

**CHAPTER 6**

**WATER CONSERVATION AND**

**DROUGHT CONTINGENCY**

## **6.1 WATER CONSERVATION**

Water conservation are those practices, techniques, programs, and technologies that will protect water resources, reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling or reuse of water so that a water supply is made available for future or alternative uses. Water conservation and drought contingency planning implemented by municipalities, water providers, and other water users supersede recommendations in this plan are considered consistent with this plan.

Texas Water Code §11.1271 requires water conservation plans for all municipal and industrial water users with surface water rights of 1,000 acre-feet per year or more and irrigation water users with surface water rights of 10,000 acre-feet per year or more. Water conservation plans of three entities in Far West Texas that meet this criteria are included in the appendices at the end of this chapter. These entities include El Paso Water Utilities (EPWU) (Appendix 6A), El Paso County Water Improvement District No.1 (Appendix 6B), and Hudspeth County Conservation and Reclamation District No.1 (Appendix 6C). Water conservation plans are also required for all other water users applying for a State water right, and may also be required for entities seeking State funding for water supply projects.

### **6.1.1 Regional Water Conservation Recommendations**

EPWU is the largest supplier of municipal water in Far West Texas, supplying approximately 95 percent of all municipal needs in 2000. The City of El Paso through the EPWU has been implementing an aggressive water conservation program for the past 13 years and has reduced the per capita demand from 200 gpcd in 1990 to 139 gpcd in 2004. The low consumption in recent years occurred because the area was under drought restrictions in 2003 and 2004. The conservation goal for El Paso is 140 gpcd, which would be the lowest large city per capita use in Texas. The continuation of the conservation effort is a key component of the El Paso Integrated Water Management Strategy discussed in Chapter 4. El Paso's Water Conservation Plan is provided in Appendix 6A.

Irrigation represents approximately 76 percent of all the water used in Far West Texas. Most of this water is diverted from the Rio Grande and is applied to crops on farms located along the Rio Grande floodplain in El Paso, Hudspeth, and Presidio Counties. During significantly dry periods, insufficient water is available in upstream reservoirs to meet the full permitted allotments, and farmers in these areas have generally approached this situation by reducing acreage irrigated, changing types of crops planted, or possibly not planting crops until water becomes available during the following season. In some cases, farmers may benefit from a number of Best Management Practices described in Chapter 4, which are a mixture of site-specific management, educational, and physical procedures that have proven to be effective and are cost-effective for conserving water.

The implementation of water conservation programs that are cost effective, meet state mandates, and result in permanent real reductions in water use will be a challenge for the citizens of Far West Texas. Smaller communities that lack financial and technical resources will be particularly challenged and will look to the State for assistance. Irrigation conservation may result in significant reductions in water use. However, without financial and technical assistance, it is unlikely that aggressive irrigation conservation programs will be implemented.

## **6.1.2 Water Conservation Considerations**

### **6.1.2.1 Water-Saving Plumbing Fixture Program**

The Texas Legislature created the Water-Savings Plumbing Fixture Program on Jan. 1, 1992 to promote water conservation. Manufacturers of plumbing fixtures sold in Texas must comply with the Environmental Performance Standards for Plumbing Fixtures, which requires all plumbing fixtures such as showerheads, toilets and faucets sold in Texas to conform with specific water use efficiency standards.

Because more water is used in the bathroom than any other place in the home, water-efficient plumbing fixtures play an integral role in reducing water consumption, wastewater production, and consumers' water bills. It is estimated that switching to water-efficient

fixtures can save the average household between \$50 and \$100 per year on water and sewer bills. Many hotels and office buildings find that water-efficient fixtures can save 20 percent on water and wastewater costs.

### **6.1.2.2 Water Conservation Best Management Practice**

The 78<sup>th</sup> Texas Legislature under Senate Bill 1094 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. TWDB Report 362, Water Conservation Best Management Practices Guide was prepared in partial fulfillment of this charge. The Guide is organized into three sections, for municipal, industrial, and agricultural water user groups with a total of 55 Best Management Practices (BMPs). Each BMP has several elements that describe the efficiency measures, implementation techniques, schedule of implementation, scope, water savings estimating procedures, cost effectiveness considerations, and references to assist end-users in implementation. This document can be accessed at the following TWDB web site: <http://www.twdb.state.tx.us/assistance/conservation/TaskForceDocs/WCITFBMPGuide.pdf>.

### **6.1.2.3 Water Conservation Tips**

The TWDB provides a significant amount of information and services pertaining to water conservation that can be accessed at:

<http://www.twdb.state.tx.us/assistance/conservation/consindex.asp> . Likewise, [Water Conservation Tips](#) were developed by the TCEQ's Clean Texas 2000.

### **6.1.3 Model Water Conservation Plans**

Water Conservation Plan forms are available from TCEQ in WordPerfect and PDF formats. The forms for the following entity types listed below are available at [http://www.tceq.state.tx.us/permitting/water\\_supply/water\\_rights/conserve.html](http://www.tceq.state.tx.us/permitting/water_supply/water_rights/conserve.html). You can receive a print copy of a form by calling 512/239-4691 or by email to [wras@tceq.state.tx.us](mailto:wras@tceq.state.tx.us).

**Municipal Use** - Utility Profile and Water Conservation Plan Requirements for Municipal Water Use by Public water Suppliers (TCEQ-10218)

**Wholesale Public Water Suppliers** - Profile and Water Conservation Plan Requirements for Wholesale Public Water Suppliers (TCEQ-20162)

**Industrial/Mining Use** - Industrial/Mining Water Conservation Plan (TCEQ-10213)

**Agricultural Uses** –

Agriculture Water Conservation Plan-Non-Irrigation (TCEQ-10541)

System Inventory and Water Conservation Plan for Individually-Operated Irrigation System (TCEQ-10238)

System Inventory and Water Conservation Plan for Agricultural Water Suppliers Providing Water to More Than One User (TCEQ-10244)

## 6.2 DROUGHT CONTINGENCY

Drought is a frequent and inevitable factor in the climate of Texas. Therefore, it is vital to plan for the effect that droughts will have on the use, allocation and conservation of water in the state. Far West Texas is perennially under drought or near-drought conditions compared with more humid areas of the State. Although residents of the Region are generally accustomed to these conditions, the low rainfall and the accompanying high levels of evaporation underscore the necessity of developing plans that respond to potential disruptions in the supply of groundwater and surface water caused by drought conditions.

Because of the range of conditions that affected the more than 4,000 water utilities throughout the state in 1997, the Texas Legislature directed the TCEQ to adopt rules establishing common drought plan requirements for water suppliers. As a result, the TCEQ requires all wholesale public water suppliers, retail public water suppliers serving 3,300 connections or more, and irrigation districts to submit drought contingency plans. For all retail public water suppliers serving less than 3,300 connections, the drought contingency plans must have been prepared and adopted no later than May 1, 2005, and shall be available for inspection upon request.

### **6.2.1 Drought Response Triggers**

Droughts typically develop slowly and insidiously over a period of months or even years and can have a major impact on the region. Water shortages may also occur over briefer periods as a result of water production and distribution facility failures. Drought contingency plans provide a structured response that is intended to minimize the damaging effects caused by the water shortage conditions. A common feature of drought contingency plans is a structure that allows increasingly stringent drought response measures to be implemented in successive stages as water supply diminishes or water demand increases. This measured or gradual approach allows for timely and appropriate action as a water shortage develops. The onset and termination of each implementation stage should be defined by specific “triggering” criteria. Triggering criteria are intended to ensure that timely action is taken in response to a developing situation and that the response is appropriate to the level of severity of the situation.

Each water-supply entity is responsible for establishing its own drought or emergency contingency plan that includes appropriate triggering criteria. Depending on the water use category, the plan may ultimately affect the health and welfare of a large population or it may only affect the property of a single owner. Entities providing drought contingency plans to the Far West Texas Water Planning Group are listed in Section 6.3.

Drought response triggers should be specific to each water supplier and should be based on an assessment of the water user’s vulnerability. For instance, a user on a surface-water source is likely to experience shortage from a drought sooner than a user on a groundwater source, simply due to the nature of the supply source. In some cases it may be more appropriate to establish triggers based on a supply source volumetric indicator such as a lake surface elevation or an aquifer static water level. Similarly, triggers might be based on supply levels remaining in a storage tank. However, this type of trigger will likely come too late for the entity to know it is in trouble; therefore, a supply source trigger is preferable. Triggers based on demand levels can also be effective as long as the entity does not overestimate how far it can stretch its supply or how much water its retail customers can manage to conserve. Whichever method is employed, trigger criteria should be defined on

well-established relationships between the benchmark and historical experience. If historical observations have not been made then common sense must prevail until such time that more specific data can be presented.

