinkler systems only. The use of hose-end sprinklers is prohibited at all times.
- The watering of golf course tees is prohibited unless the golf course utilizes a water source other than that provided by the _____ (name of water user group).
- The use of water for construction purposes from designated fire hydrants under special permit is to be discontinued.

Stage 4 Response -- CRITICAL Water Shortage Conditions

Target: Achieve a ___ percent reduction in _____ (e.g., total water use, daily water demand, etc.).

Region M Regional Water Plan

Best Management Practices for Supply Management:

Describe measures, if any, to be implemented directly by _____ (*name of water user group*) to manage limited water supplies and/or reduce water demand. Examples include reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas, use of alternative supply source(s), and use of reclaimed water for non-potable purposes.

Water Use Restrictions for Reducing Demand:

All requirements of Stage 2 and 3 shall remain in effect during Stage 4 except:

- Irrigation of landscaped areas shall be limited to designated watering days between the hours of 6:00 am and 10:00 am and between 8:00 pm and 12:00 midnight and shall be by means of hand-held hoses, hand-held buckets, or drip irrigation only. The use of hose-end sprinklers or permanently installed automatic sprinkler systems is prohibited at all times.
- Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane, or other vehicle not occurring on the premises of a commercial car wash or commercial service station and not in the immediate interest of public health, safety, and welfare is prohibited. Further, such vehicle washing at commercial car washes and commercial service stations shall occur only between the hours of 6:00 am and 10:00 am and between 6:00 pm and 10 pm.
- The filling, refilling, or adding of water to swimming pools, wading pools, and jacuzzi-type pools is prohibited.
- Operation of any ornamental fountain or pond for aesthetic or scenic purposes is prohibited except where necessary to support aquatic life or where such fountains or ponds are equipped with a recirculation system.
- 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, and time limits for approval of such applications are hereby suspended for such time as this drought response stage or a higher-numbered stage shall be in effect.

Stage 5 Response -- EMERGENCY Water Shortage Conditions

Target: Achieve a ___ percent reduction in _____ (*e.g., total water use, daily water demand, etc.*).

Region M Regional Water Plan

Best Management Practices for Supply Management:

Describe measures, if any, to be implemented directly by _____ (*name of water user group*) to manage limited water supplies and/or reduce water demand. Examples include reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas, use of alternative supply source(s), and use of reclaimed water for non-potable purposes.

Water Use Restrictions for Reducing Demand:

All requirements of Stage 2, 3, and 4 shall remain in effect during Stage 5 except:

- Irrigation of landscaped areas is absolutely prohibited.
- Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane, or other vehicle is absolutely prohibited.

Stage 6 Response -- WATER ALLOCATION

In the event that water shortage conditions threaten public health, safety, and welfare, the _____ (*designated official*) is hereby authorized to allocate water according to the following allocation plan:

Single-Family Residential Customers

The allocation to residential water customers residing in a single-family dwelling shall be as follows:

Persons per Household	Gallons per Month
1 or 2	6,000
3 or 4	7,000
5 or 6	8,000
7 or 8	9,000
9 or 10	10,000
11 or more	12,000

“Household” means the residential premises served by the customer’s meter. “Persons per household” includes only those persons currently physically residing at the premises and expected to reside there for the entire billing period. It shall be assumed that a particular customer’s household is comprised of two (2) persons unless the customer notifies the _____ (*name of water user group*) of a greater number of persons per household using a form prescribed by the _____ (*designated official*), who shall give his/her best effort to see that such forms are mailed, otherwise provided, or made available to every residential customer. If, however, a customer does not receive such a form, it shall be the customer’s responsibility to go to the _____ (*name of water user group*) offices to complete and sign the form claiming more than two (2) persons per

Region M Regional Water Plan

household. New customers may claim more persons per household at the time of applying for water service using the form prescribed by the _____ (*designated official*). When the number of persons per household increases so as to place the customer in a different allocation category, the customer may notify the _____ (*name of water user group*) on such form, and the change will be implemented in the next practicable billing period. If the number of persons in a household is reduced, the customer shall notify the _____ (*name of water user group*) in writing within two (2) days. In prescribing the method for claiming more than two (2) persons per household, the _____ (*designated official*) shall adopt methods to insure the accuracy of claims. Any person who knowingly, recklessly, or with criminal negligence falsely reports the number of persons in a household or fails to timely notify the _____ (*name of water user group*) of a reduction in the number of person in a household shall be fined not less than \$_____.

Residential water customers shall pay the following surcharges:

- \$_____ for the first 1,000 gallons over allocation
- \$_____ for the second 1,000 gallons over allocation
- \$_____ for the third 1,000 gallons over allocation
- \$_____ for each additional 1,000 gallons over allocation

Surcharges shall be cumulative.

Master-Metered Multi-Family Residential Customers

The allocation to a customer billed from a master meter which jointly measures water to multiple permanent residential dwelling units (*e.g., apartments, mobile homes*) shall be allocated 6,000 gallons per month for each dwelling unit. It shall be assumed that such a customer's meter serves two dwelling units unless the customer notifies the _____ (*name of water user group*) of a greater number on a form prescribed by the _____ (*designated official*). The _____ (*designated official*) shall give his/her best effort to see that such forms are mailed, otherwise provided, or made available to every such customer. If, however, a customer does not receive such a form, it shall be the customer's responsibility to go to the _____ (*name of water user group*) offices to complete and sign the form claiming more than two (2) dwellings. A dwelling unit may be claimed under this provision whether it is occupied or not. New customers may claim more dwelling units at the time of applying for water service on the form prescribed by the _____ (*designated official*). If the number of dwelling units served by a master meter is reduced, the customer shall notify the _____ (*name of water user group*) in writing within two (2) days. In prescribing the method for claiming more than two (2) dwelling units, the _____ (*designated official*) shall adopt methods to insure the accuracy of claims. Any person who knowingly, recklessly, or with criminal negligence falsely reports the number of dwelling units served by a master meter or fails to timely notify the _____ (*name of water user group*) of a reduction in the number of persons in a household shall be fined not less than \$_____.

