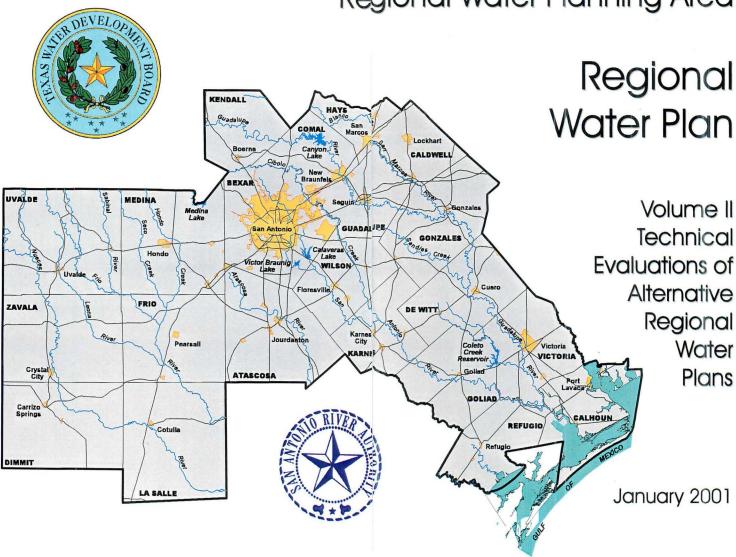
## South Central Texas Regional Water Planning Area



Prepared by:

South Central Texas Regional Water Planning Group

With administration by:

San Antonio River Authority

With technical assistance by:

HDR Engineering, Inc.

Moorhouse Associates, Inc.

Open Forum

In association with:
Paul Price Associates, Inc
LBG-Guyton Associates
R.J. Brandes Company
The Wellspec Company



#### South Central Texas Regional Water Planning Area

#### Regional Water Plan

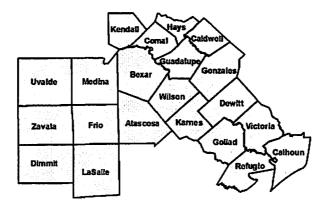
#### Volume II — Technical Evaluations of Alternative Regional Water Plans

#### Prepared by:

#### **South Central Texas Regional Water Planning Group**

With administration by:

#### **San Antonio River Authority**



With technical assistance by:

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January 2001

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## Jolume III: Technical Evaluations of Water Supply Options

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## South Central Texas Regional Water Planning Area Regional Water Plan

| Ms. Evelyn Bonavita, Chair       | Mr. Bruce T. Foster                          |
|----------------------------------|--|
| Public Representative            | Agricultural Representative                  |
| Mr. Richard Eppright, Vice-Chair | Ms. Susan Hughes                             |
| Agricultural Representative      | Environmental Representative                 |
| Mr. Fred Pfeiffer, Secretary     | Ms. Gloria Rivera                            |
| River Authorities Representative | Small Business Representative                |
| Mr. Mike Mahoney                 | Dr. Darrell Brownlow                         |
| Water Districts Representative   | Small Business Representative                |
| Mr. Douglas R. Miller            | Mr. Mike Fields                              |
| Small Business Representative    | Electric Generating Utilities Representative |
| Judge Charles Johnson            | Mr. Bill West                                |
| County Representative            | River Authorities Representative             |
| Commissioner John Kight          | Mr. Con Mims                                 |
| County Representative            | Nueces River Authority                       |
| Mr. Mike Thuss                   | Mr. Greg Ellis                               |
| Municipal Representative         | Water Districts Representative               |
| Mayor Gary Middleton             | Mr. Tom Moreno                               |
| Municipal Representative         | Water Districts Representative               |
| Mr. Pedro Nieto                  | Mr. Ron Naumann                              |
| Municipal Representative         | Water Utilities Representative               |
| Mr. Hugh Charlton                | As adopted by the South Central Texas        |
| Industry Representative          | Regional Water Planning Group on this date   |

## South Central Texas Regional Water Planning Area Regional Water Plan

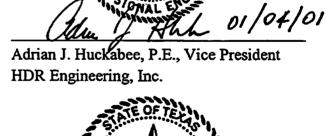
Herbert W. Grubb, PhD, Senior Vice President
HDR Engineering, Inc.



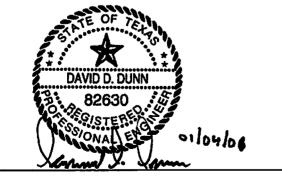
Samuel K. Vaugh, P.E., Professional Associate HDR Engineering, Inc.



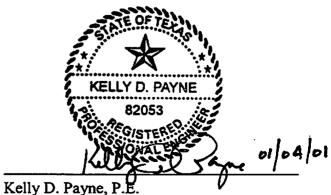
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#### 1.0 Introduction

The South Central Texas Regional Water Planning Group (SCTRWPG) has employed a planning process (Figure 1-1) focused on the development of a Regional Water Plan to meet the needs of every water user group in the region for a period of fifty years. Given the history of sharp and divisive conflict concerning water planning in this region, the planning process has provided extraordinary opportunities for participation by water user groups in providing input to achieve the goal of a plan that will "provide for the orderly development, management, and conservation of water resources..." 31 TAC 357.5(a). To build consensus among the constituencies represented by the members of the SCTRWPG, the planning process has emphasized the coordination and careful integration of technical information with information provided through public participation.

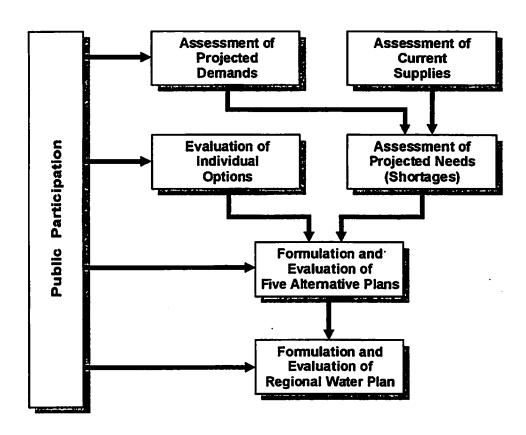


Figure 1-1. Planning Process

Conflict over the past several decades in this region has focused on how to manage the Edwards Aquifer so as to meet the needs of many water user groups. Central to progress in resolving this conflict, and thus in achieving the formulation of a water plan acceptable to all constituencies represented in the SCTRWPG, is the assurance that all of the different competing strategies for meeting water needs will be given consideration. It has thus been central to the viability of the planning process itself that the evaluation of water supply options and combinations of these options in the context of a regional plan receive extraordinary attention.

To this end, the SCTRWPG has employed a planning process that ensures evaluation of virtually all the water supply options or management strategies that have been proposed or discussed in the past, together with several new ones that have never before been subjected to technical evaluation. To achieve confidence by all constituencies in the planning process, it has been necessary to evaluate the options both on a stand-alone basis (Volume III – Technical Evaluations of Water Supply Options) and in various combinations in the context of alternative plans (Volume II – Technical Evaluations of Alternative Regional Water Plans). Given the fact that some of the proposed strategies for regional management are at odds with one another, it has been important to look at a series of alternative regional water plans. By formulating five alternative regional water plans, the SCTRWPG has carefully considered many diverse management strategies. In keeping with logical and acceptable planning methods, the SCTRWPG has taken the best components of these alternative plans and developed a Regional Water Plan (Volume I – Executive Summary and Regional Water Plan).

The alternative regional water plans formulated by the SCTRWPG are identified as follows:

- Planning Unit (PU) Alternative
- Environmental/Conservation (EC) Alternative
- Economic/Reliability/Environmental/Public Acceptance (EREPA) Alternative
- Inter-Regional Cooperation (IRC) Alternative
- Recharge & Recirculation (R&R) Alternative

Technical evaluations of these alternative regional water plans are summarized in Sections 2 through 6 of this volume. In order of presentation, the tabbed section for each alternative plan includes:

- Location map
- Alternative plan description
- Summary of key information

- Unit cost, annual cost, and additional water supply by decade
- Projected drought water needs (shortages) and additional supplies by county
- Edwards Aquifer technical information
- Carrizo Aquifer technical information
- Streamflow technical information

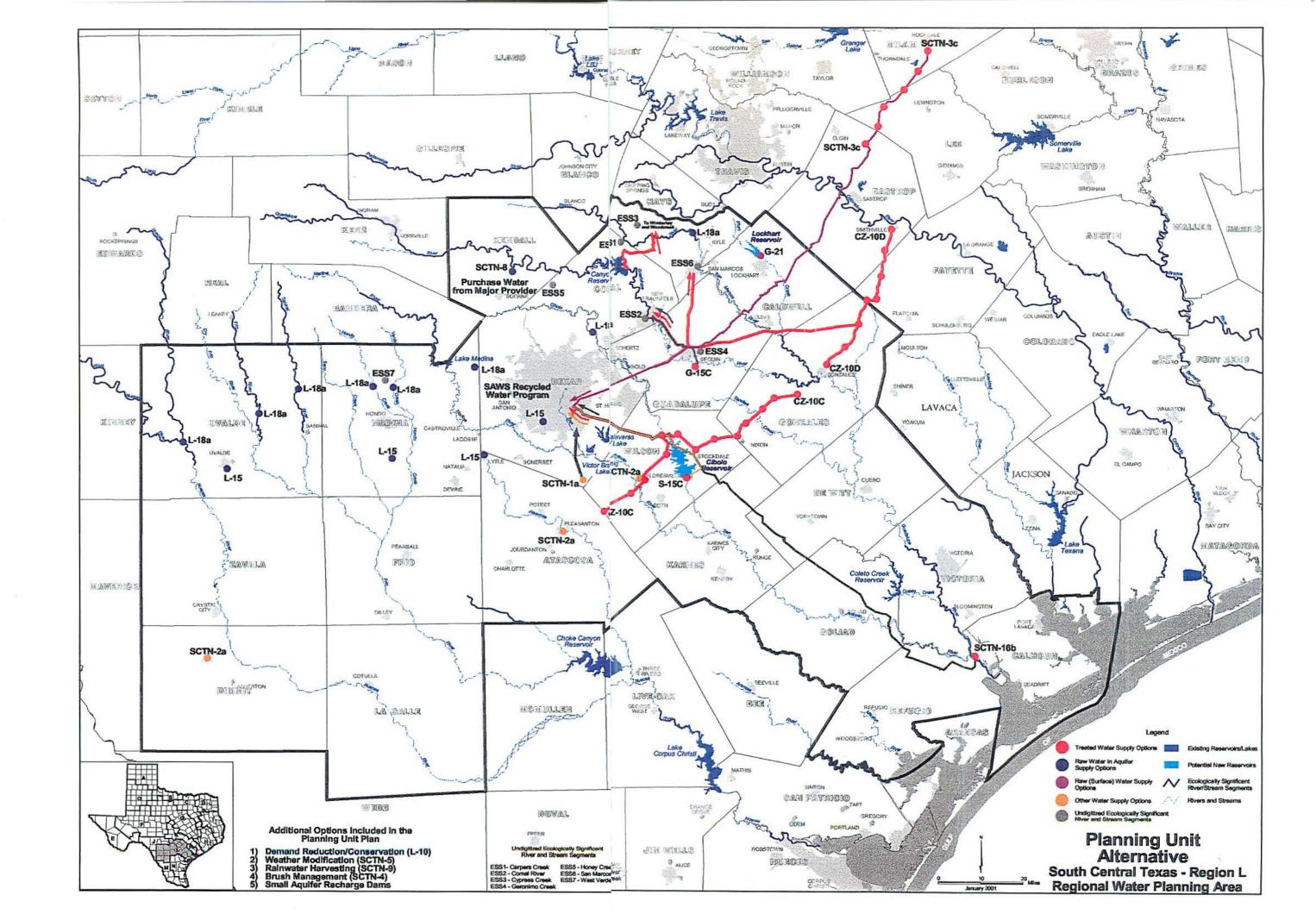
General graphical comparisons of the five alternative plans and the Regional Water Plan are included in Section 7. Preliminary environmental assessments and comparisons considering each of the five alternative plans and the Regional Water Plan are described and summarized in Section 8.

# "Planning Unit" Alternative Regional Water Plan

## South Central Texas Regional Water Planning Group

San Antonio River Authority

HDR Engineering, Inc. January 2001



#### South Central Texas Region Alternative Water Plans

Alternative Name: Planning Unit Regional Water Management Alternative Plan

Alternative ID: PU Approach (PUA)

Alternative Description: The Planning Unit Approach (PUA) includes water management strategies (options) that have been identified by water supply entities as acceptable to meet projected water needs. Major water providers and water supply entities providing documented input into this alternative regional plan included the San Antonio Water System (SAWS), the Bexar Metropolitan Water District (BMWD), the Edwards Aquifer Authority (EAA), the Guadalupe-Blanco River Authority (GBRA), and Canyon Regional Water Authority (CRWA). Also, water plan information provided to the SCTRWPG by other water suppliers of the South Central Texas Water Planning Region was included, as appropriate. From the lists of options/strategies provided by the entities mentioned above, options/strategies were selected for inclusion in this alternative regional plan that would meet the projected needs in a timely manner, and without duplication of options/strategies suggested by others. options/strategies are organized by county. In cases of projected need where no local entity has identified water management strategies, the nearest available option/strategy of the South Central Texas Regional Water Planning Group (SCTRWPG) were selected for inclusion in the Planning Unit Plan. The following water supply options/strategies are included in the Planning Unit Plan (in no particular order):

- 1. Demand Reduction / Conservation (L-10)
- 2. Edwards Irrigation Transfers (L-15)
- 3. Regional Aquifer Storage & Recovery (SCTN-1a)
- 4. Edwards Recharge Type 2 Projects (L-18a)
- 5. Simsboro Aquifer (SCTN-3c)
- 6. Carrizo Aquifer Wilson and Gonzales Counties (CZ-10C)
- 7. Carrizo Aquifer Gonzales and Bastrop Counties (CZ-10D)
- 8. Carrizo Aquifer Bexar County (BMWD)
- 9. Lower Guadalupe River Diversions (SCTN-16b)
- 10. Cibolo Reservoir (S-15C)
- 11. Carrizo Aquifer Local Supply (SCTN-2a)
- 12. Trinity Aguifer Bexar County (BMWD)
- 13. Canyon Reservoir (G-15C)
- 14. SAWS Recycled Water Program
- 15. Wimberley and Woodcreek Canyon (G-24)
- 16. Lockhart Reservoir (G-21)
- 17. Trinity Aquifer Optimization (SCTN-8)
- 18. Rainwater Harvesting (SCTN-9)
- 19. Weather Modification (SCTN-5)
- 20. Brush Management (SCTN-4)

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## Planning Unit Alternative Regional Water Plan Summary of Key Information for South Central Texas Regional Water Planning Group

#### **Quantity, Reliability, and Cost**

- Plan includes management supplies to meet projected needs, ensure reliability, and maintain springflow, resulting in a quantity of additional water supplies sufficient to meet projected needs for municipal, industrial, steam-electric power, and mining uses through the year 2050.
- Cost is greater than the average for the five alternative plans and the Regional Water Plan.

#### **Environmental Factors**

- Increased median annual streamflows in the San Antonio River.
- Most concerns with Vegetation & Wildlife Habitat among the five alternative plans under consideration.

#### **Impacts on Water Resources**

- No unmitigated reductions in water available to existing water rights.
- Long-term reductions in water levels in the Carrizo Aquifer. Drawdown would be greater than the average for the five alternative plans under consideration.

#### **Impacts on Agriculture and Natural Resources**

- Major commitment to municipal and irrigation water Demand Reduction (Conservation) (L-10).
- Includes Brush Management (SCTN-4) and Weather Modification (SCTN-5).
- Inclusion of water supply options to meet projected irrigation needs in full is estimated to be economically infeasible at this time. Weather Modification (SCTN-5) assists irrigation and dry-land agriculture (crops and ranching).
- Includes maximum potential voluntary transfer of Edwards Aquifer irrigation permits to municipal permits through lease or purchase.

#### Other Relevant Factors per SCTRWPG

• Plan includes Cibolo Reservoir (S-15).

#### Comparison of Strategies to Meet Needs

• Selection of water supply options comprising the alternative plan based on preferences expressed by planning units or on closest available supply.

#### **Interbasin Transfer Issues**

• Projected non-irrigation needs in basin(s) of origin are met throughout the planning period.

#### Third-Party Impacts of Voluntary Redistribution of Water

- Potential positive or negative effects of Edwards Irrigation Transfers (L-15).
- Lower water levels in some portions of the Carrizo Aquifer.

#### **Regional Efficiency**

- Edwards Irrigation Transfers (L-15) require no new facilities. Transferred water would likely be available at or very near locations having projected municipal, industrial, steam-electric power, and mining needs in Uvalde, Medina, Atascosa, and Bexar Counties.
- Balancing storage and regional water treatment facilities in Bexar County increase efficiency, improve reliability, and reduce unit cost.
- San Antonio Water System Regional Aquifer Storage & Recovery System (SCTN-1a) substantially reduces peak summer pumpage from the Edwards Aquifer.
- Consider reduced storage capacity for Cibolo Reservoir or include diversions from the San Antonio River to increase supply and moderate unit cost.

#### **Effect on Navigation**

• Not applicable.

### South Central Texas Region, Planning Unit Alternative – TWDB Evaluation Criteria Summary

| Management Strategy  | Quantity (acft/yr)1 | Reliability <sup>2</sup> | Cost (S/acft)3 |       | Environmental Factors  | _        | Impacts on Water Resources  | Impacts on Agricultural and Natural Resources  | Other Relevant Factors per SCTRWPG   |
|--|---------------------|--------------------------|----------------|-------|--|----------|---|--|--|
| Municipal Demand Reduction (Conservation) (L-10 Mun.)      | 44,566              | Firm                     | \$173          | •     | None. Supply developed through demand reduction.   |          | Slight reductions in treated effluent discharge.  | <ul> <li>Fewer water management strategies necessary<br/>to meet projected needs</li> </ul>                          | Conservation is a central element of the Plan.   |
| Edwards Irrigation Transfers (L-15)                        | 81,000              | Firm                     | . \$80         | •     | None. Supply developed without new fac   | ilities. | pumpage closer to springs.  | <ul> <li>Plan includes 100 percent of potential of max,<br/>voluntary transfer through lease or purchase.</li> </ul> | Encourages beneficial use of available rights.   |
| Edwards Recharge – Type 2 Projects (L-18a)                 | 21,577              | Firm                     | \$1,087        |       | Concerns with endangered & threatened<br>species, habitat, and TPWD Ecologically<br>Unique Stream Segments at some sites.<br>Enhanced springflows help endangered st | ecies.   | Limited, as most projects are located on streams that are frequently dry.     Increased aquifer levels and springflows.   | Medina Counties.   | Positive effects on discharges from Comal and<br>San Marcos Springs.     Mitigation of impacts on firm yield of Choke<br>Canyon Res. / Lake Corpus Christi System. |
| Canyon Reservoir – River Diversion (G-15C)                 | 15,000              | Firm                     | \$794          |       | Minimal. Canyon Reservoir is an existing resource.   |          | <ul> <li>Increased instream flows associated with<br/>downstream deliveries of water supply.</li> </ul>   | Not applicable.  | Encourages beneficial use of existing reservoir.     Recreational benefits with downstream delivery.   |
| Canyon Reservoir - Wimberley & Woodcreek (G-24)            | 1,048               | Firm                     | \$1,586        |       | Minimal. Pipeline could encounter endan<br>or threatened species habitat.  | gered    | Minimal, if any.  | Not applicable.  | Encourages beneficial use of existing reservoir.   |
| Lower Guadalupe River Diversion (SCTN-16b)                 | 63,117              | Firm                     | \$1,033        | •     | Concerns with endangered & threatened species, habitat, cultural resources, and Ti Ecologically Unique Stream Segment.   | 'WD      | <ul> <li>Some reductions in freshwater inflows to the<br/>Guadalupe Estuary associated with greater<br/>utilization of existing water rights and diversion<br/>of unappropriated flow.</li> </ul>   | Minimal, if any.   | Encourages beneficial use of available rights.     Protects instream flows and recreational opportunities through lower basin diversion.                           |
| Carrizo Aquifer – Wilson & Gonzales (CZ-10C) <sup>6</sup>  | 75,000              | Firm                     | \$687          | •     | Minimal. Pipeline could encounter cultur resource sites.   |          | Long-term reductions in well levels.     Some reductions in instream flow at outcrop.     Potential effects on discharge of small springs.  | Minimal, if any.   | <ul> <li>Planned withdrawals in excess of that expressed<br/>in policies of underground water conservation<br/>districts.</li> </ul>                               |
| Carrizo Aquifer – Gonzales & Bastrop (CZ-10D) <sup>6</sup> | 58,500              | Firm                     | \$1,066        | •     | Minimal. Pipeline could encounter cultur resource sites.   | ıl       | Long-term reductions in well levels.     Some reductions in instream flow at outcrop.     Potential effects on discharge of small springs.  | Minimal, if any.   | <ul> <li>Planned withdrawals in excess of that expressed<br/>in policies of underground water conservation<br/>districts.</li> </ul>                               |
| Carrizo Aquifer - Local Supply (SCTN-2a)                   | 13,700              | Firm                     | \$343          | •     | Minimal, if any.   |          | <ul> <li>Modest long-term reductions in aquifer levels.</li> </ul>  | Minimal, if any.   |  |
| Simsboro Aquifer (SCTN-3c)                                 | 55,000              | Firm                     | \$896          | •     | Concerns with endangered & threatened species, habitat, and cultural resources.  |          | Long-term reductions in aquifer levels.     Minimal reductions in instream flow at outcrop.     Potential effects on discharge of small springs.  | Minimal, if any.   | Beneficial use of groundwater now unused.     Planned Bastrop Co. supply for Region L exceeds 2030 availability per Region K.                                      |
| SAWS Recycled Water Program (SAWS)                         | 52,215              | Firm                     | \$395          | •     | None. Water supply derived from increas<br>volumes of treated wastewater.  | td       | Minimal, if any.  | Not applicable.  | Encourages beneficial use of available resource.   |
| Purchase of Water From Major Provider (PMP)                | 8,000               | Firm                     | Variable       | •     | Minimal, if any. Supply developed as par<br>other water management strategies.   | of       | Minimal, if any.  | Not applicable.  | =  |
| Cibolo Reservoir (S-15c)                                   | 31,500              | Firm                     | \$1,036        |       | Concerns with habitat and cultural resource  | cs.      | <ul> <li>Reduced streamflow immediately below dam.</li> </ul>   | Minimal.   | Substantial organized local opposition.  |
| Lockhart Reservoir (G-21)                                  | 6,048               | Firm                     | \$1,361        | •     | Concerns regarding habitat & cultural resources.   |          | Reduced streamflow immediately below dam.   | Minimal.   | Questions regarding economic feasibility.     Strong local government support.   |
| Trinity Aquifer Optimization (SCTN-8)                      | 390                 | Firm                     | \$1,885        |       | Concerns with water quality & aquatic ha   | itat.    | Minimal reductions in instream flow.     Locally increased aquifer levels.  | Minimal, if any.   |  |
| Aquifer Storage & Recovery (ASR) - (SCTN-la)               | Unquantified        | Firm                     | Unquantified   | •     | Minimal. Pipeline could encounter impor<br>habitat or encounter cultural resource sites  |          | <ul> <li>Reduced peak summer pumpage from Edwards<br/>Aquifer increases aquifer levels and springflow.</li> </ul>   | Not applicable.  | <ul> <li>SAWS South Bexar County ASR presently in<br/>implementation phase.</li> </ul>   |
| Carrizo Aquifer Bexar & Guadalupe (BMWD) 4                 | 3,000               | Firm                     |                | 200   | <b>是我是一个人的一个人的一个人的一个人的一个人的一个人的一个人的一个人的一个人的一个人的</b>   | 100000   | 2000年2月1日 - 1900年 - 1 | 是是是1966年1月1日,1988年1月日本中国   | Comment of the second  |
| Trinity Aquifer – Bexar (BMWD) <sup>4</sup>                | 1,000               | Firm                     |                | 5 500 | 40000000000000000000000000000000000000   | HISSO    |   |  |  |
| Brush Management (SCTN-4)                                  | Unquantified        | Unknown                  | Unquantified   | •     | Concerns regarding endangered & threate<br>species, vegetation & wildlife habitat, and<br>cultural resources.  |          | <ul> <li>Potential benefit to Edwards Aquifer due to<br/>increased water for recharge.</li> </ul>   | Potential improvement of pasture for grazing.  | Additional studies needed to determine quantity of dependable supply during drought.   |
| Weather Modification (SCTN-5)                              | Unquantified        | Unknown                  | Unquantified   |       | Potential increases in water supply for will<br>habitat.   | llife    | <ul> <li>Potential increases in rainfall, runoff, and<br/>aquifer recharge.</li> </ul>  | <ul> <li>Provides water for irrigated and dry-land<br/>agriculture (crops &amp; ranching).</li> </ul>                | Concerns regarding increased flood potential.  |
| Small Aquifer Recharge Dams                                | Unquantified        | Unknown                  | Unquantified   |       | Small potential effects on habitat.  |          | <ul> <li>Potential increases in local aquifer levels.</li> </ul>  | Minimal, if any.   |  |
| Rainwater Harvesting (SCTN-9)                              | Unquantified        | Unknown                  | Unquantified   |       | Minimal, if any.   |          | Minimal, if any.  | Not applicable.  | Consistent with conservation focus of Plan.  |
| Total of New Supplies <sup>5</sup>                         | 530,661             |                          |                |       |  |          |   |  |  |

| South | Central | Texas | Region, | Planning | Unit | Alternative - | TWDB | Evaluation | Criteria S | Summary | (Continued) |
|-------|---------|-------|---------|----------|------|---------------|------|------------|------------|---------|-------------|
|       |         |       |         |          |      |               |      |            |            |         |             |

| Management Strategy  |     | Comparison of Strategies to Meet Needs   |     | Interbasin Transfer Issues   |     | Third-Party Impacts of Voluntary Transfers                                       |     | Regional Efficiency   |      | Effect on<br>Navigation |
|--|-----|--|-----|--|-----|--|-----|---|------|-------------------------|
| Municipal Demand Reduction (Conservation)<br>(L-10 Mun.)   | :   | Low unit cost.  Inherent environmental benefits.   | •   | Not applicable.  | •   | Not applicable.  | •   | Implementable throughout the region.  | •    | None                    |
| Edwards Irrigation Transfers (L-15)                        | •   | Low unit cost.   | •   | Not applicable.  |     | Maximum transfer may have potential socio-<br>economic impacts to third parties. | •   | Requires no new facilities.   | •    | None                    |
| Edwards Recharge - Type 2 Projects (L-18a)                 | •   | Project unit costs range from low to high.   | •   | Not applicable.  | •   | Not applicable.  | •   | Requires no new transmission and treatment facilities.  | •    | None                    |
| Canyon Reservoir - River Diversion (G-15C)                 | •   | Moderate unit cost.  | •   | Not applicable.  |     | Not applicable.  |     | Significant additional surface water supply<br>without construction of a new reservoir.   |      | None                    |
| Canyon Reservoir - Wimberley & Woodcreek (G-24)            | •   | High unit cost, but options to meet needs are limited.                                       | •   | Not applicable.  | •   | Not applicable.  | •   | Additional surface water supply without construction of a new reservoir.  | •    | None                    |
| Lower Guadalupe River Diversion (SCTN-16b)                 | •   | Moderate to high unit cost.  | •   | Not applicable with diversion facilities located in San Antonio River Basin. | •   | Not applicable.  | :   | Shared pipeline alignment with other strategies.<br>Shared water treatment and balancing storage<br>facilities in Bexar County. | •    | None                    |
| Carrizo Aquifer - Wilson & Gonzales (CZ-10C) <sup>6</sup>  | •   | Moderate unit cost.  | •   | Not applicable.  | •   | Transfer rate could have potential socio-<br>economic impacts to third parties.  | •   | New supply proximate to Bexar County.   |      | None                    |
| Carrizo Aquifer - Gonzales & Bastrop (CZ-10D) <sup>6</sup> | •   | Moderate to high unit cost.  | ٠   | Not applicable.  |     | Transfer rate could have potential socio-<br>economic impacts to third parties.  |     | New supply reasonably proximate to Comal,<br>Guadalupe, and Hays Counties.  |      | None                    |
| Carrizo Aquifer - Local Supply (SCTN-2a)                   |     | Low unit cost.   |     | Not applicable.  |     | Not applicable.  |     | New supply proximate to points of need.   |      | None                    |
| Simsboro Aquifer (SCTN-3c)                                 | 1.  | Moderate unit cost.  | •   | Not applicable.  | •   | Limited transfer to avoid potential socio-<br>economic impacts to third parties. | •   | Beneficial use of groundwater presently<br>produced, but unused.  |      | None                    |
| SAWS Recycled Water Program (SAWS)                         |     | Low to moderate unit cost.   |     | Not applicable.  |     | Not applicable.  |     | New supply proximate to points of need.   |      | None                    |
| Purchase of Water From Major Provider (PMP)                |     | Low to moderate unit cost.   |     | Not applicable.  | •   | Not applicable.  |     | Economy of participation in regional projects.  |      | None                    |
| Cibolo Reservoir (S-15c)                                   | •   | Moderate to high unit cost.  | •   | Not applicable.  | •   | Not applicable.  | •   | Substantial storage capacity proximate to Bexar County.   | •    | None                    |
| Lockhart Reservoir (G-21)                                  | • 1 | High unit cost.  | •   | Not applicable.  | •   | Not applicable   | •   | Shared pipeline alignment with Lower Guadalupe<br>River Diversion (SCTN-16)   | •    | None                    |
| Trinity Aquifer Optimization (SCTN-8)                      |     | High unit cost.  |     | Not applicable.  |     |  |     | Implementable at various locations.   |      | None                    |
| Aquifer Storage & Recovery (ASR) - (SCTN-1a)               | •   | Effective means of reducing peak summer pumpage from the Edwards Aquifer.                    | •   | Not applicable.  |     | Not applicable.  | •   | Increases reliability of current supply from the<br>Edwards Aquifer.  | •    | None                    |
| Carrizo Aquifer - Bexar & Guadalupe (BMWD) 4               |     |  | 183 | (1) · 在工作的,  | 135 |  | 理論は |   |      |                         |
| Trinity Aquifer - Bexar (BMWD) <sup>4</sup>                |     | 产生的第三人称单数 医多种性 医多种性 医多种性 医多种性 医多种性 医多种性 医多种性 医多种性  | 355 |  |     |  |     | 是1950年第二日的日本(1960年)。<br>1960年第二日的日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日  | - CA | F-9-82-9-530            |
| Brush Management (SCTN-4)                                  | •   | Insufficient information at this time.   | •   | Not applicable.  |     | Not applicable.  | •   | May contribute positively to storage and system<br>management of supplies.  |      | None                    |
| Weather Modification (SCTN-5)                              | •   | Potentially feasible management strategy to meet<br>a portion of projected irrigation needs. | •   | Not applicable.  |     | Not applicable.  | •   | May contribute positively to storage and system<br>management of supplies.  |      | None                    |
| Small Aquifer Recharge Dams                                |     | High unit cost.  | •   | Not applicable.  | •   | Not applicable.  | •   | Implementable throughout the region.  | •    | None                    |
| Rainwater Harvesting (SCTN-9)                              |     | High unit cost; comparable to domestic well.   | •   | Not applicable.  |     | Not applicable.  |     | Implementable throughout the region.  | •    | None                    |

Notes:

1) Quantity based on full implementation and utilization of new supplies in year 2050.

2) Firm reliability indicates that new supply is dependable in a drought of record with full implementation of the Alternative Plan.

3) Unit cost based on full utilization of supply at ultimate capacity of planned facilities and includes treatment and distribution facilities necessary to meet peak daily needs.

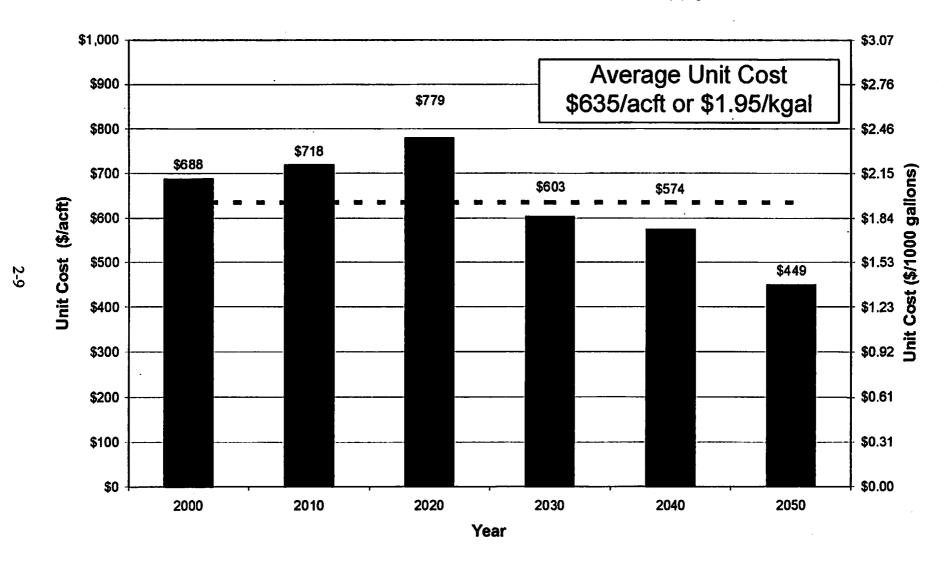
4) Management strategies are in implementation phase and have associated cost in plan.

5) Management strategies in the implementation phase include Schertz-Seguin Water Supply Project, Western Canyon Regional Water Supply Project, Lake Dunlap WTP Expansion and Mid-Cities Project, and GBRA Canyon Reservoir Contract Renewals. Supplies associated with these management strategies were counted as current supply in the technical application of alternative project, and the supplies associated with these management strategies were counted as current supplies in the technical application of alternative project, and the supplies associated with these management strategies were counted as current supplies in the technical application of alternative project, and the supplies associated with these management strategies were counted as current supplies in the technical application of alternative project, and the supplies associated with these management strategies were counted as current supplies. supply in the technical evaluation of alternative regional water plans.

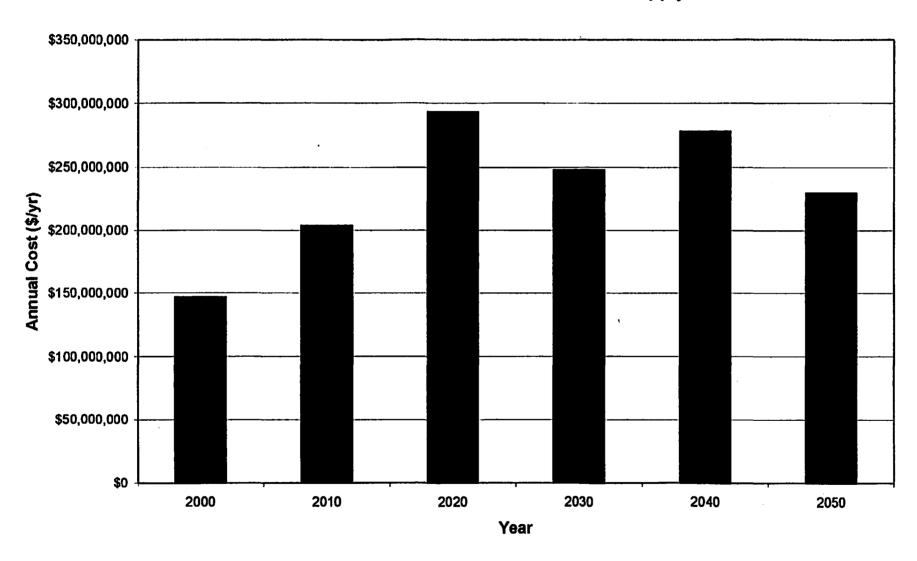
6) Subsequent to the technical evaluation of alternative regional water plans, quantity associated with this management strategy was limited in the Regional Water Plan in view of policies

of underground water conservation districts.