### **6.2.2 Surface Water Triggers**

The annual allotment of Rio Grande Project water is determined by the U.S. Bureau of Reclamation (USBR) based on the amount of usable water in storage in Elephant Butte and Caballo reservoirs. Based on the amount of storage remaining in Elephant Butte and Caballo Reservoirs at the end of the primary irrigation season (early- to mid-October), the USBR determines the amount of water that will be delivered the following year. In general, a one-year drought in the Upper Rio Grande drainage basin will have little effect on overall storage in the reservoirs. However, a long-term drought would have a significant effect on water releases downstream. Downstream users, both irrigation and municipal, are thus aware in advance of coming surface water supply shortages and can react accordingly.

The City of El Paso's Drought and Emergency Management Plan (2002) is administered through EPWU and is based on three Drought or Water Emergency Stages: (1) A Stage I water emergency is triggered when water stored in Elephant Butte Reservoir is less than 500,000 acre-feet; or when the El Paso County Water Improvement District No. 1 (EPCWID#1) declares surface water allotment is less than 3.0 acre-feet per acre on or before March 15<sup>th</sup>; or when water demand is projected to exceed 90 percent of available capacity as determined by El Paso Water Utilities; (2) A Stage II water emergency is triggered when the EPCWID#1 declares surface water allotment of less than 2.5 acre-feet per acre on or before March 15<sup>th</sup> and river water quality is projected to exceed 300 parts per million (ppm) of sulfates or 1,000 ppm of total dissolved solids in April, May or September; or when water demand is projected to exceeds 95 percent of available capacity as determined by El Paso Water Utilities; (3) A Stage III water emergency is triggered when the EPCWID#1 declares surface water allotment of less than 2.0 acre-feet per acre on or before March 15<sup>th</sup> or river water quality is projected to exceed 300 parts per million (ppm) of sulfates or 1,000 ppm of total dissolved solids during the months of June, July and August; or when water demand is

projected to exceeds 100 percent of available capacity as determined by El Paso Water Utilities. A water emergency may also be declared based on a water system failure due to weather, electrical or mechanical failure or contamination of source. Once any stage is declared, the General Manager of the EPWU can implement a variety of response measures designed to conserve water. These range from use restrictions to citations for noncompliance.

Most of the other communities in El Paso County receive their water supplies from EPWU or from other water-supply entities including the Horizon Regional MUD, El Paso County WCID No.4, and the Lower Valley Water District. Because of their reliance on supply provided by EPWU, the Lower Valley Water District drought contingency triggers and responses should be similar to the triggers and responses developed by EPWU. The other wholesale water providers rely on groundwater, which is discussed under the following Groundwater Triggers section.

Irrigation districts depend on runoff from watersheds in the Upper Rio Grande drainage basins of New Mexico and southern Colorado to provide surface water to support irrigation in El Paso and Hudspeth Counties. Hence, drought triggers for the El Paso County Water Improvement District No.1 (EPCWID #1) and the Hudspeth County Conservation and Reclamation District No.1 (HCCR #1) are established based on storage levels in Elephant Butte and Caballo Reservoirs, which are in turn dependent on meteorological and hydrological conditions in these water sheds.

Drought conditions, which impact the EPCWID #1, are those that affect the headwaters of the Rio Grande and its tributaries, such that Rio Grande Compact water deliveries into Elephant Butte Reservoir are reduced. The district's board of directors determines when a drought exists and establishes the yearly delivery allotment to its water users based on its diversion allocation from the USBR. Generally, when water storage in Elephant Butte Reservoir is less than 0.9 million acre-ft during the irrigation season (March through September), the USBR declares drought conditions and sets its diversion allocations (using the D1 and D2 curves) to the irrigation districts based on a delivery allotment of less than its normal (non-drought) 3 acre-foot per acre. During times of drought, the district will

lower its delivery allotment based on the amount of its reduced diversion allocation from the USBR and its delivery commitments to its users. The extent of the reductions in the water allotments will be dependent on the severity of the drought conditions, and will remain in effect until the conditions that triggered the drought contingency no longer exist.

The HCCRD #1 bases drought contingency planning on evaluation of the water supply projected and received by the EPCWID #1, since all waters received by HCCRD #1 are return flows and operational spills for El Paso County. Since conditions, to a degree, can be predicted prior to a crop season, the drought mitigation plan largely affects agricultural producers cropping plan. When a mild or moderate predicted shortage occurs, the HCCRD #1 will notify its clientele of the amount of the expected shortage. For a severe shortage, where the water supply will provide less than 50 percent of the expected demand, agricultural producers will be asked to prioritize their water requests based upon crop needs.

Water in the Lower Rio Grande segment is used principally for irrigation, recreation, and environmental needs. A drought trigger for this segment of the river is based on flows of less than 35,438 acre-feet. The TCEQ Rio Grande Watermaster administers the allocation of Texas' share of the international water and is responsible for informing water-rights users of expected diversions during drought years.

### **6.2.3 Groundwater Triggers**

Groundwater triggers that indicate the onset of drought in Far West Texas are not as easily identified as factors related to surface-water systems. This is attributable to (1) the rapid response of stream discharge and reservoir storage to short-term changes in climatic conditions within a region and within adjoining areas where surface drainage originates, and (2) the typically slower response of groundwater systems to recharge processes. Although climatic conditions over a period of one or two years might have a significant impact on the availability of surface water, aquifers of the same area might not show comparable levels of response for much longer periods of time, depending on the location and size of recharge areas in a basin, the distribution of precipitation over recharge areas, the amount of recharge, and the extent to which aquifers are developed and exploited by major users of groundwater.

Several groundwater basins are identified in Chapter 3 as aquifers that will likely not experience consistent water-level decline, or mining, based on comparisons between projected demand, recharge and storage. In these areas, water levels might be expected to remain constant or relatively constant over the 2000 to 2050 planning period. Because of minimal water-level changes in these aquifers, water levels are not recommended as a drought-condition trigger. Atmospheric conditions are a better indicator for these areas.

Basins that do not receive sufficient recharge to offset natural discharge and pumpage may be depleted of groundwater (e.g., mined). The rate and extent of groundwater mining are related to the timeframe and the extent to which withdrawals exceed recharge. In such basins, water levels may fall over long periods of time, eventually reaching a point at which the cost of lifting water to the surface becomes uneconomic. Thus, water levels in such areas may not be a satisfactory drought trigger. Instead, communities might consider the rate at which water levels decline in response to increased demand during drought as a sufficient indicator.

Because of the above described problems with using water levels as drought-condition indicators, most municipal water-supply entities in Far West Texas that rely on groundwater generally establish drought-condition triggers based on levels of demand that exceed a percentage of the systems production capacity. Table 6-1 provides a list of groundwater dependent entities, their supply source, their type of triggers and responses.

Water levels in observation wells in and adjacent to municipal well fields, especially where wells are completed in aquifers that respond relatively quickly to recharge events, may be established as drought triggers for municipalities in the future providing a sufficient number of measurements are made annually to establish a historical record. Water levels below specified elevations for a pre-determined period of time might be interpreted to be reasonable groundwater indicators of drought conditions. Until such historical water-level trends are established, municipalities will likely continue to depend on demand as a percentage of production capacity as their primary drought trigger.

