

5A.2 Water Conservation

5A.2.1 Description of Option

Water conservation would be defined as those methods and practices that either reduce the demand for water supply or increase the efficiency of the supply or use facilities so that available supply is conserved and made available for future use. Water conservation is typically a non-capital intensive alternative that any water supply entity can and should pursue. All water supply entities and some major water right holders are required by Senate Bill 1 regulations to submit for approval to the Texas Natural Resource Conservation Commission (TNRCC) a Drought Contingency and Water Conservation Plan before September 2000. These plans must detail the entities' plans for the water supply entity to reduce water demand at times when the demand threatens the total capacity of the water supply delivery system or overall supplies are low.

The water demand projections utilized in this study assume that approved conservation plans are in place and effective for all entities. Each entity has varying amounts of additional demand reduction included in the future demand projections described in Section 2. The assumed reductions tended to increase for future projections. Conservation activities that were assumed to be in place for the projections included:

- Water-efficient plumbing fixtures consistent with the State Water Efficient Plumbing Act of 1991;
- More efficient outdoor irrigation techniques, including the use of xeriscape landscaping;
- More thorough use of leak detection processes;
- More widespread use of water efficient appliances; and
- Use of education programs for water conservation practices.

To be considered as a viable component of the overall strategy, recommended water conservation actions would need to exceed those assumed for the TWDB projections. These could include the following:

- More stringent requirements and enforcement on any of the items listed;
- Financial incentives for more efficient practices; and
- Water rate structures that would provide incentives for increased conservation.

The only drawback to water conservation is that during dry periods, when the reduction in demand is most needed, if strong conservation measures were taken early in a drought and

assumed in the planning stages, there would be little or no flexibility remaining, should a future drought exceed that assumed during planning. The ability to adopt measures more stringent than planned could be limited in times of emergency.

To assist communities and water supply entities with their conservation planning, the TWDB has prepared a publication entitled *A Guidebook for Reducing Unaccounted-for Water*. The book includes a water audit to assist each community in assessing their system. This book is available free from the TWDB.

5A.2.2 Available Supply

The available supply for any entity would be the reduction in demand over and above that assumed in the projections. All entities, in order to be in line with projections, will need to verify that their conservation planning measures are consistent with TNRCC standards and the TWDB projections. Beyond that, some communities with a projected deficit may be able to reduce or eliminate that deficit with stronger conservation planning. In order to determine which communities might benefit from additional water conservation planning, a comparison was made for each community with a projected deficit between the projected per capita use for that community and the region-wide average. Table 5A.2-1 lists all the municipalities that have both a projected deficit and a per capita use greater than the region average. The table lists their 2030 and 2050 deficits as a percentage of their overall municipal demand, their 2030 and 2050 per capita demands, and the percentage the demand is over the region per capita average. For comparison, the projected per capita average in 2030 is about 140 gallons per capita per day (gpcd) and in 2050 is about 135 gpcd. Each of the communities listed in the table could possibly benefit from additional conservation measures. However, each city's use pattern is different, and without a thorough investigation of each system and use patterns, the true benefit of conservation for any one entity cannot be quantified at this time.

Eight cities have a projected per capita use of more than 125 percent of the region average and are even more likely to benefit from improved conservation practices. These are Morgans Point Resort, Salado, College Station, Fort Hood, Stamford, Sweetwater, Glen Rose, and Round Rock. However, except for College Station and Sweetwater, the entities have such severe projected deficits that strategies other than conservation will also be needed. However, without a thorough investigation of each system and use patterns, the true benefit of conservation for any one entity cannot be quantified.

The entities with a projected deficit of less than about 5 percent of their projected demand could possibly develop a more stringent conservation program to fully account for their deficit through the year 2030. These cities would include Bryan, Fort Hood, Taylor, and Sweetwater. Each city would have to prepare an aggressive conservation plan that included strict enforcement measures. However, they would also have to take into account the fact that the use of aggressive conservation measures alone to meet projected demand would leave little or no flexibility, should a future drought exceed that assumed during planning. The ability to adopt emergency measures even more stringent than planned may be limited in times of emergency, and contingency measures may be needed.

In addition, many of the communities in the Brazos G Region that do not have a projected deficit do have a projected per capita use above the average for the region. These average values for the region are listed in Table 5A.2-2.

Table 5A.2-2.
Brazos G Regional Average
Projected Per Capita Demand

Year	Per Capita Demand
2000	157 gpcd
2010	150 gpcd
2020	143 gpcd
2030	140 gpcd
2040	137 gpcd
2050	135 gpcd

Any community can compare their projected per capita use, determined by dividing the projected demands listed earlier in Section 2 (Table 2-3) by the projected population for the same listed in Table 2-1. Comparing those values to the averages shown in Table 5A.2-2 will provide an indication regarding the likelihood of significantly reduced demand from a strong conservation program. Such a program for these communities would increase the surplus in supply that they enjoy and delay possible future deficits beyond the planning horizon.