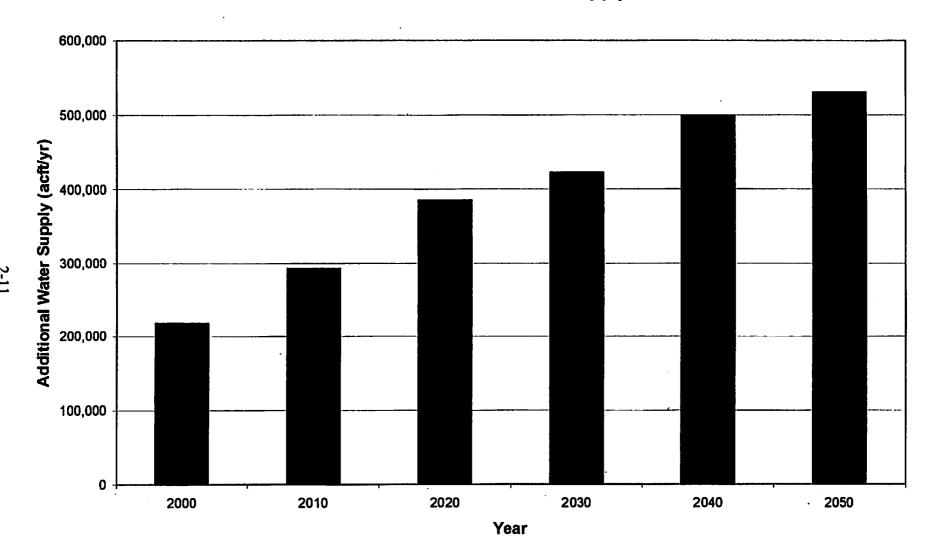
## Planning Unit Alternative Regional Water Plan Unit Cost of Cumulative Additional Water Supply



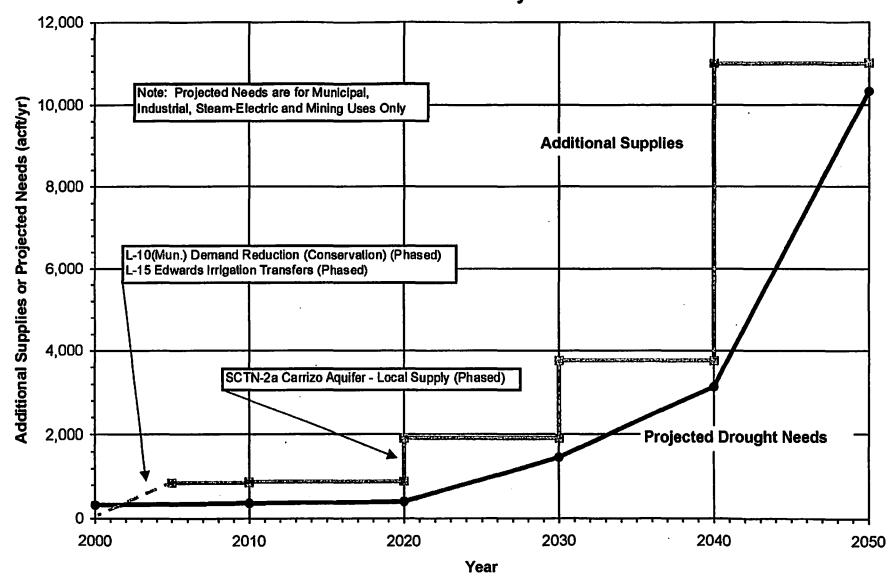
#### Planning Unit Alternative Regional Water Plan Annual Cost of Cumulative Additional Water Supply



## Planning Unit Alternative Regional Water Plan Cumulative Additional Water Supply



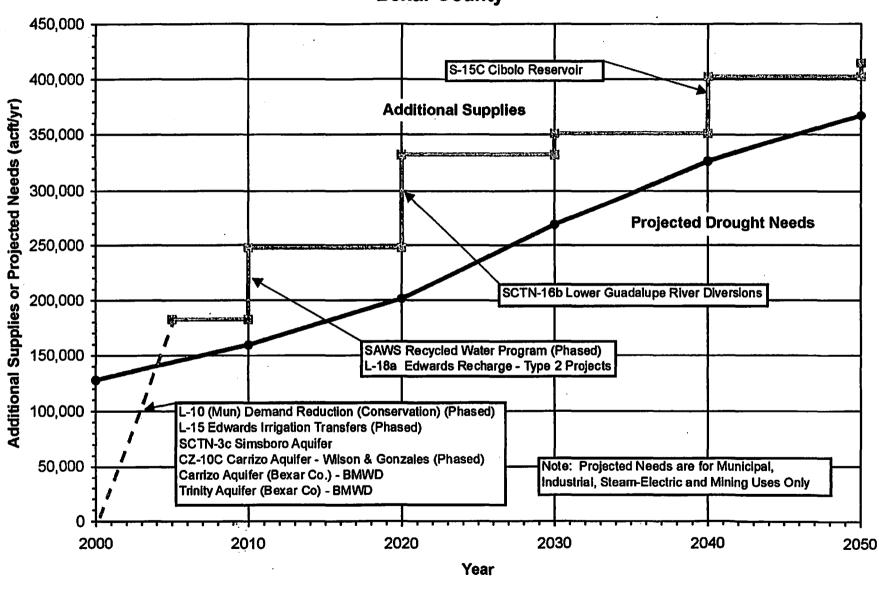
## Planning Unit Alternative Regional Water Plan Atascosa County



#### Planning Unit Regional Water Management Alternative Plan

| South Co      | entral Texas Region   |                    |                                       |                 |                 |                | Co          | unty = A       | tascosa         |
|---------------|---|--------------------|---------------------------------------|-----------------|-----------------|----------------|-------------|----------------|-----------------|
| County S      | ummary of Projected Water Needs (Shorta   | ges) and Wat       | er Manag                              | ement St        | rategies        |                | (           | Jser Grou      | p(s) = all      |
| Projected     | Water Needs (acft/yr)   |                    |                                       |                 |                 |                | 1           |                |                 |
| . 10,0000     | User Group(s)   |                    | 2000                                  | 2010            | 2020            | 2030           | 2040        | 2050           | Notes           |
|               | Municipal   |                    | 325                                   |                 |                 |                |             |                | 140168          |
|               | Industrial  |                    | 323                                   |                 |                 |                |             |                |                 |
|               | Steam-Electric  |                    | ŏ                                     | I               |                 |                |             |                |                 |
|               | Mining  |                    | ŏ                                     |                 |                 |                |             | 1,239          |                 |
|               | trrigation  |                    | 38,418                                | 36,718          | 35,170          |                |             | 40,713         |                 |
| -             | Total Needs   |                    | 38,743                                |                 |                 | 45,189         |             |                |                 |
|               | Mun, Ind, S-E, & Min Needs  |                    | 325                                   |                 |                 | 1,463          |             |                |                 |
|               | Irrigation Needs  |                    | 38,418                                |                 |                 |                | 42,190      |                |                 |
|               |   |                    |                                       |                 |                 |                |             |                |                 |
|               | nagement Strategies (acft/yr)   | Candidate          |                                       |                 |                 |                |             |                |                 |
| ID#           | Description   | New Supply         | 2000*                                 | 2010            | 2020            | 2030           | 2040        | 2050           | Notes           |
| L-10 (Mun.)   | Demand Reduction (Conservation)   |                    | 356                                   | 384             | 411             | 259            | 300         | 319            | 1               |
| L-15          | Edwards Irrigation Transfers  | 81,000             | 500                                   | 500             | 500             | 500            | 700         | 700            | 2, 3, 4         |
| SCTN-2a       | Carrizo Aquifer - Local Supply  |                    |                                       |                 |                 | 1,000          | 3,000       | 10,000         | 2, 3, 4<br>5, 6 |
| <del></del>   |   |                    | <del></del>                           | <del></del>     |                 |                |             |                |                 |
|               |   |                    |                                       |                 |                 |                |             |                |                 |
| SCTN-4        | Brush Management  |                    |                                       | <del> </del>    |                 |                |             |                | 7               |
| SCTN-5        | Weather Modification  |                    | · · · · · · · · · · · · · · · · · · · |                 | <u> </u>        |                |             |                | 7               |
| SCTN-9        | Rainwater Harvesting  |                    |                                       | <del></del>     |                 |                | ·           |                |                 |
|               | Small Aquifer Recharge Dams   |                    |                                       | 1               |                 |                |             |                | 7               |
| L-10 (lrr.)   | Demand Reduction (Conservation)   |                    | 3,692                                 | 3,692           | 3,692           | 3,692          | 3,692       | 3,692          |                 |
|               | Total New Supplies  |                    | 4,548                                 | 4,576           | 4,603           | 5,451          | 7,692       | 14,711         |                 |
|               | Total System Mgmt. Supply / Deficit   |                    | -34,195                               | -32,508         | -30,968         | -39,738        | -37,641     | -36,332        |                 |
|               | Mun, Ind, S-E, & Min System Mgmt. Supply /  | _                  | -34, 185<br>531                       |                 |                 | -38,738<br>296 |             | -30,332<br>689 | <del></del>     |
|               | Deficit   |                    | 331                                   | 310             | 310             | 250            | 007         | 000            |                 |
|               | Irrigation System Mgmt. Supply / Deficit  |                    | -34,726                               | -33,026         | -31,478         | -40,034        | -38,498     | -37,021        | i <del></del>   |
| Notes:        |   |                    |                                       |                 |                 |                |             |                |                 |
| MOTAR:        | Candidate New Supplies shown for year 2000 are identifi   | ed for adority ima | ementation                            | but will not be | e available im  | medialely      |             |                |                 |
| 1             | Demand Reduction (Conservation) strategies assumed la   | raely reflected in | projected wa                          | ler demands     | a available iii | inconstary.    | ļ           |                |                 |
| <u>2</u><br>3 | Candidate New Supply to be shared among Uvalde, Med   | ina. Atascosa, an  | d Bexar Cou                           | nties. Supply   | may not be      | eliable in dro | ought.      |                |                 |
| 3             | Pursuant to draft EAA Critical Period Management rules.   | Candidate New S    | upply repres                          | ents approxir   | nately 85 pen   | cent of        |             |                |                 |
| <del></del>   | the estimated maximum potential annual transfer (95,430   | acti) based on P   | roposed Perr                          | nits prorated   | to 400,000 at   | :tuyr.         | ļ           |                |                 |
| 5             | Additional Edwards supply is for City of Lytle.  Additional Carrizo supply is for Steam-Electric and Mining | 11160              | ļ                                     |                 |                 |                |             |                |                 |
| <u> </u>      | Early implementation of facilities assumed in cost estimat  | on to ensure suff  | icient supply                         | dudna dreije    | ht.             |                | <del></del> |                |                 |
| <del>Ť</del>  | Option expected to provide additional water supply in mar   | ny years, but depo | endable supp                          | oly during dro  | ught is preser  | ntly unquanti  | fied.       |                |                 |
| 8             | Estimates based upon use of LEPA systems on 50 perce  | nt of acreages im  | gated in 199                          | 7, with conse   | vation at 20    | percent of Im  | igation     |                |                 |
|               | application rate.   |                    |                                       |                 |                 |                |             |                |                 |

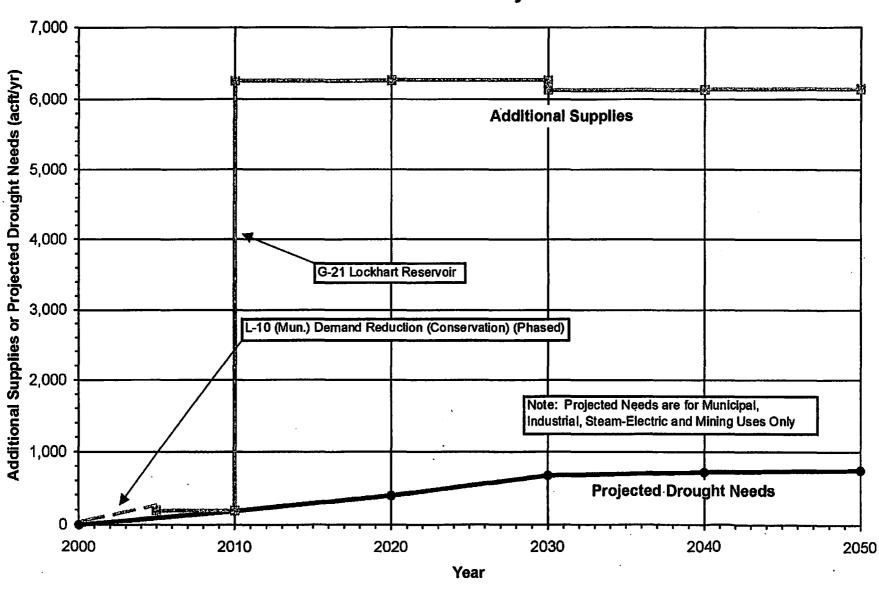
## Planning Unit Alternative Regional Water Plan Bexar County



#### Planning Unit Regional Water Management Alternative Plan

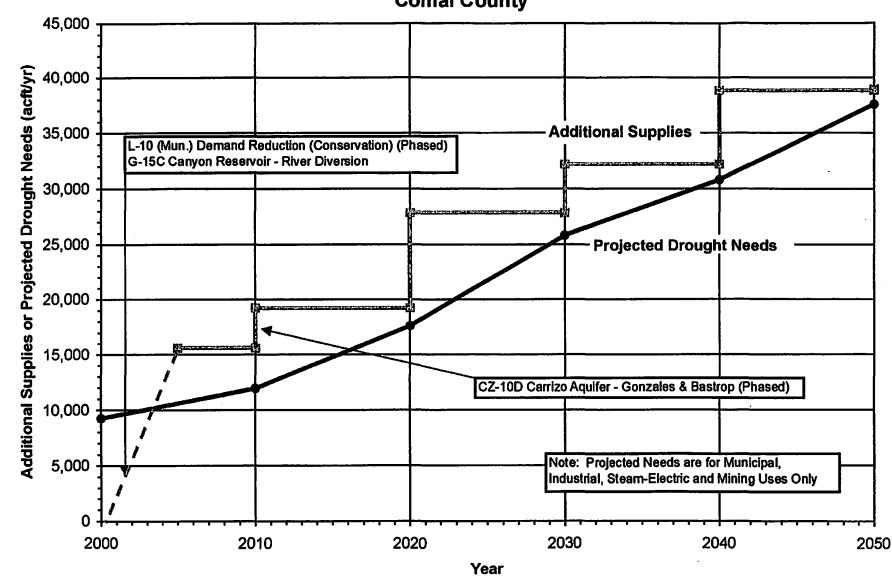
| JOBBI COMB  | al Texas Region  |  |  |   | l   |                            |             |               | ty = Bexa |  |
|-------------|--|--|--|---|---|----------------------------|-------------|---------------|-----------|--|
| County Sum  | mary of Projected Water Needs (Shortages) and \  | Nater Managem  | ent Strateg  | ies   |   | ,                          |             | User Gro      | up(s) ≈ a |  |
| rolected W  | ater Needs (acft/yr)   |  | 1  |   | 1   |                            |             |               |           |  |
|             | User Group(s)  |  | 2000   | 2010  | 2020  | 2030                       | 2040        | 2050          | Notes     |  |
|             | Municipal  |  | 122,867  | 154,495                                       | 196,301   | 262.070                    | 315,633     | 353,309       | 110103    |  |
|             | Industrial   |  | 0  | 0   | 190,301   | 1,430                      | 4,759       | 8,192         |           |  |
|             | Steam-Electric   |  | 0  | ŏ   | ő   | 1,430                      | 0           | 0,152         |           |  |
|             | Mining   |  | 4,983  | 4,936   | 5,201   | 5,406                      | 5.645       | 5.962         |           |  |
|             | Impalion   |  | 22,575   | 20,374  | 19,585  | 19,015                     | 18,385      | 17,368        |           |  |
| <del></del> | Total Needs  |  | 150,405  | 179,805                                       | 221,087   | 287,921                    | 344,422     | 384,831       |           |  |
|             | Mun, Ind, S-E, & Min Needs   |  | 127,830  | 159,431                                       | 201,502   | 268,906                    | 326,037     | 367,463       |           |  |
|             | Irrigation Needs   |  | 22,575   | 20,374  | 19,585  | 19,015                     | 18,385      | 17,368        |           |  |
|             |  |  | 22,313   | 20,374  | 18,303  | 13,013                     | 10,303      | 17,300        |           |  |
|             | gement Strategies (acft/yr)  | Candidate  |  |   |   |                            |             |               |           |  |
| D#          | Description  | New Supply   | 2000°  | 2010  | 2020  | 2030                       | 2040        | 2050          | Notes     |  |
| -10 (Mun.)  | Demand Reduction (Conservation)  |  | 33,528   | 42,509  | 41,210  | 36,533                     | 38,834      | 40,934        |           |  |
| -15         | Edwards Irrigation Transfers   | 81,000   | 50,000   | 55,000  | 60,000  | 65,000                     | 70,000      | 71,300        | 2,        |  |
| CTN-3c      | Simsboro Aquifer   | 55,000   | 55,000   | 55,000  | 55,000  | 55,000                     | 55,000      | 55,000        |           |  |
| Z-10C       | Carrizo Aquifer - Wilson & Gonzales  | 75,000   | 40,000   | 50,000  | 60,000  | 70,000                     | 75,000      | 75,000        | 4,        |  |
|             | Carrizo Aquifer (Bexar Co.) - BMWD   | 3,000  | 3,000  | 3,000   | 3,000   | 3,000                      | 3,000       | 3,000         |           |  |
|             | Trinity Aquifer (Bexar Co) - BMWD  | 1,000  | 1,000  | 1,000   | 1,000   | 1,000                      | 1,000       | 1,000         |           |  |
|             | SAWS Recycled Water Program  |  |  | 19,826  | 26,737  | 35,824                     | 43,561      | 52,215        | 7, 1      |  |
| -18a        | Edwards Recharge - Type 2 Projects   | 21,577   |  | 21,577  | 21,577  | 21,577                     | 21,577      | 21,577        |           |  |
| CTN-16b     | Lower Guadalupa River Diversions   | 63,177   |  |   | 63,177  | 63,177                     | 63,177      | 63,177        |           |  |
| -15C        | Cibolo Reservoir   | 31,500   |  |   |   |                            | 31,500      | 31,500        |           |  |
| CTN-1a      | Aquifer Storage & Recovery - Regional  |  |  |   |   |                            |             |               |           |  |
| CTN-4       | Brush Management   |  |  |   |   |                            |             |               | 1         |  |
| CTN-5       | Weather Modification   |  |  |   |   |                            |             | •             | 10        |  |
| CTN-9       | Rainwater Harvesting   |  |  |   |   |                            |             |               | 1         |  |
|             | Small Aquifer Recharge Dams  |  |  |   |   |                            |             |               | 10        |  |
| 10 (lm.)    | Demand Reduction (Conservation)  |  | 4,521  | 4,521   | 4,521   | 4,521                      | 4,521       | 4,521         | 1         |  |
|             | Total New Supplies   |  | 187,049  | 252,433                                       | 336,222   | 355,632                    | 407,170     | 419,224       |           |  |
|             | Total System Mgmt. Supply / Deficit  |  | 38,644   | 72,628  | 115,135   | 67,711                     | 62,748      | 34,393        |           |  |
|             | Mun, Ind, S-E, & Min System Mgmt. 8  |  | 54,698   | 88,481  | 130,199   | 82,205                     | 76,612      | 47,240        |           |  |
|             | Irrigation System Mgmt. Supply / Deficit   |  | -18,054  | -15,853                                       | -15,084   | -14,494                    | -13,864     | -12,847       |           |  |
|             | urigation dystem mante dupply reducti  |  | -10,000  | -10,000                                       | -10,000   | -14,404)                   | -19,004     | -12,047       |           |  |
| otes:       | O- tidat No. O - tida hara for any 2000 and ideal/ford   | las adadt i baslassa   | -101/00 000  | 14 5  | his immediate                                   |                            |             |               |           |  |
|             | Candidate New Supplies shown for year 2000 are identified<br>Demand Reduction (Conservation) strategies assumed large  | tor priority impleme:  | nistion, but wi                                    | not be avana                                  | ore commediate                                  | <u> </u>                   |             |               |           |  |
| <del></del> | Candidate New Supply to be shared among Uvalde, Medina.  |  |  |   | of be reliable i                                | in drought.                |             |               |           |  |
|             | Pursuant to draft EAA Critical Period Management rules, Co. (195.430 acft) based on Proposed Permits prorated to 400,00  | ndidate New Supply   | represents a                                       | pproximately 6                                | 5 percent of t                                  | he estimated               | maximum pot | launna laitne | transfer  |  |
|             | Effects on regional aquifer levels to be quantified.   |  |  |   |   |                            |             |               |           |  |
|             | Includes non-interruptible supplies identified by BNWD in Weter Supply Program of 1/31/2000.   |  |  |   |   |                            |             |               |           |  |
|             | Non-interruptible supplies identified by BMWD in Water Supp  | Ny Program of 1/31   | 72000.   | la cational - 4                               |   |                            |             |               |           |  |
|             |  |  | (Ozluti Byllanı                                    | nı 62mine160 l                                | iecos.  |                            |             |               |           |  |
|             | Current SAWS Recycled Water Program is included in the 2   | on one of meeting  | 20 nercent of                                      | SAWS and                                      | ted water des                                   | nand                       |             |               |           |  |
|             | Future use of recycled water for non-potable uses and based  | on goal of meeting   | 20 percent of                                      | SAWS projec                                   | abd water der                                   | nand.<br>Ier demands.      | •           |               |           |  |
| 0           | Future use of recycled water Program is included in the 24<br>Future use of recycled water for non-potable uses and bases<br>SAWS ASR program in southern Bexar County increases rel<br>Option expected to provide additional water supply in many<br>Estimates based upon use of LEPA systems on 60 percent of<br>the country of the count | on goal of meeting<br>lability of Edwards<br>rears, but depended | 20 percent of<br>Aquiler supply<br>ole supply duri | SAWS project<br>and reduces<br>and drought is | ded water den<br>seasonal aqui<br>presently ung | fer demands.<br>uantified. |             |               |           |  |

## Planning Unit Alternative Regional Water Plan Caldwell County



|            | ntral Texas Region  |                      |                 |                 |                   |             |         | County =    | Caldwe    |
|------------|---|----------------------|-----------------|-----------------|-------------------|-------------|---------|-------------|-----------|
| County     | <b>Summary of Projected Water Needs (Short</b>                  | ages) and W          | ater Manag      | gement St       | trategies         |             |         | User Gro    | up(s) = a |
| relected   | Motor Noods (seffice)   |                      |                 |                 |                   |             |         | _           | ·-        |
| rojecteu   | Water Needs (acft/yr)   |                      | 2000            | 2010            | 2020              | 2030        | 2040    | 2050        | Mater     |
|            | User Group(s)   |                      |                 |                 |                   |             |         |             | Notes     |
|            | Municipal Industrial  |                      | 0               | 188             | 393               | 668         | 714     | 737         |           |
|            | Steam-Electric  |                      | ö               | 0               |                   | <del></del> | 0       | 0           |           |
|            | Mining  | ·                    | - 0             | <u>ol</u>       | - <del></del> 6 - | <del></del> | - 0     |             |           |
|            | Imgation  |                      |                 | <u> </u>        |                   |             | <u></u> |             |           |
|            | Total Needs   |                      | ŏ               | 188             | 393               | 668         | 714     | 737         |           |
|            | Mun, Ind, S-E, & Min Needs                                      |                      | ŏ               | 188             | 393               | 668         | 714     | 737         |           |
|            | Irrigation Needs  |                      | Ō               | 0               | 0                 | 000         | 0       | <u></u>     |           |
|            | iii gatan maaa  |                      |                 |                 |                   | •           | Ů,      |             |           |
| Vater Man  | agement Strategies (acft/yr)                                    | Candidate            |                 | 1               |                   |             |         |             |           |
| D#         | Description   | New Supply           | 2000            | 2010            | 2020              | 2030        | 2040    | 2050        | Notes     |
| -10 (Mun.) | Demand Reduction (Conservation)                                 |                      | 195             | 208             | 218               | 82          | 93      | 104         |           |
| -21        | Lockhart Reservoir  |                      |                 | 6.048           | 6,048             | 6.048       | 6.048   | 6.048       |           |
|            |   |                      |                 |                 |                   |             |         |             |           |
|            |   |                      |                 |                 |                   |             |         |             |           |
|            |   |                      | [               |                 |                   |             |         |             |           |
|            |   |                      |                 |                 |                   |             |         |             |           |
|            |   |                      |                 |                 |                   |             |         |             |           |
|            | Small Aquifer Recharge Dams                                     |                      | <u>  </u>       |                 |                   |             |         |             |           |
| -10 (lm.)  | Demand Reduction (Conservation)                                 |                      | i               |                 |                   |             |         |             |           |
|            |   |                      |                 |                 |                   |             |         |             |           |
|            |   |                      | 127             |                 |                   | 2 122       |         |             |           |
|            | Total New Supplies  | · · · · -            | 195             | 6,254           | 6,266             | 6,130       | 6,141   | 6,152       |           |
|            | Total System Mgmt, Supply / Deficit                             |                      | 195             | 6,066           | 5,873             | 5,462       | 5,427   | 5,415       |           |
|            | Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit              |                      | 195             | 6,066           | 5,873             | 5,462       | 5,427   | 5,415       |           |
|            | Irrigation System Mgmt. Supply / Deficit                        |                      | .,,,            | 0,000           | 3,073             | 0,402       | 0       | 3,413       |           |
|            | inigation system ingint. Supply / Dencit                        |                      | U               | U <sub>1</sub>  |                   |             | U       | U           |           |
| otes:      |   |                      |                 |                 |                   |             | . 7     |             |           |
|            | Damand Reduction (Conservation) strategies assumed largely re   | eflected in projecte | d water demand  | is.             | <del></del>       | <del></del> |         |             |           |
|            | Water supply for City of Lockhart and/or other users downstream |                      | 1.3.0. 000      | <del></del>     |                   |             |         |             |           |
|            | Option expected to provide additional water supply in many year |                      | supply during d | rought is orose | oth woo odifi     | <del></del> |         | <del></del> |           |

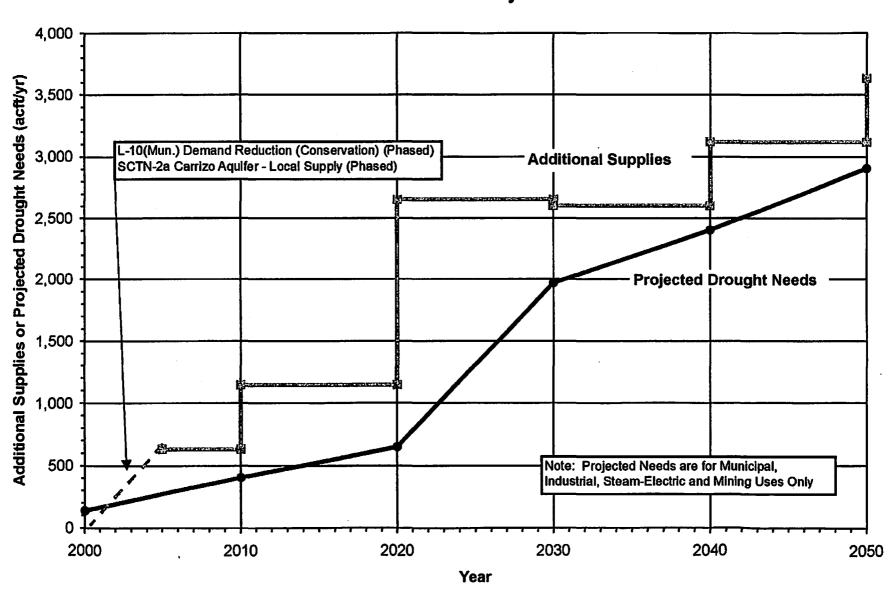
## Planning Unit Alternative Regional Water Plan Comal County



#### Planning Unit Regional Water Management Alternative Plan

| South Ce    | ntral Texas Region  |                     |                |                | T                   | ····              |               | County      | = Coma |
|-------------|---|---------------------|----------------|----------------|---------------------|-------------------|---------------|-------------|--------|
|             | mmary of Projected Water Needs (Shortages) a  | nd Water Mana       | gement S       | trategies      |                     |                   |               | User Grou   |        |
|             |   |                     |                |                |                     |                   |               |             |        |
| Projected \ | Water Needs (acft/yr)   |                     |                |                |                     |                   |               |             |        |
|             | User Group(s)   |                     | 2000           | 2010           | 2020                | 2030              | 2040          | 2050        | Notes  |
|             | Municipal   |                     | 2,289          | 5,049          | 10,487              | 18,282            | 25,205        | 33,062      |        |
|             | Industrial  |                     | 1,388          | 1,425          | 1,486               | 1,737             | 2,009         | 2,289       |        |
|             | Steam-Electric Mining   | <del></del>         | 0<br>5,570     | 5,464          | 5,628               | <u>0</u><br>5,798 | 0<br>3.590    | 2,224       |        |
|             | Irrigation  |                     | 30             | 5,404<br>14    | 3,028<br>0          | <u>5,780</u>      | 3,380         | 2,224       |        |
|             |   |                     | 9,277          | 11,952         | 17,601              | 25,815            | 30,804        | 37,575      |        |
|             | Total Needs   |                     |                |                |                     |                   |               |             |        |
|             | Mun, Ind, S-E, & Min Needs  |                     | 9,247          | 11,938         | 17,601              | 25,815            | 30,804        | 37,575      |        |
|             | Irrigation Needs  |                     | 30             | 14             | 0                   | _ 0               | 0             | 0           |        |
| 100         | A Olivia de la Cida   | 0                   |                |                |                     |                   |               |             |        |
|             | agement Strategies (acft/yr)  | Candidate           |                |                |                     |                   |               |             |        |
| ID#         | Description   | New Supply          | 2000*          | 2010           | 2020                | 2030              | 2040          | 2050        | Notes  |
| L-10 (Mun.) | Demand Reduction (Conservation)   |                     | 616            | 718            | 848                 | 718               | 824           | 942         |        |
| G-15C       | Canyon Reservoir - River Diversion  | 15,000              | 15,000         | 15,000         | 15,000              | 15,000            | 15,000        | 15,000      |        |
| CZ-10D      | Carrizo Aquifer - Gonzales & Bastrop  | 90,000              |                |                | 3,500               | 12,000            | 16,500        | 23,000      | 3, 4,  |
|             |   |                     |                |                |                     |                   |               |             |        |
|             | ·   |                     |                |                |                     | <del></del>       |               |             |        |
|             |   |                     |                |                |                     |                   |               |             |        |
|             | Small Aquifer Recharge Dams   |                     |                |                | i                   |                   |               |             |        |
| L-10 (lrr.) | Demand Reduction (Conservation)   |                     |                |                |                     |                   |               |             |        |
|             |   |                     |                |                |                     |                   |               |             |        |
|             |   |                     |                |                |                     |                   |               |             |        |
|             | Total New Supplies  |                     | 15,616         | 15,718         | 19,348              | 27,718            | 32,324        | 38,942      |        |
|             |   |                     |                |                |                     |                   |               |             |        |
|             | Total System Mgmt. Supply / Deficit   |                     | 6,339          | 3,766          | 1,747               | 1,903             | 1,520         | 1,367       | ·-···  |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /  |                     | 6,369          | 3,780          | 1,747               | 1,903             | 1,520         | 1,367       |        |
|             | Deficit   |                     |                |                |                     |                   |               |             |        |
|             | Irrigation System Mgmt. Supply / Deficit  |                     | -30            | -14            | 0                   | 0                 | 0             | 0           |        |
|             |   |                     |                |                |                     |                   |               |             |        |
| Notes:      |   |                     |                |                | 41-4                |                   |               |             |        |
| <u>-</u>    | Candidate New Supplies shown for year 2000 are identified for<br>Demand Reduction (Conservation) strategies assumed largely |                     |                |                | e immediately.<br>T | т                 |               |             |        |
| 1           | Portion of Canyon firm yield (with amendment) diverted below  |                     | so water dem   | mus.           |                     |                   |               | <del></del> |        |
| <u> </u>    | Candidate New Supply to be shared among Comal, Guadalup   |                     | e Effecte on   | regional acuif | er levels to be     | mushlified        |               |             |        |
| <u> </u>    | Portion of 90,000 activyr available from northern Gonzales and  |                     |                |                | U. 107019 10 00     | Accimion.         |               |             |        |
| 5           | Early implementation of facilities assumed in cost estimation to  |                     |                |                | Ĭ                   |                   |               |             |        |
| 6           | Option expected to provide additional wat   | er supply in many v | ears, but depe | ndable supply  | during drough       | t is presentiv    | unquantified. |             |        |

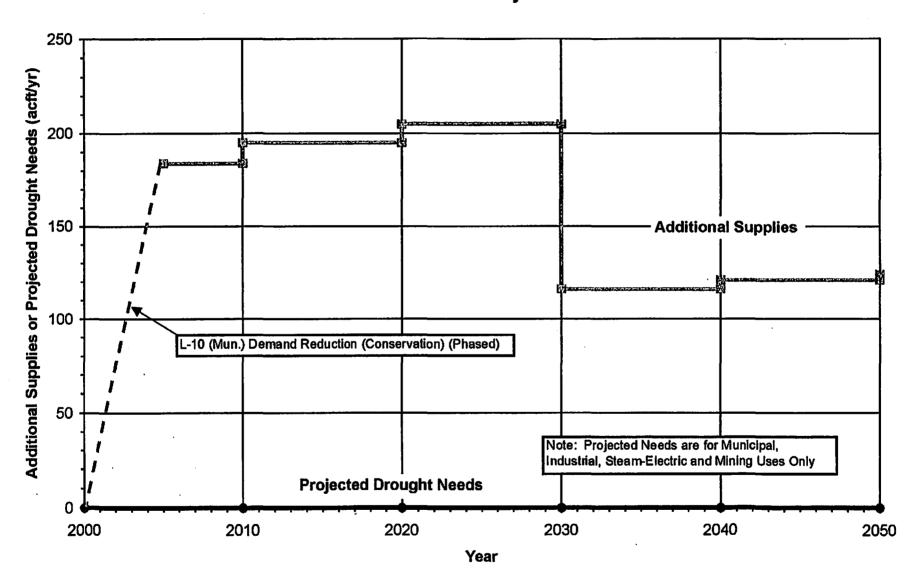
## Planning Unit Alternative Regional Water Plan Dimmit County