**TABLE 6-1. SUGGESTED OR MANDATED DROUGHT TRIGGERS FOR GROUNDWATER DEPENDENT ENTITIES**

<b>Water-Supply Entity</b>	<b>Entity Water Supply Source</b>	<b>Drought Trigger</b>	<b>Trigger Response</b>
Alpine	Igneous Aquifer	Daily water demand exceeds 75% of production capacity.	Multi-stage limitation on water use.
Van Horn	West Texas Bolsons Aquifer (Wild Horse Flat)	1. System demand exceeds production or storage capacity measured over a 24-hour period.	4-stage increasing limitation on water use.
El Paso (EPWU) *	Hueco and Mesilla Bolson Aquifers	Drought triggers are based on three surface-water allotment stages beginning with an annual allotment of less than 3.0 acre-feet per acre.	EPWU Manager can implement a variety of response measures designed to conserve water.
Anthony	Mesilla Bolson Aquifer	Daily water demand exceeds 75% of production capacity.	Multi-stage limitation on water use.
Vinton	Mesilla Bolson Aquifer	1. Daily water demand exceeds 75% of production capacity; 2. Water levels in wells drop below pump intake level; 3. Power failure of over 30 minutes.	Multi-stage limitation on water use.
Horizon Regional MUD Horizon City	Hueco Bolson Aquifer	Daily water demand exceeds 75% of production capacity.	Multi-stage limitation on water use.
Dell City	Bone Spring-Victorio Peak Aquifer	Daily water demand exceeds 75% of production capacity.	Multi-stage limitation on water use.
Sierra Blanca	West Texas Bolsons Aquifer (Wild Horse Flat)	Linked to Van Horn	Linked to Van Horn
Fort Davis WSC Fort Davis	Igneous Aquifer	4 trigger levels beginning with mild shortages. Second stage begins when daily water demand exceeds 60% of production capacity.	4-stage increasing limitation on water use.
Marfa	Igneous Aquifer	Daily water demand exceeds 75% of production capacity.	Multi-stage limitation on water use.
Presidio	West Texas Bolsons Aquifer (Presidio Bolson)	Daily water demand exceeds 75% of production capacity.	Multi-stage limitation on water use.
Terrell County WCID #1 Sanderson	Edwards-Trinity (Plateau) Aquifer	3 trigger levels beginning when daily water demand exceeds 80% of production capacity.	3-stage increasing limitation on water use.

\* The Far West Texas Water Planning Group considers groundwater triggers for El Paso (EPWU) not to be relevant.

Water-use categories in the Region other than municipal that are dependent on groundwater as their primary or only source of supply must rely on a number of factors to identify drought conditions. In most cases, atmospheric condition (days without measurable rainfall) is the most obvious factor. Various drought indices (Palmer, Standard Precipitation, and Keetch-Byram) are available from State and local sources. Groundwater conservation districts, agricultural agencies, as well as individuals can access these indices for use in determining local drought conditions and appropriate responses.

As discussed earlier in this section, groundwater levels in this part of the State have only limited use as drought triggers. Although numerous water-level measurements are available on a number of wells in the Region, most of this data represents only one measurement a year. This does not allow for observation of seasonal fluctuation or response to recharge events. However, Table 6-2 provides a selection of wells (one per aquifer) with a history of measurements and a proposed drought trigger level. Staff of the TWDB measure most of these wells annually. Wells selected for drought contingency triggers should be re-evaluated for appropriateness during the next planning period.

Groundwater conservation districts are generally responsible for monitoring conditions within their boundaries and making appropriate public notification. Outside of existing districts, the TWDB should assume responsibility of public notification of drought conditions based on their water-level monitoring network. Appropriate drought responses are the responsibility of and at the discretion of private well owners.

**TABLE 6-2. SUGGESTED GROUNDWATER LEVEL TRIGGERS BY SOURCE**

Aquifer	County	Well Number	Avg. Depth to Water in 1990s	Trigger Depth to Water
Hueco Bolson **	El Paso	49-13-710 EPWU #67	14.7 decline to 5.5 rise *	Unknown **
Mesilla Bolson **	El Paso	49-04-138 JL-EPWU #117	4.6 decline to 3.4 rise *	Unknown **
Rio Grande Alluvium	El Paso	49-04-701	6.4	7.3
Edwards-Trinity (Plateau)	Terrell	53-53-601	Unknown	30 ft. below avg summer depth
Bone Spring-Victorio Peak	Hudspeth	48-07-516	121	135
Igneous	Brewster	52-35-709	113	144
Marathon	Brewster	52-55-106	Unknown	30 ft. below avg. summer depth
Rustler ***				
Salt Basin				
Wild Horse	Culberson	47-59-106	227	20 ft. below avg. summer depth
Lobo	Culberson	51-02-903	197	20 ft. below avg summer depth
Ryan	Jeff Davis	51-19-902	109	30 ft. below avg. summer depth
Other West Texas Bolsons***				

\* Ranges of annual drawdown.

\*\* The Hueco and Mesilla Bolson aquifers are undergoing a continuous water-level decline and, therefore, a depth trigger is inappropriate. Water-level changes shown are related to normal variations in groundwater pumping at the well and the well field in general, and are not believed to be drought induced. Drawdown levels that may be used as drought triggers during drought-of-record conditions have not been identified in these or any other wells in the well field. However, due to their proximity to the Rio Grande, it is believed that these wells would be most likely to show effects if a drought-of-record were to occur.

\*\*\* Very little pumpage, if any, comes from these aquifers and, therefore, a depth trigger is meaningless.

\*\*\*\* Wells selected for drought triggers should be re-evaluated for appropriateness during next planning period.

### 6.2.3.1 Model Drought Contingency Plans

The TCEQ has prepared model drought contingency plans for wholesale and retail public water suppliers, water supply corporations, and investor owned utilities that meet the TCEQ's minimum requirements. The forms for the entity types listed below are available at [http://www.tceq.state.tx.us/permitting/water\\_supply/water\\_rights/contingency.html](http://www.tceq.state.tx.us/permitting/water_supply/water_rights/contingency.html). You can receive a print copy of the model plan by calling 512/239-4691, or by e-mail to [wras@tceq.state.tx.us](mailto:wras@tceq.state.tx.us).

- Handbook for Drought Contingency Planning for Retail Public Water Suppliers.
- Handbook for Drought Contingency Planning for Wholesale Public Water Suppliers.
- Handbook for Drought Contingency Planning for Irrigation Districts.
- Model Drought Contingency Plan for the Investor Owned Utility.
- Model Drought Contingency Plan for the Water Supply Corporation.

The model drought contingency plans for the above categories incorporate the following guidelines:

- Specific, quantified targets for water use reductions
- Drought response stages
- Triggers to begin and end each stage
- Supply management measures
- Demand management measures
- Descriptions of drought indicators
- Notification procedures
- Enforcement procedures
- Procedures for granting exceptions
- Public input to the plan
- Ongoing public education
- Adoption of plan
- Coordination with regional water planning group

### **6.3 WATER CONSERVATION MANAGEMENT AND DROUGHT CONTINGENCY PLANS**

In the consideration of regional conservation and drought management issues, the Far West Texas Water Planning Group reviewed active water conservation management and drought contingency plans provided to the planning group by the following entities.

#### Public Supply Entities

- City of Alpine - Water Conservation and Drought Contingency Plan (August 2005)
- Dell City – Water Conservation and Drought Contingency Plan (August 2000)

- El Paso County Water Authority – Water Conservation and Drought Contingency Plan (May 2001)
- El Paso County WCID #4 – Drought Contingency Plan (August 2000)
- El Paso Water Utilities – El Paso’s Water Conservation Plan (May 2005)
- El Paso Water Utilities – EPWU Drought and Water Emergency Management Response Plan (November 2002)
- Esperanza Water Service Company – Drought Contingency Plan (August 2000)
- Fort Davis WSC – Drought Contingency Plan (August 2000)
- Fort Davis Estates – Drought Contingency Plan (August 2001)
- Green Acres/River View Water Works – Drought Contingency Plan (August 2000)
- Horizon Regional MUD – Water Conservation and Drought Contingency Plan (April 2005)
- Lajitas Utility Company – Drought Contingency Plan (November 2005)
- Marathon Water Supply and sewer Service Corp. – Drought Contingency Plan (July 2000)
- City of Sanderson – Comprehensive Plan (1994)
- Study Butte WSC – Drought Contingency Plan (April 2001)
- Terrell County WCID No.1 – Drought Contingency Plan
- Turf Water System – Drought Contingency Plan (August 2000)
- Town of Valentine – Drought Contingency Plan (August 2000)
- Town of Van Horn – Water Conservation and Drought Contingency Plan (July 1996)
- Villa Alegre estates – Drought Contingency Plan (August 2000)
- Vinton Hills Water System – Drought Contingency Plan (August 2000)
- Vinton Village Estates – Drought Contingency Plan (August 2000)

#### Irrigation Districts

- El Paso County Water Improvement District No.1 – *Management Plan*
- Hudspeth County Conservation and Reclamation District No.1 – *Management Plan*

## 6.4 GROUNDWATER CONSERVATION DISTRICTS

The Texas Legislature has established a process for local management of groundwater resources through groundwater conservation districts. The districts are charged with managing groundwater by providing for the conservation, preservation, protection, recharging and prevention of waste of groundwater within their jurisdictions. An elected or appointed board governs these districts and establishes rules, programs and activities specifically designed to address local problems and opportunities. Texas Water Code §36.0015 states, in part, “Groundwater Conservation Districts created as provided by this chapter are the state’s preferred method of groundwater management.” Five districts are currently in operation within the planning region.