Region M Regional Water Plan

Customers billed from a master meter under this provision shall pay the following monthly surcharges:

- \$____ for 1,000 gallons over allocation up through 1,000 gallons for each dwelling unit.
- \$____ thereafter, for each additional 1,000 gallons over allocation up through a second 1,000 gallons for each dwelling unit.
- \$____ thereafter, for each additional 1,000 gallons over allocation up through a third 1,000 gallons for each dwelling unit.
- \$____ thereafter, for each additional 1,000 gallons over allocation.

Surcharges shall be cumulative.

Commercial Customers

A monthly water allocation shall be established by the _____ (*designated official*) or his/her designee for each nonresidential commercial customer other than an industrial customer who uses water for processing purposes. The non-residential customer's allocation shall be approximately ____ percent (*e.g. 75%*) of the customer's usage for a corresponding month's billing period during the previous 12 months. If the customer's billing history is shorter than 12 months, the monthly average for the period for which there is a record shall be used for any monthly period for which no history exists; provided, however, a customer, ____ percent of whose monthly usage is less than ____ gallons, shall be allocated ____ gallons. The _____ (*designated official*) shall give his/her best effort to see that notice of each non-residential customer's allocation is mailed to such customer. If, however, a customer does not receive such notice, it shall be the customer's responsibility to contact the _____ (*name of water user group*) to determine the allocation. Upon request of the customer or at the initiative of the _____ (*designated official*), the allocation may be reduced or increased if, (1) the designated period does not accurately reflect the customer's normal water usage, (2) one nonresidential customer agrees to transfer part of its allocation to another nonresidential customer, or (3) other objective evidence demonstrates that the designated allocation is inaccurate under present conditions. A customer may appeal an allocation established hereunder to the _____ (*designated official or alternatively, a special water allocation review committee*). Nonresidential commercial customers shall pay the following surcharges.

Customers whose allocation is ____ gallons through ____ gallons per month:

- \$____ per thousand gallons for the first 1,000 gallons over allocation
- \$____ per thousand gallons for the second 1,000 gallons over allocation
- \$____ per thousand gallons for the third 1,000 gallons over allocation
- \$____ per thousand gallons for each additional 1,000 gallons over allocation

Customers whose allocation is ____ gallons per month or more:

Region M Regional Water Plan

- ___ times the block rate for each 1,000 gallons in excess of the allocation up through 5 percent above allocation
- ___ times the block rate for each 1,000 gallons from 5 percent through 10 percent above allocation
- ___ times the block rate for each 1,000 gallons from 10 percent through 15 percent above allocation
- ___ times the block rate for each 1,000 gallons more than 15 percent above allocation

Surcharges shall be cumulative. As used herein, “block rate” means the charge to the customer per 1,000 gallons at the regular water rate schedule at the level of the customer’s allocation.

Industrial Customers

A monthly water allocation shall be established by the _____ (*designated official*) or his/her designee for each industrial customer which uses water for processing purposes. The industrial customer’s allocation shall be approximately ___ percent (*e.g., 90%*) of the customer’s water usage baseline. Ninety (90) days after the initial imposition of the allocation, the industrial customer’s allocation shall be further reduced to ___ percent (*e.g., 85%*) of the customer’s water usage baseline, computed on the average water use for the ___-month period ending prior to the date of implementation of Stage 2 of the Plan. If the industrial water customer’s billing history is shorter than ___ months, the monthly average for the period for which there is a record shall be used for any monthly period for which no billing history exists. The _____ (*designated official*) shall give his/her best effort to see that notice of each industrial customer’s allocation is mailed to such customer. If, however, a customer does not receive such notice, it shall be the customer’s responsibility to contact the _____ (*name of water user group*) to determine the allocation, and the allocation shall be fully effective notwithstanding the lack of receipt of written notice. Upon request of the customer or at the initiative of the _____ (*designated official*), the allocation may be reduced or increased (1) if the designated period does not accurately reflect the customer’s normal water use because the customer had shut down a major processing unit for repair or overhaul during the period, (2) the customer has added or is in the process of adding significant additional processing capacity, (3) the customer has shut down or significantly reduced the production of a major processing unit, (4) the customer has previously implemented significant permanent water conservation measures such that the ability to further reduce water use is limited, (5) the customer agrees to transfer part of its allocation to another industrial customer, or (6) if other objective evidence demonstrates that the designated allocation is inaccurate under present conditions.. A customer may appeal an allocation established hereunder to the _____ (*designated official or alternatively, a special water allocation review committee*). Industrial customers shall pay the following surcharges:

Customers whose allocation is _____ gallons through _____ gallons per month:

\$_____ per thousand gallons for the first 1,000 gallons over allocation

Region M Regional Water Plan

- \$___ per thousand gallons for the second 1,000 gallons over allocation
- \$___ per thousand gallons for the third 1,000 gallons over allocation
- \$___ per thousand gallons for each additional 1,000 gallons over allocation.

Customers whose allocation is _____ gallons per month or more:

- ___ times the block rate for each 1,000 gallons in excess of the allocation up through 5 percent above allocation
- ___ times the block rate for each 1,000 gallons from 5 percent through 10 percent above allocation
- ___ times the block rate for each 1,000 gallons from 10 percent through 15 percent above allocation
- ___ times the block rate for each 1,000 gallons more than 15 percent above allocation.

Surcharges shall be cumulative. As used herein, “block rate” means the charge to the customer per 1,000 gallons at the regular water rate schedule at the level of the customer’s allocation.

Section X: Enforcement

- (a) No person shall knowingly or intentionally allow the use of water from the _____ (*name of water user group*) 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 _____ (*designated official* 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 _____ dollars (\$___) and not more than _____ dollars (\$___). 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 _____ (*designated official*) 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 reconnection charge, hereby established at \$_____, and any other costs incurred by the _____ (*name of water user group*) in discontinuing the service. In addition, suitable assurance must be given to the _____ (*designated official*) 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 _____ (*name of water user group*), 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 parents' 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) Any employee of the _____ (*name of water user group*), police officer, or other _____ employee designated by the _____ (*designated official*), 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, and the offense charged, and shall direct him/her to appear in the _____ (*e.g., municipal court*) on the date shown on the citation, for which the date shall not be less than 3 days nor more than 5 days from the date the citation was issued. 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 _____ (*e.g., 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 _____ (*e.g., 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 _____ (*e.g., municipal court*) before all other cases.