#### Planning Unit Regional Water Management Alternative Plan

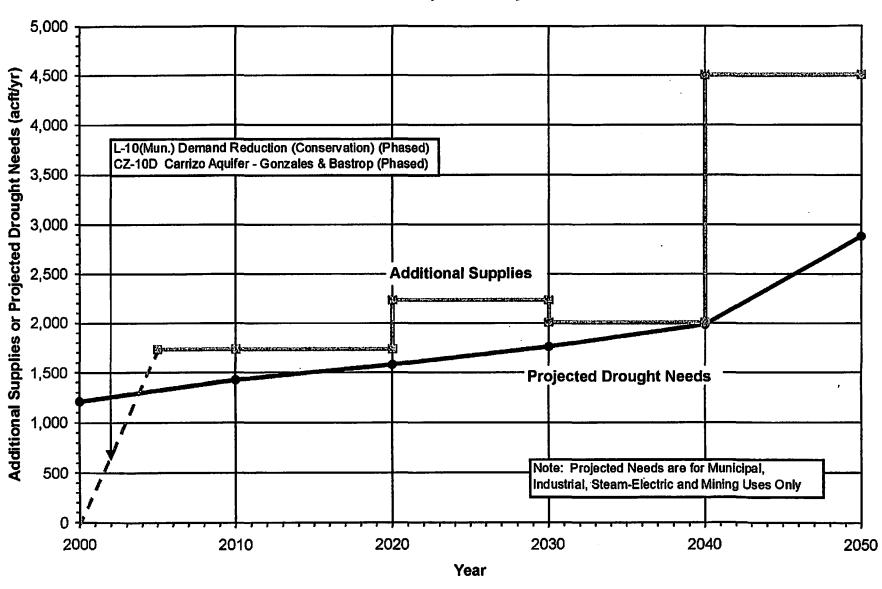
| South Cer    | ntral Texas Region   |                     |                  |                  |                 |                |             | County       | = Dimmit    |
|--------------|--|---------------------|------------------|------------------|-----------------|----------------|-------------|--------------|-------------|
|              | mmary of Projected Water Needs (Shortages) an                    | d Water Mana        | gement Str       | ategies          |                 |                |             | User Gro     |             |
| Projected V  | Water Needs (acft/yr)  |                     |                  |                  |                 |                | _           |              |             |
| , rojoutou t | User Group(s)  |                     | 2000             | 2010             | 2020            | 2030           | 2040        | 2050         | Notes       |
|              | Municipal  |                     | 138              | 405              | 649             | 1,054          | 1,479       | 1.959        | 110103      |
| ··           | Industrial   |                     | 130              | 0                | 019             |                | 1,473       | 0            |             |
|              | Steam-Electric   |                     | ö                | <del>- ŏ</del> l | ŏ               | <del>- 6</del> | <del></del> |              |             |
|              | Mining   |                     | Ö                | ō                | Ŏ               | 915            | 925         | 949          |             |
|              | Irrigation   |                     | ō                | Ō                | O               | 2,133          | 1,737       | 1,331        |             |
|              | Total Needs  |                     | 138              | 405              | 649             | 4,102          | 4,141       | 4,239        |             |
|              | Mun, Ind, S-E, & Min Needs                                       |                     | 138              | 405              | 649             | 1,969          | 2,404       | 2,908        |             |
|              | Irrigation Needs   |                     | 0                | 0                | 0               | 2,133          | 1,737       | 1,331        |             |
|              | i iiigation weeds  |                     | U)               |                  |                 | 2,100          | 1,137       | 1,001        |             |
| Water Man    | agement Strategies (acft/yr)                                     | Candidate           |                  |                  |                 |                |             |              |             |
| ID#          | Description  | New Supply          | 2000*            | 2010             | 2020            | 2030           | 2040        | 2050         | Notes       |
| L-10 (Mun.)  | Demand Reduction (Conservation)                                  |                     | 131              | 144              | 156             | 104            | 118         | 133          |             |
| SCTN-2a      | Carrizo Aquifer - Local Supply                                   |                     | 500              | 1,000            | 1,000           | 2,500          | 3,000       | 3.500        | 2,          |
|              |  |                     |                  |                  |                 |                |             |              |             |
| SCTN-4       | Brush Management   |                     |                  |                  |                 |                |             |              |             |
| SCTN-5       | Weather Modification   |                     | ·                | ·                |                 |                |             | -            |             |
| SCTN-9       | Rainwater Harvesting   | _                   |                  |                  |                 |                | 1           |              |             |
|              | Small Aquifer Recharge Dams                                      |                     |                  |                  |                 |                |             |              |             |
| L-10 (lm.)   | Demand Reduction (Conservation)                                  |                     |                  |                  |                 |                |             |              |             |
|              | Total New Supplies   |                     | 631              | 1,144            | 1,156           | 2,604          | 3,118       | 3,633        |             |
|              | Total System Mgmt. Supply / Deficit                              |                     | 493              | 739              | 507             | -1,498         | -1,023      | -606         |             |
|              | Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit               |                     | 493              | 739              | 507             | 635            | 714         | 725          |             |
|              | Irrigation System Mgmt. Supply / Deficit                         |                     | 0                | 0                | 0               | -2,133         | -1,737      | -1,331       |             |
|              |  |                     |                  |                  |                 |                |             |              |             |
| Notes:       | Candidate New Supplies shown for year 2000 are identified for p  | elacitu implomanta  | ion but will not | ho available is  |                 | <u>:</u>       |             |              |             |
|              | Demand Reduction (Conservation) strategies assumed largely re    |                     |                  |                  | шивовену.       | <sub>1</sub>   |             |              |             |
| 1            | Additional well(s) for Carrizo Springs and Mining supply.        | auscraa iu brojecte | n water deways   | J5.              | <del></del>     |                |             | <del>,</del> | <del></del> |
| 2            | Early implementation of facilities assumed in cost estimation to | neura cufficiant cu | note during decr | ught .           |                 |                |             |              |             |
| <u>3</u>     | Option expected to provide additional water supply in many year  | e hut desendable    | enote dedes 4    | rought is orose  | othe unougation | L              |             |              | · · · · ·   |

## Planning Unit Alternative Regional Water Plan Frio County



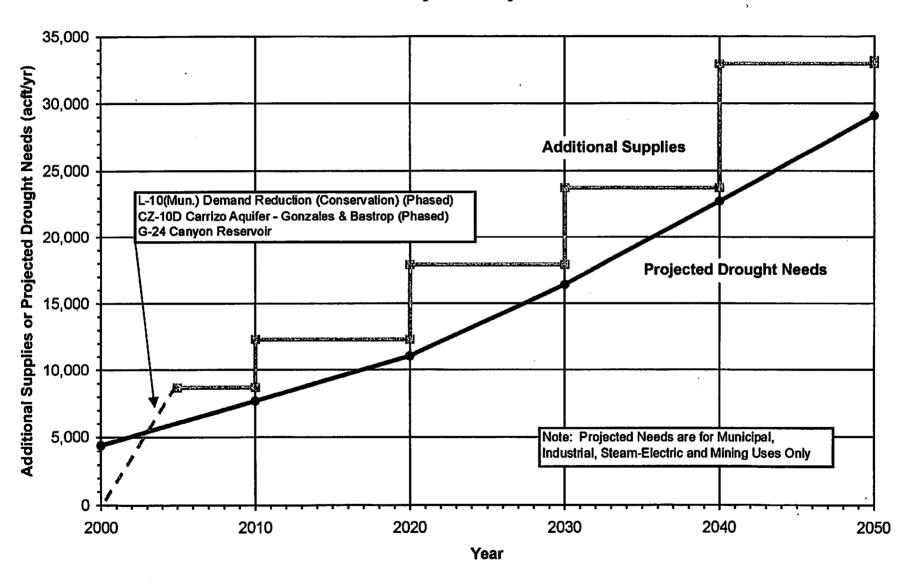
| South Ce    | ntral Texas Region  County Summary of Projected Water Needs (S   | hortages) and  | Water Man         | agement S  | trategies        |                    |         | Coun<br>User Grou | ty = Fri  |
|-------------|--|--|-------------------|--|------------------|--------------------|---------|-------------------|-----------|
| Burn W      | County Summary of Projected Water Needs (S   | nortages/ and  | vvater ivian      | agement o  | trategies        | Bred L             |         | User Gro          | 1p(s) - 6 |
| Projected ' | Water Needs (acft/yr)  |  |                   |  |                  | Second Internal of |         |                   |           |
|             | User Group(s)  |  | 2000              | 2010   | 2020             | 2030               | 2040    | 2050              | Notes     |
|             | Municipal  |  | 0                 | 0  | 0                | 0                  | 0       | 0                 |           |
|             | Industrial   |  | 0                 | 0  | 0                | 0                  | 0       | 0                 |           |
|             | Steam-Electric   |  | 0                 | 0  | 0                | 0                  | 0       | 0                 |           |
|             | Mining   |  | 0                 | 0  | 0                | 0                  | 0       | 0                 |           |
|             | Irrigation   |  | 71,126            | 67,646   | 64,365           | 76,505             | 73,519  | 70,662            |           |
|             | Total Needs  |  | 71,126            | 67,646   | 64,365           | 76,505             | 73,519  | 70,662            |           |
|             | Mun, Ind, S-E, & Min Needs   |  | 0                 | 0  | 0                | 0                  | 0       | 0                 |           |
|             | Irrigation Needs   |  | 71,126            | 67,646   | 64,365           | 76,505             | 73,519  | 70,662            |           |
| Mater Man   | agement Strategies (acft/ur)   | Candidate  | TOTAL DESIGNATION | (F) (1) (1)  | The land of      |                    |         | 10 200 12 - 14    |           |
|             | agement Strategies (acft/yr)   | THE RESIDENCE OF THE PARTY OF T | 2000              | 2010   | 2020             | 2020               | 20.40   | 2050              | Mataa     |
| D#          | Description  | New Supply   | 2000              | 2010   | 2020             | 2030               | 2040    | 2050              | Notes     |
| 10 (Mun.)   | Demand Reduction (Conservation)  |  | 184               | 195  | 205              | 116                | 121     | 124               |           |
|             |  |  |                   |  |                  |                    |         |                   |           |
| SCTN-4      | Brush Management   |  |                   |  |                  |                    |         |                   |           |
| SCTN-5      | Weather Modification   |  |                   |  |                  |                    |         |                   |           |
| SCTN-9      | Rainwater Harvesting   |  |                   |  |                  |                    |         |                   |           |
| 301113      | Small Aquifer Recharge Dams  |  |                   |  |                  |                    |         |                   |           |
| L-10 (Irr.) | Demand Reduction (Conservation)  |  | 5,947             | 5,947  | 5,947            | 5,947              | 5,947   | 5,947             |           |
|             | Total New Supplies   |  | 6,131             | 6,142  | 6,152            | 6,063              | 6,068   | 6,071             | 0.00      |
|             | Total System Mgmt. Supply / Deficit  |  | -64,995           | -61,504  | -58,213          | -70,442            | -67,451 | -64,591           |           |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit   |  | 184               | 195  | 205              | 116                | 121     | 124               |           |
|             | Irrigation System Mgmt. Supply / Deficit   |  | -65,179           | -61,699  | -58,418          | -70,558            | -67,572 | -64,715           |           |
| Notes:      |  |  |                   | STATE OF THE STATE |                  |                    | 100.00  |                   |           |
| 2           | Demand Reduction (Conservation) strategies assumed largely re<br>Option expected to provide additional water supply in many year | s, but dependable s  | upply during dr   | ought is preser  |                  |                    |         |                   |           |
| 3           | Estimates based upon use of LEPA systems on 50 percent of ac application rate.   | reages irrigated in 1  | 1997, with cons   | ervation at 20   | percent of irrig | ation              |         |                   |           |

## Planning Unit Alternative Regional Water Plan Guadalupe County



|             | entral Texas Region  |                       |                  |                  |                  | -         | Co       | unty = Gu | adalup |
|-------------|--|-----------------------|------------------|------------------|------------------|-----------|----------|-----------|--------|
| County St   | ummary of Projected Water Needs (Shortages) a                    | nd Water Mana         | gement St        | rategies         |                  |           |          | User Grou |        |
| Projected   | Water Needs (acft/yr)  |                       | ŧ                |                  |                  | ,         |          |           |        |
| Fiolecied   | User Group(s)  |                       | 2000             | 2010             | 2020             | 2030      | 2040     | 2050      | Notes  |
|             | Municipal  |                       | 29               | 23               | 30               | 71        | 87       | 773       | 140162 |
|             | Industrial   |                       | 985              | 1,204            | 1,350            | 1,487     | 1.692    | 1,899     |        |
|             | Steam-Electric   |                       |                  | 1,204            | 1,550            | 1,407     | 1,032    | 0         |        |
|             | Mining   |                       | 198              | 198              | 200              | 202       | 207      | 213       |        |
|             | Irrigation   |                       | 985              | 879              | 779              | 684       | 594      | 508       |        |
| ···         | Total Needs  |                       | 2,195            | 2,304            | 2,359            | 2,444     | 2,580    | 3,393     |        |
|             | Mun, Ind, S-E, & Min Needs                                       |                       | 1,210            | 1,425            | 1,580            | 1,760     | 1,986    | 2,885     |        |
|             | Irrigation Needs   |                       | 985              | 879              | 779              | 684       | 594      | 508       |        |
|             |  |                       |                  |                  |                  |           |          |           |        |
| Water Mai   | nagement Strategies (acft/yr)                                    | Candidate             |                  |                  |                  |           |          |           |        |
| ID#         | Description  | New Supply            | 2000*            | 2010             | 2020             | 2030      | 2040     | 2050      | Notes  |
| L-10 (Mun.) | Demand Reduction (Conservation)                                  |                       | 235              | 236              | 236              | 5         | 5        | 6         |        |
| CZ-10D      | Carrizo Aquifer - Gonzales & Bastrop                             | 90,000                | 1,500            | 1,500            | 2,000            | 2,000     | 2,500    | 4,500     | 2, 3,  |
|             |  |                       |                  |                  |                  |           | <u>.</u> |           |        |
|             |  |                       |                  |                  |                  |           |          |           |        |
|             | <u> </u>   |                       |                  |                  |                  |           |          |           |        |
|             |  |                       |                  |                  |                  |           |          |           | ·      |
|             | Contraction Devices Device                                       |                       |                  |                  |                  |           |          | <u>-</u>  |        |
| L-10 (lm.)  | Small Aquifer Recharge Dams Demand Reduction (Conservation)      |                       |                  |                  | <del></del>      |           |          |           |        |
| L-10 (III.) | Demand Reduction (Conservation)                                  |                       | ——               |                  |                  |           |          |           |        |
|             |  | -                     | <del></del>      |                  |                  |           |          |           |        |
|             | Total New Supplies   |                       | 1,735            | 1,736            | 2,236            | 2,005     | 2,505    | 4,506     |        |
|             | ,                          |                       | 1,000            | 1,1.00           | 2,240            | 2,000     |          | 1,000     |        |
| -           | Total System Mgmt. Supply / Deficit                              |                       | -460             | -568             | -123             | -439      | -75      | 1,113     |        |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit               |                       | 525              | 311              | 656              | 245       | 519      | 1,621     |        |
|             | Irrigation System Mgmt. Supply / Deficit                         |                       | -985             | -879             | -779             | -684      | -594     | -508      |        |
|             |  |                       |                  |                  |                  |           |          | · ·       |        |
| Notes:      |  |                       |                  |                  |                  |           | I        |           |        |
| •           | Candidate New Supplies shown for year 2000 are Identified for    | priority implementati | on, but will not | be available in  | mediately.       |           |          |           |        |
| 1           | Demand Reduction (Conservation) strategies assumed largely r     |                       |                  |                  |                  |           |          |           |        |
| 2           | Candidate New Supply to be shared among Comal, Guadalupe,        | and Hays Counties     | . Effects on re  | gional aquifer i | evels to be qua  | antified. |          |           |        |
| 3           | Portion of 90,000 activyr available from northern Gonzales and s | southern Bastrop Co   | unties under C   | Z-10D.           |                  |           | 1        |           |        |
| 4           | Early implementation of facilities assumed in cost estimation to |                       |                  |                  |                  |           | T        |           |        |
| 5           | Option expected to provide additional water supply in many year  | rs, but dependable s  | upply during d   | rought is prese  | ntly unquantific | ed.       |          |           |        |

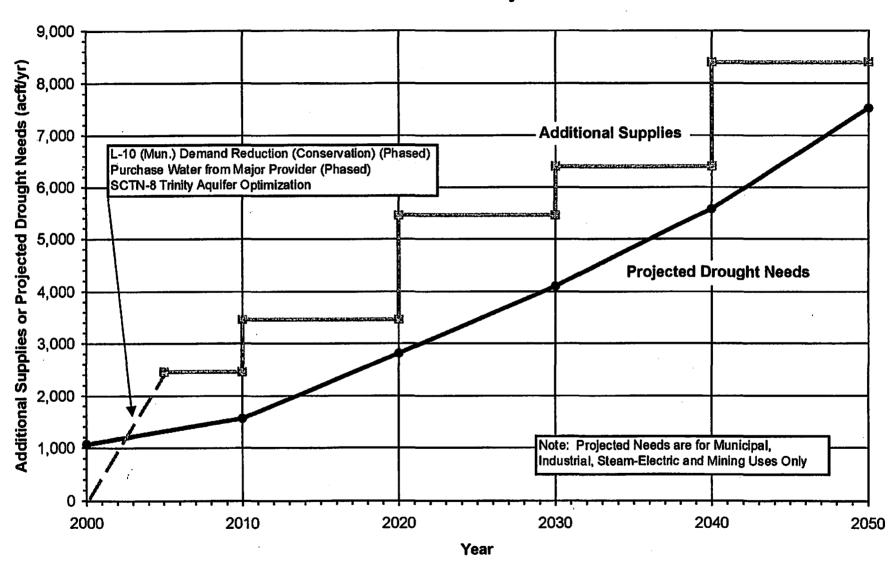
## Planning Unit Alternative Regional Water Plan Hays County



#### Planning Unit Regional Water Management Alternative Plan

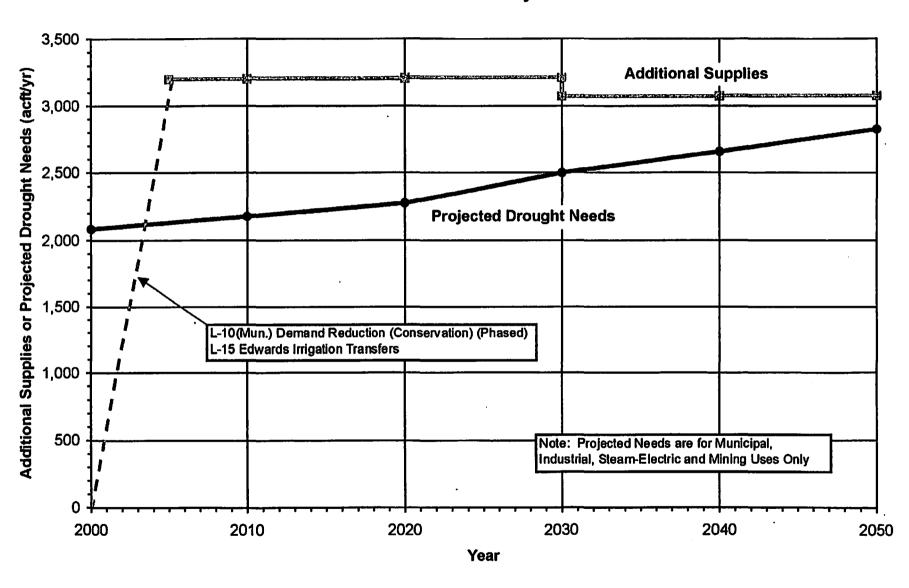
|             | ntral Texas Region   |                       |                |                |                 |             |              | Count       | y = Hays    |
|-------------|--|-----------------------|----------------|----------------|-----------------|-------------|--------------|-------------|-------------|
| County Su   | immary of Projected Water Needs (Shortages) as                   | nd Water Mana         | gement St      | rategles       |                 |             |              | User Gro    | up(s) = all |
| Projected ! | Water Needs (acft/yr)  |                       |                |                |                 |             |              |             |             |
| Fiojecteu   | User Group(s)  |                       | 2000           | 2010           | 2020            | 2030        | 2040         | 2050        | Notes       |
|             |  |                       |                |                |                 |             |              |             | Notes       |
|             | Municipal<br>Industrial  |                       | 4,325<br>0     | 7,609<br>0     | 10,980          | 16,349<br>0 | 22,696<br>0  | 29,059      |             |
|             | Steam-Electric   |                       | <del></del>    |                | <u>ö</u> l      | <del></del> |              |             |             |
|             | Mining   | <del></del>           | 84             | 82             | 68              | 55          | 37           | 28          |             |
| ·           | Irrigation   |                       |                | 0              |                 | 0           | <del></del>  |             |             |
|             | Total Needs  | -                     | 4,409          | 7,691          | 11,048          | 16,404      | 22,733       | 29,087      |             |
|             |  |                       |                |                |                 |             |              |             |             |
|             | Mun, Ind, S-E, & Min Needs                                       |                       | 4,409          | 7,691          | 11,048          | 16,404      | 22,733       | 29,087      |             |
|             | Irrigation Needs   |                       | 0)             | 0              | 0               | 0           | 0            | 0           |             |
|             |  |                       |                |                |                 |             |              |             |             |
| Water Man   | agement Strategies (acft/yr)                                     | Candidate             |                |                |                 |             |              | Ī           | C           |
| ID#         | Description  | New Supply            | 2000*          | 2010           | 2020            | 2030        | 2040         | 2050        | Notes       |
| L-10 (Mun.) | Demand Reduction (Conservation)                                  | THE COPPLY            | 647            | 747            | 873             | 699         | 906          | 1,174       |             |
| CZ-10D      | Carrizo Aquifar - Gonzales & Bastrop                             | 90,000                | 4,000          | 7,000          | 10,500          | 16,000      | 22,000       | 31,000      | 2, 3,       |
| G-24        | Canyon Reservoir   | 1,048                 | 1,048          | 1,048          | 1,048           | 1,048       | 1,048        | 1,048       |             |
| <del></del> |  | .,,,,,                | 7,5 1.5        |                |                 |             |              |             |             |
|             |  |                       |                |                |                 |             |              |             |             |
|             |  |                       |                |                |                 |             |              |             |             |
|             |  |                       |                |                |                 |             |              |             |             |
|             | Small Aquifer Recharge Dams                                      |                       |                |                |                 |             |              |             |             |
| L-10 (lm.)  | Demand Reduction (Conservation)                                  |                       |                |                |                 |             |              |             |             |
|             |  |                       |                |                |                 |             |              |             |             |
|             |  | _                     |                |                |                 |             |              |             |             |
| ~           | Total New Supplies   |                       | 5,695          | 8,795          | 12,421          | 17,747      | 23,954       | 33,222      |             |
|             |  |                       |                |                |                 |             |              |             |             |
|             | Total System Mgmt. Supply / Deficit                              |                       | 1,286          | 1,104          | 1,373           | 1,343       | 1,221        | 4,135       | <b>.</b>    |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit               |                       | 1,286          | 1,104          | 1,373           | 1,343       |              |             |             |
| <del></del> |  | <del></del>           |                |                |                 |             | 1,221        | 4,135       |             |
|             | Irrigation System Mgmt. Supply / Deficit                         |                       | 0              | 0              | 0               | 0           | 0            | 0           |             |
| Notes:      |  |                       |                |                |                 |             | •            | , 1         |             |
| 10168:      | Candidate New Supplies shown for year 2000 are identified for    | nindiv implementati   | on hulwill not | he available i |                 |             | <del></del>  | <u></u>     |             |
| 1           | Demand Reduction (Conservation) strategies assumed largety re    | effected in ornierlas | waler deman    | le T           |                 |             | <del> </del> | <del></del> |             |
| 2           | Candidate New Supply to be shared among Comal, Guadalupe,        | and Havs Counties     | Effects on re  | nional aquifer | levels to be ou | entified    | ···          |             |             |
| 3           | Portion of 90,000 active available from northern Gonzales and s  | outhern Bastron Co    | unties under C | Z-10D.         | 1               |             |              |             |             |
| 4           | Early implementation of facilities assumed in cost estimation to |                       |                |                |                 | i           |              |             |             |
| 5           | Candidate New Supply for Wimberley and Woodcreek.                |                       | 1              |                |                 |             |              |             |             |
| 6           | Option expected to provide additional water supply in many year  | s, but dependable s   | h enhub vlaau  | rought is pres | nily unquantifi | ied.        |              |             |             |

## Planning Unit Alternative Regional Water Plan Kendall County



| South Ce         | ntral Texas Region   |                       |                                       |                 |                 |                                       |       | County = | = Kendall   |
|------------------|--|-----------------------|---------------------------------------|-----------------|-----------------|---------------------------------------|-------|----------|-------------|
| County Su        | immary of Projected Water Needs (Shortages) a                    | nd Water Mana         | gement St                             | rategies        |                 | 1                                     |       |          | up(s) = all |
|                  |  |                       |                                       |                 |                 |                                       |       |          |             |
| Projected        | Water Needs (acft/yr)  |                       |                                       |                 |                 |                                       |       |          |             |
|                  | User Group(s)  |                       | 2000                                  | 2010            | 2020            | 2030                                  | 2040  | 2050     | Notes       |
|                  | Municipal  |                       | 1,070                                 | 1,560           | 2,808           | 4,099                                 | 5,578 | 7,518    |             |
|                  | Industrial   |                       | 2                                     | 3               | 4               | 4                                     | 5     | 6        |             |
|                  | Steam-Electric   |                       | Ö                                     | 0               | 0               | 0                                     | 0     | 0        |             |
|                  | Mining   |                       | 0                                     | 0               | 0               | 0                                     | 0     | 0        |             |
| ,                | Irrigation   |                       | 0                                     | 0               | 0               | 0                                     | 0     | 0        |             |
|                  | Total Needs  |                       | 1,072                                 | 1,563           | 2,812           | 4,103                                 | 5,583 | 7,524    |             |
|                  | Mun, Ind, S-E, & Min Needs                                       |                       | 1,072                                 | 1,563           | 2,812           | 4,103                                 | 5,583 | 7,524    |             |
|                  | Irrigation Needs   |                       | 0                                     | 0               | 0               | 0                                     | 0     | 0        |             |
|                  |  |                       |                                       |                 |                 |                                       |       |          |             |
| <b>Water Mar</b> | nagement Strategies (acft/yr)                                    | Candidate             |                                       |                 |                 | Ì                                     |       |          |             |
| ID#              | Description  | New Supply            | 2000*                                 | 2010            | 2020            | 2030                                  | 2040  | 2050     | Notes       |
| L-10 (Mun.)      | Demand Reduction (Conservation)                                  |                       | 67                                    | 71              | 71              | 11                                    | 11    | 11       | 1           |
|                  | Purchase Water from Major Provider                               |                       | 2,000                                 | 2,000           | 3,000           | 5,000                                 | 6,000 | 8,000    | 2, 3        |
| SCTN-8           | Trinity Aquifer Optimization                                     | 390                   | 390                                   | 390             | 390             | 390                                   | 390   | 390      |             |
|                  |  |                       |                                       |                 |                 |                                       |       |          |             |
|                  |  |                       | · · · · · · · · · · · · · · · · · · · |                 |                 |                                       |       |          |             |
|                  |  |                       |                                       |                 |                 |                                       |       |          |             |
| SCTN-4           | Brush Management   |                       |                                       |                 |                 |                                       |       |          |             |
| SCTN-5           | Weather Modification   |                       |                                       | <del></del>     |                 |                                       |       |          | <u> </u>    |
| SCTN-9           | Rainwater Harvesting   |                       | <del></del>                           |                 |                 |                                       |       |          |             |
| 999              | Small Aquifer Recharge Dams                                      |                       |                                       |                 |                 |                                       |       |          | 4           |
| L-10 (Irr.)      | Demand Reduction (Conservation)                                  |                       |                                       |                 |                 | · · · · · · · · · · · · · · · · · · · |       |          | <del></del> |
|                  | Total New Supplies   |                       | 2,457                                 | 2,461           | 3,461           | 5,401                                 | 6,401 | 8,401    |             |
|                  |  |                       |                                       | _,,             | e, is i         | 0,10                                  |       | 0,10,1   |             |
|                  | Total System Mgmt. Supply / Deficit                              |                       | 1,385                                 | 898             | 649             | 1,298                                 | 818   | 877      |             |
|                  | Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit               |                       | 1,385                                 | 898             | 649             | 1,298                                 | 818   | 877      |             |
|                  | Irrigation System Mgmt. Supply / Deficit                         |                       | Ō                                     | 0               | 0               | 0                                     | 0     | Ö        |             |
|                  | g  |                       |                                       |                 |                 |                                       |       | •        |             |
| Notes:           |  |                       | 1                                     |                 | 1               | -                                     |       |          |             |
| •                | Candidate New Supplies shown for year 2000 are identified for    | priority implementati | on, but will not                      | be available in | nmediately.     |                                       |       |          |             |
| 1                | Demand Reduction (Conservation) strategies assumed largely n     | eflected in projected | water demand                          | is.             |                 |                                       |       |          |             |
| 2                | Assumed purchase from Bexar County major provider. Kendali       |                       |                                       |                 | ounty table.    |                                       |       |          |             |
| 3                | Early implementation of facilities assumed in cost estimation to |                       |                                       |                 |                 |                                       |       |          |             |
| 4                | Option expected to provide additional water supply in many year  | rs, but dependable s  | supply during d                       | rought is prese | ently unquantif | ied.                                  |       |          |             |

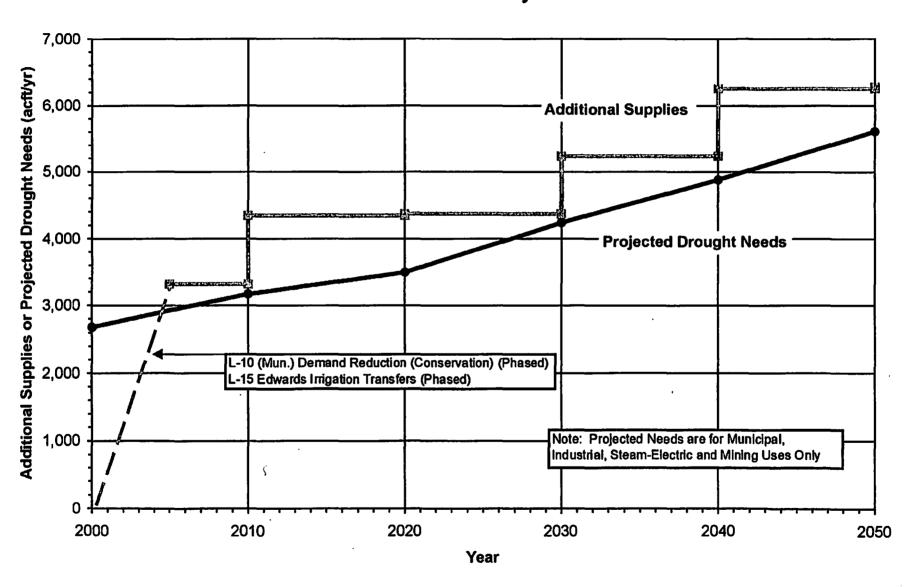
# Planning Unit Alternative Regional Water Plan Medina County



#### Planning Unit Regional Water Management Alternative Plan

| South Ce   | entral Texas Region  |                                       |                 |                 |                  |           |         | County :    | = Medina    |
|--|--|---------------------------------------|-----------------|-----------------|------------------|-----------|---------|-------------|-------------|
| County S   | ummary of Projected Water Needs (Shortages)                      | and Water Mar                         | nagement        | Strategies      |                  |           |         |             | up(s) = all |
| Projected  | Water Needs (acft/yr)  |                                       |                 |                 |                  |           |         |             |             |
| · rojecteu                                       | User Group(s)  |                                       | 2000            | 2010            | 2020             | 2030      | 2040    | 2050        | Notes       |
| <del>                                     </del> | Municipal  |                                       | 2,015           | 2,110           | 2,208            | 2,427     | 2,582   | 2,750       | 110100      |
|  | Industrial   |                                       | 2,0,0           | 2,110           | 0                |           | 2,002   | 2,750       |             |
|  | Steam-Electric   |                                       | 0               | Ō               | Ō                | 0         | Ō       | 0           |             |
|  | Mining   |                                       | 68              | 68              | 70               | 72        | 74      | 76          |             |
|  | Irrigation   |                                       | 98,916          | 65,268          | 91,320           | 92,320    | 88,925  | 84,692      |             |
|  | Total Needs  |                                       | 100,999         | 67,446          | 93,596           | 94,819    | 91,581  | 87,518      |             |
| L  | Mun, Ind, S-E, & Min Needs                                       |                                       | 2,083           | 2,178           | 2,276            | 2,499     | 2,656   | 2,826       |             |
|  | Irrigation Needs   |                                       | 98,916          | 65,268          | 91,320           | 92,320    | 88,925  | 84,692      |             |
| Water Ma   | nagement Strategies (acft/yr)                                    | Candidate                             |                 |                 |                  | .         |         |             |             |
| ID#  | Description  | New Supply                            | 2000*           | 2010            | 2020             | 2030      | 2040    | 2050        | Notes       |
| L-10 (Mun.)                                      | Demand Reduction (Conservation)                                  |                                       | 200             | 205             | 211              | 73        | 76      | 78          | 1           |
| L-15   | Edwards Imgation Transfers                                       | 81,000                                | 3,000           | 3,000           | 3,000            | 3,000     | 3,000   | 3,000       | 2, 3        |
| ļ  |  |                                       |                 |                 |                  |           |         |             |             |
|  |  | · · · · · · · · · · · · · · · · · · · |                 | <del></del>     | <del></del>      | ·····     |         |             |             |
|  |  |                                       |                 |                 | ·                |           |         |             |             |
|  |  |                                       |                 |                 |                  |           |         |             |             |
| SCTN-4   | Brush Management   |                                       |                 |                 |                  |           |         |             | 4           |
| SCTN-5   | Weather Modification   |                                       |                 |                 |                  |           |         |             | 4           |
| SCTN-9   | Rainwater Harvesting   |                                       |                 | <u> </u> .      |                  |           |         |             | 4           |
| 1. 40 (10.)                                      | Small Aquiler Recharge Dams                                      |                                       | 44 003          | 44 003          | 44 003           |           | 44 003  | 44 007      | 4           |
| L-10 (lm.)                                       | Demand Reduction (Conservation)                                  | -                                     | 11,887          | 11,867          | 11,867           | 11,887    | 11,887  | 11,867      | 5           |
|  | Total New Supplies   |                                       | 15,067          | 15,072          | 15,078           | 14,940    | 14,943  | 14,945      |             |
|  | Total System Mgmt. Supply / Deficit                              |                                       | -85,932         | -52,374         | -78,518          | -79,879   | -76,638 | -72,573     |             |
|  | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit            |                                       | 1,117           | 1,027           | 935              | 574       | 420     | 252         |             |
|  | Irrigation System Mgmt. Supply / Deficit                         |                                       | -87,049         | -53,401         | -79,453          | -80,453   | -77,058 | -72,825     |             |
| D1-4   |  |                                       |                 |                 |                  |           |         |             |             |
| Notes:   | Candidate New Supplies shown for year 2000 are identified for    | r ododki implomanti                   | tion but udil s | ot he evallable | Immediatabi      |           |         |             |             |
| 1  | Demand Reduction (Conservation) strategies assumed largely       |                                       |                 |                 | minieulatery.    |           |         | <del></del> |             |
| 2  | Candidate New Supply to be shared among Uvalde, Medina, A        |                                       |                 |                 | he reliable in d | lrought   | -       |             |             |
| 3  | Pursuant to draft EAA Critical Period Management rules, Cand     |                                       |                 |                 |                  |           |         |             |             |
|  | the estimated maximum potential annual transfer (95,430 acft)    | based on Proposed                     | Permits prore   | ated to 400,00  | 0 acft/yr.       |           |         |             |             |
| 4  | Option expected to provide additional water supply in many ye    |                                       |                 |                 |                  |           |         |             |             |
| 5  | Estimates based upon use of LEPA systems on 80 percent of        |                                       |                 |                 | 40 percent of I  | rrigation |         | l           |             |
| L  | application rate, but applicable to only 50 percent of Edwards A | Aquiter imigation per                 | mitted quantiti | 185.            |                  |           |         |             |             |

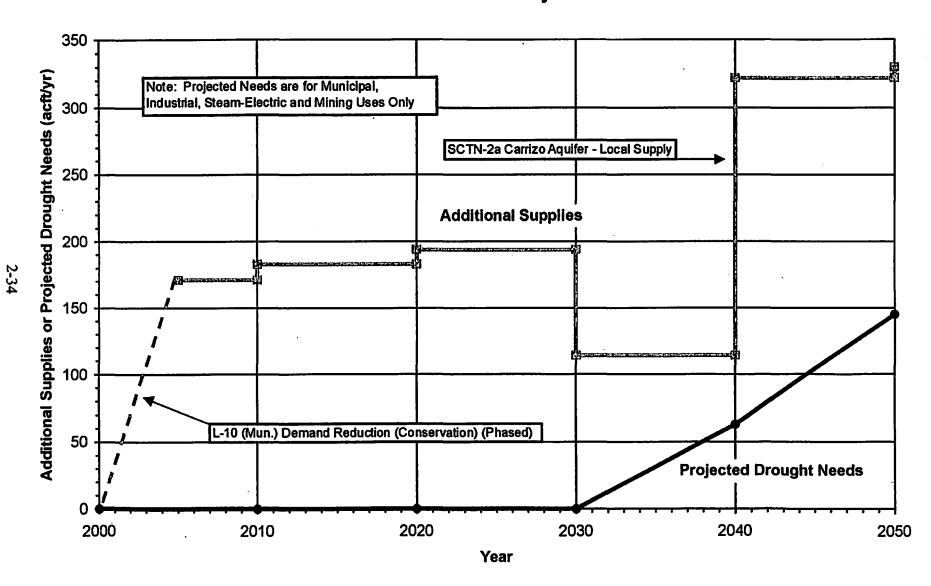
# Planning Unit Alternative Regional Water Plan Uvalde County