### 6.4.1 Brewster County Groundwater Conservation District

The Brewster County Groundwater Conservation District was confirmed in 2001 and serves the all of Brewster County, the largest county in the State. The mission of the District is to manage, protect, and conserve the groundwater resources of Brewster County, while protecting private property rights and promoting constructive and sustainable development in the county. Management goals include:

- Improve the understanding of groundwater in the District
- Implement rules for drilling, completing, equipping, and operating of water wells
- Implement strategies that will provide for the most efficient use, long-term sustainability and conservation of groundwater
- Recommend strategies that will protect and enhance the quality and quantity of water by controlling and preventing waste

- Minimize the degradation of the aquifers by considering regulations for spacing of wells and production from wells
- Determine aquifer conditions to be used as trigger mechanisms to assist water suppliers in implementing emergency drought management plans
- Minimize the potential for contamination of groundwater by new or existing wells
- Prevent damage or degradation to the aquifers in the District by the export of water from the District

#### **6.4.2 Culberson County Groundwater Conservation District**

The Culberson County Groundwater Conservation District occupies the southwestern half of Culberson County and was confirmed in May 1998. Aquifers managed by the District primarily include the Wild Horse Flat, Michigan Flat, and Lobo Flat West Texas Bolsons, and the Capitan Reef aquifer. The District adopted a management plan in 2000, along with associated rules and regulations, and has established the following management goals:

- Improve the basic understanding of groundwater conditions in the District
- Implement management strategies that will provide for the most efficient use of groundwater
- Strive to prevent the waste of water
- Minimize the influence of pumping of wells on the degradation of the aquifers by regulating the spacing of wells and by use of a Production Use Measurement Area
- Minimize the potential for contamination of groundwater by new or existing wells
- Monitor water export out of the District

#### **6.4.3 Hudspeth County Underground Water Conservation District #1**

The Hudspeth County Underground Water Conservation District #1 was created in 1956 and is located in the Dell Valley irrigation area of northeast Hudspeth County, with the Community of Dell City lying approximately in the center of the District. The principal aquifer in the District is the Bone Spring-Victoria Peak. The District recently installed eight

continuous water-level recorders and has placed flow gauges on irrigation wells. The latest District management plan adopted in 2002 includes the following management goals and activities:

- Provide for the most efficient use of groundwater
- Control and prevent the waste of groundwater
- Address natural-resource issues
- Curtail permitted withdrawals from the aquifer during periods of extreme drought
- Promote the efficient application of irrigation water to field crops

#### **6.4.4 Jeff Davis County Underground Water Conservation District**

The Jeff Davis County Underground Water Conservation District was formed in August 1994 (HB 2866) and includes all of Jeff Davis County and portions of Brewster, Pecos and Presidio Counties within its jurisdiction. Primary aquifers managed by the District include the Ryan Flat and Lobo Flat West Texas Bolsons and the Igneous. District activities include the registration of all new wells and the permitting of wells that are capable of producing 25,000 gallons per day or more. State well construction standards are enforced and water levels are monitored in 28 observation wells located in high use areas. The District is involved in a wellhead protection program with the Fort Davis Water Supply Corp. and also provides educational programs for schools and the public. The following goals are included in the District's 2003 management plan:

- Provide for the most efficient use of groundwater
- Control and prevent waste of groundwater
- Implement management strategies that will address drought conditions
- Implement management strategies that will promote water conservation

#### **6.4.5 Presidio County Underground Water Conservation District**

Presidio County residents approved the formation of the Presidio County Underground Water Conservation District in an election held August 31, 1999. Primary aquifers to be managed in the District include the Presidio-Redford Bolson, the Ryan Flat West Texas Bolson, and the Igneous. District activities include well permitting, recharge enhancement, and public education. The District developed a management plan in 2000 (revised 2003) which includes the following goals:

- Provide for the most efficient use of groundwater
- Control and prevent waste of groundwater
- Implement strategies that will address drought conditions
- Implement strategies that will promote water conservation.

**APPENDIX 6A**

**CITY OF EL PASO**

**WATER CONSERVATION PLAN**

## APPENDIX 6A

### City of El Paso Water Conservation Program

In 1990, the Public Service Board (PSB) named a 40 member Citizens Advisory Committee to look at all areas of water use and make recommendations for a water conservation program. This was in response to seasonally high peak demands as well as a growing concern of meeting long-term goals. At the same time, El Paso's Water Resource Management Plan was being finalized. One of the proposed measures included in the management plan was water conservation as the most economical way to help achieve projected water use savings. In addition, the Committee reported wasteful water use practices needed to be eliminated in order to successfully accomplish the 160 gallons per capita per day (gpcd) goal. The practices identified were lawn and garden irrigation, high volume plumbing fixtures, evaporative cooling and at-home car washing.

This report became the basis for El Paso's Water Conservation Ordinance that the PSB presented to City Council for approval in 1991. Consequently, the EPWU-PSB initiated a comprehensive water conservation program that includes a range of voluntary and mandatory programs as well as utility policy changes designed to help reach long-term goals. By implementing innovative water conservation measures such as permanent changes in water use, strategic public education, changes in the plumbing code, the water conservation ordinance affecting new and existing homes and businesses, water system optimization and higher cost of water by establishing an increased block rate structure, the El Paso Water Utilities seek to reduce per capita use 20 percent, from the 200 gallons per capita per day (gpcd) used in 1989 to 160 gpcd by the year 2000.

**TABLE 1. HISTORICAL TOTAL SYSTEM WATER CONSUMPTION DATA**

Year	Population	Growth	Total Water*	GPPD**
1990	554,502	2.0%	37.87	187
1991	558,499	2.5%	35.21	170
1992	582,553	2.4%	36.59	172
1993	596,664	2.4%	38.61	177
1994	610,832	2.3%	40.40	181
1995	625,057	2.3%	40.34	177
1996	639,339	2.2%	40.11	172
1997	653,404	2.2%	39.72	167
1998	668,074	2.2%	39.95	164
1999	682,527	2.1%	40.70	163
2000	697,037	2.1%	40.43	159
2001	690,000	-1.0%	39.15	155
2002	690,000	0%	38.46	153
2003	682,637	-1.1%	36.99	148
2004	682,137	-0.1%	34.66	139

\* Billion Gallons

\*\* Gallons per Person per Day

## **MANDATORY RESTRICTIONS**

### **Conservation Ordinance**

The Water Conservation Ordinance contains mandatory, year-round restrictions on certain water use activities, prohibits water waste and applies to any person who uses water from the El Paso Water Utilities supply system. Mandatory restrictions included in the ordinance are:

### **Landscape Watering Days**

Before 1991, customers of El Paso Water Utilities could water their yards any time, any day, the water distribution system was always catching up with demand; and then in June 1990, reservoir levels were alarmingly low, just before the evening irrigation peak of 6:00 - 8:00 P.M. Levels at some reservoirs were only three feet high, jeopardizing fire protection in some areas of the city. This experience resulted in the adoption of a three-day per week landscape watering schedule designed to reduce wasteful irrigation practices and to reduce peak demand on the system. The year around schedule allows EVEN numbered addresses to water Tuesday, Thursday and Saturday. ODD numbered addresses are allowed to water Wednesday, Friday and Sundays. There is no residential watering on Mondays. Schools, parks, cemeteries, golf courses and industrial sites are allowed to water Monday, Wednesday and Friday.

### **Watering Days Times Restrictions**

To extend the conservation efforts, landscape irrigation restriction times were adopted in addition to the watering day's schedule. From April 1 through September 30, outdoor watering is allowed only before 10:00 a.m. or after 6:00 p.m.

### **Exceptions**

If a customer desires a change in irrigation days and hours, it is the customer's responsibility to apply for a variance and demonstrate hardship. A Review Board can modify established schedules or approve requests for variances. Variances are based on the Review Board's recommendations and are usually granted to customers that, because of age or health or depend on someone else to do yard work, or for those out-dated irrigation systems that cannot irrigate within the allotted time.