Section XI: Variances

The _____ (*designated official*) 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 is 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.

Region M Regional Water Plan

Persons requesting an exemption from the provisions of this Ordinance shall file a petition for variance with the _____ (*name of water user group*) within 5 days after the Plan or a particular drought response stage has been invoked. All petitions for variances shall be reviewed by the _____ (*designated official*) 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) a 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) a description of the relief requested
- (f) the 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 _____ (*name of water user group*) shall be subject to the following conditions, unless waived or modified by the _____ (*designated official*) or his/her designee:

- (a) Variances granted shall include a timetable for compliance.
- (b) Variances granted shall expire when the Plan is no longer in effect, unless the petitioner has failed to meet specified requirements.

No variance shall be retroactive or shall otherwise justify any violation of this Plan occurring prior to the issuance of the variance.

7. Review and Update of Drought Contingency Plan

This drought contingency plan will be updated at least every 5 years as required by TCEQ regulations.

**ATTACHMENT 6-4 Municipal Water
Conservation Strategies**

Region M Regional Water Plan

These water conservation strategies from Report 362 for this region:

1. golf course conservation
2. metering all new connections & retrofitting existing connections
3. showerhead, aerator, and toilet flapper retrofitting
4. educating through schools
5. landscape irrigation conservation
6. water-wise landscape design
7. athletic field conservation
8. dissemination of public information
9. rainwater harvesting
10. parklands conservation
11. residential clothes washer incentives

Golf Course Conservation

Description

This water conservation strategy is designed for WUGs that serve golf course customer(s). Because golf courses in Region M's dry climate use significant amounts of water for maintenance, they attract public scrutiny. Fortunately, golf courses are often good candidates for reuse water (discussed in detail in Chapter 4) or other alternative water sources. In fact, non-potable water reuse is a recommended water management strategy for WUGs. Some utilities may already be implementing one or more of the elements of this strategy, and they may want to adopt additional features outlined below. Once a strategy is adopted, the utility should monitor it closely to achieve maximum water efficiency benefit.

The main goal of each WUG's water conservation plan is to reduce demand by predetermined goal amounts. WUGs should require each golf course to develop its own conservation plan to meet water savings goals, including calculating amounts needed to adequately maintain greens and referencing evapotranspiration (ET). A golf course's plan should utilize enhanced water conservation methods such as Computer-Controlled Irrigation Systems (CCIS) or similar technology. To achieve maximum efficiency, a CCIS should incorporate at least the following components: computer controller, software, interface modules, satellite field controller, soil sensors, and weather station. The CCIS should be designed to prevent over-watering, flooding, pooling, and losses from evaporation and run-off; further, sprinkler heads should be calibrated so as not to exceed the soil's saturation capacity.

Non-potable water strategies explained in Chapter 4 can also be incorporated into this conservation scheme. Switching from a potable to non-potable water source requires implementation dates for the conversion. Remember that reclaimed, reused, and/or recycles water used at golf courses must meet TCEQ quality standards for treated effluent and human contact.

Soil improvement is another effective method for reducing irrigation water usage. Soil improvement programs on high-visibility areas such as golf courses can demonstrate to the public the efficacy of this strategy. For golf courses, annual compost applications of ¼ to ½ inch on turf areas and 1 inch on flower beds are recommended. In addition, compost is most beneficial when applied in the fall.

Metering all New Connections and Retrofitting Existing Connections

Description

This strategy is intended for WUGs that do not have 100 percent metering of customer connections. Its purpose is to ensure that all aspects of meter installation, replacement, testing, and repair are managed for optimal water use efficiency. Increased maintenance efforts contributing to improved meter accuracy should result in higher revenue and less water loss. Metering of new customer connections and retrofitting of existing connections are effective methods of accounting for total water usage within a utility's service area.

Proper installation of correct sizes and types of meters is essential for good utility management. (The American Water Works Association [AWWA] provides numerous resources in the reference section of this strategy.) The purpose of this strategy is to ensure that all aspects of meter installation, replacement testing, and repair are managed for optimal water use efficiency.

To qualify as a bonafide strategy, a utility's meter program must include:

- 1) mandatory metering of existing connections and new connections;
- 2) a policy governing installation of adequate and properly-sized meters, as determined by a customer's current water use patterns. Using compound meters for multifamily residential connections or other industrial and commercial accounts is also recommended;
- 3) direct utility metering of each duplex, triplex, and fourplex unit, whether each occupies a separate lot, and whether multiple buildings occupy a single commercial lot;
- 4) metering of all utilities, publicly owned facilities, and customers;
- 5) mandatory construction meters and access keys to account for water used in new construction;
- 6) mandatory separate irrigation meters for all new commercial buildings having a site plan area of more than 10,000 square feet and for all duplexes, triplexes, and fourplexes;
- 7) implementation of the State requirements in HB 2404, passed by the 77th Legislature Regular Session and implemented through Texas Water Code 13.502, which requires that all new apartments be either directly metered by the utility or submetered by the owner;
- 8) review of capital recovery fees to determine whether fees provide any disincentive for developers to use utility metering of apartment units;
- 9) annual testing and maintenance of all meters larger than two inches, since a meter may under-register water use as it ages;
- 10) regular testing and evaluation of 5/8- and 3/4-inch meters which have been in service 8 to 10 years, to determine meter accuracy OR a periodic, consistent replacement program based on the meter's age or cumulative water volume through the meter. This program

should be based on testing of meters at each utility to determine the optimal replacement/repair period, since it depends on both the quality of water and the average flow rate through the meter, versus the meter's capacity;

11) an effective monthly meter-reading program where readings are not estimated except due to inoperable meters or extenuating circumstances. Broken meters should be fixed within 7 days or an otherwise-stated reasonable time frame; and,

12) an accounting of water savings and revenue gains through implementation of the Meter Repair and Replacement Program.

Every year, the utility should estimate its annual water savings resulting from the strategy. Savings can be estimated based upon a statistical sample analyzed as part of the meter-testing program. The utility can then project potential future annual savings and include those figures in the plan's water savings targets and goals.