#### Planning Unit Regional Water Management Alternative Plan

| South Ce         | entral Texas Region<br>ummary of Projected Water Needs (Shortages | and Motor M          |                  | h Ctrotogio     |                |               |         | County:   | = Uvalde    |
|------------------|---|----------------------|------------------|-----------------|----------------|---------------|---------|-----------|-------------|
| County St        | ummary of Projected water Needs (Shortages)                       | and water wa         | anagemen         | t Strategie     | 8              |               |         | User Grou | ip(8) = aii |
| Projected        | Water Needs (acft/yr)   |                      |                  |                 |                |               |         |           | <del></del> |
|                  | User Group(s)   | ·                    | 2000             | 2010            | 2020           | 2030          | 2040    | 2050      | Notes       |
|                  | Municipal   |                      | 2,682            | 3,166           | 3,493          | 4,241         | 4,880   | 5,609     |             |
|                  | Industrial  |                      |                  | 0               | 0              | Ö             | 0       | 0         | -           |
|                  | Steam-Electric  |                      | Ō                | O               | O              | Ö             | Ö       | Ō         |             |
|                  | Mining  |                      | 0                | 0               | 0              | Ō             | 0       | O         |             |
|                  | Irrigation  |                      | 75,263           | 72,798          | 70,154         | 71,022        | 68,880  | 65,676    |             |
|                  | Total Needs   |                      | 77,945           | 75,964          | 73,647         | 75,263        | 73,760  | 71,285    |             |
|                  | Mun, Ind, S-E, & Min Needs  |                      | 2,682            | 3,166           | 3,493          | 4,241         | 4,880   | 5,609     |             |
|                  | Irrigation Needs  |                      | 75,263           | 72,798          | 70,154         | 71,022        | 68,880  | 65,676    |             |
| Water Mai        | nagement Strategies (acft/yr)                                     | Candidate            |                  |                 |                |               |         |           |             |
| ID#              | Description   | New Supply           | 2000*            | 2010            | 2020           | 2030          | 2040    | 2050      | Notes       |
| L-10 (Mun.)      | Demand Reduction (Conservation)                                   |                      | 318              | 346             | 371            | 235           | 258     | 283       | 10000       |
| L-15             | Edwards Irrigation Transfers                                      | 81,000               | 3.000            | 4,000           | 4,000          | 5,000         | 5,000   | 6,000     | 2, 3,       |
|                  |   |                      |                  |                 |                |               |         |           |             |
| SCTN-4<br>SCTN-5 | Brush Management<br>Weather Modification                          |                      |                  |                 |                |               | -       |           |             |
| SCTN-9           | Rainwater Harvesting  |                      |                  | •••             |                |               |         |           |             |
| 00111-0          | Small Aquifer Recharge Dams                                       |                      |                  |                 |                |               |         |           | <del></del> |
| L-10 (lrr.)      | Demand Reduction (Conservation)                                   |                      | 14,143           | 14,143          | 14,143         | 14,143        | 14,143  | 14,143    |             |
|                  | Total New Supplies  |                      | 17,461           | 18,489          | 18,514         | 19,378        |         | 20,426    |             |
|                  | Total System Mgmt. Supply / Deficit                               |                      | -60,484          | -57,475         | -55,133        | -55,885       | -54,359 | -50,859   |             |
|                  | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit             |                      | 636              | 1,180           | 878            | 994           | 378     | 674       |             |
|                  | Irrigation System Mgmt. Supply / Deficit                          |                      | -61,120          | -58,655         | -56,011        | -56,879       | -54,737 | -51,533   |             |
| Notes:           |   |                      |                  |                 |                |               |         |           |             |
|                  | Candidate New Supplies shown for year 2000 are identified         | or priority implemen | ntation, but wil | l not be availa | ble immediate  | ilv.          |         |           |             |
| 1                | Demand Reduction (Conservation) strategies assumed large          |                      |                  |                 | i i            |               | :       |           |             |
| 2                | Candidate New Supply to be shared among Uvalde, Medina,           | Atascosa, and Bex    | ar Countles.     | Supply may n    | ot be reliable | n drought.    |         |           |             |
| 3                | Pursuant to draft EAA Critical Period Management rules, Car       | ndidate New Supply   | represents a     | proximately 8   | 35 percent of  |               |         |           |             |
|                  | the estimated maximum potential annual transfer (95,430 ac        | (I) based on Propos  | ed Permils pro   | oraled to 400,  | 000 acft/yr.   |               |         |           |             |
| 4                | Early implementation of facilities assumed in cost estimation     |                      |                  |                 |                |               |         |           |             |
| 5                | Option expected to provide additional water supply in many y      |                      |                  |                 |                |               |         |           |             |
| 6                | Estimates based upon use of LEPA systems on 80 percent of         |                      |                  |                 | at 40 percent  | of irrigation |         |           |             |
|                  | application rate, but applicable to only 50 percent of Edwards    | Aquifer Irrigation p | ermitted quan    | tities.         | l              | J             | l       | l         |             |

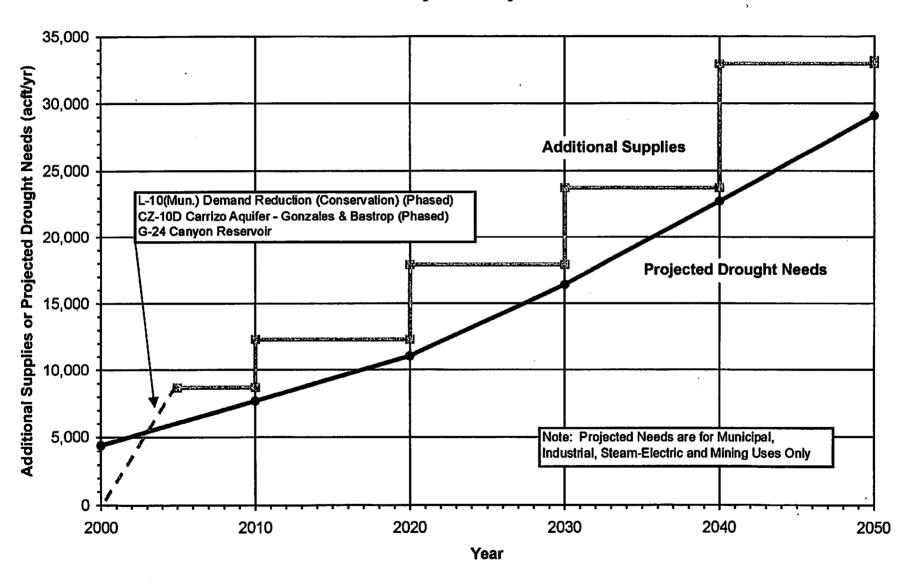
## Planning Unit Alternative Regional Water Plan Wilson County



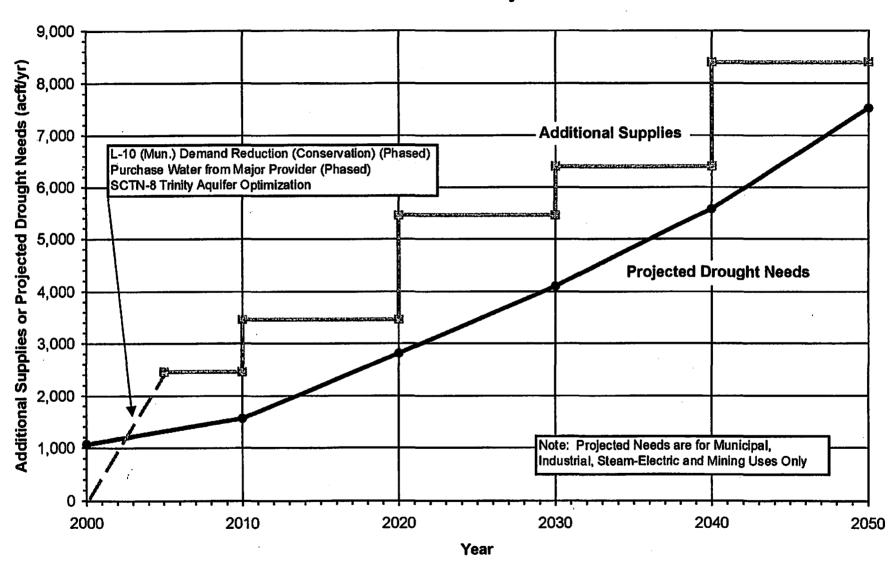
#### Planning Unit Regional Water Management Alternative Plan

| South Ce               | entral Texas Region   |                      | i i           |          |      |      |            | County          | = Wilsor |
|------------------------|---|----------------------|---------------|----------|------|------|------------|-----------------|----------|
|                        | ummary of Projected Water Needs (Shortages) a   | nd Water Man         | agement St    | rategies |      |      |            | <b>User Gro</b> |          |
|                        |   |                      |               |          |      |      |            |                 |          |
| <b>Projected</b>       | Water Needs (acft/yr)   |                      |               |          |      |      |            |                 |          |
|                        | User Group(s)   |                      | 2000          | 2010     | 2020 | 2030 | 2040       | 2050            | Notes    |
|                        | Municipal   |                      | Ō             | 0        | 0    | 0    | 63         | 145             |          |
|                        | Industrial  |                      | 0             | 0        | Ō    | 0    | 0          | o               |          |
|                        | Steam-Electric  |                      | 0             | 0        | 0    | 0    | 0          | Ō               |          |
|                        | Mining  |                      | 0             | 0        | 0    | 0    | 0          | 0               |          |
|                        | Irrigation  |                      | 0             | 0        | 0    | 0    | 0          | 0               |          |
|                        | Total Needs   |                      | 0             | 0        | 0    | 0    | 63         | 145             |          |
|                        | Mun, Ind, S-E, & Min Needs  |                      | 0             | 0        | 0    | 0    | 63         | 145             |          |
|                        | Irrigation Needs  |                      | 0             | 0        | 0    | 0    | . 0        | 0               |          |
| Water Mar              | no noment Charter les (action)  | Condidate            |               |          | -    |      |            |                 |          |
|                        | nagement Strategies (acft/yr)   | Candidate            | 2000          | 2010     |      | 2030 |            |                 | Nadaa    |
| ID#                    | Description   | New Supply           |               |          | 2020 |      | 2040       | 2050            | Notes    |
| L-10 (Mun.)<br>SCTN-2a | Demand Reduction (Conservation) Carrizo Aquifer - Local Supply                                    |                      | 171           | 183      | 194  | 114  | 122<br>200 | 130<br>200      |          |
|                        | Oanizo Agailet - Eccal Guppiy   |                      |               |          |      |      | 200        | 200             |          |
|                        |   |                      |               |          |      |      |            |                 |          |
|                        |   |                      |               |          |      |      |            |                 |          |
| SCTN-4                 | Brush Management  |                      |               |          |      |      |            |                 |          |
| SCTN-5                 | Weather Modification  |                      |               |          |      |      |            |                 | ,        |
| SCTN-9                 | Rainwater Harvesting Small Aquifer Recharge Dams  |                      |               |          |      |      |            |                 | ·····    |
| L-10 (lrr.)            | Demand Reduction (Conservation)   |                      | <del>  </del> |          |      |      |            |                 |          |
| L-10 (III.)            | Total New Supplies  |                      | 171           | 183      | 194  | 114  | 322        | 330             |          |
|                        | Total How Cap blica   |                      | 11            |          | 10-4 | 114  |            |                 |          |
|                        | Total System Mgmt. Supply / Deficit   |                      | 171           | 183      | 194  | 114  | 259        | 185             |          |
|                        | Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit  | <del></del>          | 171           | 183      | 194  | 114  | 259        | 185             |          |
|                        | Irrigation System Mgmt. Supply / Deficit  |                      | 0             | 0        | 0    | 0    | 0          | 0               |          |
|                        |   |                      |               |          |      |      |            |                 |          |
| Notes:                 |   | liberary in the con- |               |          |      |      |            |                 |          |
| 1                      | Demand Reduction (Conservation) strategies assumed largely of Additional well(s) for Floresville. | enected in projecte  | water demand  | 18.      |      |      |            |                 |          |
|                        |   |                      |               |          |      |      |            |                 |          |

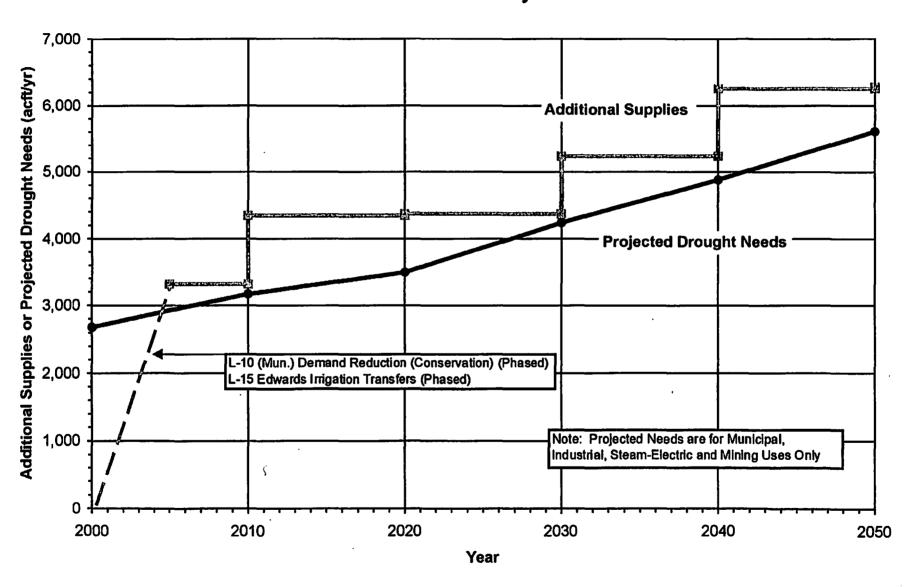
## Planning Unit Alternative Regional Water Plan Hays County



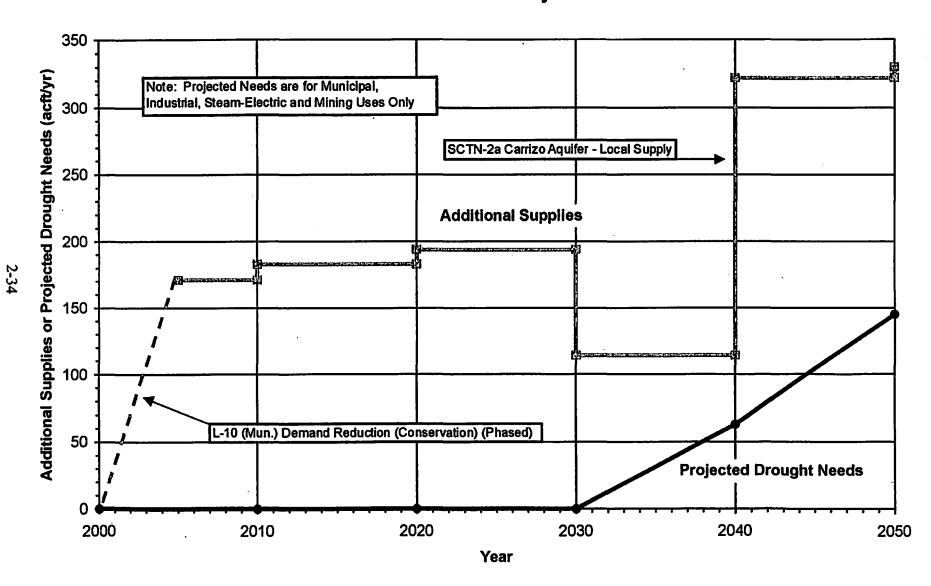
## Planning Unit Alternative Regional Water Plan Kendall County



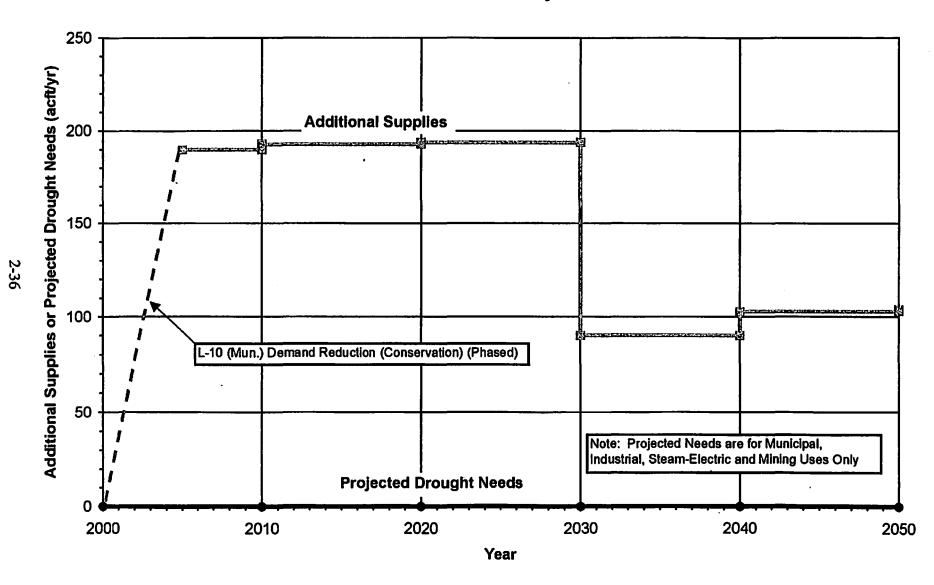
# Planning Unit Alternative Regional Water Plan Uvalde County



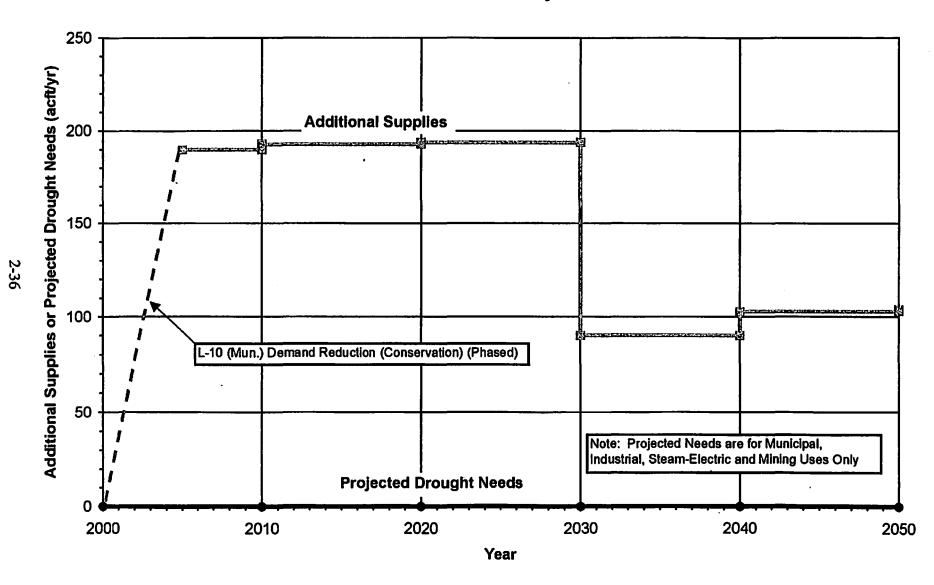
## Planning Unit Alternative Regional Water Plan Wilson County



## Planning Unit Alternative Regional Water Plan-Zavala County



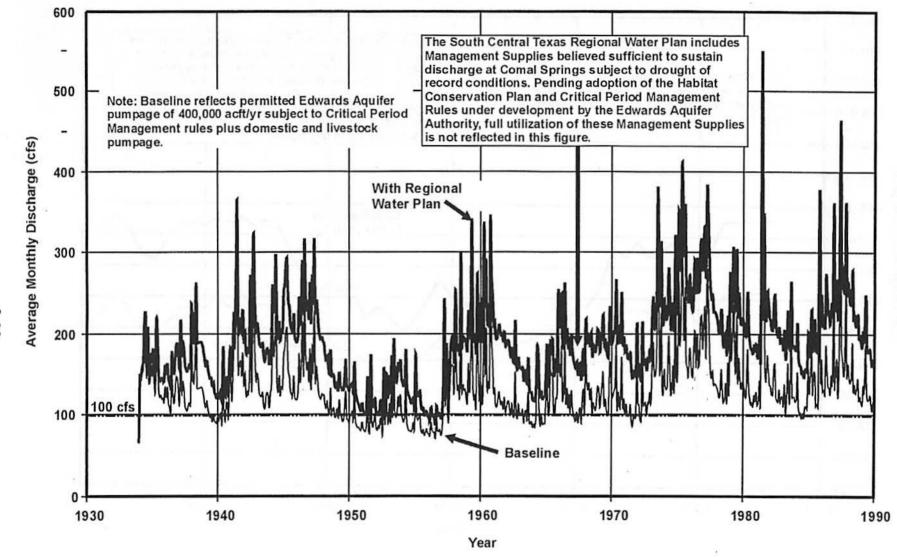
## Planning Unit Alternative Regional Water Plan-Zavala County



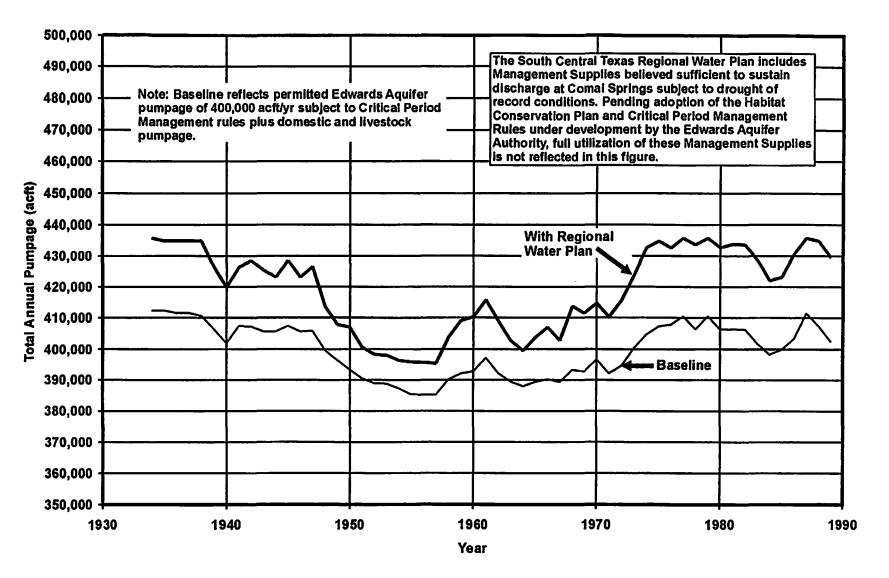
#### Planning Unit Alternative Regional Water Plan

| South Ce         | entral Texas Region   |                    |  |                |                |                 |          | County   | = Zavala    |
|------------------|---|--------------------|--|----------------|----------------|-----------------|----------|----------|-------------|
| County Su        | ummary of Projected Water Needs (Shortages) a                   | nd Water Mana      | agement St                                       | rategies       |                |                 |          | User Gro | up(s) = al  |
| Ductoolod        | Mistage No. do (mostly)   |                    |  | -              |                |                 | _        |          |             |
| Projected        | Water Needs (acft/yr)   |                    |  | 2010           |                |                 |          |          |             |
|                  | User Group(s)   |                    | 2000   |                | 2020           | 2030            | 2040     | 2050     | Notes       |
|                  | Municipal   |                    | 0  | <u> </u>       |                | 0               | 0        | 0        |             |
|                  | Industrial  |                    | 0  |                | 0              |                 | 0        | 0        |             |
|                  | Steam-Electric  |                    | 0  | 0              | - 0            | 0               | 0        | 0        |             |
|                  | Mining  |                    | 80,722   | 70 500         | 70 666         | 90,000          | 0 0 0 0  | 0        |             |
|                  | Irrigation  |                    |  | 76,589         | 72,655         | 88,293          | 84,673   | 81,200   |             |
|                  | Total Needs   |                    | 80,722   | 76,589         | 72,655         | 88,293          | 84,673   | 81,200   |             |
|                  | Mun, Ind, S-E, & Min Needs                                      |                    | 0  | - 0            | 0              | 0               | 0        | 0        |             |
|                  | Irrigation Needs  |                    | 80,722   | 76,589         | 72,655         | 88,293          | 84,673   | 81,200   |             |
| Water Mar        | nagement Strategies (acft/yr)                                   | Candidate          |  |                |                |                 |          |          |             |
| ID#              | Description   | New Supply         | 2000   | 2010           | 2020           | 2030            | 2040     | 2050     | Notes       |
| L-10 (Mun.)      | Demand Reduction (Conservation)                                 |                    | 190  | 193            | 194            | 90              | 103      | 104      | •           |
|                  |   |                    |  |                |                |                 |          |          |             |
|                  |   |                    |  |                |                |                 |          |          |             |
|                  |   |                    | L  |                |                |                 |          |          |             |
|                  |   |                    | <b>.</b>   |                |                |                 |          |          |             |
|                  |   |                    |  |                |                |                 |          |          |             |
| 20714            | 2 (1)   |                    | <del> </del>                                     |                |                |                 |          |          | <del></del> |
| SCTN-4<br>SCTN-5 | Brush Management Weather Modification                           |                    | <u> </u>   |                | ·              |                 |          |          |             |
| SCTN-9           | Rainwater Harvesting  |                    | <del>                                     </del> |                |                |                 |          |          |             |
| 2014-a           | Small Aquifer Recharge Dams                                     |                    | <del> </del>                                     |                | <del></del>    | -               |          |          |             |
| L-10 (lm.)       | Demand Reduction (Conservation)                                 |                    | 6,401  | 6,401          | 6,401          | 6,401           | 6,401    | 6,401    |             |
| -                | Total New Supplies  |                    | 6,591  | 6,594          | 6,595          | 6,491           | 6,504    | 6,505    |             |
|                  | Total New Supplies  |                    | 0,551  | 0,004)         | 0,000          | 0,401           | 0,304    | 0,303    |             |
|                  | Total System Mgmt. Supply / Deficit                             |                    | -74,131  | -69,995        | -66,060        | -81,802         | -78,169  | -74,695  | <u></u>     |
|                  | Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit              |                    | 190  | 193            | 194            | 90              | 103      | 104      |             |
|                  | Irrigation System Mgmt. Supply / Deficit                        |                    | -74,321  | -70,188        | -66,254        | -81,892         | -78,272  | -74,799  |             |
|                  |   |                    |  |                |                |                 |          | فتنونس   |             |
| Notes:           |   | -A                 |  |                |                |                 |          |          |             |
| 1                | Demand Reduction (Conservation) strategies assumed largely r    |                    |  |                | -41            |                 |          |          |             |
| 2                | Option expected to provide additional water supply in many year |                    |  |                |                |                 |          |          |             |
| 3                | Estimates based upon use of LEPA systems on 50 percent of a     | creages imgated in | 1997, WILL COU                                   | ervation at 20 | parcent of imp | jauon applicati | on rate. |          |             |

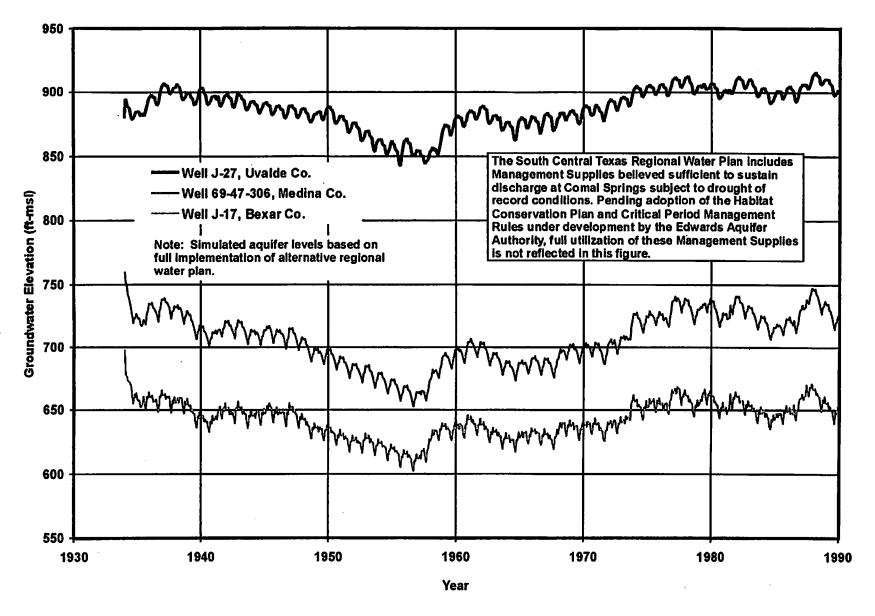
Planning Unit Alternative Regional Water Plan Simulated Comal Springs Discharge



Planning Unit Alternative Regional Water Plan Simulated San Marcos Springs Discharge

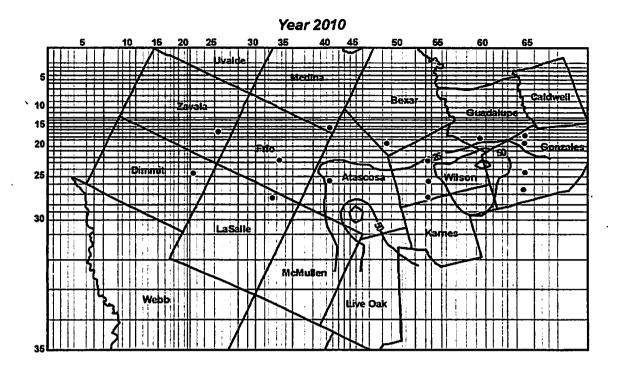


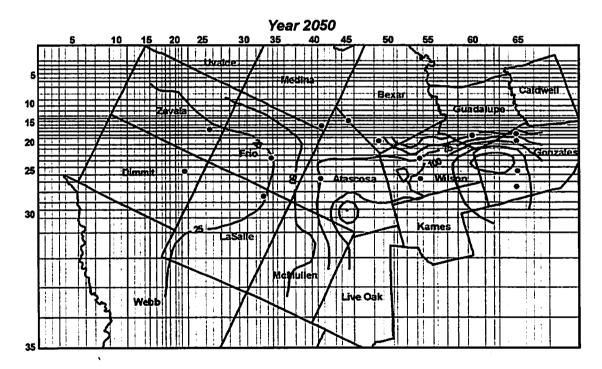
Planning Unit Alternative Regional Water Plan Simulated Edwards Aquifer Pumpage



Planning Unit Alternative Regional Water Plan Simulated Edwards Aquifer Levels

Planning Unit Alternative Regional Water Plan Additional Carrizo Groundwater Pumpage

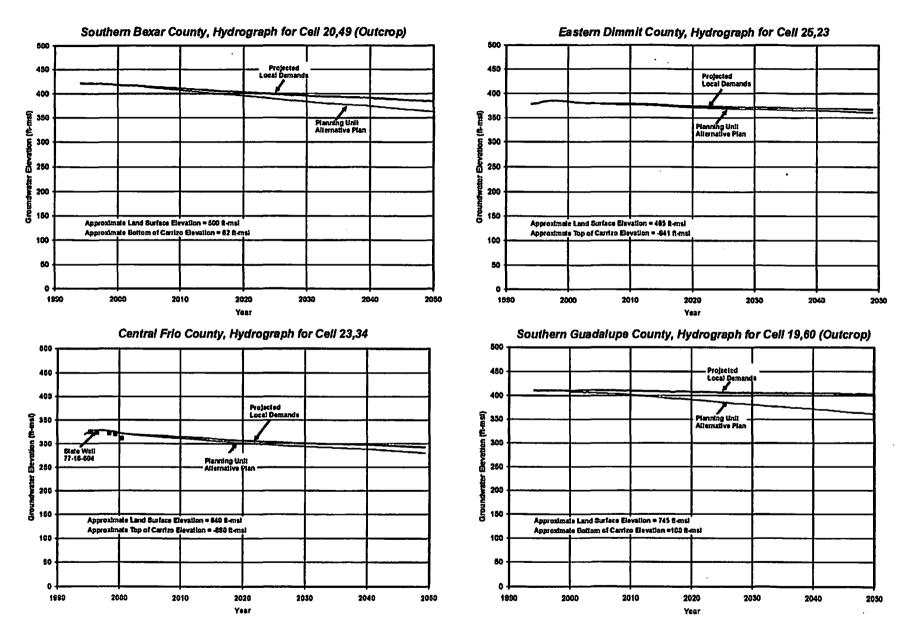




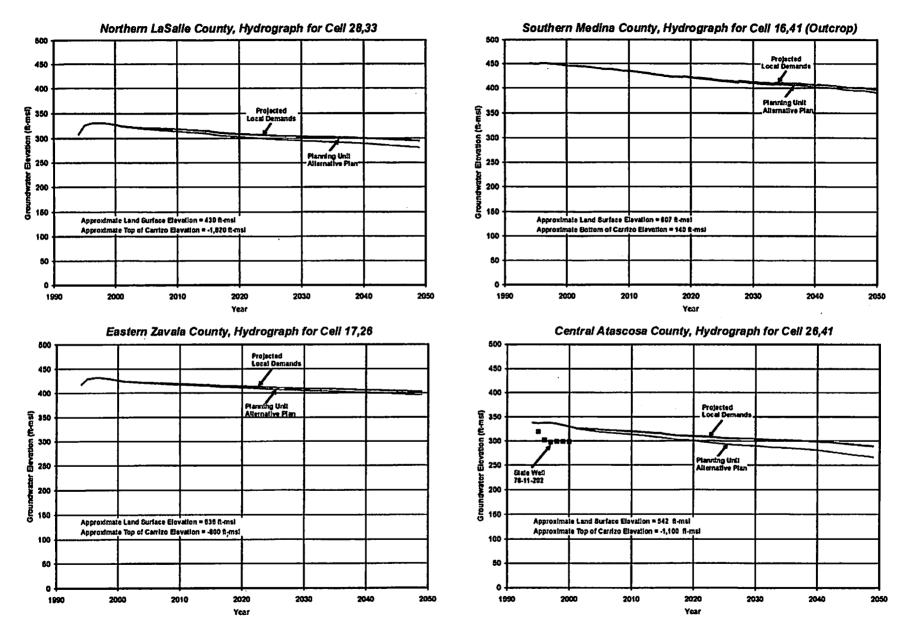
Note: Drawdown is referenced to simulated 1994 aquifer levels and includes both projected local demands and development of water supply options in this alternative regional water plan.