Landscape Watering Permits are issued for thirty days for the establishment of new lawns and landscapes or for one day for the application of either chemicals or fertilizer.

### **Car Washing**

Is only allowed using a bucket and/or a hand-held hose equipped with a positive shut-off nozzle. All "fund-raising" car wash events must be held at commercial establishments. During different drought management stages, washing of vehicles will only be permitted at commercial establishments approved by the El Paso Water Utilities.

### Water Waste

Any activity that causes water to spray or flow into the street or public right-of-way is prohibited and considered a violation. Violations are class C misdemeanor in nature. Although El Paso Water Conservation Ordinance does not require written warnings before a citation is given, the Conservation Department introduced the ordinance via warnings as part of their public education campaign. Washing of sidewalks, driveways, patios and other non-porous surfaces with a hose is prohibited except to eliminate dangerous conditions.

### Leak Repair

After Inspectors notification, leaks must be repaired within five working days. Failure to do so might result in a citation.

The enforcement of the conservation ordinance has been the responsibility of the El Paso Water Utilities since June of 1992 and allows for fines from \$50 to \$500 for each violation.

**TABLE 2. WATER CONSERVATION ENFORCEMENT HISTORY**

Year	Telephone	D-hanger	Verbal	Written	Citation	Conservation. Line
1991*	40	1,025	1,268	208	29	n/a
1992**	388	152	449	77	14	n/a
1993	508	198	619	1,025	100	2,164
1994	569	329	675	699	118	1,234
1995	576	289	534	322	121	2,756
FY 1996-97	925	355	1,145	410	192	1,634
FY 1997-98	450	549	554	478	400	2,179
FY 1998-99	505	594	727	279	227	11,882
FY 1999-00	595	671	924	253	269	12,091
FY 2000-01	610	2,697	4,447	141	210	21,409
FY 2001-02	509	3,000	1,646	400	300	18,500
FY 2002-03	669	777	1,409	143	1,054	14,830
FY 2003-04	509	1,731	1,604	291	804	11,292
FY 2004-05	284	478	759	131	309	19,991

\* Figures for the months of Jun -Oct only.

\*\* Figures for the months of Jun - Dec only

## UTILITY POLICY CHANGES

### Block Rate Structure

In 1991, the utilities adopted an aggressive conservation-oriented rate structure. The same year the conservation program was launched. These two factors along with an intense media campaign resulted in the initial 15.4 percent per capita reduction. For more information on the Utilities' rate structure, please log-on into our Website at <http://www.epwu.org>

### Changes in the Plumbing Code

Another area identified for significant water savings was the elimination of the high volume plumbing fixtures. Toilets using 1.6 gallons per flush and ultra-conserving showerheads and faucets using 2.5 gallons per minute (gpm) are now required under the City's Plumbing Code, to be installed in new constructions and remodeling jobs. Because in El Paso, thirty percent of the water consumed during the summer is used for evaporative cooling, the Plumbing Code does not allow any continuous bleed-off lines to be installed at evaporative cooling systems, only automated evacuation pumps are permitted to drain the unit reservoir after so many hours of operation. Existing bleed-off lines should be directed to drain into the landscape if possible. The code also requires swimming pools to be equipped with filtration or recycling systems and to be covered when not in use to reduce water loss through evaporation.

### Large and Very Large Water Users

In April 1992, the Ordinance established that *Large Water Users* (averaging 10,000 gallons or more per day) to submit a Water Conservation Plan. The plan contains water use projections; it identifies areas for reduction and the re-use of water, and specifies conservation goals as a condition for new or continued service. In addition to the water conservation plan, the Public Service Board requires *Very Large Water Users* (averaging 100,000 gallons or more per day) to submit a water use justification report with a re-use component as a condition for new or expanded service.

Because of their non-peak use pattern, *Very Large Users* were not contributing to the cost of serving their demands. The average cost per CCF paid by these customers was lower than the charges incurred by other customers. The established block structure for residential customers did not apply to them. The utility was not recovering resource-related costs from these significant users. A rate analysis study was commissioned to address this issue. In 1994, an increased block rate that provides economic incentives to recycle was adopted for the *Very Large Users*. Incentives for recycling are structured based on percent of potable water recycled.

### Local Government Turf Irrigation Accounts

Due to their summer peak use pattern, turf irrigation accounts have a higher peak to average ratio, as evidenced by the concentration of water use in the summer months. The amount of water used by these accounts is relatively insignificant to the total system water use, approximately two- percent.

Under the increase block rate structure, irrigation accounts tend to have an extremely low Average Winter Consumption (AWC), which is used to calculate block thresholds. Accordingly, the vast majority of the water use in the summer by these accounts was billed at the higher block 2 and 3 rates. Some irrigation accounts were increasing their Average Winter Consumption (AWC) in order to avoid the summer excess rate. This situation was not encouraging conservation.

The Utilities established a “Local Government Turf Irrigation Accounts” rate that bills water use based on monthly allotment levels. These levels are based on evapotranspiration measurements and allows for enough watering to replenish evaporation loss. Water use within the allotment is charged at \$.95 CCF, usage above such allotments is charged at block 3 rates. Agencies such as public schools, universities and colleges are included in this rate.

**TABLE 4. MONTHLY ALLOTEMENT FOR LOCAL GOVERNMENT YARDMETER ACCOUNTS (PER ACRE)**

Month	Maximum CCF Per Acre	Month	Maximum CCF Per Acre
January	40	July	280
February	40	August	200
March	50	September	180
April	180	October	120
May	200	November	50
June	280	December	40

**Water Rights**

In response to the Water Resource Management Plan goal of relying less on ground water sources, El Paso Water Utilities has developed an aggressive program to obtain water rights to increase the use of surface water. In 1997, surface water accounted for almost 50% of the total water used in El Paso, a sharp contrast from the 20% figure of 1989. For more information on water rights, call the El Paso Water Utilities Planning Department at (915) 594-5681

**Reclaimed Use**

The City of El Paso is effectively using reclaimed water help lessen demands on the potable water supply system. Over the past several years, a series of projects has been undertaken to increase the use of recycled water. Several □ distribution lines have been installed on the West Side. Large turf irrigators such as Coronado Country Club and city parks are using reclaimed water for irrigation. Other reclaimed programs such as golf course irrigation, aquifer recharge, power plant cooling and various industrial uses have been in-service since 1960. For more information regarding reclaimed water use, please call (915) 594-5730

**Drought Management Plan**

Due to the potential decrease in surface water allotments from the Irrigation District, the Utilities have a contingency plan to manage drought and emergency conditions. This means that the Utility can continue to deliver cost effective, adequate, safe and a reliable water supply during periods of critical water shortages as a result of either drought or emergency interruption to available water supplies.

**Future Sources**

The EPWU is pursuing several options for future water supply. The Hueco basin contains 3 to 4 million-acre feet of brackish ground water. Pilot plant studies have demonstrated that the salts can be removed, however further study is needed to define a feasible method for disposing of the salt. For more information on regional water planning, visit our Web site at <http://www.epwu.org>

**VOLUNTARY PROGRAMS (Conservation Initiatives)**

**Education**

El Paso Water Utilities is involved in many activities to increase public awareness. These include monthly conservation messages on the back of bills, periodic bill stuffers, billboards, TV, radio, newspaper and displays at citywide shows, fairs, and festivals as well as presentations to civic groups and other organizations. The Conservation Department also makes presentations to school groups and youth organizations that often include a visit by our “Willie” mascot. Development of the “Willie” character has allowed greater visibility in promoting water conservation.

The Utility is involved with “Drinking Water Week”, a project of AWWA held every full week of May of every year. Different activities are planned for that time, with emphasis on tours of the different plants and a student poster contest.

**TABLE 5. EDUCATIONAL EFFORTS BY THE CONSERVATION DEPARTMENT**

	Presentations	Attendees	Media Contacts
FY 1996-97	106	40,094	27
FY 1997-98	126	40,900	42
FY 1998-99	299	56,234	60
FY 1999-00	602	51,223	64
FY 2000-01	380	40,000	45
FY 2001-02	149	132,993	13
FY 2002-03	331	25,703	225
FY 2003-04	257	102,049	252
FY 2004-05	216	67,060	247

## **INITIATIVES**

The Utility funds several programs that enhance the goals of the conservation program while providing information on wise water use.