Showerhead, Aerator, and Toilet Flapper Retrofits

Description

This strategy is intended for WUGs that serve homes and apartment units constructed before 1995, when no active retrofit program existed for efficient showerheads and faucet aerators. Once a WUG adopts this strategy, it should closely monitor the strategy to achieve maximum water efficiency benefits.

Plumbing retrofits usually include showerheads as well as kitchen and bathroom faucet aerators. More recent studies show that toilet flappers should be included in this effective strategy to conserve water used by the residential sector. Four types of high-quality, low-flow plumbing devices are to be installed under this program:

showerheads rated at 2.0 gallons per minute ("gpm") or less;

kitchen faucet aerators of 2.2 gpm or less;

bathroom faucet aerators of 1.5 gpm or less; and,

toilet flappers that operate at the designed flush volume for a given toilet model.

Studies have shown that many 1.6 gallons-per-flush ("gpf") toilets actually use more water. Therefore, if 1.6 gpf toilets are installed, their flush volume should be checked and, if necessary, the water level in their tanks should be adjusted to restore the flush volume to 1.6 gpf. If after adjustment a tank's flush volume is still well above 1.6 gpf, the toilet is likely to originally have had an early closure flapper. If so, the replacement flapper needed to restore a 1.6 gpf volume can often be determined by comparing the model number (usually located on the inside of the tank) with research on compatibility of flappers. If the device is one of several early models, the flapper could be replaced during the utility's survey, and/or information about the correct replacement flapper should be provided to the customer. The utility may meet this strategy's requirements through inspection programs and enforceable ordinances requiring replacement of inefficient plumbing when ownership of the property transfers, or by date certain no later than five years.

Under this strategy, the utility should:

Region M Regional Water Plan

1) Identify the total number of single-family (“SF”) and multi-family (“MF”) residences constructed prior to 1995. The utility may have data showing the number of SF homes existing at the end of 1994, or census data can be used; however, that data cannot be separated into SF and MF units. Another approach is to use the census data from 1990 and 2000, which does include the number of housing units by type. This information can then be used to estimate SF units (“detached units” in the census data) at the end of 1994. A linear growth assumption yields the following approach: Take the difference (2000 detached units minus 1990 detached units) and multiply by 40 percent (4 years), and add this to the number of 1990 detached units. The answer produces an estimate of SF units at the end of 1994. Similar calculations can be used to determine MF units.

2) Develop a plan to directly install plumbing devices in single-family homes and multi-family residential facilities or, alternatively, provide kits for installation with follow up inspections.

3) If feasible, include a program to restore the flush volume of 1.6 gpf toilets to their designed flush volume. After determining the potential number of participants, select at least one of these approaches:

- 1) Direct Install and Kit Distribution Program
- 2) Ordinance Approach Upon Change of Ownership of Property
- 3) Ordinance Approach By Date Certain

School Education

Description

The goal of this strategy is to launch an elementary school-level education program since lessons learned by students about good water use habits are often shared with the whole family. The strategy is intended for WUGs that serve schools as a regular part of the customer base. A WUG may have already accomplished this strategy if it has a current school education program that meets the criteria. Before deciding whether this strategy is necessary, the utility should review existing curricula to see if the local school district is already offering water conservation-related courses. Once a WUG decides to adopt this strategy, the strategy must be closely monitored to achieve the maximum water efficiency benefit.

School education programs, while not directly related to any equipment change, may nevertheless result in both short- and long-term water savings. Students’ behavioral changes based upon greater knowledge are often shared with parents and implemented at home. To be effective, a school education program should provide grade-level-appropriate curriculum materials which increase in complexity from elementary school through high school. If such a curriculum does not already exist, local experts may be willing to help develop the desired materials.

Implementation should consist of at least the following actions:

Region M Regional Water Plan

1) Evaluate available local and regional materials to determine their applicability to the WUG's local water conditions. Consider creating an advisory committee of local educators to assist in choosing or creating the curriculum.

2) Implement a school education program to promote water conservation and related benefits. Programs include providing instructional assistance, educational materials, and classroom presentations to public and private schools in the utility's service area that identify urban, agricultural, and environmental issues and conditions in the local watershed and water service area. When possible, educational materials should meet the TEKS guidelines.

3) A water-oriented curriculum focused on conservation and resource issues should be made available for all grades.

a. Grade-appropriate programs and/or materials should first be implemented for grade levels 1 to 6. Alternatively, a presentation or educational show can be offered for some or all of these grade levels.

b. For grades 7 and 8 and for high school students, the WUG should do one of the following: distribute grade-appropriate materials for high school science, political science, or other appropriate classes; present assembly-type programs to high schools; sponsor science fairs with emphasis on conservation; implement education programs with community groups like Scouts, 4-H clubs, etc. The WUG can elect to meet this strategy by focusing only on grades 1 to 6 or 7 to 12 but with higher participation rates. In conjunction with the Showerhead and Aerator Strategy, consider providing a water audit unit as part of the curriculum whereby the students take flow measurements of showerheads and faucet aerators at their homes. If their showerheads and faucet aerators operate at higher than the current standard, the students would receive efficient showerheads and faucet aerators to install with their parents' assistance. This study unit can be successfully implemented as early as grade 5.

To track progress of this strategy, the WUG should gather and have available the following documentation (according to TWDB):
number of school presentations made during reporting period;
number and type of curriculum materials developed and/or provided by water user group, including confirmation that curriculum materials meet state education framework requirements and are grade-level appropriate;
number and percent of students reached by presentations and by curriculum;
number of students reached outside the WUG's service area;
number of in-service presentations or teacher's workshops conducted during thereporting period;
results of evaluation tools used, such as pre- and post-tests, student surveys, and teacher surveys;
copies of program marketing and educational materials; and,
annual budget for school education programs related to conservation.

Landscape Irrigation Conservation

Description

This strategy is intended for use by a WUG having a substantial percentage of customers using automated landscape irrigation systems. If data are lacking or absent, the summer peak/winter average ratio can be used to determine whether to proceed with this strategy. A ratio of 1.6 or greater indicates the potential for substantial water savings upon implementation and enforcement of this strategy. For maximum water-use efficiency benefit, the WUG should adhere closely to the measures described below.