Monitoring Well Location

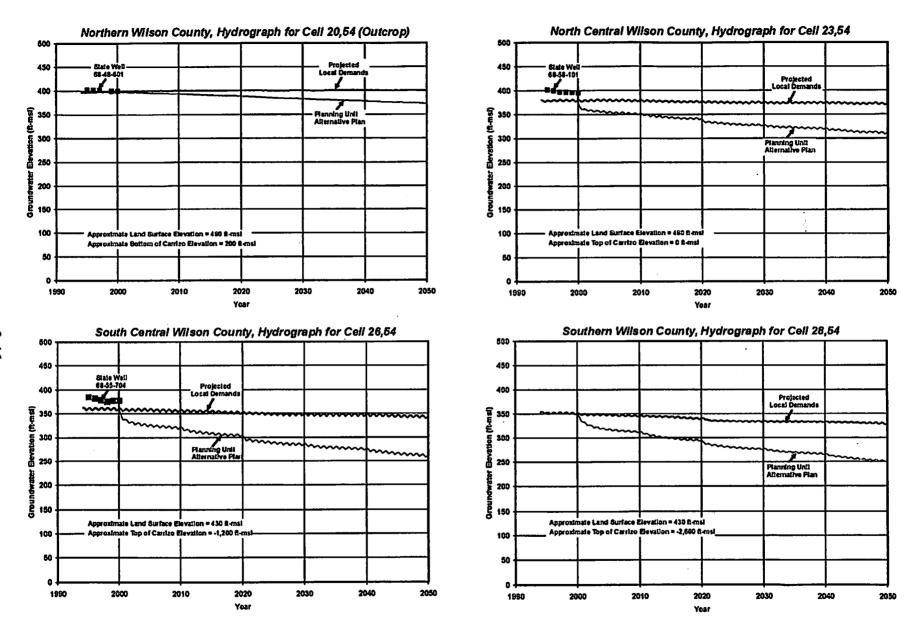
Planning Unit Alternative Regional Water Plan Simulated Carrizo Aquifer Drawdown



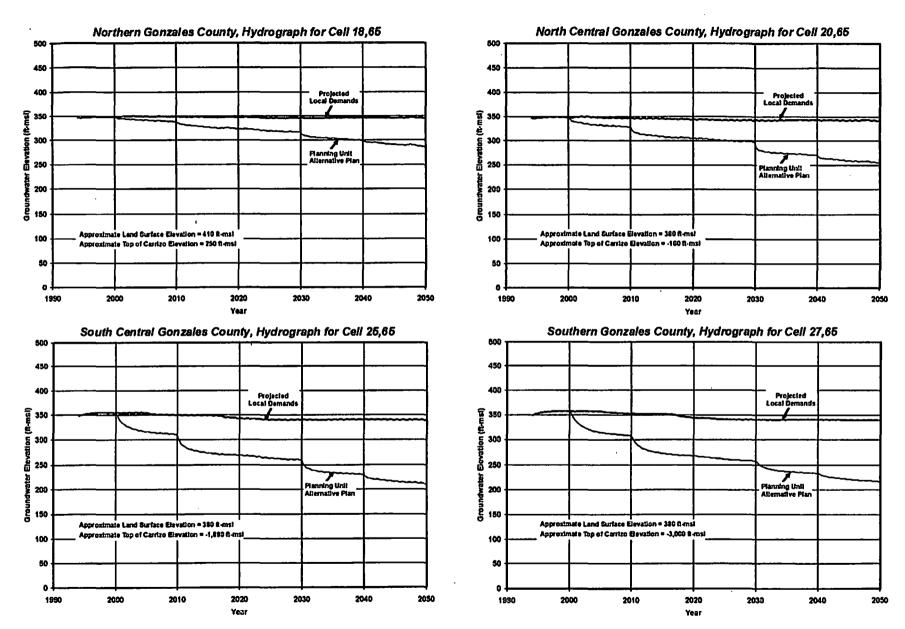
Planning Unit Alternative Regional Water Plan - Carrizo Aquifer



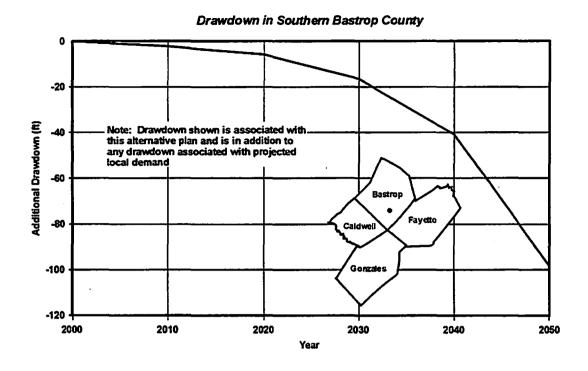
Planning Unit Alternative Regional Water Plan - Carrizo Aquifer

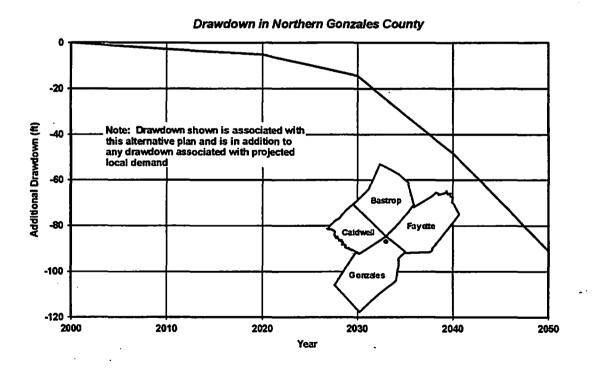


Planning Unit Alternative Regional Water Plan - Carrizo Aquifer

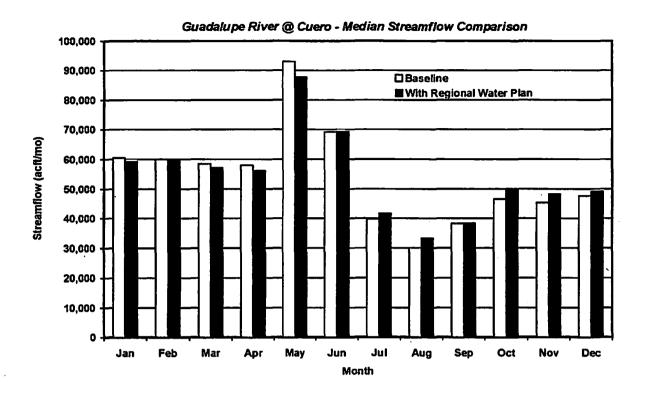


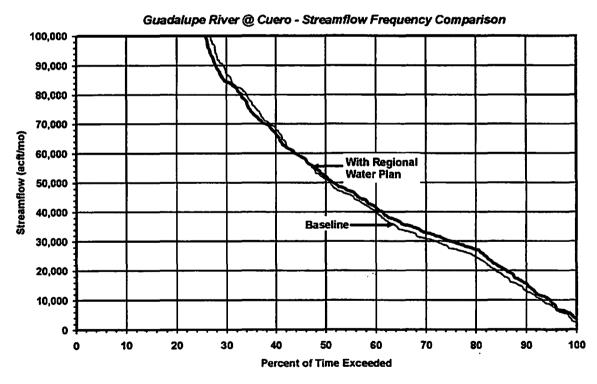
Planning Unit Alternative Regional Water Plan - Carrizo Aquifer



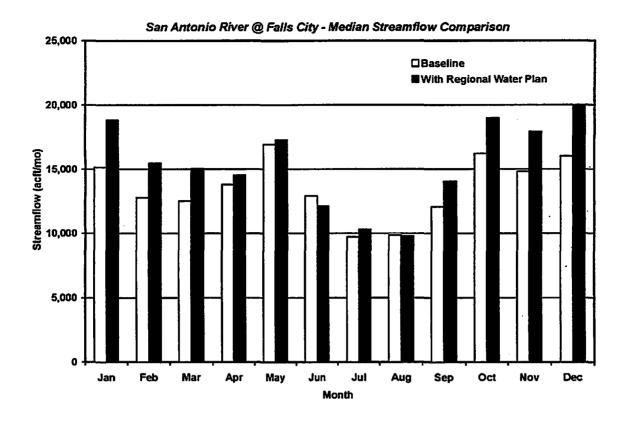


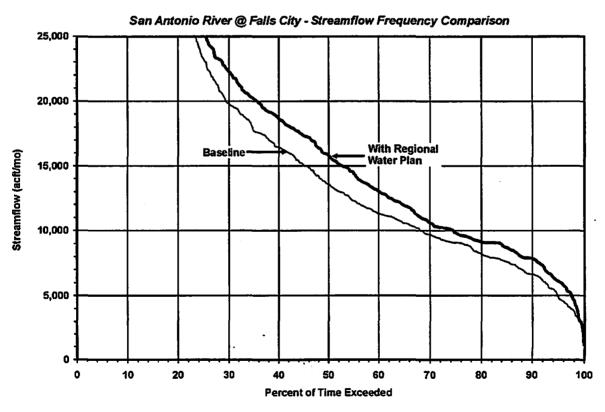
Planning Unit Alternative Regional Water Plan — Carrizo Aquifer



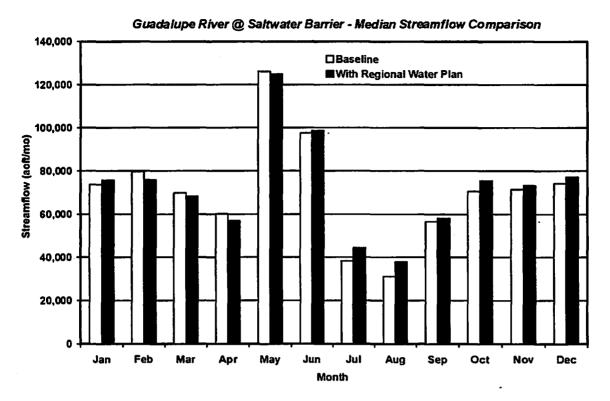


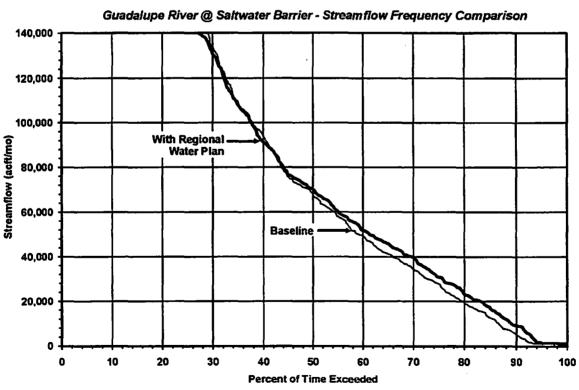
Planning Unit Alternative Regional Water Plan Streamflow Comparisons





Planning Unit Alternative Regional Water Plan Streamflow Comparisons





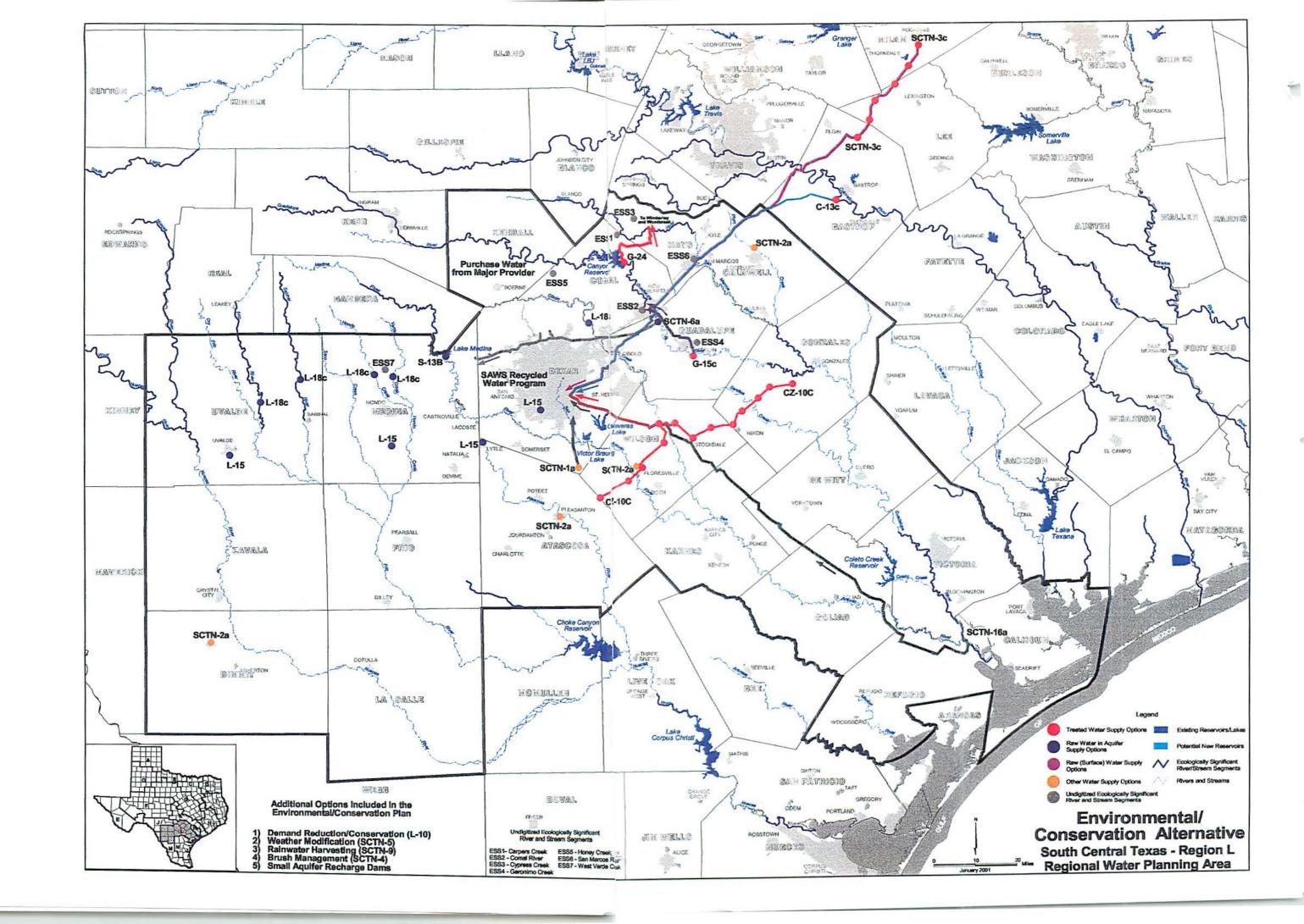
Planning Unit Alternative Regional Water Plan Streamflow Frequency Comparisons

# "Environmental/Conservation" Alternative Regional Water Plan

South Central Texas Regional Water Planning Group

San Antonio River Authority

HDR Engineering, Inc. January 2001



#### South Central Texas Region Alternative Water Plans

Alternative Name: Environmental/Conservation

Alternative ID: E/C

Alternative Description: The Environmental/Conservation Alternative Regional Water Plan is predicated on the development of water supply options having the least expected environmental impacts and on the implementation of advanced conservation measures as assumed in the water demand projections adopted for the South Central Texas Region. Potential environmental impacts of various water supply options were assessed in a qualitative manner through consideration of endangered species, unique stream segments, bays & estuaries, instream flows, riparian forests, cultural resources, size/habitat, water quality, and sustainability. Efficiency, as reflected in unit cost, is considered as a secondary criterion for selection of water supply options for inclusion in this alternative regional water plan.

The following water supply options are included in the Environmental/Conservation Alternative Regional Water Plan (in no particular order):

- 1. Demand Reduction / Conservation (L-10)
- 2. Edwards Irrigation Transfers (L-15)
- 3. Medina Lake Recharge Enhancement (S-13B)
- 4. SAWS Recycled Water Program
- 5. Colorado R. @ Bastrop LCRA Stored Water (C-13C)
- 6. Carrizo Aquifer Wilson & Gonzales Counties (CZ-10C)
- 7. Lower Guadalupe River Diversions (SCTN-16a)
- 8. Edwards Recharge Type 2 Projects (L-18c)
- 9. Edwards Recharge Guadalupe R. Diversions (SCTN-6a)
- 10. Simsboro Aquifer (SCTN-3c)
- 11. Canyon Reservoir (G-15C)
- 12. Carrizo Aquifer Local Supply (SCTN-2a)
- 13. Wimberley & Woodcreek Canyon (G-24)
- 14. Regional Aquifer Storage & Recovery (SCTN-1a)
- 15. Weather Modification (SCTN-5)
- 16. Rainwater Harvesting (SCTN-9)
- 17. Brush Management (SCTN-4)

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# Environmental/Conservation Alternative Regional Water Plan Summary of Key Information for South Central Texas Regional Water Planning Group

#### Quantity, Reliability, and Cost

- Plan includes management supplies to meet projected needs, ensure reliability, and maintain springflow, resulting in a quantity of additional water supplies sufficient to meet projected needs for municipal, industrial, steam-electric power, and mining uses through the year 2050.
- Cost is below the average for the five alternative plans and the Regional Water Plan.

#### **Environmental Factors**

- Greatest increase in median annual streamflow in the San Antonio River and least decrease in median annual freshwater inflow to the Guadalupe Estuary among the five alternative plans and the Regional Water Plan.
- Below average concerns in all resource categories among the five alternative plans and the Regional Water Plan.

#### Impacts on Water Resources

- No unmitigated reductions in water available to existing water rights.
- Long-term reductions in water levels in the Carrizo Aquifer. Drawdown would be less than the average for the five alternative plans under consideration.

#### **Impacts on Agriculture and Natural Resources**

- Major commitment to municipal and irrigation water Demand Reduction (Conservation) (L-10).
- Includes Brush Management (SCTN-4) and Weather Modification (SCTN-5).
- Inclusion of water supply options to meet projected irrigation needs in full is estimated to be economically infeasible at this time. Weather Modification (SCTN-5) assists irrigation and dry-land agriculture (crops and ranching).
- Includes maximum potential voluntary transfer of Edwards Aquifer irrigation permits to municipal permits through lease or purchase.
- Includes Medina Lake Recharge Enhancement (S-13B) which reduces or eliminates water supplies from the Medina Lake System for irrigation in Bexar, Medina, and Atascosa Counties.

#### Other Relevant Factors per SCTRWPG

#### Comparison of Strategies to Meet Needs

 Selection of water supply options comprising the alternative plan based on implementation of advanced conservation measures and minimization of environmental impacts.

#### **Interbasin Transfer Issues**

- Projected non-irrigation needs in basin(s) of origin are met throughout the planning period.
- Plan includes two interbasin transfers: 1) Edwards Recharge Guadalupe River Diversions (SCTN-6a) from the Guadalupe River near Lake Dunlap to the outcrop of the Edwards Aquifer in the San Antonio River Basin; and 2) LCRA Stored Water (C-13C) from the Colorado River at Bastrop to Bexar County.
- Plan includes one potential interbasin transfer from the Saltwater Barrier at the confluence of the Guadalupe and San Antonio Rivers (SCTN-16a) to Bexar County.

#### Third-Party Impacts of Voluntary Redistribution of Water

- Potential positive or negative effects of Edwards Irrigation Transfers (L-15).
- Lower water levels in some portions of the Carrizo Aquifer.

#### Regional Efficiency

- Edwards Irrigation Transfers (L-15) require no new facilities. Transferred water would likely be available at or very near locations having projected municipal, industrial, steam-electric power, and mining needs in Uvalde, Medina, Atascosa, and Bexar Counties.
- Terminal storage and regional water treatment facilities in Bexar County increase efficiency, improve reliability, and reduce unit cost.
- San Antonio Water System Regional Aquifer Storage & Recovery System (SCTN-1a) substantially reduces peak summer pumpage from the Edwards Aquifer.
- Edwards Recharge Guadalupe River Diversions (SCTN-6a) provides for recovery and recirculation of enhanced Comal springflow resulting from implementation of Edwards Recharge Type 2 Projects (L-18c).

#### **Effect on Navigation**

• Not applicable.

## South Central Texas Region, Environmental/Conservaion Alternative – TWDB Evaluation Criteria Summary

| Management Strategy                                       | Quantity (acft/yr) | Reliability <sup>2</sup> | Cost (\$/acft) 3 | $\overline{}$ | F  | _  | Impacts on Water Resources   | 1  | mpacts on Agricultural and Natural Resources  | 1             | Other Relevant Factors per SCTRWPG  |
|---|--------------------|--------------------------|------------------|---------------|--|----|--|--|---|---------------|---|
| Municipal Demand Reduction (Conservation)                 | 44,566             | Firm                     | \$173            | +-            | Environmental Factors  | ⊢  |  | <del>                                     </del> |   | 1_            | Conservation is a central element of the Plan   |
| (L-10 Mun.) Edwards Irrigation Transfers (L-15)           |                    |                          | 3173             |               | None. Supply developed through deman reduction.  | •  | Slight reductions in treated effluent discharge  |  | Fewer water management strategies necessary to meet projected needs                             | Ľ             |   |
| <u> </u>  | 81,000             | Firm                     | . \$80           | •             | None. Supply developed without new falities.   | •  | Reductions in springflow due to relocation of pumpage closer to springs.   | •  | Plan includes 100 percent of potential of max.<br>voluntary transfer through lease or purchase. | •             | Encourages beneficial use of available rights.  |
| Edwards Recharge - Type 2 Projects (L-18c)                | 13,451             | Firm,                    | \$486            | •             | Concerns with endangered & threatened species, habitat, and TPWD Ecologically Unique Stream Segments at some sites. Enhanced springflows help endangered secies. | •  | Limited, as most projects are located on streams that are frequently dry. Increased aquifer levels and springflows.                        | •  | Typically higher well levels in Uvalde & Medina Counties.                                       | •             | Positive effects on discharges from Comal and<br>San Marcos Springs.<br>Mitigation of impacts on firm yield of Choke<br>Canyon Res. / Lake Corpus Christi System. |
| Canyon Reservoir - River Diversion (G-15C)                | 15,000             | Firm                     | \$794            | •             | Minimal. Canyon Reservoir is an existin resource.  | •  | Increased instream flows associated with downstream deliveries of water supply.  | •  | Not applicable.   | :             | Encourages beneficial use of existing reservoir.  Recreational benefits with downstream delivery.   |
| Canyon Reservoir - Wimberley & Woodcreek (G-24)           | 1,048              | Firm                     | \$1,586          | 1             | Minimal. Pipeline could encounter endatered or threatened species habitat.   | •  | Minimal, if any.   | ٠  | Not applicable.   | •             | Encourages beneficial use of existing reservoir.  |
| Lower Guadalupe River Diversion (SCTN-16a)                | 56,276             | Firm                     | \$856            | •             | Concerns with endangered & threatened species, habitat, cultural resources, and TWD Ecologically Unique Stream Segment.  | •  | Some reductions in freshwater inflows to the<br>Gundalupe Estuary associated with greater<br>utilization of existing water rights.         | •  | Minimal, if any.  | :             | Encourages beneficial use of available rights.  Protects instream flows and recreational opportunities through lower basin diversion.                             |
| Carrizo Aquifer – Wilson & Gonzales (CZ-10C) <sup>5</sup> | 75,000             | Firm                     | \$764            | •             | Minimal. Pipeline could encounter cultural resource sites.   | :  | Long-term reductions in well levels.  Some reductions in instream flow at outcrop.  Potential effects on discharge of small springs.       | •  | Minimal, if any.  | •             | Planned withdrawals in excess of that expressed<br>in policies of underground water conservation<br>districts.  |
| Carrizo Aquifer - Local Supply (SCTN-2a)                  | 14,700             | Firm                     | \$386            | •             | Minimal, if any  | -  | Modest long-term reductions in aquifer levels.   | ١.   | Minimal, if any,  | 1             |   |
| Simsboro Aquifer (SCTN-3c)                                | 55,000             | Firm                     | \$927            | •             | Concerns with endangered & threatened species, habitat, and cultural resources.  | :  | Long-term reductions in aquifer levels.  Minimal reductions in instream flow at outcrop.  Potential effects on discharge of small springs. | •  | Minimal, if any.  | •             | Beneficial use of groundwater now unused. Planned Bastrop Co. supply for Region L exceeds 2030 availability per Region K.   |
| SAWS Recycled Water Program (SAWS)                        | 52,215             | Firm                     | \$395            | •             | None. Water supply derived from increasd volumes of treated wastewater.  | •  |  | 1-   | Not applicable.   | •             | Encourages beneficial use of available resource.  |
| Purchase of Water From Major Provider (PMP)               | 8,000              | Firm                     | \$877            | •             | Minimal, if any. Supply developed as par of other water management strategies.   | •  | Minimal, if any.   | <u>├</u>   | Not applicable.   |               |   |
| LCRA Stored Water - Colorado Riv @ Bastrop (C-13C)        | 50,000             | Firm                     | \$854            | •             | Concerns with endangered & threatened species, habitat, cultural resources, and TIWD Ecologically Unique Stream Segments.  | •  | Reductions in freshwater inflows to Matagorda<br>Bay associated with greater utilization of<br>existing water rights.                      | •  | Minimal.  | •             | Encourages beneficial use of existing reservoir.  |
| Medina Lake Recharge Enhancement (S-13B)                  | 8,136              | Firm                     | \$159            | •             | Concerns with endangered & threatened species.   | •  | Increased lake levels, aquifer levels, and springflows.  | 1.   | Potentially eliminates irrigation from the BMA Canal System.                                    | •             | Owner of the Medina Lake System opposed to inclusion of this strategy in the Plan.  |
| Edwards Recharge - Guadalupe Riv Diversions (SCTN-<br>6a) | 42,121             | Firm                     | \$534            | •             | Concerns with endangered & threatened species, habitat, and cultural resources.  | •  | Increased springflow and reduced streamflow below Lake Dunlan.   | •  | Not applicable.   | 1.            | Downstream interests keenly opposed to this management strategy.  |
| Aquifer Storage & Recovery (ASR) - (SCTN-1a)              | Unquantified ·     | Firm                     | Unquantified     | •             | Minimal. Pipeline could encounter imporant habitat or encounter cultural resource site   | •  | Reduced peak summer pumpage from Edwards Aquifer increases aquifer levels and springflow.  | •  | Not applicable.   | •             | SAWS South Bexar County ASR presently in implementation phase.  |
| Brush Management (SCTN-4)                                 | Unquantified       | Unknown                  | Unquantified     | ٠             | Concerns regarding endangered & threate×d species, vegetation & wildlife habitat, and cultural resources   | •  | Potential benefit to Edwards Aquifer due to increased water for recharge.  | •  | Potential improvement of pasture for grazing.   | •             | Additional studies needed to determine quantity of dependable supply during drought.  |
| Weather Modification (SCTN-5)                             | Unquantified       | Unknown                  | Unquantified     | •             | Potential increases in water supply for willlife habitat.  | •  | Potential increases in rainfall, runoff, and aquifer recharge.   | •  | Provides water for irrigated and dry-land agriculture (crops & ranching).                       | •             | Concerns regarding increased flood potential.   |
| Small Aquifer Recharge Dams                               | Unquantified       | Unknown                  | Unquantified     | •             | Small potential effects on habitat.  | •  | Potential increases in local aquifer levels.   | ١.   | Minimal, if any.  | +             |   |
| Rainwater Harvesting (SCTN-9)                             | Unquantified       | Unknown                  | Unquantified     |               | Minimal, if any.   | T. | Minimal, if any.   | <del>Ť</del>                                     | Not applicable,   | <del>  </del> | Consistent with conservation focus of Plan.   |
| Total of New Supplies                                     | 516,513            |                          |                  | <u> </u>      | evenuences as duly.  |    | · · · · · · · · · · · · · · · · · · ·  |  | Not applicable.   |               | Consistent with conservation focus of Plan.   |

| Management Strategy                                     |          | Comparison of Strategies to Meet Needs  |   | Interbasin Transfer Issues   |            | Third-Party Impacts of Voluntary Transfers   |         | Regional Efficiency  | 1  | Effect on<br>Navigation |
|---|----------|---|---|--|------------|--|---------|--|----|-------------------------|
| Municipal Demand Reduction (Conservation) (L-10 Mun.)   | :        | Low unit cost Inherent environmental benefits   | • | Not applicable   | Ŀ          | Not applicable   | •       | Implementable throughout the region  | •  | None                    |
| Edwards Irrigation Transfers (L-15)                     | •        | Low unit cost.  | • | Not applicable.  | •          | Maximum transfer may have potential socio-<br>economic impacts to third parties.     | •       | Requires no new facilities.  | •  | None                    |
| Edwards Recharge - Type 2 Projects (L-18c)              | •        | Low unit cost   | • | Not applicable.  | •          | Not applicable.  | •       | Requires no new transmission and treatment facilities.   | •  | None                    |
| Canyon Reservoir - River Diversion (G-15C)              | •        | Moderate unit cost.   | • | Not applicable.  | •          | Not applicable.  | •       | Significant additional surface water supply without construction of a new reservoir.   | 1. | None                    |
| Canyon Reservoir Wimberley & Woodcreek (G-24)           | • .      | High unit cost, but options to meet needs are limited.                                    | • | Not applicable.  | -          | Not applicable.  | •       | Additional surface water supply without construction of a new reservoir.   | •  | None                    |
| Lower Guadalupe River Diversion (SCTN-16a)              | •        | Moderate unit cost.   | • | Not applicable with diversion facilities located in San Antonio River Basin. | •          | Not applicable.  | •       | Shared pipeline alignment with other strategies.  Shared water treatment and balancing storage facilities in Bexar County.       | •  | None                    |
| Carrizo Aquifer Wilson & Gonzales (CZ-10C) <sup>3</sup> | •_       | Moderate unit cost.   | • | Not applicable.  | •          | Transfer rate could have potential socio-<br>economic impacts to third parties.      | •       | New supply proximate to Bexar County.  | •  | None                    |
| Carrizo Aquifer - Local Supply (SCTN-2a)                | •        | Low unit cost.  | • | Not applicable.  | •          | Not applicable.  | •       | New supply proximate to points of need.  | •  | None                    |
| Simsboro Aquifer (SCTN-3c)                              | •        | Moderate unit cost.   | • | Not applicable.  |            | Limited transfer to avoid potential socio-<br>economic impacts to third parties.     | •       | Beneficial use of groundwater presently produced, but unused.  Phased sharing of resource between Bexar, Comal, & Hays Counties. | •  | None                    |
| SAWS Recycled Water Program (SAWS)                      | •        | Low to moderate unit cost.  | • | Not applicable.  | •          | Not applicable.  | •       | New supply proximate to points of need.  | •  | None                    |
| Purchase of Water From Major Provider (PMP)             | <u> </u> | Low to moderate unit cost.  | • | Not applicable.  | <u>] •</u> | Not applicable.  | $\perp$ |  | 1. | None                    |
| LCRA Stored Water - Colorado Riv @ Bastrop (C-<br>13C)  | •        | Moderate unit cost.   | • | TNRCC Interbasin Transfer permit required.                                   | •          | Not applicable.  | •       | Shared pipeline alignment with other strategies.  Shared water treatment and balancing storage facilities in Bexar County.       | •  | None                    |
| Medina Lake Recharge Enhancement (S-13B)                | •        | Low unit cost.  | • | Not applicable.  | ] <u> </u> | Potentially significant impacts due to reduced irrigation from the BMA Canal System. | •       | Requires no new facilities.  | •  | None                    |
| Edwards Recharge Guadalupe Riv Diversions<br>(SCTN-6a)  | •        | Low to moderate unit cost.  | • | TNRCC Interbasin Transfer permit required                                    | •          | Not applicable.  | •       | Provides for recovery and recirculation of<br>enhanced springflow from Edwards Recharge -<br>Type 2 Projects (L-18c).            | •  | None                    |
| Aquifer Storage & Recovery (ASR) - (SCTN-1a)            | <b>_</b> | Effective means of reducing peak summer pumpage from the Edwards Aquifer.                 | • | Not applicable.  | •          | Not applicable.  | •       | Increases reliability of current supply from the Edwards Aquifer.  | •  | None                    |
| Brush Management (SCTN-4)                               | •        | Insufficient information at this time.  | • | Not applicable.  | <u> </u>   | Not applicable.  | •       | May contribute positively to storage and system management of supplies.  | •  | None                    |
| Weather Modification (SCTN-5)                           | •        | Potentially feasible management strategy to meet a portion of projected irrigation needs. | • | Not applicable.  | <u> </u>   | Not applicable.  | •       | May contribute positively to storage and system management of supplies.  | •  | None                    |
| Small Aquifer Recharge Dams                             | •        | High unit cost.   | • | Not applicable.  | <u> •</u>  | Not applicable.  | •       | Implementable throughout the region.   |    | None                    |
| Rainwater Harvesting (SCTN-9)                           | •        | High unit cost; comparable to domestic well.  | • | Not applicable.  | •          | Not applicable.  | 1.      | Implementable throughout the region.   | 1. | None                    |

Notes:

1) Quantity based on full implementation and utilization of new supplies in year 2050.

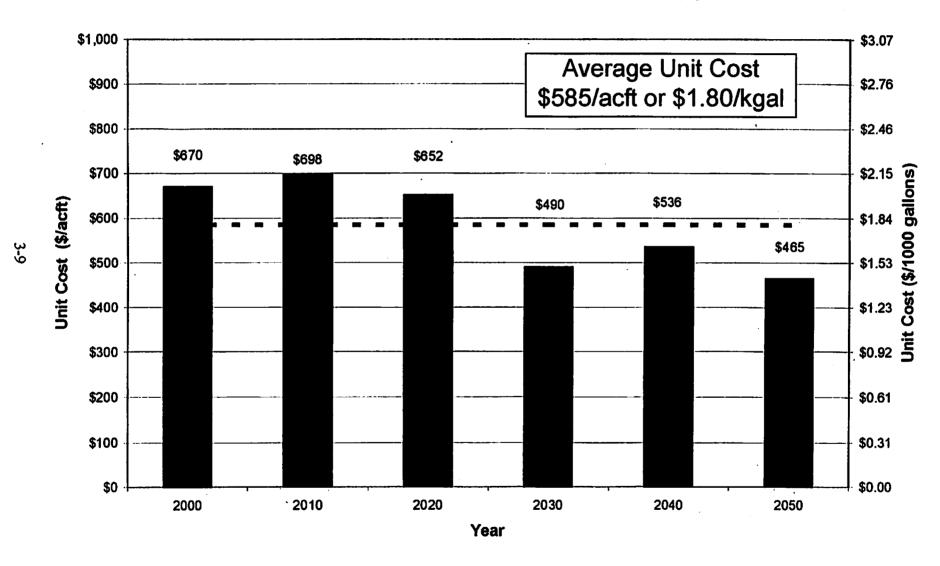
2) Firm reliability indicates that new supply is dependable in a drought of record with full implementation of the Alternative Plan.

3) Unit cost based on full utilization of supply at ultimate capacity of planned facilities and includes treatment and distribution facilities necessary to meet peak daily needs.

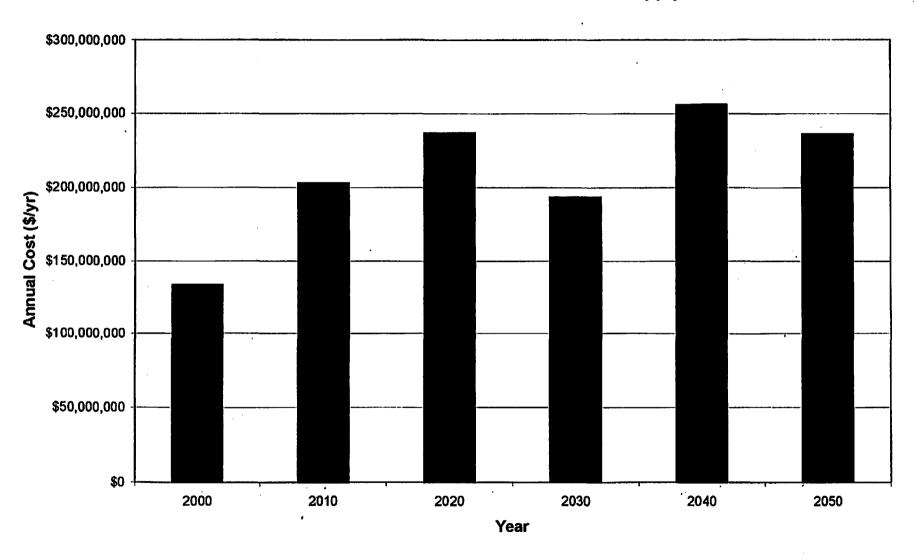
4) Management strategies in the implementation phase include Schertz-Seguin Water Supply Project, Western Canyon Regional Water Supply Project, Hays/IH35 Water Supply Project, Lake Dunlap WTP Expansion and Mid-Cities Project, and GBRA Canyon Reservoir Contract Renewals. Supplies associated with these management strategies were counted as current supply in the technical evaluation of alternative regional water plans.

5) Subsequent to the technical evaluation of alternative regional water plans, quantity associated with this management strategy was limited in the Regional Water Plan in viev of policies of underground water conservation districts.