### “Cash for Your Commode”

When the plumbing code changes became effective, (September 12, 1991) the Utility kicked off its “Cash for Your Commode” rebate program. A customer can receive a 75% rebate (up to \$100 per toilet) for replacing an existing larger water-using toilet with an ultra-low-flow toilet. Since the beginning of the program, over 30,000 toilets have been replaced, saving an estimated 340 million gallons of water and wastewater a year.

### “Free Showerhead Distribution”

During 2000, more than 160,000 low-flow showerheads were delivered to customers. An evaluation of this program showed a decrease of 1 Billion gallons of wastewater.

### “Refrigeration Units Rebate”

In coordination with the El Paso Electric, a rebate of \$300.00 is given to residential customers or homebuilders for the installation of central refrigeration units.

### “Horizontal Washing Machines Rebates”

A rebate of \$200 for the purchase and installation of horizontal washing machines is available to our residential and a \$300 rebate for our commercial customers.

### “Evaporative Bleed-off Line Clamps”

The Utility distributes free evaporative bleed-off line clamps for customers that have evaporative cooling systems. Water used for cooling purposes in El Paso accounts for 15% of residential use, restricting the bleed-off flow will save millions of gallons that usually are dumped into the sewer.

### “Desert Blooms CDROM”

Since 1990, the Utility has been working with the Texas A&M Extension Service to promote water efficiency in urban landscapes. Workshops and seminars are provided to increase awareness of water issues in the region. The CDROM was developed to fill the need for regional plant selection information. “Desert Blooms”, has information in both English and Spanish of more than 400 trees, shrubs, groundcovers, grasses and flowers that are adapted or native to the Chihuahuan Desert.

### “Turf Rebate Program”

Living in the Chihuahuan Desert calls for beautiful, colorful and most importantly, water conserving landscapes. Because our desert receives an average of only 8 inches of rainfall a year, it makes sense to use native and watertight plants, which require little or no additional irrigation. Water is a precious commodity and living in harmony with our desert proves your commitment and respect for our region and its limited water resources.

This rebate program offers an incentive to convert established turf areas to water-efficient landscape designs that incorporate low water use plants and common sense horticulture practices. This program is for established residential customers (no-new homes are eligible) and established commercial and industrial customers. The Utility pays \$1.00 per square foot of established grass that is replaced with an approved landscape.

“Hot Water on Demand”

This new program has been added to our conservation portfolio as a result of Public Working Committee recommendations. The average home wastes nearly 10,000 gallons of water every year as people wait for hot water. The How Water on Demand systems re-circulates hot water through the house so that hot water reaches the tap in a shorter time. This rebate offers direct retail customers of El Paso Water Utilities a \$100 rebate check for each pump installed at the residential site, with a \$300 rebate maximum per site.

“Waterless Urinals”

The Utility continues to promote the installation of waterless urinals as another efficient way to save water. A total of 100 units have been distributed to area school districts and city offices. Staff is conducting installation verification visits to gather information about maintenance and acceptance comments.

### **Report of Major Accomplishments for Water Conservation**

#### **1989-90**

- Reduce Summer Peak Demand with implementation of water odd/even schedule program.
- Initiated demonstration project with Texas A&M Research Center and Keep El Paso Beautiful to demonstrate water conservation type landscaping. Several sites around El Paso were Xeriscaped as demonstration gardens.

#### **1990-91**

- Water Conservation Advisory Committee developed comprehensive water conservation plan and recommended to employ a water conservation manager.

#### **1991-92**

- Water Conservation Department is formed with a total of five full time employees. A Manager, two Conservation Technicians, one Graphics designer and a Clerk Typist.
- Initiated public education campaign to include monthly messages on the back of the water bill, printed brochures and inserts and television spots.

#### **1992-93**

- Assumed enforcement of the water conservation ordinance.
- Implemented “Cash for your Commode Toilet Rebate Program” 3,600 units the first year.
- Expanded water conservation public education campaign by participating in several community events.
- Initiation of a three-year grant “Water Smart” program in cooperation with the Texas Agricultural Extension Service to increase awareness of landscape water use and appreciation of the Chihuahuan desert.

#### **1993-94**

- Expanded conservation program to hire three additional full time employees. Two Enforcement Inspectors and one Clerk Typist.
- Water conservation programs submitted by large water users were reviewed and customers contacted for progress report.
- Initiated Plant “Water Smart” Program with the Nursery Association. Banner, ID tags and printed materials were distributed to area nurseries.
- Assisted in drafting the Landscape Ordinance with City Planning Department.
- Assisted in water use survey to determine water issues awareness level.

**1994-95**

- Continue enforce the city's conservation ordinance.
- Initiated free irrigation water audit program.
- Continue toilet rebate.
- Aggressive mass media education campaign.
- Education programs to schools. Willie mascot visits.

**1995-96**

- Identified local government yard meter accounts monthly allocation basis.
- Invited Municipal Court Judges for a conservation forum.
- A total of 72 Willie presentations to schools.
- Continue with education campaign.
- Continue toilet rebate

**1996-97**

- Presented Amy Vickers report to the Public Service Board.
- Organized Water Conservation and Reuse Committee to redirect the conservation program.
- Increase the number of toilet appointments from 50 to 56 a week.
- Conducted 28 Willie presentations reaching 2,736 students.
- Provided 72 additional conservation presentations reaching 5,413 customers.
- Participated in six citywide education programs reaching 31,945 attendees.
- Increase number of citations from 118 to 128 and reduced warnings from 699 to 309.

**1997-98**

- Finalize Water Conservation and Reuse Advisory Committee meetings and presented committees' overall recommendations to the Public Service Board.
- Obtained a \$25,000 grant from the Bureau of Reclamation to develop a bilingual water smart landscape CD-ROM with information about plants for urban landscapes located in the Chihuahuan Desert along with conservation information, regional resources and efficient horticultural techniques for the El Paso, Las Cruces and Cd. Juárez area. The project was coordinated with NMSU, UTEP, Texas Agricultural Extension Service and the Texas Urban Forest Service.
- Develop program with local Car Wash Association to curtail water waste from fund-raising car wash events. The program is called "Let's Do It Right" and allows groups to collaborate with participating commercial car wash establishments to hold fund raising non-profit events.
- Coordinated a pilot program in cooperation with El Paso Electric Company. The program called "Be Water Wise and Energy Efficient" teaches middle school students the importance of energy and water conservation. A total of 600 middle school students participated in the first year.

- Launched effective television media campaign to increase awareness of conservation.
- Increase number of citations by 274% for violations to the conservation ordinance.
- A rate modification for yard meters other than local government accounts was implemented to eliminate AWC calculation and charging Block 2 rates for yard meter consumption.

### **1998-99**

- Finalized development of the Desert Blooms CDROM, a project partially funded by the Bureau of Reclamation. Presented final product to the Public Service Board during their monthly meeting.
- Developed a marketing campaign for the preliminary introduction and distribution of the Desert Blooms project and continued implementation of conservation focused television campaign.
- Participated as speaker for:
  - Texas Water Conservation and Irrigation Conference in Houston, TX. With “El Paso’s Enforcement Program – Water Cops.”
  - 3<sup>rd</sup>. Annual Water Conservation Conference in Las Cruces, NM.
- Received the following awards:
  - 1998 AWWA Water Mark Award for Communication Excellence for the “Willie’s World Activity Book.”
  - Honorable mention from AWWA for the main lobby mural and new brochure depicting the “El Paso Water Utilities System” under the large utility miscellaneous category.
- Organized the first El Paso’s “Tree Conference” and landscape workshop for professional and homeowners for the most up-to-date information on tree care and water conservation in your landscape. Project done in cooperation with UTEP and the Texas Agricultural Extension and Research Center (300 attendees)
- Completed training of conservation staff in regards to irrigation systems water audits, educational presentations, ground water model demonstrations and vignettes with “Willie” the mascot.