5A.2.3 Environmental Issues

No substantial environmental impacts are anticipated, as water conservation is typically a non-capital intensive alternative that is not associated with direct physical impacts to the natural environment. A summary of the few environmental issues that might arise for this alternative are presented in Table 5A.2-3.

**Table 5A.2-3.
Environmental Issues: Water Conservation**

Water Management Option	Water conservation
Implementation Measures	Voluntary reduction, reduced diversions, water pricing, mandatory restrictions (landscaping ordinances, watering days), city drought contingency plans
Environmental Water Needs / Instream Flows	No substantial impact identified, assuming relatively low reduction in diversions and return flows; substantial reductions in municipal and industrial diversions from water conservation would result in possibly low to moderate positive impacts as more stream flow would be available for environmental water needs and instream flows
Bays and Estuaries	No substantial impact identified, assuming relatively low reduction in diversions and return flows
Fish and Wildlife Habitat	No substantial impact identified, assuming relatively low reductions in diversions and return flows; possible low to moderate positive impact to aquatic and riparian habitats with substantial reductions as more stream flow would be available to these habitats; possible moderate positive benefits from implementation of site-specific xeriscape landscaping
Cultural Resources	No substantial impact anticipated
Threatened and Endangered Species	No substantial impact identified, assuming relatively low reduction in diversions and return flows; possible low to moderate positive impact to aquatic and riparian threatened and endangered species (where they occur) with substantial diversion reductions
Comments	Assumes no substantial change in infrastructure with attendant landscape impacts; further assumes that infrastructure improvements which do occur will largely be in urbanized settings

5A.2.4 Engineering and Costing

For planning and cost estimating purposes, a 5 percent reduction in demand over and above that needed to meet the projections was assumed. Since water conservation plans are required for each community by Senate Bill 1, regular costs for implementing and enforcing a general conservation program were not estimated. Only the efforts needed to enforce a more stringent conservation plan over and above that assumed in the projections were studied. These might include a buyback program for water in efficient appliances and fixtures, adjusted water rate structures, and enforcement of more stringent requirements. For the purposes of estimating,

one additional full-time employee was assumed for the more aggressive program per 50,000 residents. Buybacks of appliances and fixtures from 5 percent of the residences annually was assumed. No cost was associated with the adjusted rate structure as these changes tend to result in increased revenues from higher prices that offset the reduction in revenue from less water sold. Based on these assumptions, a very approximate annual cost of \$225,000 was estimated for each 50,000 in population for the 5 percent reduction in demand. Using the regional average per capita demand for 50,000 residents, this equates to a unit cost of \$1.76 per 1,000 gallons saved or \$574 per acft. This is a higher cost than would typically be expected for the conservation efforts required to match those assumed in the projections. These costs would be for those efforts over and above those assumed in the projections.

5A.2.5 Implementation Issues

This water supply option has been compared to the plan development criteria, as shown in Table 5A.2-4, and the option meets each criterion.

**Table 5A.2-4.
Comparison of Water Conservation Option to Plan Development Criteria**

<i>Impact Category</i>	<i>Comment(s)</i>
A. Water Supply: 1. Quantity 2. Reliability 3. Cost	1. Limited, up to 5 percent of demand. 2. Variable, dependent on public acceptance. 3. Reasonable.
B. Environmental factors 1. Environmental Water Needs 2. Habitat 3. Cultural Resources 4. Bays and Estuaries	1. None or low impact. 2. No apparent negative impact. 3. None. 4. None or low impact.
C. Impact on Other State Water Resources	<ul style="list-style-type: none"> • No apparent negative impacts on state water resources. • No effect on navigation.
D. Threats to Agriculture and Natural Resources	<ul style="list-style-type: none"> • None
E. Equitable Comparison of Strategies Deemed Feasible	<ul style="list-style-type: none"> • Option is considered to meet municipal and industrial shortages
F. Requirements for Interbasin Transfers	<ul style="list-style-type: none"> • Not applicable
G. Third Party Social and Economic Impacts from Voluntary Redistribution	<ul style="list-style-type: none"> • Not applicable

Each water supply entity is required by Senate Bill 1 regulations to prepare and submit a Drought Contingency and Water Conservation Plan for approval. The cost and effort required for implementation and enforcement of these plans will vary considerably from entity to entity depending on existing staff and programs. Most communities, except for the smaller ones, will likely need one or more people devoted full-time to the program and its enforcement. Costs for educational and promotional aspects of the program will also need to be borne.

No environmental implementation issues have been identified. However, as noted above, water conservation and drought contingency plans are required as part of the Regional Water Plan [31 TAC 357.5(E) (5) and (J)(1) (A and C); also 357.7(6)(A)].