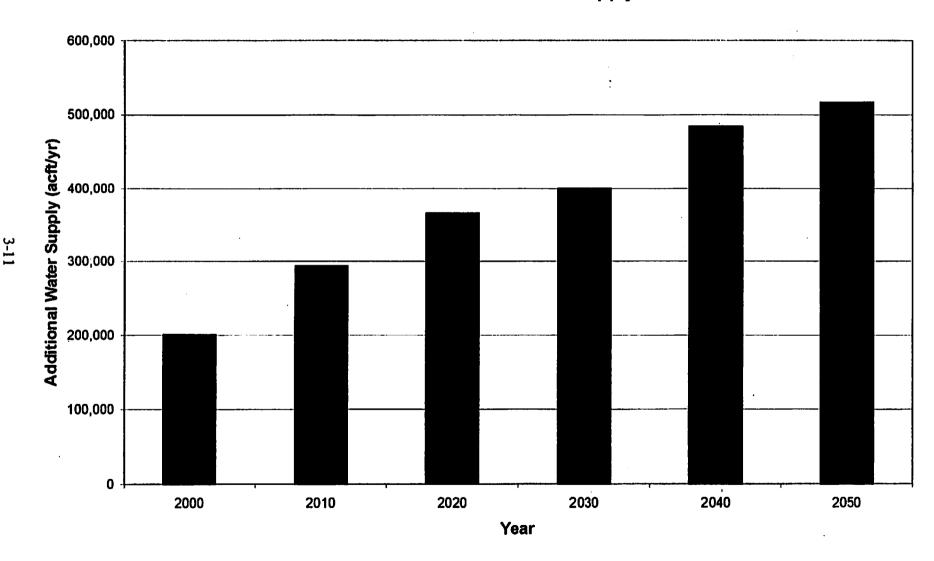
### Environmental/Conservation Alternative Regional Water Plan Unit Cost of Cumulative Additional Water Supply



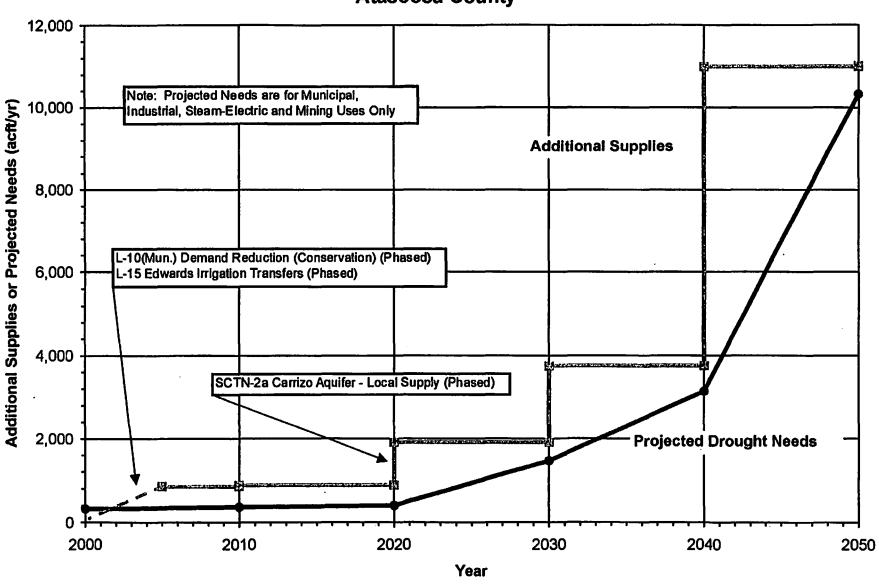
### Environmental/Conservation Alternative Regional Water Plan Annual Cost of Cumulative Additional Water Supply



# Environmental/Conservation Alternative Regional Water Plan Cumulative Additional Water Supply

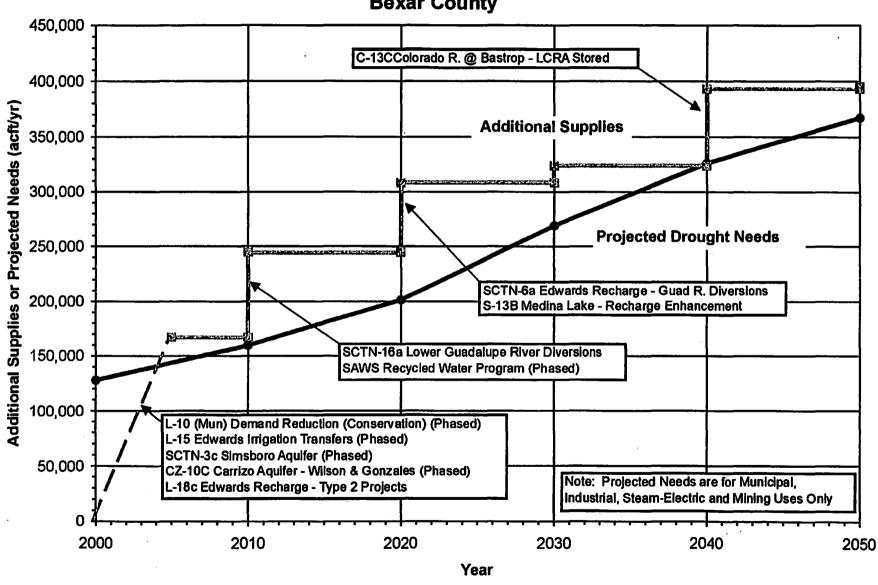


### Environmental/Conservation Alternative Regional Water Plan Atascosa County



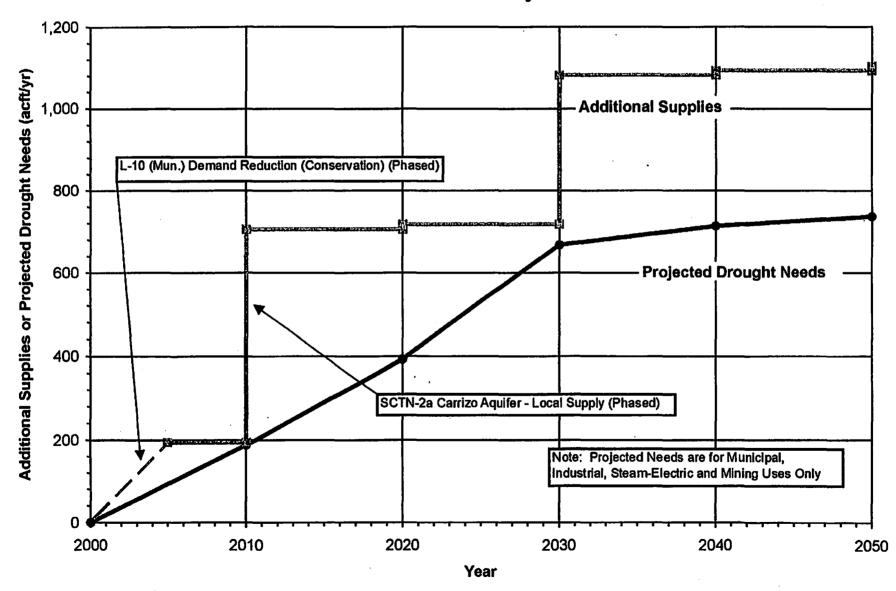
|             | entral Texas Region  |                       |               |                |                |               | Co             | unty = A     | tascosa   |
|-------------|--|-----------------------|---------------|----------------|----------------|---------------|----------------|--------------|-----------|
| County S    | iummary of Projected Water Needs (Shorta                   | ges) and Wa           | ter Manag     | ement St       | rategles       |               | U              | ser Grou     | p(s) = al |
| Projecter   | d Water Needs (acft/yr)                                    | •                     |               |                |                |               |                |              |           |
|             | User Group(s)  |                       | 2000          | 2010           | 2020           | 2030          | 2040           | 2050         | Notes     |
| · · · · ·   | Municipal  |                       | 325           | 366            | 401            | 468           | 530            | 587          | 140162    |
|             | Industrial   |                       | 323           | <u>300</u>     | 401            | 0             | 330            | 0            |           |
|             | Steam-Electric   |                       | ŏ             |                |                |               | 1,504          | 8,504        |           |
|             | Mining   |                       | <u> </u>      |                | - 6            | 995           | 1,109          | 1,239        |           |
|             | Imagalion  |                       | 38,418        | 36,718         | 35,170         | 43,726        | 42,190         | 40,713       |           |
|             | Total Needs  |                       | 38,743        |                | 35,571         | 45,189        |                |              |           |
|             |  |                       |               | 37,084         |                |               | 45,333         | 51,043       |           |
|             | Mun, Ind, S-E, & Min Needs                                 |                       | 325           | 366            | 401            | 1,463         | 3,143          | 10,330       |           |
|             | irrigation Needs   |                       | 38,418        | 36,718         | 35,170         | 43,726        | 42,190         | 40,713       |           |
| Water Ma    | nagement Strategies (acft/yr)                              | Candidate             | ·             |                |                |               |                |              | -         |
| ID#         | Description  | New Supply            | 2000*         | 2010           | 2020           | 2030          | 2040           | 2050         | Notes     |
| L-10 (Mun.) | Demand Reduction (Conservation)                            |                       | 356           | 384            | 411            | 259           | 300            | 319          |           |
| L-15        | Edwards Irrigation Transfers                               | 81,000                | 500           | 500            | 500            | 500           | 700            | 700          | 2, 3,     |
| SCTN-2a     | Carrizo Aquifer - Local Supply                             |                       |               |                |                | 1.000         | 3,000          | 10,000       | 5,        |
| <del></del> |  |                       |               |                |                |               |                |              | ·         |
|             |  |                       |               |                |                |               |                |              |           |
|             |  |                       |               |                |                |               |                |              |           |
| SCTN-4      | Brush Management   |                       |               |                |                |               |                |              |           |
| SCTN-5      | Weather Modification                                       |                       |               |                |                |               |                |              |           |
| SCTN-9      | Rainwater Harvesting                                       |                       |               |                |                |               |                |              |           |
|             | Small Aquifer Recharge Dams                                |                       |               |                |                |               |                |              |           |
| L-10 (Irr.) | Demand Reduction (Conservation)                            |                       | 3,692         | 3,692          | 3,692          | 3,692         | 3,692          | 3,692        |           |
|             | Total New Supplies   |                       | 4,548         | 4,576          | 4,603          | 5,451         | 7,692          | 14,711       |           |
|             | Total System Mgmt. Supply / Deficit                        | •                     | 24 405        | 22 500         | 20.000         | 20 720        | 27 644         | 20 222       |           |
|             |  |                       | -34,195       | -32,508        | -30,968        | -39,738       | -37,641        | -36,332      |           |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit      |                       | 531           | 518            | 510            | 296           | 857            | 689          |           |
|             | irrigation System Mgmt. Supply / Deficit                   |                       | -34,726       | -33,026        | -31,478        | -40,034       | -38,498        | -37,021      |           |
| Notes:      |  |                       | 1             |                |                |               |                |              |           |
| •           | Candidate New Supplies shown for year 2000 are identif     | lied for priority imp | dementation.  | but will not b | e available i  | nmedialely.   | <u> </u>       |              |           |
| 1           | Demand Reduction (Conservation) strategies assumed I       |                       |               |                |                |               | ··             | <u>†</u>     |           |
| 2           | Candidate New Supply to be shared among Uvalde, Med        | dina, Atascosa, ar    | nd Bexar Cou  | nties. Suppl   | y may not be   | reliable in d | rought.        |              |           |
| 3           | Pursuant to draft EAA Critical Period Management rules,    | Candidate New S       | Supply repres | ents approxi   | mately 85 pa   | rcent of      |                |              |           |
|             | the estimated maximum potential annual transfer (95,43)    | 0 acfi) based on F    | roposed Pen   | mits prorated  | to 400,000 a   | cft/yr.       |                |              |           |
| 4           | Additional Edwards supply is for City of Lytle.            |                       |               |                |                |               |                |              |           |
| 5           | Additional Carrizo supply is for Steam-Electric and Minin  | g use.                |               |                |                |               |                |              |           |
| 6           | Early implementation of facilities assumed in cost estima  | tion to ensure suf    |               |                |                |               |                |              |           |
| 7           | Option expected to provide additional water supply in ma   | any years, but dep    | endable sup   | ply during dro | ought is pres  | ently unquan  | lified.        |              |           |
| 3           | Estimates based upon use of LEPA systems on 50 percentages | ent of acreages in    | igated in 199 | 7, with conse  | ervation at 20 | percent of it | rigation appli | cation rate. |           |

### Environmental/Conservation Alternative Regional Water Plan Bexar County



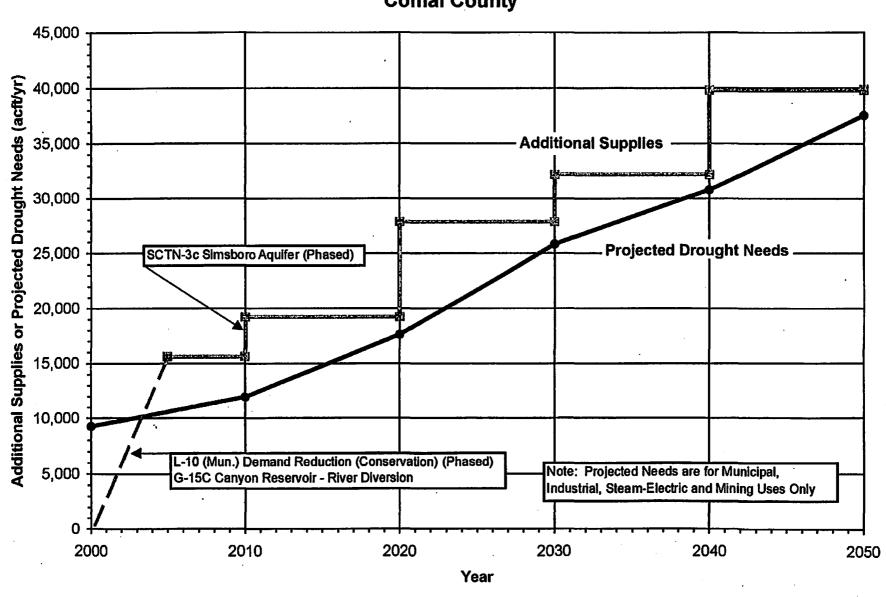
| Cauth Canta | of Towar Barlon   | 3.0              |                |              |              |   |               |          |              |
|-------------|---|------------------|----------------|--------------|--------------|---|---------------|----------|--------------|
|             | al Texas Region<br>mary of Projected Water Needs (Shortages) and \  | Matas Managar    | and Charles    | -1           |              |   |               |          | ty = Bexa    |
|             |   | vater managen    | ient attate    | 105          |              |   |               | User Gro | oup(s) = al  |
| Projected W | ater Needs (acft/yr)  |                  |                |              |              |   |               |          |              |
|             | User Group(s)   |                  | 2000           | 2010         | 2020         | 2030                                    | 2040          | 2050     | Notes        |
|             | Municipal   |                  | 122,867        | 154,495      | 196,301      | 262,070                                 | 315,633       | 353,309  |              |
|             | Industrial  |                  | Q              | 0            | 0            | 1,430                                   | 4,759         | 8,192    |              |
|             | Steam-Electric  |                  | 0              | 0            | 0            | 0                                       | 0             | 0        |              |
|             | Mining  |                  | 4,983          | 4,938        | 5,201        | 5,408                                   | 5,645         | 5,982    |              |
|             | Irrigation  |                  | 22,575         | 20,374       | 19,585       | 19,015                                  | 18,385        | 17,368   |              |
|             | Total Needs   |                  | 150,405        | 179,805      | 221,087      | 287,921                                 | 344,422       | 384,831  |              |
|             | Mun, Ind, S-E, & Min Needs  |                  | 127,830        | 159,431      | 201,502      | 268,906                                 | 326,037       | 367,463  |              |
|             | Irrigation Needs  |                  | 22,575         | 20,374       | 19,585       | 19,015                                  | 18,385        | 17,368   |              |
| Water Manag | gement Strategies (acft/yr)   | Candidate        |                |              | -            |   |               |          |              |
| ID#         | Description   | New Supply       | 2000*          | 2010         | 2020         | 2030                                    | 2040          | 2050     | Notes        |
|             | Demand Reduction (Conservation)   |                  | 33,528         | 42,509       | 41,210       | 36,533                                  | 38,834        | 40.934   |              |
| L-15        | Edwards Irrigation Transfers  | 81,000           | 50,000         | 55,000       | 60,000       | 65,000                                  | 70,000        | 71,300   | 2,           |
| SCTN-3c     | Simsboro Aquifer  | 55,000           | 51,000         | 48,000       | 41,000       | 27,000                                  | 18,500        | 11,500   |              |
| CZ-10C      | Carrizo Aquifer - Wilson & Gonzales   | 75,000           | 19,000         | 19,000       | 29,000       | 49,000                                  | 64,000        | 70,500   | <del></del>  |
| L-18c       | Edwards Recharge - Type 2 Projects  | 13,451           | 13,451         | 13,451       | 13,451       | 13,451                                  | 13,451        | 13,451   |              |
| SCTN-16a    | Lower Guadalupe River Diversions  | 46,813           | 13,431         | 46,813       | 46.813       | 46,813                                  | 46,813        | 46.813   |              |
| 00111-100   | SAWS Recycled Water Program   | 40,010           |                | 19,826       | 26,737       | 35.824                                  | 43,561        | 52,215   | 6.           |
| SCTN-6a     | Edwards Recharge - Guad. R. Diversions  | 42,121           |                | 10,020       | 42,121       | 42,121                                  | 42,121        | 42.121   | <u></u>      |
| S-13B       | Medina Lake - Recharge Enhancement  | 8,136            |                |              | 8,138        | 8.136                                   | 8,136         | 8.138    |              |
| C-13C       | Colorado R. @ Bastrop - LCRA Stored   | 50,000           |                |              | 0,100        | 0,150                                   | 50,000        | 50,000   |              |
| SCTN-1a     | Aquifer Storage & Recovery - Regional   |                  |                |              |              |   | 00,000        |          | -            |
| SCTN-4      | Brush Management  |                  |                |              |              |   |               |          | 1            |
| SCTN-5      | Weather Modification  |                  |                |              |              |   |               |          | 1            |
| SCTN-9      | Rainwater Harvesting  |                  |                |              |              |   |               |          | <u> </u>     |
| 1==         | Small Aquifer Recharge Dams   |                  |                |              |              |   |               |          | <del>i</del> |
| L-10 (Irr.) | Demand Reduction (Conservation)   |                  | 4,521          | 4,521        | 4,521        | 4,521                                   | 4,521         | 4,521    | 1            |
| 2 10 (0.1.7 | Total New Supplies  |                  | 171,500        |              |              | 328,399                                 | 397.937       | 399,991  |              |
|             |   |                  |                |              |              |   |               |          |              |
| . —         | Total System Mgmt. Supply / Deficit   |                  | 21,095         | 69,315       | 91,902       | 40,478                                  | 53,515        | 15,160   |              |
| ļ           | Mun, Ind, S-E, & Min System Mgmt. S   |                  | 39,149         | 85,168       | 106,966      | 54,972                                  | 67,379        | 28,007   |              |
|             | Irrigation System Mgmt. Supply / Deficit  |                  | -18,054        | -15,853      | -15,064      | -14,494                                 | -13,864       | -12,847  |              |
| Notes:      | O-didde No. Configuration (   |                  | 10 - 1 1       | 4-41         |              | -D-bt- 1-                               |               |          |              |
|             | Candidate New Supplies shown for year 2000 are id   |                  |                |              |              | vallable imm                            | rediately.    |          |              |
| 1           | Demand Reduction (Conservation) strategies assum  | Modice Africa    | rea in proje   | cted water o | emanos.      |   | lable to de-  |          | <del></del>  |
| 2           | Candidate New Supply to be shared among Uvalde,<br>Pursuant to draft EAA Critical Period Management n<br>estimated maximum potential annual transfer (95,43     | Medina, Atasco   | Sa, and Be)    | ET COUNTIES  | Supply M     | By not be re                            | nable in droi | Antr     | <u> </u>     |
| 3           | estimated maximum potential annual transfer (95.43  | D acfi) based on | Proposed       | Permils oron | ated to 400. | 000 active.                             | in or use     |          |              |
| 4           | Candidate New Supply to be shared among Bexar, (  | Comal, and Hav   | s Counties.    | Effects on r | egional agu  | ifer levels to                          | be quantific  | ad.      |              |
| 5           | Candidate New Supply to be shared among Bexar a   |                  |                |              |              |   |               |          |              |
| 6           | Current SAWS Recycled Water Program is included   |                  |                |              |              |   | 1             |          |              |
| 7           | Future use of recycled water for non-potable uses as  |                  |                |              |              |   | er demand     |          |              |
| 8           | Supply dependent upon future water needs in Regio   |                  |                |              |              | -,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | <u> </u>      |          |              |
| 9           | SAWS ASR program in southern Bexar County Incre   | ases reliability | of Edwards     | Aquifer supr | ly and redu  | ces season                              | al aquifer de | mands.   | ·            |
| 10          | Option expected to provide additional water supply in   | n many years, h  | ut dependet    | ie supply di | ulna drough  | t is present                            | v unquantifi  | ed.      |              |
| 111         | Oplion expected to provide additional water supply in<br>Estimates based upon use of LEPA systems on 80 papplication rate, but applicable to only 50 percent of | ercent of acrea  | jes irrigated  | In 1997, wi  | h conserva   | lion at 40 pe                           | rcent of imig | alion    |              |
|             | application rate, but applicable to only 50 percent of  | Edwards Aquife   | r irrigation p | ermitted qua | ntilles      | ·                                       |               |          |              |

# Environmental/Conservation Alternative Regional Water Plan Caldwell County



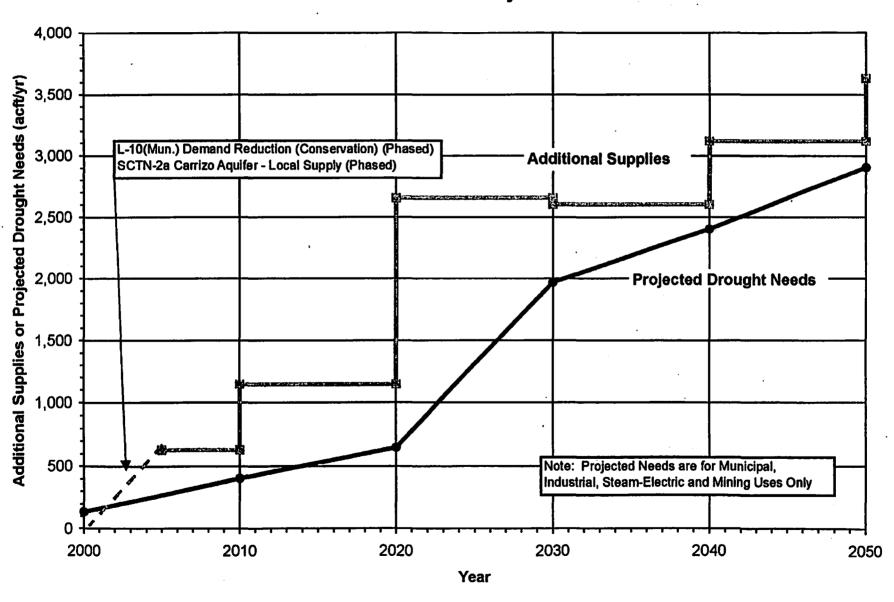
| South C     | entral Texas Region                                   |                   | <u> </u>      |              |            |            | C           | ounty =     | Caldwell    |
|-------------|---|-------------------|---------------|--------------|------------|------------|-------------|-------------|-------------|
| County S    | Summary of Projected Water Needs (Shortag             | es) and Wate      | r Manage      | ment Strat   | legies     |            |             | User Grou   | ıp(s) = all |
| Projecter   | d Water Needs (acft/yr)                               |                   |               |              |            |            |             |             |             |
|             | User Group(s)   |                   | 2000          | 2010         | 2020       | 2030       | 2040        | 2050        | Notes       |
|             | Municipal   |                   | 0             |              | 393        | 668        | 714         | 737         |             |
|             | Industrial  |                   | <del> </del>  |              |            | 0          | 0           | 0           |             |
|             | Steam-Electric  |                   | ŏ             |              | Ö          | Ō          | Ō           | Ŏ           |             |
|             | Mining  |                   | 0             | 0            | 0          | 0          | 0           | 0           |             |
|             | Irrigation  |                   | 0             | 0            | 0          | 0          | 0           | 0           |             |
|             | Total Needs   |                   | 0             | 188          | 393        | 668        | 714         | 737         |             |
|             | Mun, Ind, S-E, & Min Needs                            |                   | 0             |              | 393        | 668        | 714         | 737         |             |
|             | Irrigation Needs                                      |                   | 0             | 0            | Ō          | 0          | 0           | 0           |             |
| 101-4       | Objects of a filter                                   | Operalistate      |               |              |            |            |             |             |             |
| water ma    | anagement Strategies (acft/yr)                        | Candidate         |               | ļ <u></u>    |            |            |             |             | ļ           |
| ID#         | Description   | New Supply        | 2000          | 2010         | 2020       | 2030       | 2040        | 2050        | Notes       |
| L-10 (Mun.) | Demand Reduction (Conservation)                       |                   | 195           |              | 218        | 82         | 93          |             | 1           |
| SCTN-2a     | Carrizo Aquifer - Local Supply                        | <del></del>       |               | 500          | 500        | 1,000      | 1,000       | 1,000       | 2           |
|             |   |                   |               |              |            |            |             |             |             |
|             |   |                   |               |              |            |            |             |             |             |
|             |   |                   |               |              |            |            |             |             |             |
|             | Small Aquifer Recharge Dams                           |                   | ļ             |              |            |            |             |             | 3           |
| L-10 (lrr.) | Demand Reduction (Conservation)                       |                   |               |              |            |            |             |             |             |
|             |   |                   |               |              |            |            |             |             |             |
|             | Total New Supplies                                    |                   | 195           | 708          | 718        | 1,082      | 1,093       | 1,104       | -           |
|             | Total System Mgmt. Supply / Deficit                   |                   | 195           | 518          | 325        | 414        | 379         | 367         |             |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit |                   | 195           |              | 325        | 414        | 379         | 367         | •           |
|             | Irrigation System Mgmt. Supply / Deficit              |                   | 0             | 0            | 0          | 0          | 0           | 0           |             |
| Notes:      |   |                   |               |              |            |            |             |             |             |
| 1           | Demand Reduction (Conservation) strategies assur      | med largely sells | octod in cost | locted water | demands    | <u>-</u>   |             |             | <del></del> |
| 2           | Additional well(s) for Lockhart.                      | HOO HOLDERY FORE  | scied iii bio | arian Malai  | Gennanda.  |            |             |             |             |
| 3           |   | <u> </u>          |               | l andahir s  |            |            |             |             | <del></del> |
| <u> </u>    | Option expected to provide additional water s         | uppiy in many ye  | ears, Dui de  | havogoie 2i  | pppy gunng | orought IS | presenuy ur | iquantined. | <u> </u>    |

### Environmental/Conservation Alternative Regional Water Plan Comal County



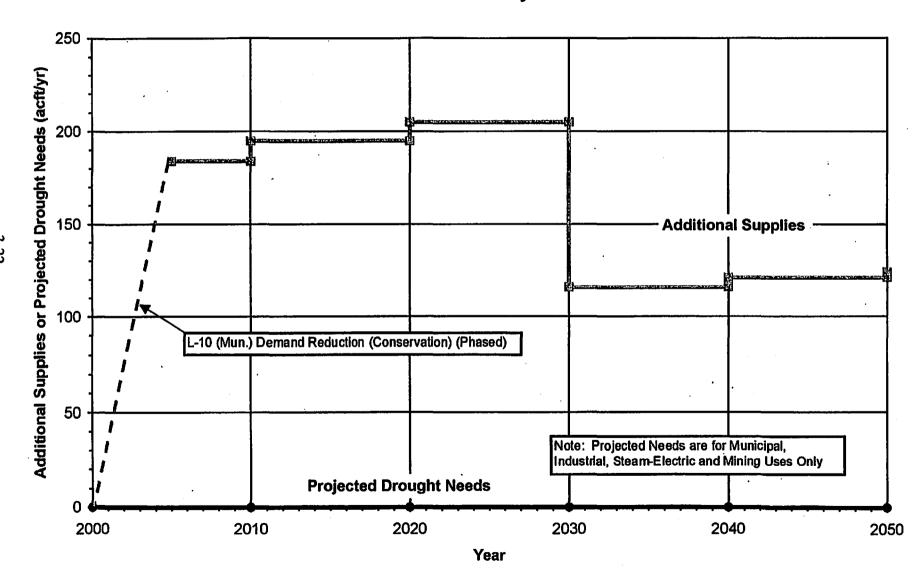
| South Co     | entral Texas Region   |                    |               |  |                        |                       |          | County       | = Comal     |
|--------------|---|--------------------|---------------|--|------------------------|-----------------------|----------|--------------|-------------|
| County S     | ummary of Projected Water Needs (Shortag                      | es) and Water      | r Manager     | nent Strat                             | egies                  |                       |          | User Grou    | p(s) = all  |
| Projected    | l Water Needs (acft/yr)                                       |                    |               |  |                        |                       |          |              |             |
| i rojected   | User Group(s)   | *******            | 2000          | 2010                                   | 2020                   | 2030                  | 2040     | 2050         | Notes       |
|              | Municipal   |                    | 2,289         |  | 10.487                 | 18,282                | 25,205   | 33,062       | 110168      |
|              | Industrial  |                    | 1,388         | 1,425                                  | 1,486                  | 1,737                 | 2,009    | 2.289        |             |
|              | Steam-Electric  |                    | 1,300         | 1,420                                  | 1,400                  | 1,737                 | <u> </u> | <u>2,208</u> |             |
|              | Mining  | <del></del>        | 5,570         | <u></u>                                | 5.628                  | 5.796                 | 3,590    | 2,224        |             |
| <del> </del> | Irrigation  |                    | 30            |  | <u> </u>               | 0,750                 |          | 2,227        |             |
| <b>-</b>     | Total Needs   |                    |               |  | 17,601                 | 25,815                | 30,804   |              |             |
|              |   |                    | 9,277         |  |                        |                       |          |              |             |
| <u> </u>     | Mun, Ind, S-E, & Min Needs                                    |                    | 9,247         | 11,938                                 | 17,601                 | 25,815                | 30,804   | 37,575       |             |
| )            | Irrigation Needs  |                    | 30            | 14                                     | 0                      | 0                     | 0        | 0            |             |
| Water Ma     | nagement Strategies (acft/yr)                                 | Candidate          |               |  | •                      |                       |          |              |             |
| ID#          | Description   | New Supply         | 2000*         | 2010                                   | 2020                   | 2030                  | 2040     | 2050         | Notes       |
| L-10 (Mun.)  | Demand Reduction (Conservation)                               | 11011 Cuppiy       | 616           |  | 848                    | 718                   | 824      | 942          | 110100      |
| G-15C        | Canyon Reservoir - River Diversion                            | 15,000             | 15,000        |  | 15,000                 | 15,000                | 15,000   |              | <del></del> |
| SCTN-3c      | Simsboro Aquifer  | 55,000             | 10,000        | 10,000                                 | 3,500                  | 12,000                | 16,500   |              | 3, 4        |
|              |   |                    |               |  |                        |                       |          |              |             |
|              |   |                    |               |  |                        |                       |          |              |             |
|              |   |                    |               |  |                        |                       |          |              |             |
|              | Small Aquiler Recharge Dams                                   |                    |               |  |                        |                       |          |              |             |
| L-10 (lrr.)  | Demand Reduction (Conservation)                               |                    |               |  |                        |                       |          |              |             |
| ·            |   |                    |               |  |                        |                       |          |              |             |
|              | Total New Supplies  |                    | 15,616        | 15,718                                 | 19,348                 | 27,718                | 32,324   | 39,942       |             |
|              | Total System Mgmt. Supply / Deficit                           |                    | 6,339         | 3,766                                  | 1,747                  | 1,903                 | 1,520    | 2,367        |             |
|              | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit         |                    | 6,369         |  | 1,747                  | 1,903                 | 1,520    |              |             |
|              | Irrigation System Mgmt. Supply / Deficit                      |                    | -30           | -14                                    | 0                      | 0                     | 0        | . 0          |             |
|              |   |                    |               |  |                        |                       |          |              |             |
| Notes:       |   | <u> </u>           | L             | ا ــــــــــــــــــــــــــــــــــــ |                        | <del></del>           |          | _ <u>.</u>   |             |
| ļ <u> </u>   | Candidate New Supplies shown for year 2000 are identified     |                    |               |  | vailable imme          | diately.              |          |              |             |
| 1            | Demand Reduction (Conservation) strategies assumed lar        |                    | ojected wate  | r demands.                             |                        |                       |          |              |             |
| <u> 2</u>    | Portion of Canyon firm yield (with amendment) diverted be     | low Seguin.        |               | ll                                     | <del></del> !          |                       |          |              |             |
| 3            | Candidate New Supply to be shared among Bexar, Comal          | and Hays Countie   | s. Effects of | n regional aqu                         | iter levels to         | <u>be quantitied.</u> |          |              |             |
| 4            | Early implementation of facilities assumed in cost estimation |                    |               |  | 17                     |                       |          | ļ            |             |
| 5            | Option expected to provide additional water supply in man     | y years, but depen | danie supply  | anuut atonti                           | <u>ıı ıs presenliy</u> | unquantitied          | •        |              |             |

# Environmental/Conservation Alternative Regional Water Plan Dimmit County



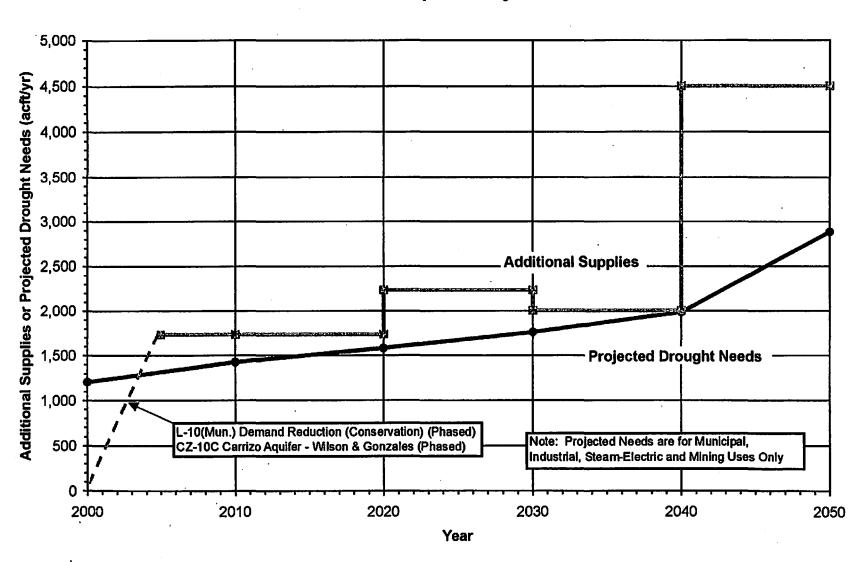
| South C     | entral Texas Region   |                      |                |                |                 |               |        | County =     | Dimmi  |
|-------------|---|----------------------|----------------|----------------|-----------------|---------------|--------|--------------|--|
| County S    | Summary of Projected Water Needs (Shortage                    | es) and Water        | Managen        | nent Strate    | gies            | j             |        | Jser Grou    |  |
| Projector   | d Water Needs (acft/yr)                                       |                      |                |                |                 | 1             | 1      |              |  |
| FIDJectet   | User Group(s)   |                      | 2000           | 2010           | 2020            | 2030          | 2040   | 2050         | Notes  |
|             | Municipal   |                      | 138            | 405            | 649             | 1,054         | 1,479  | 1,959        | 140162   |
|             | Industrial  |                      | 130            | - 403          | 0 0             | 1,034         | 1,478  | 1,959        |  |
| <del></del> | Steam-Electric  | ····                 | <del> </del>   | ŏ              | ŏ               | ő             | 0      | <del>ŏ</del> | · <del>· · · · · · · · · · · · · · · · · · ·</del> |
|             | Mining  |                      | <del>ŏ</del> l | ő              |                 | 915           | 925    | 949          |  |
|             | Irrigation  |                      | ől             | Ö              | Ö               | 2,133         | 1,737  | 1,331        |  |
|             | Total Needs   |                      | 138            | 405            | 649             | 4,102         | 4,141  | 4,239        |  |
|             | Mun, Ind, S-E, & Min Needs                                    |                      | 138            | 405            | 649             | 1,969         | 2,404  | 2,908        |  |
|             | Irrigation Needs  |                      | 130            | - 405          | 0               | 2,133         | 1,737  | 1,331        |  |
|             | inigation reeds   |                      | U              | U              | U U             | 2,133         | 1,737  | 1,001        | _  |
| Water Ma    | anagement Strategies (acft/yr)                                | Candidate            |                |                |                 | [             |        |              |  |
| ID#         | Description   | New Supply           | 2000*          | 2010           | 2020            | 2030          | 2040   | 2050         | Notes  |
| L-10 (Mun.) | Demand Reduction (Conservation)                               |                      | 131            | 144            | 156             | 104           | 118    | 133          |  |
| SCTN-2a     | Carrizo Aquifer - Local Supply                                |                      | 500            | 1,000          | 1,000           | 2,500         | 3,000  | 3,500        | 2,   |
|             |   |                      |                |                |                 |               |        |              |  |
| SCTN-4      | Brush Management  |                      |                |                |                 |               |        |              |  |
| SCTN-5      | Weather Modification  |                      |                | i              |                 |               |        |              |  |
| SCTN-9      | Rainwater Harvesting  |                      |                |                |                 |               |        | _            |  |
|             | Small Aquifer Recharge Dams                                   |                      |                |                |                 |               |        |              |  |
| L-10 (lm.)  | Demand Reduction (Conservation)                               |                      |                |                |                 |               |        |              |  |
|             | Total New Supplies  |                      | 631            | 1,144          | 1,156           | 2,604         | 3,118  | 3,633        |  |
|             | Total System Mgmt. Supply / Deficit                           |                      | 493            | 739            | 507             | -1,498        | -1,023 | -606         |  |
|             | . Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit          |                      | 493            | 739            | 507             | 635           | 714    | 725          | -  |
|             | Irrigation System Mgmt. Supply / Deficit                      |                      | 0              | 0              | 0               | -2,133        | -1,737 | -1,331       |  |
| Notes:      |   |                      |                |                |                 |               |        |              |  |
| •           | Candidate New Supplies shown for year 2000 are Identifie      | d for priority imple | mentation, but | will not be av | railable imme   | diately.      |        |              |  |
| 1           | Demand Reduction (Conservation) strategies assumed lar        | gely reflected in pr | ojected water  | demands.       |                 |               |        |              |  |
| 2           | Additional well(s) for Carrizo Springs and Mining supply.     |                      |                |                |                 | ]             |        |              |  |
| 3           | Early implementation of facilities assumed in cost estimation |                      |                |                |                 | l             |        | <u>:</u>     |  |
| 4           | Option expected to provide additional water supply in many    | y years, but depen   | dable supply   | during drough  | it is presently | unquantified. |        |              |  |