Landscape irrigation conservation practices are an effective method of accounting for and lowering outdoor water usage while maintaining landscapes and avoiding run-off. With this strategy, the WUG provides residential and non-residential customers with education, incentives, and assistance in improving their landscape water-use efficiency. Incentives include rebates for purchase and installation of water-efficient equipment. Successful implementation of this strategy can be accomplished by performing one or a combination of the approaches listed below.

- 1) ETo-Based Water Budgets
- 2) Water-Use Surveys, Metering, and Budgeted Water Use
- 3) Landscape Design
- 4) Minimum Standards and Upgrades

As a means of rapidly increasing cost-effectiveness and water savings, the WUG should consider offering the Landscape Irrigation Program to large-landscape customers first. Incentives can include rebates for irrigation audits and systems upgrades, recognition for water-efficient landscapes through signage and award programs, and certification of trained landscapers and volunteers who can promote the program. WUG staff can also be trained to provide irrigation audits which can include resetting irrigation controllers for more efficient schedules.

Water-wise Landscape Design

Description

This strategy is intended for a WUG with 20 percent or more of its residential customers having landscapes consisting of high-water-use materials that consume more than 20,000 gallon per month or which use more than twice as much water in summer as in winter. Using this strategy, the WUG would offer financial incentives for conversion to water-wise landscaping or would require by ordinance that all new landscapes incorporate water-wise principles (which involve not only plant selection but also the tactics listed below). Financial incentive programs further contain an educational component based on the seven principles of water-wise landscaping.

Because water-wise landscaping materials often consume whatever quantity of water the customer supplies, careful follow-up is necessary to guard against excess irrigation. From the outset, incentives should be designed to be rescinded if water use returns to previous levels or exceeds the projected water budget for the new landscape. For new

Region M Regional Water Plan

customers and change-of-service customer accounts, the WUG should provide information on water-wise landscape design plus efficient irrigation equipment and management. The WUG should install water-wise landscaping at water its facilities and offices. Other tactics of water-wise landscaping include encouraging capture of rainwater and limiting irrigation to the quantity of rainwater captured.

Some cities with lawmaking powers have adopted ordinances that define water-conserving landscapes to be installed in buffer areas, new commercial buildings, new homes, and apartment complexes. Any ordinance for new homes should incorporate requirements for water-wise principles, specifying water-efficient landscaping materials only. Soil improvement programs in high-visibility areas can publicly demonstrate their effectiveness. For most landscapes, recommendations are for compost applications of $\frac{1}{4}$ to $\frac{1}{2}$ inch annually on turf areas and 1 inch annually on flower beds. (Compost is most beneficial when applied in the fall.) Water-wise landscape programs follow the seven principles of Xeriscape™, from the Texas A&M Horticulture Website, listed below and explained in greater detail in resources listed in the reference section:

- planning and design
- soil analysis and improvement
- appropriate plant selection
- practical turf areas
- efficient irrigation
- use of mulches
- appropriate maintenance

1) Rebate and Incentive Approach

- a. Within one year of implementation, develop and implement a plan to market a low-water landscape design and conversion program.
- b. Within one year of implementation, develop and implement a customer incentive program.
- c. Rescind incentives, including rebates, if water use returns to previous levels within two years.

2) Ordinance Approach

In the first twelve (12) months, plan a program that includes stakeholder meetings as needed. Consider offering rebates for a portion or all of the time this program is in place. For example, offer rebates for five years and publicize this so customers will participate early in the program. Develop a plan for educating realtors and landscape companies about the requirements. Plan a follow-up inspection program after retrofit. Develop and pass the ordinance. Implement the ordinance and a tracking plan for the number of units retrofitted. In the second year and thereafter, continue the implementation and outreach program for realtors and landscape companies. Continue verification inspections. Provide estimates of water savings from landscape conversions based upon actual metered data.

Athletic Field Conservation

Region M Regional Water Plan

Description

Athletic field conservation is an effective method of reducing water system demand. The athletic field manager implements a water regimen using only what is necessary to maintain the turf's viability and protect users' health. Water is applied only to areas essential to the field's use. Athletic fields often involve visible water use during daylight hours, leading to perceptions by both the public and utility operators that water use may be excessive.

Measures listed for this strategy can be implemented individually or in combination; some utilities may already employ one or more measures and may decide to include others. Once adopted, the strategy should be monitored closely to achieve the maximum water efficiency benefits.

Using this strategy, a WUG provides the customer (through staff or a third party) a landscape water-use survey and uses the results to develop reference evapotranspiration ("ET_o")-based water-use budgets equal to no more than 100 percent ET_o per square foot of landscape area.

At a minimum, the athletic field strategy should mandate replacement of all manually controlled and quick-couple irrigation systems with automatic irrigation systems and controllers. The automatic controllers should be capable of shutting off flows when sudden pressure loss occurs, as with a system break. Access to such controllers should be limited to the authorized landscape manager or should be designed to shut off flows automatically if the irrigation system is activated manually.

When the practice is cost-effective, athletic field users should be required to install computer-controlled irrigation systems (CCISs) or similar technology. To achieve maximum efficiency, a CCIS should incorporate at least the following components: computer controller, software, interface modules, satellite field controller, soil sensors, and weather station. The CCIS should be designed to prevent over-watering, flooding, pooling, and losses from evaporation and run-off; further, sprinkler heads should be calibrated so as not to exceed the soil's saturation capacity.

Use of reclaimed, reused, and/or recycled water for athletic fields is both recommended and encouraged; however, such use must meet TCEQ water quality standards for treated effluent and human contact. When utilizing reclaimed water or water with high levels of total dissolved solids (TDS) or hardness, the water budget must be adjusted to permit leaching of salts below the root zone of turf grass. Consultation with local extension agents can assist athletic field managers in properly utilizing lower-quality water for irrigation.