### **1999-00**

- Introduced “Desert Blooms” CDROM to the public through a comprehensive media and promotional campaign. Received the following awards for the project:
  - 1889-99 American Advertising Award “Best of Show” for the best interactive media category.
  - 1999 AWWA Water Mark award for the best use of technology.
  - 1999 AWWA Conservation and Reuse, under large utility indirect category.
  - 1999 Texas Urban Forestry “Community Forestry Award”

- Implemented the second “Be Water Wise and Energy Efficient” program in cooperation with El Paso Electric and additional sponsorship from “Partners in Education” was secured to underwrite an additional 600 students. Completed evaluation of program showed that 1,400 households program to date showed a 12% water use reduction.
- Continued implementation of television campaign aimed at reducing water use and increase awareness of regional water issues.
- Received recognition from the League of Women Voters during their 1999 Mission Possible conference for EPWU “Protection and Preservation of the Environment” educational efforts.
- Participated as speaker for:
  - Low Desert Xeriscape Conference in Tucson AZ. With “Desert Blooms, a SunScape Guide to Plants for a Water-scarce Region”.
  - Spring and Fall SunScape series at UTEP, a seven-week comprehensive Xeriscape workshop.
  - Spring and Fall Texas Agricultural Extension Master Gardener program series.
- Secured a \$10,000 grant from the Bureau of Reclamation to develop a SunScape Landscape printed brochure to be used in conjunction with “Desert Blooms”.
- Organized the second annual “Tree Conference” in El Paso.
- Organized and completed the first ever Bi-national, Tri-state, Tri-city “Water Festival” in cooperation with NMSU, Bureau of Reclamation, EPA, WERC and other environmental agencies a total of 12,000 students from Cd. Juárez, Las Cruces and El Paso participated in the three day event.
- Participated in the EPWU’s Public Working Committee (PWC) to gain insight and input into plans for phase II water conservation program initiatives. Participated in the preparation of the final report to the PSB.
- Obtained \$20,000 from UTEP CERM program to work on a water sustainability information campaign to increase appreciation of the Chihuahuan desert.

**2000-01**

- Implemented PWC phase II recommendations:
  - “Showerhead Replacement Program”. 200,000 showerheads were distributed to El Paso Water Utilities customers during FY 2000-01
  - Initiated the Join Water Conservation Initiative Program for Horizontal Axis Washing Machines and Refrigerated Air Conditioner program in cooperation with El Paso Electric and El Paso Water Utilities.
  - Hired temporary enforcement during the summer of 2000
  - Hired Water Conservation Education Specialist to help lead and coordinated all educational events.

- Participated as speaker for:
  - Nursery and Landscape Exposition in Dallas, TX. With “Effectiveness of El Paso’s Water Conservation Program.”
  - Water Conservation in Landscape Irrigation Conference in Houston, TX. With “A City Gets Tough with Water Wasters”.
  - Conservation Forum in Salt Lake City, UT. With “El Paso Water Utilities Water Conservation Program in a Water Scarce Region.”
  - Spring and Fall SunScape series at UTEP.
  - Spring and Fall Texas Agricultural Extension Master Gardener program series for Texas and New Mexico.
- Implemented 3<sup>rd</sup>. “Be Water Wise and Energy Efficient” program. Funds from El Paso’s Independent School District were secured for an additional 300 middle school students.
- Organized and completed the second “Water Festival” and the 3<sup>rd</sup>. “Tree Conference” in El Paso. Both festival and conference are major educational events reaching more than 15,000 citizens.
- Received the following awards:
  - 2000 AWWA Water Mark award for the “Bi-national, Tri-state, Tri-city Water Festival” under the educational campaign.
  - 2000 AWWA Water Mark award for the “Willie’s Bingo” an interactive board game for children.
- Continued implementation of television campaign aimed at reducing water use and increase awareness of regional water issues.

**2001-02**

- Implemented PWC phase III conservation initiatives:
  - “Turf Rebate Pilot Program” a PWC recommendation under conservation phase III initiatives. A total of 138 sites participated in the pilot program removing 269,343 sq. ft. of grass. An evaluation of the pilot program was conducted under a contract with the Stratus Company.
  - “Evaporative Bleed-off Clamp” program. More than 20,000 clamps were distributed to EPWU customers during FY 2001-02
  - Amended the Water Conservation Ordinance to allow fundraising carwash events only at commercial carwash establishments and to limit grass amount on new residential homes and commercial properties.
  - Initiated the “Waterless Urinals Pilot Program” with El Paso, Ysleta and Socorro school districts. A total of 30 units were installed at different school sites.
- Continued implementation of the JWCI with El Paso Electric. A total of 301 washing machines and 428 refrigeration unit rebates were processed.
- Participated as speaker for:
  - Conferencia Internacional de Conservación de Agua in Madrid Spain with “Programa de Conservación en la ciudad de El Paso, Texas.”

- Organized and completed the 3<sup>rd</sup>. “Water Festival” (12,000 attendees) and the forth “Tree Conference” (500 attendees).
- Participated with educational booths at the Home and Garden Show (11,000 attendees) and the Generation 2000 (45,000 attendees) youth events at the Civic Center.
- Continued implementation of television campaign aimed at reducing water use and increase awareness of regional water issues.
- Received the following awards:
  - 2000 Public Relation Society of America (RIA) award for “Showerhead Program Campaign” and for the “Appreciation of the Chihuahuan Desert” television spots funded by UTEP-CERM.
- Worked with the El Paso International Airport in the design of water efficient landscape areas around the airport terminals.
- Remodeled EPWU main building landscape to reflect a more efficient design in a commercial setting utilizing plants that are adapted or native to our desert environment.

**2002-03**

- Continued implementation of all conservation initiatives: 350 turf sites, 674 refrigeration units, 759 washing machines, 2,708 toilet rebates. 10,000 clamps and 29,526 showerheads were distributed.
- Coordinated installation of landscape and plumbing fixtures on a Parade of Homes “Water Smart” home. Requested donations totaled more than \$40,000 for this project. Donations included plants, gravel, irrigation system, landscape fabric, landscape design and volunteer hours from Master Gardeners who helped instruct the public regarding water efficiency in the landscape.
- Amended the Conservation Ordinance regarding drought conditions.
- Participated as speaker for:
  - 2002 American Planning Association Planning with Borders, not Boundaries conference in El Paso, TX. With “Water, a Diamond in the Desert”.
  - Spring SunScape series at UTEP.
  - Fall Texas Agricultural Extension Master Gardener program.
- Organized and completed the 4<sup>th</sup>. “Water Festival” (8,000 attendees) and the 5<sup>th</sup>. “Tree Conference” (300 attendees).
- Participated in the Home and Garden Show.
- Coordinated, with El Paso Car Wash Association, the creation and airing of a television spot to promote the use of commercial car wash establishments.
- Coordinated Green Industry breakfast to initiate a public campaign promoting low-water use plants. Initiated Ms. Tree television campaign.

- Design and produced educational materials for Region XIX Head Start Program to be used at the Intellizeum. Materials included giant puzzles, memory card game, bags, coloring magnets and the water cycle interactive exhibit.
- Participated in the brainstorming session for the new Water Resource Learning Center at the planned Ft. Bliss/EPWU desalination plant.

#### **2003-04**

- Continued implementation of all conservation initiatives: 1,250 turf sites, 1,218 refrigeration units, 1,655 washing machines, 3,374 toilet rebates. 10,000 clamps and 30,101 showerheads were distributed.
- Successfully coordinated and implemented Stage One and Two of the EPWU drought and Water Emergency Management Response Plan approved by the PWC and City Council, including the supervision of the call-in center and additional temporary enforcement staff.
- Completed revision of educational materials to include drought information.
- Continue working with Region 19 Head Start Program to develop three giant lenticular murals depicting the Chihuahuan desert, regional water resources and water uses for the Intellizeum. Participated in the Head Start General Audit where the El Paso program received outstanding grades.
- Worked with the Junior League in the development of the Xeriscape demonstration garden for the Keystone Desert Botanical Garden. Active member of the educational committee for the park. Worked with Junior League members to request funds from the EPWU-PSB.
- Appointed to the Water Conservation Implementation Task force set for by the 78<sup>th</sup> Texas Legislature.
- Participated and implemented in the development of new EPWU/WIT project initiatives such as subsurface irrigation and hot water on demand pilot programs.
- Participated as speaker for:
  - 2004 Water Sources Conference in Austin, TX. With “Savings from a Turf Rebate Program in the Chihuahuan desert”.
  - 2004 Rotary International RYLA conference in Cd. Juárez, Mexico. With “El Paso’s Water Utilities Conservation Program.”
- Received the following award:
  - 2003 AWWA Water Mark award for the work done at the “Intellizeum Head Start Region 19.”

**APPENDIX 6B**

**EL PASO COUNTY WATER IMPROVEMENT**

**DISTRICT NO.1**

**WATER CONSERVATION PLAN**

## **APPENDIX 6B**

### **El Paso County Water Improvement District No. 1**

#### Mission, and General Description:

The El Paso County Water Improvement District No. 1 (EPCWID No.1) was organized in 1917 as part of the U.S. Bureau of Reclamation's Rio Grande Project. A five-member elected board governs the district. The EPCWID No.1 has ownership of all project works, easements, ditches, laterals, canals, drains, and rights-of-way associated with the project.