# Environmental/Conservation Alternative Regional Water Plan Frio County



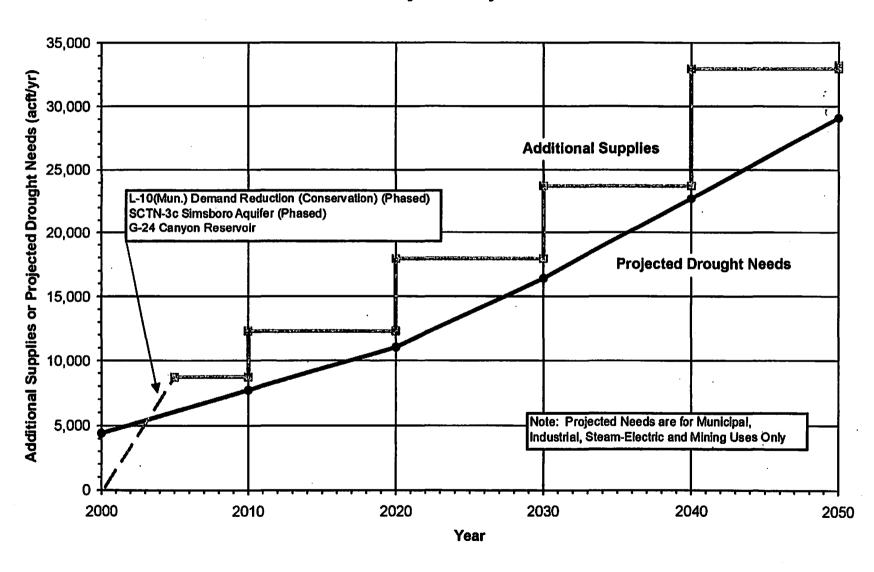
| South Co        | entral Texas Region  |                    |              |                  |                |                  |             | Coun         | ty = Fric |
|-----------------|--|--------------------|--------------|------------------|----------------|------------------|-------------|--------------|-----------|
| County S        | ummary of Projected Water Needs (Shortage                  | s) and Water       | Managen      | ent Strate       | gies           |                  |             | Jser Grou    |           |
|                 |  |                    |              |                  |                |                  |             |              | F (-/     |
| Projected       | Water Needs (acft/yr)                                      | _                  |              |                  |                | ſ                |             |              |           |
|                 | User Group(s)  |                    | 2000         | 2010             | 2020           | 2030             | 2040        | 2050         | Notes     |
|                 | Municipal  |                    | 0            | 0                | 0              | 0                | 0           | 0            |           |
|                 | Industrial   | <del></del>        | ő            | ő                | Ö              | Ö                | Ö           | <del></del>  |           |
|                 | Steam-Electric   |                    | O            | O.               | Ö              |                  | Ō           | ō            |           |
|                 | Mining   |                    | Ō            | 0                | 0              | O                | 0           | ō            |           |
|                 | Irrigation   |                    | 71,126       | 67,646           | 64,365         | 76,505           | 73,519      | 70,662       |           |
|                 | Total Needs  |                    | 71,126       | 67,646           | 64,365         | 76,505           | 73,519      | 70,662       |           |
|                 | Mun, Ind, S-E, & Min Needs                                 |                    | 0            | 0.10.10          | 0              | 0                | 0           | <u></u>      |           |
|                 | Irrigation Needs   |                    | 71,126       | 67,648           | 64,365         | 76,505           | 73,519      | 70,662       |           |
|                 | 1111941011110040   |                    | 71,120       | 91,040           | 04,000         | 10,000           | 70,010      | 70,002       |           |
| Water Ma        | nagement Strategies (acft/yr)                              | Candidate          |              |                  |                |                  |             |              | •         |
| ID#             | Description  | New Supply         | 2000         | 2010             | 2020           | 2030             | 2040        | 2050         | Notes     |
| L-10 (Mun.)     | Demand Reduction (Conservation)                            | топ оприд          | 184          | 195              | 205            | 116              | 121         | 124          |           |
| C. 10 (Islail.) | Delitario (Canada) (Canada)                                |                    |              |                  |                |                  |             | ——— <u>'</u> |           |
|                 |  |                    |              | f                |                |                  |             | _            |           |
|                 |  |                    | ·            |                  |                |                  |             |              |           |
|                 |  |                    | <del>-</del> |                  |                | i                |             |              |           |
|                 |  |                    |              |                  |                |                  |             |              |           |
|                 |  |                    |              |                  |                |                  |             |              |           |
|                 |  |                    |              |                  |                |                  |             |              |           |
| SCTN-4          | Brush Management   |                    |              |                  |                |                  |             |              |           |
| SCTN-5          | Weather Modification                                       |                    |              | i i              |                |                  |             |              |           |
| SCTN-9          | Rainwater Harvesting                                       |                    |              |                  |                | 1                |             |              |           |
|                 | Small Aquifer Recharge Dams                                |                    |              |                  |                |                  |             |              |           |
| L-10 (lrr.)     | Demand Reduction (Conservation)                            |                    | 5,947        | 5,947            | 5,947          | 5,947            | 5,947       | 5,947        |           |
|                 | Total New Supplies   |                    | 6,131        | 6,142            | 6,152          | 6,063            | 6,068       | 6,071        |           |
|                 | 10001000   |                    | 9,1011       | <b>U</b>   1 1 1 | Clica          |                  | - 0,000     | 5,57.1       |           |
|                 | Total System Mgmt. Supply / Deficit                        |                    | -64,995      | -61,504          | -58,213        | -70,442          | -67,451     | -64,591      |           |
|                 | Mun, Ind, S-E, & Min System Mgmt. Supply /                 | <del></del>        | 184          | 195              | 205            | 116              | 121         | 124          |           |
|                 | mun, mu, 3-2, a min System ingint. Supply /                |                    | 104          | 193              | 205            | ' ' ' '          | 121         | 124          |           |
| <del></del>     |  |                    | CF 470       | 04.000           | 50.440         | — <del></del>    | <del></del> |              |           |
|                 | irrigation System Mgmt. Supply / Deficit                   |                    | -65,179      | -61,699          | -58,418        | -70,558          | -67,572     | -64,715      |           |
| Notes:          |  |                    |              |                  |                | 1                |             |              |           |
| 1               | Demand Reduction (Conservation) strategies assumed large   | ach reflected in a | rolad welst  | demende          | <del></del>    |                  |             |              | · · ·     |
| 2               | Option expected to provide additional water supply in many | vears but deser    | dable cunch  | tudno drovoh     | t la presentiv | halillanuanii    |             |              |           |
| 2               | Estimates based upon use of LEPA systems on 50 percent     | of acreance inine  | ted in 1907  | ith conservat    | ling at 20 per | cent of Irricati | <del></del> | <del></del>  |           |
|                 |  |                    |              |                  |                |                  |             |              |           |

### Environmental/Conservation Alternative Regional Water Plan Guadalupe County



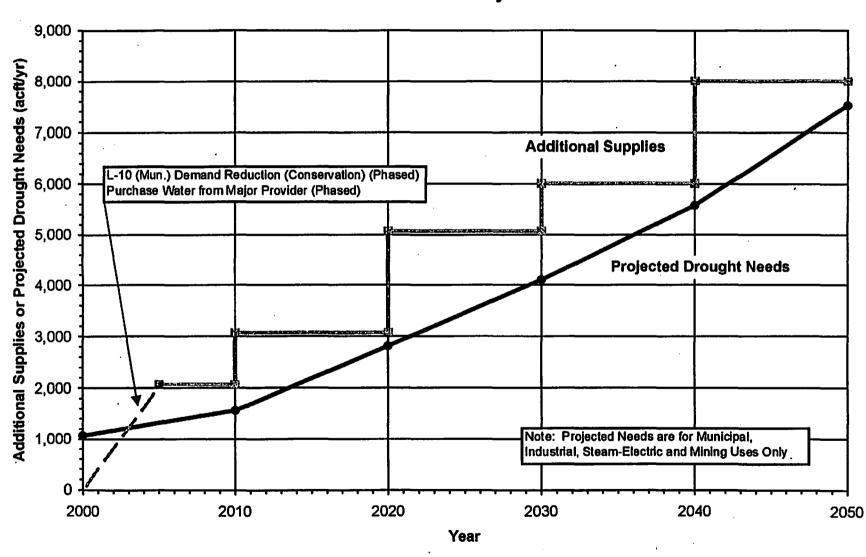
| South Co        | entral Texas Region   |                                       |               |   | j              |         | Cou   | inty = Gu   | adalupe |
|-----------------|---|---------------------------------------|---------------|---|----------------|---------|-------|-------------|---------|
| <b>County S</b> | ummary of Projected Water Needs (Shortage                     | es) and Water                         | Managen       | nent Strat                              | egies          |         |       | User Grou   |         |
| Projected !     | Water Needs (acft/yr)   |                                       |               |   |                |         |       |             |         |
| Fiolecten       | User Group(s)   | · · · · · · · · · · · · · · · · · · · | 2000          | 2010                                    | 2020           | 2030    | 2040  | 2050        | Notes   |
|                 | Municipal   |                                       | 2000          | 23                                      | 30             | 71      | 2040  | 773         | HOIES   |
|                 | Industrial  |                                       | 985           | 1,204                                   | 1,350          | 1,487   | 1,692 | 1,899       |         |
|                 | Steam-Electric  |                                       | 800           | 1,204                                   | 1,330          | 1,487   | 1,092 | 1,033       |         |
| · <del></del>   | Mining  |                                       | 198           | 198                                     | 200            | 202     | 207   | 213         |         |
|                 | Irrigation  | ·                                     | 985           | 879                                     | 779            | 684     | 594   | 508         |         |
|                 | Total Needs   |                                       | 2,195         | 2,304                                   | 2,359          | 2,444   | 2,580 | 3,393       |         |
|                 |   |                                       |               |   |                |         |       |             |         |
|                 | Mun, Ind, S-E, & Min Needs                                    |                                       | 1,210         | 1,425                                   | 1,580          | 1,760   | 1,986 | 2,885       |         |
|                 | Irrigation Needs  |                                       | 985           | 879                                     | 779            | 684     | 594   | 508         |         |
|                 |   |                                       |               |   |                |         |       |             |         |
|                 | nagement Strategies (acft/yr)                                 | Candidate .                           |               |   |                |         |       |             |         |
| ID#             | Description   | New Supply                            | 2000*         | 2010                                    | 2020           | 2030    | 2040  | 2050        | Notes   |
| L-10 (Mun.)     | Demand Reduction (Conservation)                               |                                       | 235           | 236                                     | 236            | 5       | . 5   | 6           | 1       |
| CZ-10C          | Carrizo Agulfer - Wilson & Gonzales                           | 75,000                                | 1,500         | 1,500                                   | 2,000          | 2,000   | 2,500 | 4,500       | 2, 3    |
|                 |   |                                       |               |   |                |         |       |             |         |
|                 |   |                                       |               |   |                |         |       |             |         |
|                 |   |                                       |               |   |                |         |       |             |         |
|                 |   |                                       |               |   |                |         |       |             |         |
|                 |   |                                       |               |   |                |         |       |             |         |
|                 | ·   |                                       |               |   |                |         |       |             |         |
|                 | Small Aquifer Recharge Dams                                   |                                       |               |   |                |         |       |             | 4       |
| L-10 (lrr.)     | Demand Reduction (Conservation)                               |                                       |               |   |                |         |       |             |         |
|                 |   |                                       |               |   |                |         |       |             |         |
|                 |   |                                       |               |   |                |         |       |             |         |
|                 | Total New Supplies  |                                       | 1,735         | 1,736                                   | 2,236          | 2,005   | 2,505 | 4,506       | -       |
|                 |   |                                       |               |   |                |         |       |             |         |
|                 | Total System Mgmt. Supply / Deficit                           |                                       | -460          | -568                                    | -123           | -439    | -75   | 1,113       |         |
|                 | Mun, Ind, S-E, & Min System Mgmt. Supply /                    |                                       | 525           | 311                                     | 656            | 245     | 519   | 1,621       |         |
|                 | Deficit   | '                                     | 323           | • | ****           |         | , 5.5 | ',-2.       |         |
|                 | Irrigation System Mgmt. Supply / Deficit                      |                                       | -985          | -879                                    | -779           | -684    | -594  | -508        |         |
|                 | i millation obstem white orbbid i paneit                      |                                       | -505          | -010                                    | -, 10          | -504    | -007  | -550        |         |
| Notes           |   |                                       |               |   |                |         |       |             |         |
| Notes:          | Candidate New Supplies shown for year 2000 are identified     | d for adority imple                   | mentation but | l will not be e                         | and aldelies   | diately |       |             |         |
| 1               | Demand Reduction (Conservation) strategies assumed large      |                                       |               |   | randine intime | watery. |       | <del></del> |         |
| 2               | Candidate naw supply to be shared by Bexar and Guadatu        |                                       |               |   | ls to be guest | lified  |       | <del></del> |         |
| 3               | Early Implementation of facilities assumed in cost estimation | n in ensure suffici                   | eni sunniv du | ino qualer iove                         | o to oa dagii  | u.10U.  |       |             |         |
|                 |   |                                       |               |   |                |         |       |             |         |

### Environmental/Conservation Alternative Regional Water Plan Hays County



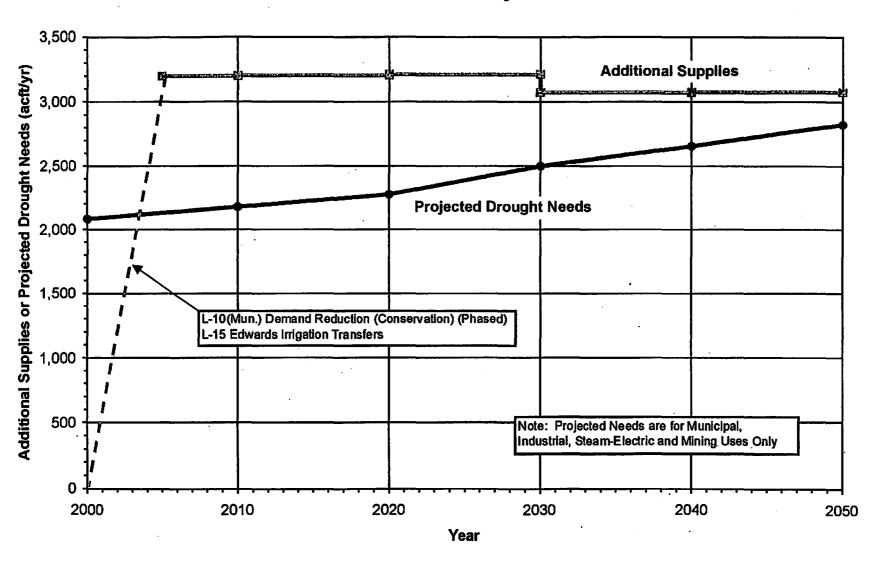
| South C     | entral Texas Region   |                       |               |               |                  |               | _        | County    | / = Hays |
|-------------|---|-----------------------|---------------|---------------|------------------|---------------|----------|-----------|----------|
| County S    | Summary of Projected Water Needs (Shortag                     | es) and Water         | Manager       | nent Strat    | egies            |               |          | User Grou |          |
| Projector   | d Water Needs (acft/yr)                                       |                       |               |               |                  |               | ì        |           | <u>.</u> |
| Fiolecter   | User Group(s)   |                       | 2000          | 2010          | 2020             | 2030          | 2040     | 2050      | Notes    |
|             |   |                       |               | 7,609         | 10,980           | 16,349        | 22,696   | 29,059    | Mores    |
|             | Municipal<br>Industrial                                       |                       | 4,325<br>0    | 7,609         | 10,980<br>0      | 10,349        | 22,090   | 29,039    |          |
|             | Steam-Electric  |                       | <del> </del>  | <del> </del>  |                  | <del></del>   | <u>v</u> | 0         |          |
|             | Mining  |                       | 84            | 82            | 68               | 55            | 37       | 28        |          |
|             | Imigation   |                       | <u>_</u>      | 0             | <u>-</u>         | 0             | 0        | 0         |          |
|             | Total Needs   |                       | 4,409         | 7,691         | 11,048           | 16,404        | 22,733   | 29,087    |          |
|             | Mun, Ind, S-E, & Min Needs                                    |                       | 4,409         | 7,691         | 11,048           | 16,404        | 22,733   | 29,087    |          |
|             | Irrigation Needs  |                       | <del></del>   | 7,001         | 0                | 0             | 0        | 20,007    |          |
|             | migation receas   |                       | U             |               |                  | U             | U        |           |          |
| Water Ma    | anagement Strategies (acft/yr)                                | Candidate             |               |               |                  |               |          |           |          |
| ID#         | Description   | New Supply            | 2000*         | 2010          | 2020             | 2030          | 2040     | 2050      | Notes    |
| L-10 (Mun.) | Demand Reduction (Conservation)                               |                       | 647           | 747           | 873              | 699           | 906      | 1,174     |          |
| SCTN-3c     | Simsboro Aquifer  | 55,000                | 4,000         | 7,000         | 10,500           | 16,000        | 22,000   | 31,000    | 2, 3     |
| G-24        | Canyon Reservoir  | 1,048                 | 1,048         | 1,048         | 1,048            | 1,048         | 1,048    | 1,048     |          |
|             |   |                       |               |               |                  |               |          |           |          |
|             |   |                       |               |               |                  |               |          |           |          |
|             |   |                       |               |               |                  |               |          |           |          |
|             |   |                       |               |               |                  |               |          |           |          |
|             |   |                       |               |               |                  |               |          |           |          |
|             | Small Aguifer Recharge Dams                                   |                       |               | l             |                  |               |          |           |          |
| L-10 (lrr.) | Demand Reduction (Conservation)                               |                       |               |               |                  |               |          |           |          |
|             |   |                       |               |               |                  |               |          |           |          |
|             | T-4-1 N O   |                       | 5 605         | 0.705         | 40 404           | 47 747        | 00.054   | 22 222    |          |
|             | Total New Supplies  |                       | 5,695         | 8,795         | 12,421           | 17,747        | 23,954   | 33,222    |          |
|             | Total System Mgmt. Supply / Deficit                           |                       | 1,286         | 1,104         | 1,373            | 1,343         | 1,221    | 4,135     |          |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /                    |                       | 1,286         | 1,104         | 1,373            | 1,343         | 1,221    | 4,135     |          |
|             | Deficit   |                       | .,200         | .,.04         | 1,5.5            | 1,040         | ','      | 4,100     |          |
|             | Irrigation System Mgmt. Supply / Deficit                      |                       | 0             | 0             | 0                | 0             | 0        | 0         | ·        |
|             | migation System mymt. Supply / Dentit                         |                       |               |               | <u></u>          | <u>VI</u>     |          |           |          |
| Notes:      |   |                       |               |               |                  | _             |          |           |          |
| •           | Candidate New Supplies shown for year 2000 are identified     | d for priority impler | nentation, bu | will not be a | vallable imme    | diately.      |          |           |          |
| 1           | Demand Reduction (Conservation) strategies assumed large      | gely reflected in pr  | ected water   | demands.      |                  |               |          |           |          |
| 2           | Candidate New Supply to be shared among Bexar, Comal,         | and Hays Countie      | s. Effects on | regional aqu  | ifer levels to I | e quantified. |          |           |          |
| 3           | Early Implementation of facilities assumed in cost estimation | n to ensure suffici   | ent supply du | ring drought. |                  |               |          |           |          |
| 4           | Candidate New Supply for Wimberley and Woodcreek.             |                       |               |               |                  |               |          |           |          |
| 5           | Option expected to provide additional water supply in many    | years, but depen-     | dable supply  | during drough | it is presently  | unquantified. |          |           |          |

# Environmental/Conservation Alternative Regional Water Plan Kendall County



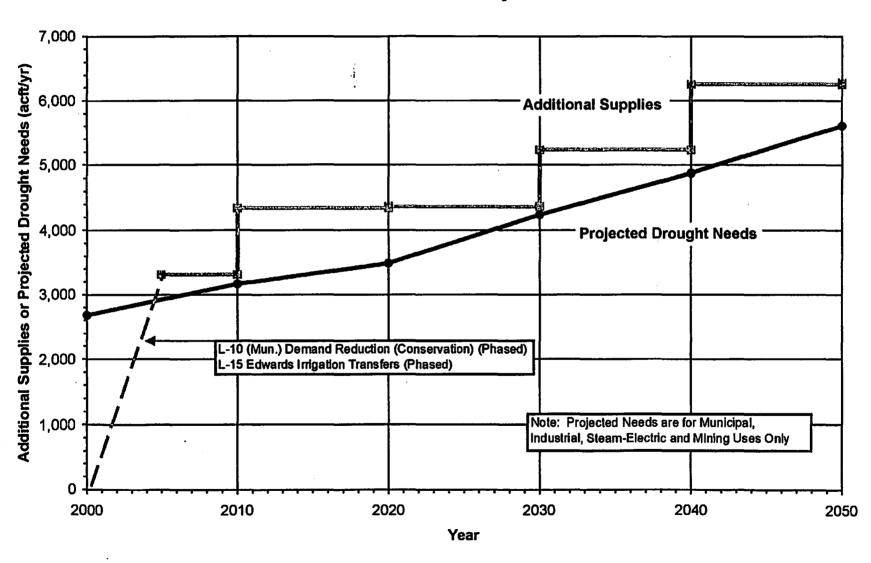
| South Ce         | entral Texas Region   |                      |                |                 |                        |               |       | County =  | Kendall |
|------------------|---|----------------------|----------------|-----------------|------------------------|---------------|-------|-----------|---------|
| County S         | ummary of Projected Water Needs (Shortage                     | es) and Water        | Managen        | nent Strate     | egles                  |               |       | User Grou |         |
|                  |   |                      |                |                 |                        |               |       |           |         |
| <u>Projected</u> | Water Needs (acft/yr)   |                      |                |                 |                        |               |       |           |         |
|                  | User Group(s)   |                      | 2000           | 2010            | 2020                   | 2030          | 2040  | 2050      | Notes   |
|                  | Municipal   |                      | 1,070          | 1,560           | 2,808                  | 4,099         | 5,578 | 7,518     |         |
|                  | Industrial  |                      | 2              | 3               | 4                      | 4             | 5     | 6         |         |
|                  | Steam-Electric  |                      | 0              | 0               | 0                      | 0             | 0     | 0         |         |
|                  | Mining  |                      | 0              | 0               | 0                      | 0             | O     | 0         |         |
|                  | Irrigation  |                      | 0              | 0               | 0                      | 0             | 0     | 0         |         |
|                  | Total Needs   |                      | 1,072          | 1,563           | 2,812                  | 4,103         | 5,583 | 7,524     |         |
|                  | Mun, Ind, S-E, & Min Needs                                    |                      | 1,072          | 1,563           | 2,812                  | 4,103         | 5,583 | 7,524     | _       |
|                  | Irrigation Needs  |                      | 0              | 0               | 0                      | 0             | 0     | 0         |         |
| Mater Ma         | nagement Strategies (acft/yr)                                 | Candidate            |                |                 |                        |               |       |           |         |
| ID#              | Description   | New Supply           | 2000*          | 2010            | 2020                   | 2030          | 2040  | 2050      | Notes   |
| L-10 (Mun.)      | Demand Reduction (Conservation)                               |                      | 67             | 71              | 71                     | 11            | 11    | 11        |         |
|                  | Purchase Water from Major Provider                            |                      | 2,000          | 2,000           | 3,000                  | 5,000         | 6,000 | 8,000     | 2, 3    |
|                  |   |                      |                |                 |                        |               |       |           |         |
|                  |   |                      |                |                 |                        |               |       |           |         |
| SCTN-4           | Brush Management  |                      |                |                 |                        |               |       |           |         |
| SCTN-5           | Weather Modification  |                      |                |                 |                        |               |       |           | -       |
| SCTN-9           | Reinwater Harvesting Small Aquifer Recharge Dams              |                      |                | }               |                        | ·             |       |           |         |
| L-10 (lrr.)      | Demand Reduction (Conservation)                               |                      |                |                 |                        |               |       |           |         |
| L-10 (III.)      | Total New Supplies  |                      | 2,067          | 2,071           | 3,071                  | 5,011         | 6,011 | 8,011     |         |
|                  |   |                      |                |                 |                        |               |       |           |         |
|                  | Total System Mgmt. Supply / Deficit                           |                      | 995            | 508             | 259                    | 908           | 428   | 487       |         |
| •                | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit         |                      | 995            | 508             | 259                    | 908           | 428   | 487       |         |
|                  | Irrigation System Mgmt. Supply / Deficit                      |                      | 0              | 0               | 0                      | Ō             | 0     | 0         |         |
| Notes:           |   |                      |                |                 |                        |               |       |           |         |
| •                | Candidate New Supplies shown for year 2000 are identified     |                      |                |                 | vailable imme          | diately.      |       |           |         |
| 1                | Demand Reduction (Conservation) strategies assumed large      | gely reflected in pr | rojected water | demands.        |                        |               |       |           |         |
| 2                | Assumed purchase from Bexar County major provider. Ke         | ndall County wate    | r needs are n  | ot reflected in | <b>Bexar Count</b>     | y table.      |       |           |         |
| 3                | Early implementation of facilities assumed in cost estimation |                      |                |                 | l                      |               |       |           |         |
| 4                | Option expected to provide additional water supply in many    | y years, but depen   | dable supply   | during drough   | <u>nt is presently</u> | unquantified. |       |           |         |

### Environmental/Conservation Alternative Regional Water Plan Medina County



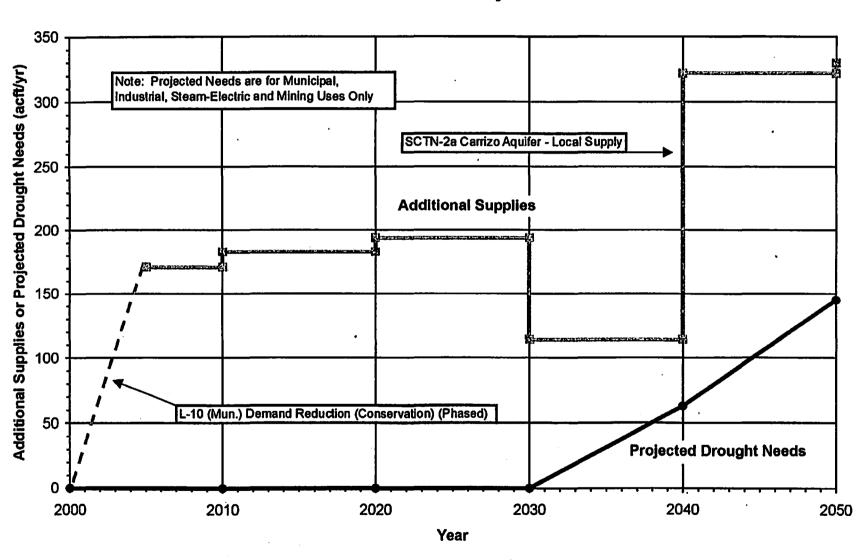
| South C         | entral Texas Region   |                      |               |                 |                                       |   | (        | County =   | Medina            |
|-----------------|---|----------------------|---------------|-----------------|---------------------------------------|---|----------|------------|-------------------|
| <b>County S</b> | Summary of Projected Water Needs (Shortag                     | es) and Water        | Manager       | nent Strate     | gies                                  |   |          | Jser Grou  |                   |
| Proloctor       | d Water Needs (acft/yr)                                       |                      |               |                 |                                       |   |          |            | · · · · · · · · · |
| Projected       | User Group(s)   |                      | 2000          | 2010            | 2020                                  | 2030                                    | 2040     | 2050       | Notes             |
|                 | Municipal   |                      | 2,015         |                 |                                       | 2,427                                   | 2,582    |            | Notes             |
|                 | Industrial  |                      | 2,015         |                 | 2,206<br>0                            | 2,921                                   | 2,582    | 2,750<br>0 |                   |
|                 | Steam-Electric  |                      | 0             |                 | <u>ö</u>                              | <del></del>                             | 0        | 0          |                   |
|                 | Mining  |                      | 68            | 68              | 70                                    | 72                                      | 74       | 76         |                   |
|                 | Irrigation  |                      | 98,916        |                 | 91,320                                | 92,320                                  | 88,925   | 84,692     |                   |
|                 | Total Needs   |                      | 100,999       | 97,446          | 93,596                                | 94,819                                  | 91,581   | 87,518     |                   |
|                 | Mun, Ind, S-E, & Min Needs                                    |                      | 2.083         |                 | 2,276                                 | 2,499                                   | 2,656    | 2,826      |                   |
|                 | Irrigation Needs  |                      | 98,916        |                 | 91,320                                |   | 88,925   | 84,692     |                   |
|                 |   |                      |               | 55,200          | 01,000                                | Ų D Į O Ū O                             | 00,000   | 0 1,002    |                   |
| Water Ma        | anagement Strategles (acft/yr)                                | Candidate            |               |                 |                                       |   |          |            |                   |
| ID#             | Description   | New Supply           | 2000*         | 2010            | 2020                                  | 2030                                    | 2040     | 2050       | Notes             |
| L-10 (Mun.)     | Demand Reduction (Conservation)                               |                      | 200           | 205             | 211                                   | 73                                      | 76       | 78         | 1                 |
| L-15            | Edwards Irrigation Transfers                                  | 81,000               | 3,000         | 3,000           | 3,000                                 | 3,000                                   | 3,000    | 3,000      | 2, 3              |
|                 |   |                      |               |                 |                                       |   |          |            |                   |
|                 | · · · · · · · · · · · · · · · · · · ·                         |                      |               |                 |                                       |   |          |            |                   |
|                 |   |                      |               |                 |                                       |   |          |            |                   |
|                 |   |                      |               | [I              |                                       |   |          |            |                   |
|                 |   |                      |               | ļI              |                                       |   |          |            |                   |
| SCTN-4          | Brush Management  |                      |               |                 |                                       |   |          |            |                   |
| SCTN-5          | Weather Modification  |                      |               |                 | · · · · · · · · · · · · · · · · · · · | • |          |            |                   |
| SCTN-9          | Rainwater Harvesting  |                      |               | <del></del>     |                                       |   |          |            |                   |
| 5,5,111         | Small Aquifer Recharge Dams                                   |                      |               |                 |                                       |   | -        |            | 4                 |
| L-10 (irr.)     | Damand Reduction (Conservation)                               |                      | 11,867        | 11,867          | 11,867                                | 11,887                                  | 11,867   | 11,867     | 5                 |
|                 | Total New Supplies  | -                    | 15,067        |                 | 15,078                                | 14,940                                  | 14,943   | 14,945     |                   |
|                 |   |                      |               | 10,012          | 10,010                                | 7 7/0 10                                | 1 1,0 10 | 1 1,5 10   |                   |
|                 | Total System Mgmt. Supply / Deficit                           |                      | -85,932       | -82,374         | -78,518                               | -79,879                                 | -76,638  | -72,573    |                   |
|                 | Mun, Ind, S-E, & Min System Mgmt. Supply /                    | ** *********         | 1,117         |                 | 935                                   | 574                                     | 420      | 252        |                   |
|                 | Deficit   |                      | .,            | ',•=-           |                                       |   |          |            |                   |
|                 | Irrigation System Mgmt. Supply / Deficit                      |                      | -87,049       | -83,401         | -79,453                               | -80,453                                 | -77,058  | -72,825    |                   |
|                 | inigation System ingint: Supply / Delicit                     |                      | -01,049       | -03,401         | -19,433                               | -00,433                                 | -77,030  | 72,023     |                   |
| Notes:          |   |                      |               |                 |                                       |   |          |            |                   |
| •               | Candidate New Supplies shown for year 2000 are identifie      | d for priority imple | nentation, hu | l will not be a | railable imme                         | dialety.                                |          |            |                   |
| 1               | Demand Reduction (Conservation) strategies assumed lar        |                      |               |                 |                                       |   | t        |            |                   |
| 2               | Candidate New Supply to be shared among Uvalde, Medir         |                      |               |                 | y not be rella                        | able in drougt                          | 11.      |            |                   |
| 3               | Pursuant to draft EAA Critical Period Management rules, C     | andidate New Sur     | ply represen  | ls approximat   | ely 85 percen                         | it of                                   |          |            |                   |
|                 | the estimated maximum potential annual transfer (95,430 a     | acft) based on Pro   | posed Permit  | s prorated to   | 100,000 acft/                         | ır.                                     |          |            |                   |
| 4               | Option expected to provide additional water supply in man     | y years, but depen   | dable supply  | during drough   | it is presently                       | unquantified                            |          |            |                   |
| 5               | Estimates based upon use of LEPA systems on 80 percen         |                      |               |                 | lion at 40 per                        | cent of irrigat                         | ion      |            |                   |
|                 | application rate, but applicable to only 50 percent of Edward | rds Aquiler imigatio | n permitted o | uantities.      |                                       | <u> i</u>                               | I        |            |                   |