Figuring total water savings for this strategy may be difficult, but increased efficiencies can be estimated for each water-wasting action that is eliminated through this strategy. In replacing inefficient equipment, water savings are realized by using new or upgraded equipment. For landscape water, savings can be calculated based on each water waste incident. In an irrigation survey, water savings are expected in the range of 15-20 percent

for athletic fields with no CCIS if recommended efficiency measures are implemented. Switching to artificial turf, reusing waste water, or employing other non-potable alternatives can save up to 100 percent of the potable water supply used in irrigation. Simple measurement of water use before and after conversions will reveal savings.

Public Information

Description

Public education about water conservation should begin at a young age. Elementary schools should incorporate a curriculum with lessons in water conservation methods starting at kindergarten. Varied activities could range from poster contests promoting water conservation in early grades to teaching xeriscape techniques in middle school. Projects with a hands-on approach enhance students' interest and might include field trips to water plants, guest speakers, lessons about water usage when bathing, brushing teeth, and washing dishes, cars, and pets. Providing pamphlets and newsletters also raises public awareness.

Any WUG can adopt this public information strategy to effectively promote specific water conservation programs and practices which emphasize the importance of using water efficiently. A WUG may have already accomplished this strategy if it is conducting a public information program that meets the criteria of this strategy. Once a WUG decides to adopt this strategy, the utility should monitor it closely to achieve maximum water efficiency benefits.

The goal is to provide an overall understanding of water resources in the community relating to the importance of managing and sustaining existing water supplies so that construction of new facilities can be delayed or avoided. An equally important objective of the program is to provide information about specific actions individual water users should take to implement these goals.

A broad variety of tools can be used to effectively communicate water conservation measures to the public including print, radio, and television media; billboards; direct distribution; special events such as exhibits and facilities tours; and maintenance of an informative website. Print media activities can take the form of press releases and regular columns in gardening periodicals. Electronic media efforts include talk shows, news conferences, public service announcements, and even paid commercials. Utilities can also distribute materials directly through bill inserts, newsletters, fliers, and door hangers---all of which allow targeting of specific messages to specific audiences. In addition, special events provide excellent opportunities for direct interaction with the public at facility tours, exhibits, trade shows, group presentations, landscape conservation competitions, and seminars. And remember--web sites are now an essential and economical method of reaching the public since the same information can be posted electronically. Remember to include links to the WUG's web site.

Integrating a WUG's public information efforts with programs of other local agencies multiplies the impact. Other agencies which stress water conservation include Texas

Cooperative Extension Service offices, Texas Water Development Board, Texas Parks & Wildlife, Texas Soil & Water Conservation Board, Texas Commission on Environmental Quality, and Texas Forest Service. Some business associations, neighborhood associations, and not-for-profit groups may also offer partnering opportunities for an overall WUG conservation program or specific strategies.

Rainwater Harvesting and Condensate Reuse

Description

TWDB publishes a guide for rainwater harvesting that is available upon request.

All rainwater harvesting systems are comprised of six basic components:

- A. catchment surface (such as a roof) -- the surface upon which the rain falls
- B. gutters and downspouts -- transport channels from catchment surface to storage
- C. leaf screens and roof-washers -- systems that remove contaminants and debris
- D. cisterns or storage tanks -- where collected rainwater is stored
- E. conveying -- the delivery system for stored rainwater, either by gravity or pump
- F. water treatment – filters, equipment, and additives to settle, filter, and disinfect

This strategy is intended for use by WUGs concerned with reducing outdoor irrigation demands on their potable water systems. Calculation of potential savings will vary according to regional climate patterns. Rainwater harvesting and condensate reuse are applicable to ICI buildings, but private homes can also benefit from rainwater harvesting. Utilities may help to realize savings possible with this strategy by customer education efforts. For maximum water-use efficiency benefits, the WUG should adhere closely to the measures described below.

Rainwater harvesting and condensate reuse (“RWH/CR”) conservation programs are practical methods of reducing potable water usage while maintaining healthy landscapes and avoiding run-off problems. Using this strategy, the WUG provides customer support, education, and incentives and assists with proper installation and use of RWH/CR systems. RWH/CR systems are most effective when used in conjunction with other water efficiency measures such as water-saving equipment and habits. Today’s rainwater harvesting is based on ancient practices of collecting (usually from rooftops) and storing rainwater close to its source, in cisterns or surface impoundments, and using it for nearby needs. Industrial, commercial, and institutional (“ICI”) users already save money by collecting condensate from large cooling systems and returning it to their cisterns. Facilities with large cooling demands are best positioned to take advantage of condensate reuse which due to its quality has potential uses for landscape irrigation, cooling tower make-up water, and some industrial processes. Because precipitation varies in rate and occurrence, rainwater or condensate should be used with maximum efficiency. Incentives to motivate rainwater collection may include rebates for purchasing and installing water-efficient equipment.

Several factors should be considered in the design of rainwater harvesting and condensate reuse systems. Components include the collection area, a first-flush device, a roof washer, an opaque storage structure with capacity for anticipated demand, and a

Region M Regional Water Plan

distribution system. Design consideration should be given to the highest feasible elevations for collection and storage systems to take advantage of gravity flow. For proper design and implementation of RWH/CR guidelines, the Texas Water Development Board's Texas Manual on Rainwater Harvesting 2004 should be used as a resource, as should technical assistance from professional installers and manufacturers of RWH/CR equipment.

Programs should consider these elements:

1) Retrofit or Rain Barrel Program

Using bill inserts to market the program will allow a WUG to target its largest summer-peak users first. The WUG should also consider asking local weather announcers, radio gardening show hosts, and newspaper columnists for assistance in publicizing the program. Public and/or private partnerships with non-profits (gardening clubs, neighborhood associations, and Texas Cooperative Extension Service offices), local building groups, and green-industry businesses are other potential avenues to leverage resources. Incentives can include rebates for RWH/CR systems, recognition through signage and award programs, and certification of trained landscape company employees and volunteer representatives.