The Rio Grande Project provides full irrigation service to water-rights lands in the Elephant Butte Irrigation District and in the EPCWID No.1. The EPCWID No.1 has 69,010 water-rights acres, all located in the bottomlands of the river. Although the district does not provide wholesale public water supply, it supplies water to the City of El Paso for municipal and industrial purposes.

The principal focus of the EPCWID No.1 is to furnish high-quality irrigation water to El Paso County producers in amounts that allow for management flexibility and enhanced opportunity for increased farm revenue.

#### Water Resources and Supply:

The sources of water for the EPCWID No.1 are the headwaters and tributaries of the Rio Grande and the Elephant Butte and Caballo reservoirs. The amount of water available to Texas is specified by the Rio Grande Compact and is a percentage of the water in the Rio Grande passing the gauging station at Otowi, New Mexico. Since 1990, the annual allotment to the EPCWID No.1 has been 376,862 acre-ft. The district's board determines the individual allotments, which translates to 4 acre-ft per acre since 1990. The bulk of the water is available for use from March through September.

#### Water Use:

The principal use of surface water in the EPCWID No.1 is for field and vegetable crops and commercial orchard irrigation. Field crops are cotton (mostly Pima), alfalfa, corn, sorghum for silage, and wheat. The principal vegetable crops are peppers and onions. There are over 8,000 acres of commercial pecans in the valley. In addition to commercial agriculture production, irrigation water is distributed to numerous small tracts (less than 2 acres in size) that have the appropriate water rights.

Although the EPCWID No.1 is not a provider of potable water, the district furnishes water to the City of El Paso and to the Lower Valley Water District for subsequent treatment and municipal and industrial use.

#### Management of Water Supplies:

The EPCWID No.1 has little ability to manage the over-all supply of water to the district. This is determined largely by the Rio Grande Compact and various other contracts with the U.S. Bureau of Reclamation. However, once water reaches the first diversion structure for the district, the efficiency of use of the water is largely the responsibility of the

district and individual water users. Loss of water during transport can represent a significant loss of water for agricultural producers. Since the district has ownership of all project works, ditches, laterals, canals, and drains, a loss minimization program is in effect. The district has a flow telemetry system in place to monitor major canals.

Actions, Procedures, Performance, and Goals:

Agricultural producers can order water, so as to be able to time water applications. The producer works with a dispatcher and a ditchrider to prevent unnecessary water losses. Water is metered to an individual producer, and producers are charged for water used. A new water allotment schedule is now in effect, such that:

- Allotment 1 represents the base allotment (currently 2 acre-ft) which producers are charged, whether or not the water is used.
- Allotment 2 represents an additional amount of water (currently 2 acre-ft, such that allotments 1+2 represent the total allotment) available to producers. Charges are based on the amount of water used.
- Allotment 3 represents water available from October through February. Producers are charged only for water that they use.
- Allotment 4 represents water that producers can use from a pool set aside by the district. This allotment is for emergency purposes to finish a crop, and will be charged accordingly at a higher rate.

The EPCWID No.1 monitors water levels in Elephant Butte Reservoir and snow pack levels of the headwaters of the Rio Grande. Reductions in potential allotments are forecast based on the amount of storage in Elephant Butte Reservoir. The district is prepared to issue warning forecasts to help agricultural producers plan cropping systems, back-up water supply systems, and arrange financing for potential water shortfalls.

The EPCWID No.1 recognizes that agricultural demand for water, along with increasing demands by the City of El Paso and the Lower Valley Water District, exceeds the available water supply to the district. As such, the district has developed a public/clientele information program that focuses on water conservation and irrigation and saline soil management through a newsletter and public meetings. The district cooperates with the Texas Agricultural Extension Service, Natural Resource Conservation Service, and other state agencies to educate clientele in improved water management practices.

Drought Contingency:

Drought conditions that impact the EPCWID No.1 are those that affect the headwaters of the Rio Grande and its tributaries, such that Rio Grande Compact water delivery requirements into Elephant Butte Reservoir are reduced. The district's board of directors determines when a drought exists. Generally, when water storage in Elephant Butte Reservoir is less than 0.9 million acre-ft during the irrigation season (March through September), drought conditions are declared.

During times of drought, the district will allot water to all water users on a pro rata basis. The extent of the water allotments will be dependent on the severity of the drought conditions, and will remain in effect until the conditions that triggered the drought contingency no longer exist. Under Section 11.083 of the Texas Water Code, noncompliance with the drought contingency plan is punishable by fine and/or incarceration.

(Source: "Operations Guide" of EPCWID No.1 dated July 9, 1998, U.S. Department of the Interior Bureau of Reclamation's "Legal and Institutional Framework for Rio Grande Project Water Supply and Use" dated October 1995, EPCWID No.1's Drought Contingency Plan (recent), and personal communication.)

**APPENDIX 6C**

**HUDSPETH COUNTY CONSERVATION AND  
RECLAMATION DISTRICT NO.1**

**WATER CONSERVATION PLAN**

## **APPENDIX 6C**

### **Hudspeth County Conservation and Reclamation District No. 1**

#### Mission, and General Description:

The irrigation district plan for the Hudspeth County Conservation and Reclamation District No. 1 (HCCRD No.1) was developed in November of 1991. The district occupies approximately 18,300 acres of Rio Grande River bottomlands from the El Paso/Hudspeth County line downstream to Fort Quitman. The district was created to provide adequate irrigation to those lands.

The HCCRD No.1 was organized in 1924 to consolidate water diversions from the Rio Grande. Under a Warren Act contract, the district has taken a direct diversion of the river since 1925. A board of directors governs the district, with headquarters in Fort Hancock, Texas.

#### Water Resources and Supply:

The district's primary source of water includes untreated water obtained from permitted Rio Grande diversions; drainage waters; return flows from farming operations; operational waste associated with the U.S. Bureau of Reclamation's Rio Grande Project; and return flows from El Paso water and sewage treatment plants. The district's operations are primarily recycling and reuse that further the use of the waters in the Rio Grande Basin. Because the water supply to the HCCRD No.1 is totally dependent on the water supply to the EPCWID No.1, the supply is erratic, and the optimal utilization of available water is difficult.

#### Water Use:

All water used in the district is for irrigation. The HCCRD No.1 does not supply potable water. When ample water is available, lands in the district are quite productive. Cotton, small grains, forages, and irrigated pasture represent the principal crops.

#### Management of Water Supplies:

The HCCRD No.1 has constructed a system of canals, drains, and regulating reservoirs to distribute irrigation water through the district. Over the last several years, the volume of the regulating reservoirs has been expanded by 3,200 acre-ft. A program to reduce canal losses is in place.

The HCCRD No.1 taxes water-use customers on a per acre basis of irrigable land. Additional assessments are made on acres watered under percentage water conditions, in order to equate the taxes with benefits delivered. The district meters water delivered to customers. When the supply of water exceeds customer demands, the district may sell water to out-of-district purchasers.

#### Actions, Procedures, Performance, and Goals:

The goal of the HCCRD No. 1 is to conserve the waters of the Rio Grande to the maximum extent possible. As such the district seeks the cooperation of all users. The

district also holds regular public meetings. The public may have direct input during the meetings or through private contact with a district board member.

Currently, the district has an annual evaluation of the conservation program, and may make revisions to the program. If changes have been made to the plan, an annual report will be generated.

Between 1991 and 1995, the HCCRD No.1 in cooperation with the TWDB, Natural Resource Conservation Service, and the Texas Agricultural Extension Service provided water conservation brochures, conducted irrigation management workshops and field days, implemented a water metering program, and studied canal water losses.

Drought Contingency:

The HCCRD No.1 bases drought contingency planning on evaluation of the water supply projected and received by the EPCWID No.1, since all waters received by HCCRD No.1 are recyclable water from El Paso County. Since conditions, to a degree, can be predicted prior to a crop season, the drought mitigation plan largely affects agricultural producers cropping plan. When a mild or moderate predicted shortage occurs, the HCCRD No.1 will notify its clientele of the amount of the expected shortage. For a severe shortage, where the water supply will provide less than 50 percent of the expected demand, agricultural producers will be asked to prioritize their water requests based upon crop needs.