2) New Construction -- In addition to retrofitting existing homes and buildings, a WUG may also choose to focus support for RWH/CR systems in new construction. Under this approach, the WUG could:

a. adopt regulations requiring all new ICI properties to install a RWH/CR system that collects and stores rainwater and condensate from all eligible sources and distributes it to an irrigation system and/or a cooling tower make-up system;

b. implement an incentive program to encourage builders and owners of new

ICI properties to install RWH/CR systems that collect and store rainwater and condensate from all eligible sources, then distribute to irrigation and/or a cooling tower make-up system. In large ICI buildings requiring cooling towers, designers should consider returning condensate flows from air conditioning coils to cooling tower make-up. This strategy could also be effective as part of a Green Builder- type rating system incorporating water-wise landscaping and adequate soil depth;

c. implement an incentive program to encourage builders and homeowners to install RWH systems for landscapes to reduce potable water consumption in hot weather; and,

d. adopt regulations requiring all new homes and/or multi-unit properties to install plumbing that separately collects and stores rainwater from all eligible sources and distributes the rainwater through a subsurface irrigation system, either around the foundation or for landscape use.

Park Conservation

Description

This strategy is targeted at all WUGs which manage parks or serve customers with parklands. Most WUGs fall into this category. Target areas include public facilities such as irrigated parks, recreation centers, fountains, and pools. These facilities use significant volumes of water and sometimes come under public scrutiny as a result. Specific

Region M Regional Water Plan

measures listed under this strategy can be implemented individually or in combination. WUGs may already have adopted one or more of these principles since irrigation conservation practices and careful water use for operation and maintenance of park facilities can effectively reduce demand.

Under the park conservation strategy, WUGs require managers of every park having an irrigation system to develop a conservation plan. Municipal parks departments should develop comprehensive written policies and procedures for all irrigated parks under their jurisdiction. Operating and Maintaining pools is also addressed. All park facilities should be metered so all water use can be billed as means of reinforcing the importance efficient water use. For parks with athletic fields, irrigation should be in accordance with the Athletics Fields strategy of this Plan. WUGs should encourage park managers to cease irrigation in areas not affected by public use.

Prior to developing a specific park conservation plan, the WUG should consider a series of planning meetings with park irrigation personnel and management to discuss water conservation issues and to prepare an adequate scope of action. Additionally, park irrigation staff could participate in voluntary environmental management programs.

Residential Clothes Washer Incentive Program

Description

This strategy can be implemented by any WUG serving residential customers. Under this strategy, the WUG would develop and implement an incentive program to encourage customers to purchase water-efficient clothes washers, best described by using water factor (WF) terminology. WF is calculated by dividing the gallons of water used to wash a full load of clothes by the capacity of the washer tub in cubic feet. An efficient washer using 27 gallons for a full load of clothes in a 3-cubic-foot tub would have a WF of 9. According to the tiers determined by the Consortium for Energy Efficiency (“CEE”) in 2004, a clothes washer needs a WF equal to or less than 9.5 to be considered “efficient.” In 2001, Texas enacted legislation requiring washing machine manufacturers to report the efficiency of clothes washers sold in the state. According to the 2002 report, only 4.4 percent of washers sold in Texas qualified by having a WF equal to or less than 9.5. The 2003 report showed mild improvement, in that 9.4 percent of washers imported into Texas had a WF equal to or less than 9.5. While the trend in Texas is positive, market share is well below the reported 30 percent market share in Washington State and far lower than the 50 percent market share in the Seattle area, where a regional incentive and marketing program for efficient washers has been in place for several years. Conventional top-loading clothes washers use 41 gallons of water per load, on average, while efficient clothes washers use only 11 to 25 gallons per load.

Manufacturers started producing efficient clothes washer models in the late 1990s in anticipation of rules being adopted by the Department of Energy (“DOE”) setting higher efficiency standards. The DOE did adopt rules in 2001 with a two-step phase-in of higher efficiency standards. Clothes washers manufactured after 2004 will be required to meet a modified energy factor (“MEF”) of 1.04 (20 percent more efficient than the current

Region M Regional Water Plan

standard). This level will remain in effect until 2007, at which time an MEF of 1.26 (35 percent higher than the current standard) will be required. If manufacturers continue with current design trends for efficient clothes washers, the 2007 standard should result in significant water savings.

Of course, cost is a basic consideration. Full-featured inefficient machines cost only about \$400 while the least expensive 'efficient' machines range between \$600 to more than \$1000. For low-income customers, this price difference is the most important factor influencing buying decisions, so low- and moderate-income customers would logically be more likely to purchase efficient machines if they were offered discount incentives at the time of purchase rather than after a four-to-six-week wait.

A clothes washer incentive program is most effective when offered in conjunction with local gas and/or electric utilities since the incentive can be increased through multiple-sponsorship, and the marketing reach can be expanded. Energy savings result from more efficient motors, less energy required for heating hot water, less hot water actually used, and shorter drying times (since spin cycles on 'efficient' washers is much faster).

Incentives should be directed only to customers who can verify installation of washers qualifying as water efficient. A list of such washers is maintained and regularly updated by the Consortium for Energy Efficiency ("CEE"), a nonprofit public benefits corporation which develops national initiatives to promote manufacture and purchase of energy-efficient products and services. The U.S. Department of Energy and the Environmental Protection Agency both support CEE through active participation and funding. The CEE Residential Clothes Washer Program consists of tiers for both water efficiency and energy efficiency. Many utilities across America use the CEE list as the source of qualifying their consumers' incentive payments.

Develop and implement an incentive program designed to increase the market share of 'efficient' clothes washers to at least 20 percent by the second year of implementation. Offer the program to customers in single-family homes (including duplexes and triplexes) and in multi-family units with individual washer connections. Ask local gas and/or electric energy providers to participate, as many water utilities in Texas and other parts of the country have already successfully partnered with local energy companies. Organize stakeholder meetings. Develop a marketing plan to educate customers, appliance retailers, and realtors about this program. Initiate the program.

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8) *Seattle Home Water Conservation Survey*, Aquacraft, Inc., 2001

<http://www.aquacraft.com/>

9) *Handbook of Water Use and Conservation*, Amy Vickers, Waterplow Press, May 2001.

10) California Energy Commission

http://www.energy.ca.gov/appliances/clothes_washers/notices/2003-09-17_Washer_Final.PDF

11) Energy Star

http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers Austin WashWise Program <http://www.ci.austin.tx.us/watercon/sfwasher.htm>

12) *Seattle Home Water Conservation Study*, Aquacraft Inc., 1999

<http://www.aquacraft.com>

ATTACHMENT 6-5 Agricultural Water Conservation Template

**Irrigation Water Conservation &
Model Drought Contingency Plan
For [WATER USER GROUP]
Date**

CONTENTS OF PLAN

8. Objectives for Water User Group
9. Texas Commission on Environmental Quality Rules (Texas Administrative Codes)
10. Water Conservation Plan

1. Water Conservation Plan for [Public Water Supplier]

Recognizing the need for efficient use of existing water supplies, TCEQ has developed rules governing the development of water conservation and drought contingency plans for irrigation users. Region M has provided a conservation plan pursuant to TCEQ rules.

Objectives

- To reduce the loss and waste of water
- To reduce water consumption
- To improve the efficiency in the use of water

Model Drought Contingency Plan for [Public Water Supplier]

Objectives

This drought contingency plan (the Plan) is intended for use by [Irrigation]. The plan includes all current TCEQ requirements for a drought contingency plan.

This drought contingency plan serves to:

- To conserve available water supplies during times of drought and emergency.
- To reduce adverse impacts of water supply shortages.
- To reduce the adverse impacts of emergency water supply conditions.
- To preserve public health, welfare, and safety.

2. Texas Commission on Environmental Quality Rules

Water Conservation & Drought Contingency Plans

The TCEQ rules governing development of water conservation plans for public water suppliers are contained in Title 30 part 1, Chapter 288, Subchapter A, Rule 288.4 of the Texas Administrative Code.

A water conservation plan is defined as “A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water.”

The minimum requirements plans for agricultural use (“ individual irrigation user” _ Are as follows:

Minimum Conservation Plan Requirements

The minimum requirements in the Texas Administrative Code; Chapter 30:

- 288.4(a)(2)(A) – Description of Irrigation Production Process
- 288.4(a)(2)(B) – Description of the Irrigation Method or System and Equipment,
- 288.4(a)(2)(C) – Accurate Metering ,
- 288.4(a)(2)(D) – Specification of Conversion Goals before May 1,2005,
- 288.4(a)(2)(E) – Specification of Conversion Goals after May 1,2005,
- 288.4(a)(2)(F) – Description of Water Conserving Irrigation Equipment and Application System,
- 288.4(a)(2)(G) – Leak Detection, Repair, and Water-Loss Control,
- 288.4(a)(2)(H) – Irrigation Timing an/or Measuring the amount of Water Applied,
- 288.4(a)(2)(I) – Land Improvements for Retaining or Reducing Runoff and Increasing the Infiltration of Rain and Irrigation Water,
- 288.4(a)(2)(J) – Tailwater Recovery & Resuse, and
- 288.4(a)(2)(K) – Other Conservation Practices, Methods, or Techniques.

3.

**WATER CONSERVATION PLAN
FOR THE
(Name of Water User Group)
(Date)**

Description of the Irrigation Production Process

[This section will include a description of the irrigation production process which shall include, but is not limited to, the type of crops and acreage of each crop to be irrigated, monthly irrigation diversions, any seasonal or annual crop rotation, and soil types of the land to be irrigated] Here is a sample list below.

Location: _____

County: _____

Types of Crops Planted: _____

Acreage of each crop: _____

Acreage of land: _____

Description of land: _____

Acreage and Type of Vegetation to be Irrigated

List the acreage irrigated as part of the description of the irrigation production process.

Example Table

Region M Regional Water Plan

Type of Crop	Growing Season	Acres Irrigated/Year
Example Crop 1	May- October	200
Example Crop 2	May- September	200
Example Crop 3	April- September	200
Total Number of Acres		600

Blank Table

Type of Crop	Growing Season	Acres Irrigated/Year
Total Number of Acres		

Monthly Irrigation Diversions

List the monthly irrigation diversions to complete the description part of the irrigation production process

Month	Acre-ft
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	
Total	

Description of Soil Types

The Irrigation WUG _____ has _____ soil types within the _____ acres as determined by the soil survey for _____ County, published by the United States Department of Agriculture, Soil Conservation Service, in cooperation with the Texas Agricultural Experiment Station.

Soil Type	Permeability
Example: Valley Clay	Moderate

Description of the Irrigation Method or System and Equipment

Region M Regional Water Plan

[Include a description of the irrigation Method or system and equipment including pumps, flow rates, plans, and/or sketches of the system layout]

Accurate Measuring

[Include a description of the device or devices and/or methods being used in order to measure and account for the amount of water diverted from the source of supply.]

Specification of Water Conservation Goals

This section must include 5, 10, & 20 year targets for water savings. This will include goals for water loss programs and goals for municipal use in gallons per capita per day.

These are example Goals: (They are not mandatory)

10. Switch to a central, computer-controlled irrigation system with weather monitoring stations located throughout the _____ acre property. This change is projected to save _____ acre-ft/yr.
11. Line 500 miles of pipeline for conveyance conservation.
12. Implement and maintain a meter replacement program.
13. Keep the level of unaccounted water in the system less than ____ percent in ____ (Target year) and subsequent years.
14. Raise Public Awareness of water conservation and encourage responsible public behavior through a public/school education and information program.

*Best Management Practices provided for Irrigation can be used as a supplement for irrigation water conservation.

Description of Water-Conserving Irrigation Equipment and Application System

[Include a description of water- conserving irrigation equipment and application system or method including, but not limited to, surge irrigation, low pressure sprinkler, drip irrigation, and non leaking pipe.]

Scheduling the Timing and/or Measuring the Amount of Water Supplied

[Include a schedule of the timing and /or measuring the amount of water applied for example soil moisture monitoring.]

Tailwater Recovery and Reuse

[Include a description of tailwater recovery and reuse.]

Land Improvements for Retaining or Reducing Runoff and Increasing the Infiltration of Rain and Irrigation

[Include a description of any land improvements for retaining or reducing runoff and increasing the infiltration of rain and irrigation water. For example weed controlling & furrow diking.]

Other Conservation Practices, Methods, or Techniques

[Provide any information on any other water conservation practice, method, or technique which the user shows to be appropriate for preventing waste and achieving conservation.]