### Environmental/Conservation Alternative Regional Water Plan Uvalde County



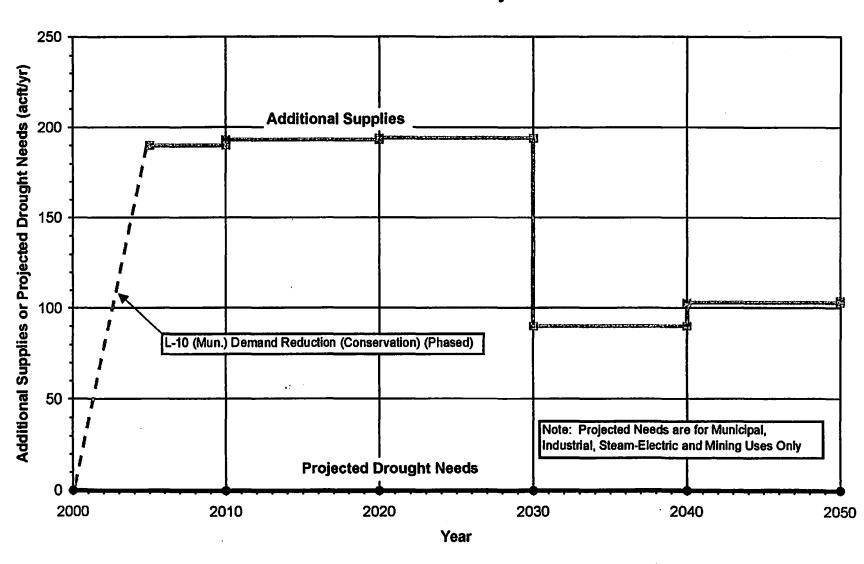
| South C      | entral Texas Region   |                     |               |                 |                 |                  |            | County =  | - Uvalde    |
|--------------|---|---------------------|---------------|-----------------|-----------------|------------------|------------|-----------|-------------|
|              | ummary of Projected Water Needs (Shortag                      | es) and Water       | Manager       | nent Strat      | egies           |                  | 1          | User Grou |             |
| Projector    | l Water Needs (acft/yr)                                       |                     |               |                 | 1               |                  |            |           |             |
| riojected    | User Group(s)   |                     | 2000          | 2010            | 2020            | 2030             | 2040       | 2050      | Notes       |
|              | Municipal   |                     | 2,682         | 3,166           | 3,493           | 4,241            | 4,880      | 5,609     | MOTES       |
|              | Industrial  |                     | 2,002         | 3, 100          | 3,483           | 4,241            | 4,880<br>0 | 0         |             |
|              | Steam-Electric  |                     | ŏ             | ŏ               | - 0             | <del>~ ~</del> i | <u>0</u>   | - 6       |             |
|              | Mining  |                     | ŏ             | 0               | <del> </del>    | <del>ŏ</del> l   | ŏ          | ŏ         |             |
|              | Irrigation  |                     | 75,263        | 72,798          | 70,154          | 71,022           | 68,880     | 65,676    |             |
|              | Total Needs   |                     | 77,945        | 75,964          | 73,647          | 75,263           | 73,760     | 71,285    |             |
|              | Mun, Ind, S-E, & Min Needs                                    |                     | 2,682         | 3,166           | 3,493           | 4,241            | 4,880      | 5,609     |             |
|              | Irrigation Needs  |                     | 75,263        | 72,798          | 70,154          | 71,022           | 68,880     | 65,676    |             |
|              |   |                     |               |                 |                 |                  |            |           |             |
|              | nagement Strategies (acft/yr)                                 | Candidate           |               |                 | 1               |                  |            |           |             |
| ID#          | Description   | New Supply          | 2000*         | 2010            | 2020            | 2030             | 2040       | 2050      | Notes       |
| L-10 (Mun.)  | Demand Reduction (Conservation)                               |                     | 318           | 346             | 371             | 235              | 258        | 283       | 1           |
| L-15         | Edwards Irrigation Transfers                                  | 81,000              | 3,000         | 4,000           | 4,000           | 5,000            | 5,000      | 6,000     | 2, 3, 4     |
|              |   |                     |               |                 |                 |                  |            |           |             |
|              |   | _                   |               |                 |                 |                  |            |           |             |
| SCTN-4       | Brush Management  |                     |               |                 |                 |                  |            |           | 5           |
| SCTN-5       | Weather Modification  |                     |               |                 |                 |                  |            |           | 5           |
| SCTN-9       | Rainwater Harvesting  |                     |               |                 |                 |                  |            |           | 5           |
|              | Small Aquifer Recharge Dams                                   |                     |               |                 |                 |                  |            |           | 5           |
| L-10 (in.)   | Demand Reduction (Conservation)                               |                     | 14,143        |                 | 14,143          | 14,143           | 14,143     | 14,143    | 6           |
|              | Total New Supplies  |                     | 17,461        | 18,489          | 18,514          | 19,378           | 19,401     | 20,426    |             |
|              | Total System Mgmt. Supply / Deficit                           |                     | -60,484       | -57,475         | -55,133         | -55,885          | -54,359    | -50,859   |             |
|              | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit         |                     | 636           | 1,180           | 878             | 994              | 378        | 674       | ·           |
|              | Irrigation System Mgmt. Supply / Deficit                      | _                   | -61,120       | -58,655         | -56,011         | -56,879          | -54,737    | -51,533   |             |
| Notes:       |   |                     |               |                 |                 |                  |            |           |             |
| Notes:       | Candidate New Supplies shown for year 2000 are identifie      | d for adarity imale | mentation by  | t will not be a | vollable imme   | diolohe          |            |           |             |
| 1            | Demand Reduction (Conservation) strategies assumed large      |                     |               |                 | Vanaule intime  | ulately.         |            |           | <del></del> |
| <del></del>  | Candidate New Supply to be shared among Uvalde, Medir         |                     |               |                 | av not ha relis | ble in drough    | nt l       |           |             |
| 3            | Pursuant to draft EAA Critical Period Management rules, C     | andidate New Sur    | ooly represen | le approximat   | ely 85 percen   | 1 of             | **         |           |             |
| <del>-</del> | the estimated maximum potential annual transfer (95,430 a     |                     |               |                 |                 |                  |            |           |             |
| 4            | Early implementation of facilities assumed in cost estimation |                     |               |                 |                 |                  |            |           |             |
| 5            | Option expected to provide additional water supply in many    |                     |               |                 | it is presently | unquantified     |            |           |             |
| 6            | Estimates based upon use of LEPA systems on 80 percent        |                     |               |                 | tion at 40 per  | cent of irrigat  | ion        |           |             |
|              | application rate, but applicable to only 50 percent of Edwar  | ds Aquifer imigatio | n permitted q | uantities.      |                 |                  |            |           |             |

# Environmental/Conservation Alternative Regional Water Plan Wilson County

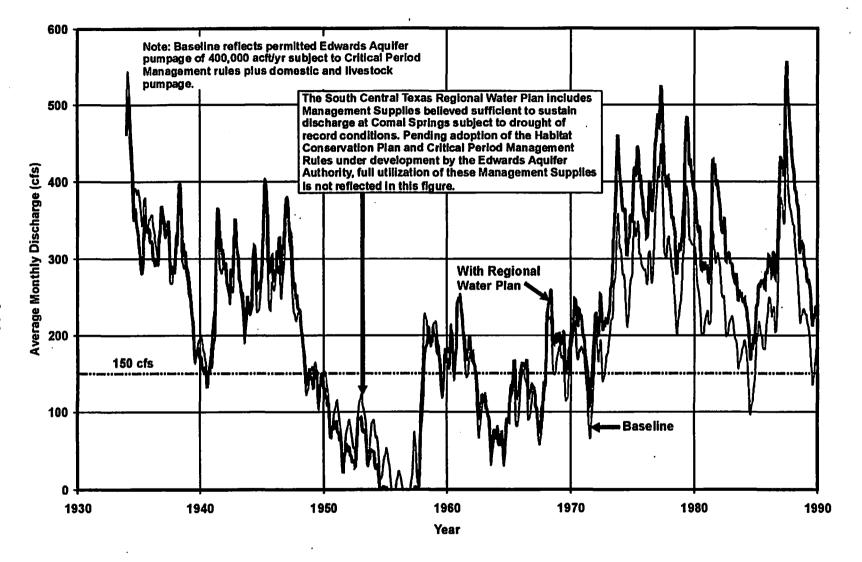


| South C     | entral Texas Region  |                  |              |               |                        |              |             | County =  | - Wilsor |
|-------------|--|------------------|--------------|---------------|------------------------|--------------|-------------|-----------|----------|
|             | ummary of Projected Water Needs (Shortage  | s) and Water     | Managen      | nent Strate   | gles                   |              |             | User Grou |          |
| Duelesta    | 100 A Al d d   |                  | 1            | 1             |                        |              |             |           |          |
| Projected   | Water Needs (acft/yr)  |                  |              |               |                        |              |             |           | ** -     |
|             | User Group(s)  |                  | 2000         | 2010          | 2020                   | 2030         | 2040        | 2050      | Notes    |
|             | Municipal  |                  | 0            |               | 0                      | 0            |             | 145       |          |
|             | Industrial   |                  | 0            |               | 0                      | 0            | 0           | 0         |          |
|             | Steam-Electric   |                  | 0            |               | 0                      | 0            | <u> </u>    | 0         |          |
|             | Mining   |                  | 0            |               | 0                      | 0            |             | 0         |          |
|             | Irrigation   |                  | 0            |               | 0                      | 0            |             | 0         |          |
|             | Total Needs  |                  | 0            |               | 0                      | 0            |             | 145       |          |
|             | Mun, Ind, S-E, & Min Needs   |                  | 0            | 0             | 0                      | 0            | 63          | 145       |          |
|             | Irrigation Needs   |                  | Ō            | 0             | 0                      | 0            | 0           | 0         | -        |
| Mateu Me    | no no mont Chroto plan (a dilum)   | Condition        |              |               |                        |              |             |           |          |
| vvater ma   | nagement Strategles (acft/yr)  | Candidate        |              |               |                        |              | <del></del> |           |          |
| ID#         | Description  | New Supply       | 2000         | 2010          | 2020                   | 2030         | 2040        | 2050      | Notes    |
| L-10 (Mun.) | Demand Reduction (Conservation)  |                  | 171          | 183           | 194                    | 114          | 122         | 130       |          |
| SCTN-2a     | Carrizo Aquifer - Local Supply   |                  |              |               |                        |              | 200         | 200       |          |
|             |  |                  |              |               |                        |              |             |           |          |
| ·           |  |                  |              |               |                        |              |             |           |          |
|             |  |                  |              | <u> </u>      |                        |              |             |           |          |
|             | <u> </u>   |                  | <b> </b>     | l             |                        |              |             |           |          |
|             |  |                  | ļ            |               |                        |              |             |           |          |
|             |  | <del></del>      |              | ļ             |                        |              | ···         |           |          |
| SCTN-4      | Brush Management   |                  |              |               |                        |              |             |           |          |
| SCTN-5      | Weather Modification   |                  |              | ļ             |                        |              |             |           |          |
| SCTN-9      | Rainwater Harvesting   |                  |              |               |                        |              |             |           |          |
| 10 //       | Small Aquifer Recharge Dams Demand Reduction (Conservation)                                      |                  |              | l             |                        |              |             | ———       |          |
| L-10 (lrr.) |  |                  | 4-4          | 400           |                        | 444          |             | 200       |          |
| ,           | Total New Supplies   | · _              | 171          | 183           | 194                    | 114          | 322         | 330       |          |
|             | Total System Mgmt. Supply / Deficit  |                  | 171          | 183           | 194                    | 114          | 259         | 185       |          |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /   |                  | 171          | 183           | 194                    | 114          | 259         | 185       |          |
|             | Deficit  |                  | '''          | 103           | 194                    | 117          | 255         | .03       |          |
|             | Irrigation System Mgmt. Supply / Deficit   |                  | 0            | 0             | 0                      | 0            | 0           | 0         |          |
|             |  |                  |              |               |                        |              |             |           |          |
| Notes:      |  |                  | لبببا        | اـــــا       |                        |              |             |           |          |
| <u> </u>    | Demand Reduction (Conservation) strategies assumed largely reflected in projected water demands. |                  |              |               |                        |              |             |           |          |
| 2           | Additional well(s) for Floresville.  | ·                | لـــــا      | <u> </u>      | <del></del>            |              |             |           |          |
| 3           | Option expected to provide additional water supply in man  | years, but depen | dable supply | driving group | <u>it is presently</u> | unquantified | l           | <u>i</u>  |          |

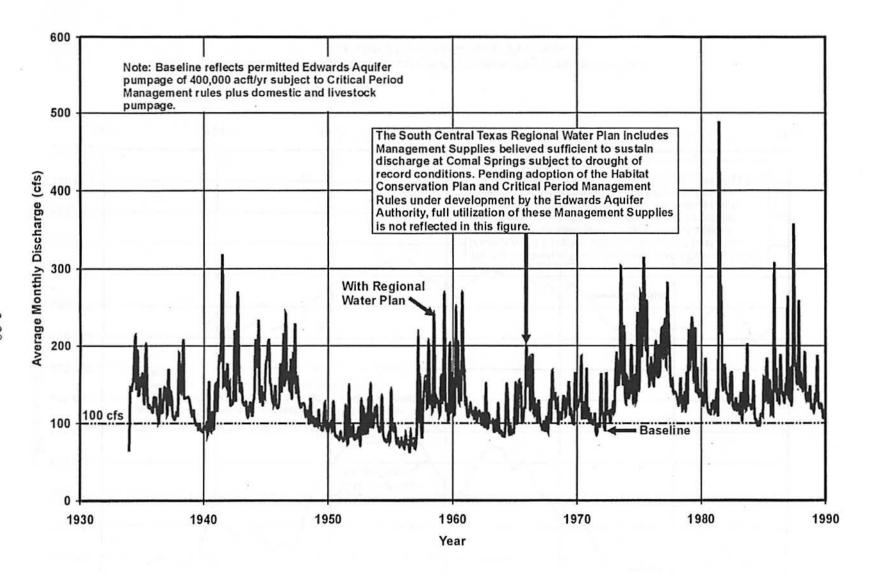
# Environmental/Conservation Alternative Regional Water Plan Zavala County



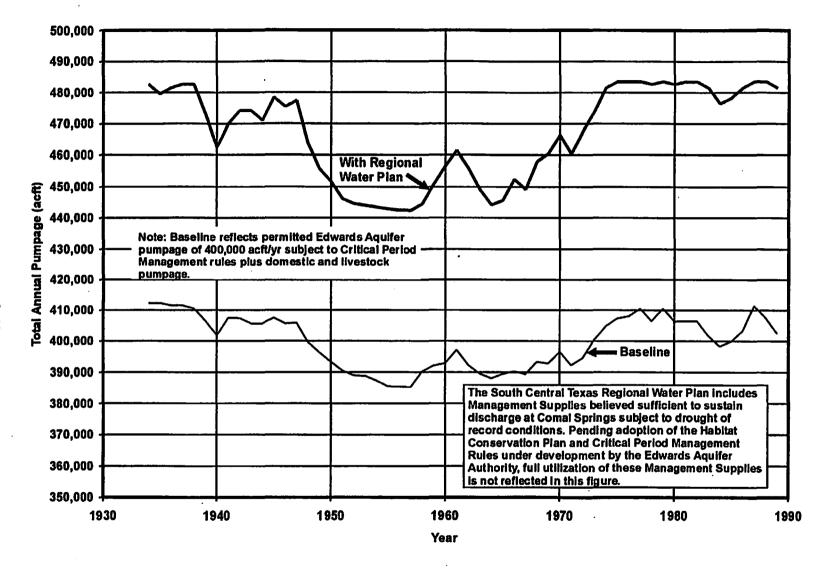
| South Co    | entral Texas Region   |                    |              |               |                |                 |         | County:      | = Zavala   |
|-------------|---|--------------------|--------------|---------------|----------------|-----------------|---------|--------------|------------|
| County S    | ummary of Projected Water Needs (Shorta   | ges) and Wat       | er Manag     | ement Str     | ategles        |                 |         | Jser Grou    | p(s) = all |
| Projected   | Water Needs (acft/yr)   |                    |              |               |                | -               |         |              |            |
| . 70,0000   | User Group(s)   |                    | 2000         | 2010          | 2020           | 2030            | 2040    | 2050         | Notes      |
|             | Municipal   |                    | 0            |               | 0              | 0               | 0       |              | 110165     |
|             | Industrial  |                    |              |               | <del></del>    | <del>\</del>    | 0       | <del>-</del> |            |
|             | Steam-Electric  |                    | ŏ            |               | <u>ŏ</u>       | <u>ŏ</u>        | ŏ       | i – š        |            |
|             | Mining  |                    | Ō            |               | Ö              | Ö               | Ö       |              |            |
|             | Irrigation  |                    | 80,722       | 76,589        | 72,655         | 88,293          | 84,673  |              |            |
|             | Total Needs   |                    | 80,722       | 76,589        | 72,655         | 88,293          | 84,673  |              |            |
|             | Mun, Ind, S-E, & Min Needs  |                    | 00,7.22      | 70,000        | , <u>1,000</u> | 00,200          | 04,070  | 0,,200       |            |
|             | irrigation Needs  |                    | 80,722       | 76,589        | 72,655         | 88,293          | 84,673  | 81,200       |            |
|             |   |                    |              |               |                |                 |         |              |            |
| Water Ma    | nagement Strategies (acft/yr)   | Candidate          |              |               |                |                 |         |              |            |
| ID#         | Description   | New Supply         | 2000         | 2010          | 2020           | 2030            | 2040    | 2050         | Notes      |
| L-10 (Mun.) | Demand Reduction (Conservation)   |                    | 190          | 193           | 194            | 80              | 103     | 104          | 1          |
|             |   |                    |              |               |                |                 |         |              |            |
|             |   |                    |              |               |                |                 |         |              |            |
|             |   |                    |              |               |                |                 |         |              |            |
|             |   |                    |              |               |                |                 |         |              |            |
|             |   |                    |              |               |                |                 |         |              |            |
|             |   |                    |              |               |                |                 |         |              |            |
| -           |   |                    |              |               |                |                 |         |              |            |
| SCTN-4      | Brush Menagement  |                    |              |               |                |                 |         |              | 2          |
| SCTN-5      | Weather Modification  |                    |              |               |                |                 |         |              | 2          |
| SCTN-9      | Rainwater Harvesting  |                    |              |               |                |                 |         |              | 2          |
| L-10 (lrr.) | Small Aquifer Recharge Dams Demand Reduction (Conservation)   |                    | 6,401        | 6,401         | 6,401          | 8,401           | 8,401   | 0.404        | 2          |
| L-10 (III.) |   |                    |              |               |                |                 |         | 6,401        | 3          |
| w.t.        | Total New Supplies  |                    | 6,591        | 6,594         | 6,595          | 6,491           | 6,504   | 6,505        |            |
|             | Total System Mgmt. Supply / Deficit   |                    | -74,131      | -69,995       | -66,060        | -81,802         | -78,169 | -74,695      |            |
| Mun         | , Ind, S-E, & Min System Mgmt. Supply / Deficit   |                    | 190          | 193           | 194            | 90              | 103     | 104          |            |
|             | Irrigation System Mgmt. Supply / Deficit  |                    | -74,321      | -70,188       | -66,254        | -81,892         | -78,272 |              |            |
|             |   |                    |              |               |                |                 |         |              |            |
| Notes:      |   |                    |              |               |                |                 |         |              |            |
| 1           | Demand Reduction (Conservation) strategies assumed la   | rgely reflected in | projected wa | ler demands.  |                |                 |         |              |            |
| 2           | Option expected to provide additional water supply in many years, but dependable supply during drought is presently unquantified. |                    |              |               |                |                 |         |              |            |
| 3           | Estimates based upon use of LEPA systems on 50 perce  | nt of acreages imi | ated in 1997 | , with conser | vation at 20   | percent of Irri | gation  |              |            |
|             | application rate.   |                    |              |               |                |                 |         |              |            |



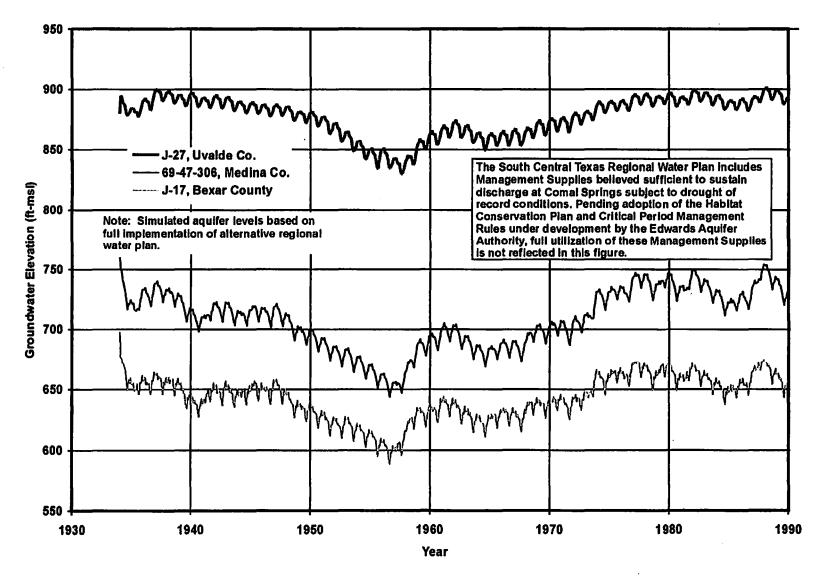
Environmental/Conservation Alternative Regional Water Plan Simulated Comal Springs Discharge



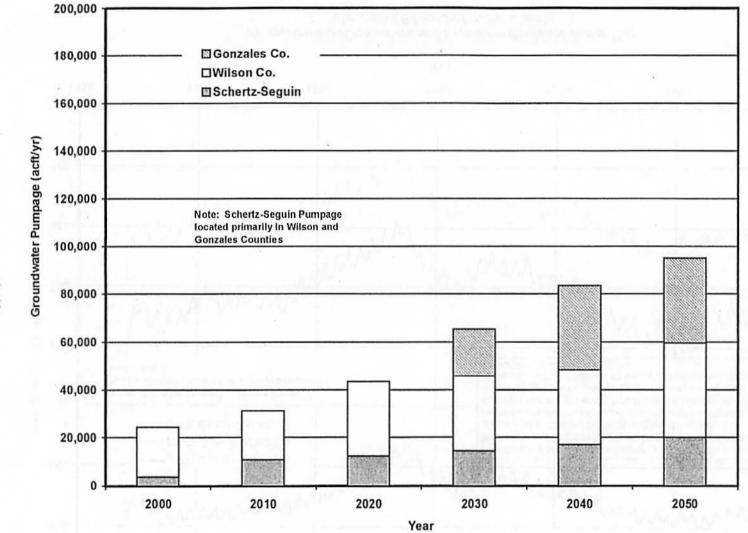
Environmental/Conservation Alternative Regional Water Plan Simulated San Marcos Springs Discharge



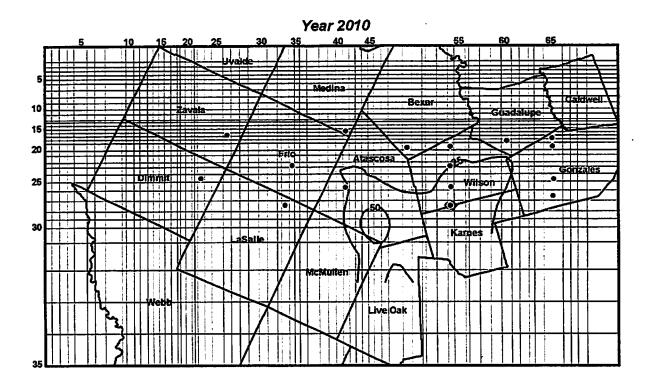
Environmental/Conservation Alternative Regional Water Plan Simulated Edwards Aquifer Pumpage

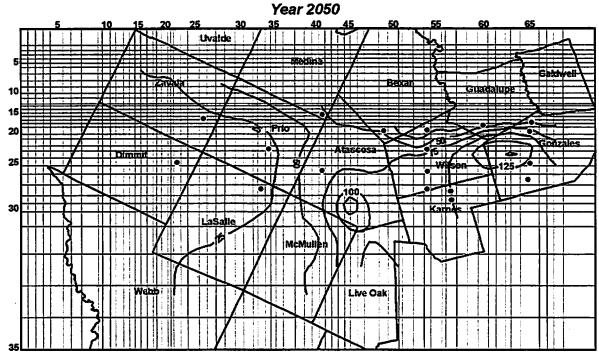


Environmental/Conservation Alternative Regional Water Plan Simulated Edwards Aquifer Levels



Environmental/Conservation Alternative Regional Water Plan Additional Carrizo Groundwater Pumpage

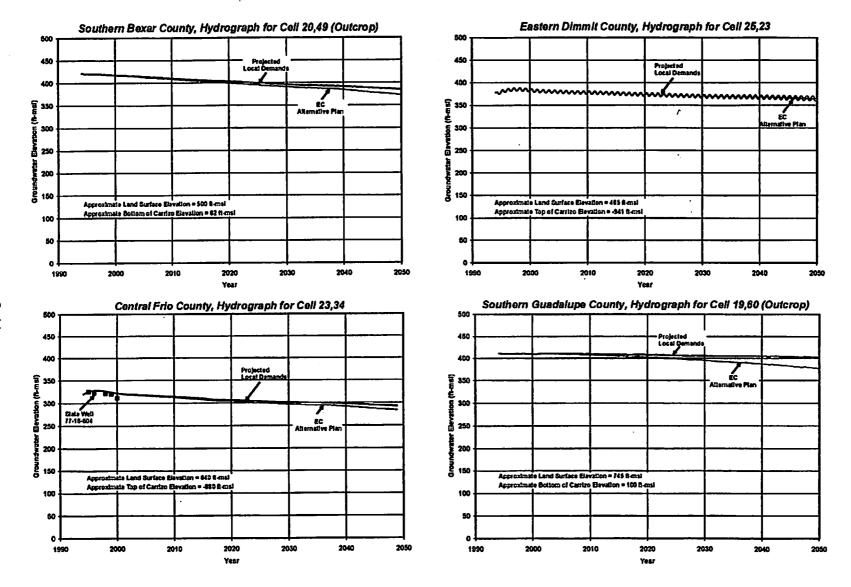




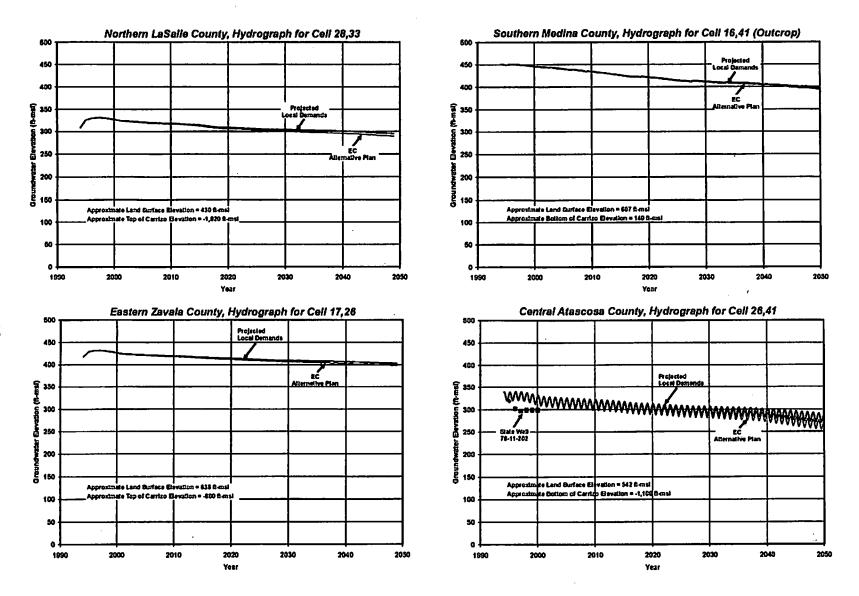
Note: Drawdown is referenced to simulated 1994 aquifer levels and includes both projected local demands and development of water supply options in this alternative regional water plan.

Monitoring Well Location

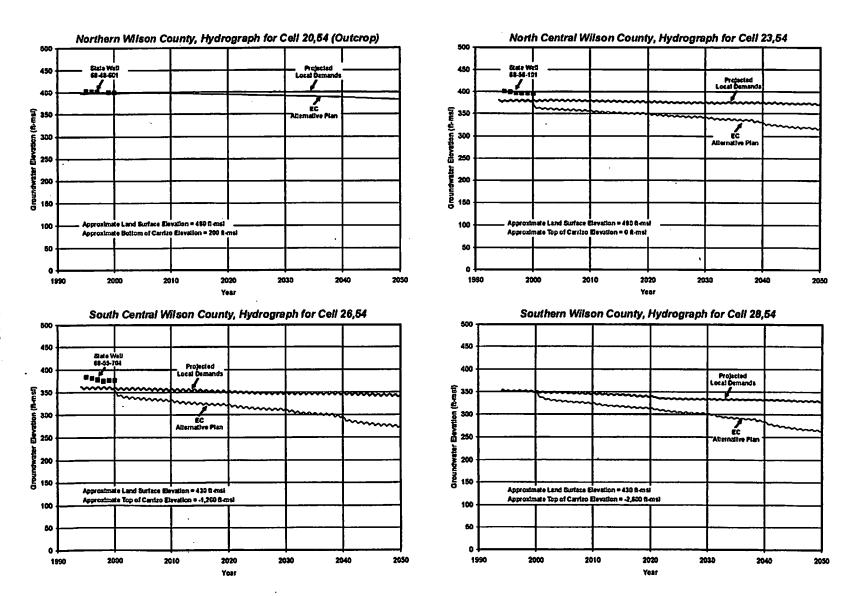
Environmental/Conservation Alternative Regional Water Plan Simulated Carrizo Aquifer Drawdown



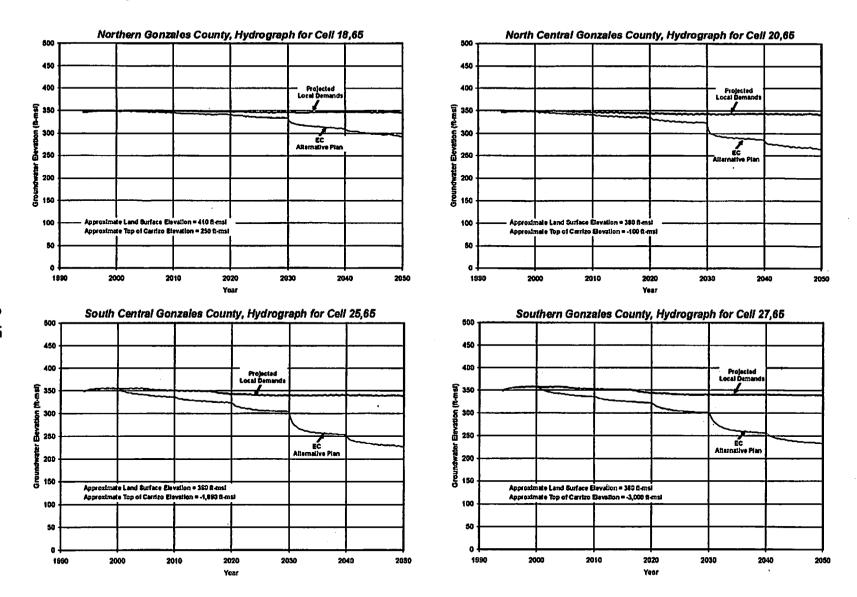
Environmental/Conservation Alternative Regional Water Plan - Carrizo Aquifer



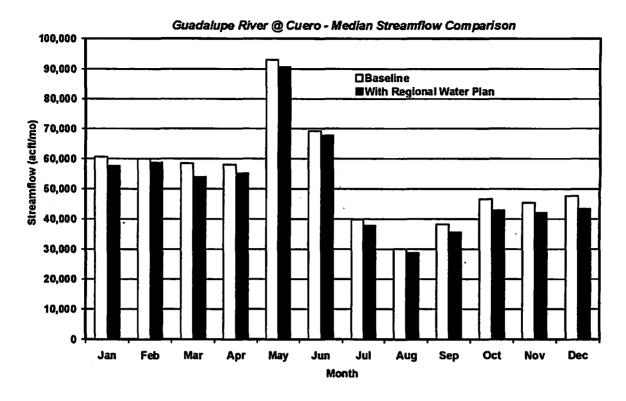
Environmental/Conservation Alternative Regional Water Plan - Carrizo Aquifer

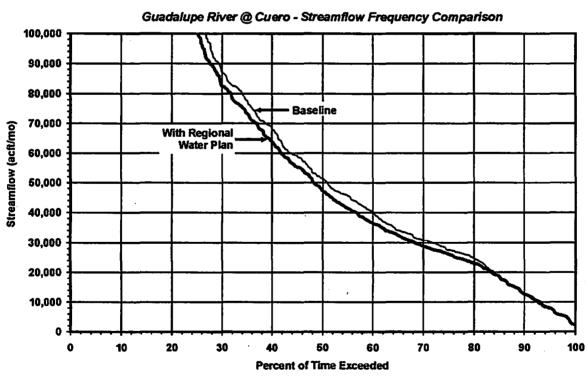


Environmental/Conservation Alternative Regional Water Plan - Carrizo Aquifer

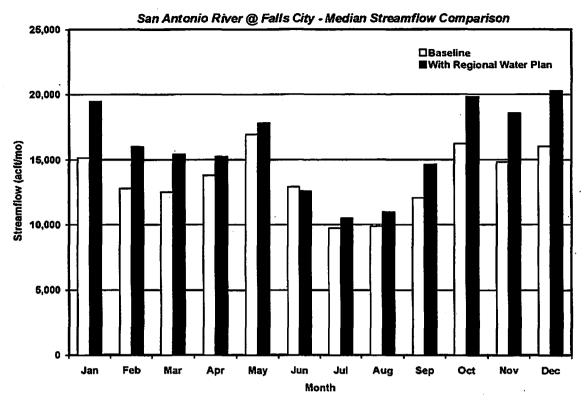


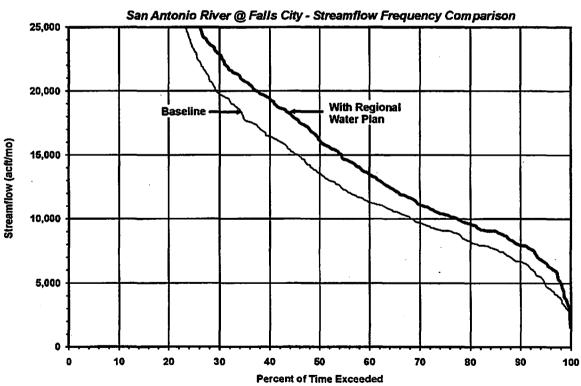
Environmental/Conservation Alternative Regional Water Plan - Carrizo Aquifer



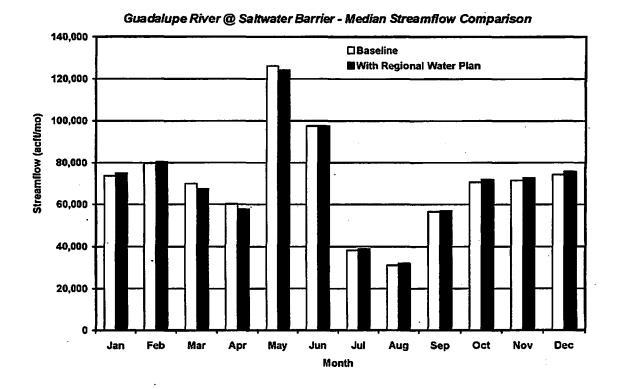


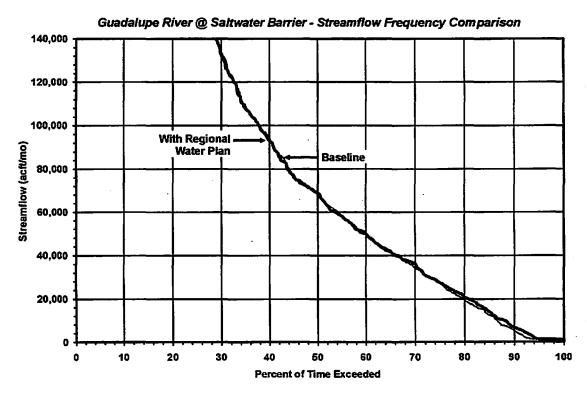
Environmental/Conservation Alternative Regional Water Plan Streamflow Comparisons





Environmental/Conservation Alternative Regional Water Plan Streamflow Comparisons





Environmental/Conservation Alternative Regional Water Plan Streamflow Frequency Comparisons

| ·   | <u> </u>   | <del>,</del>   |  |   |               | i                       |                     |   |              |  | ·  | <del></del>    | 1                          | 1                         | 1                          |  |              |
|---|--|--|--|---|---------------|-------------------------|---------------------|---|--------------|--|--|----------------|----------------------------|---------------------------|----------------------------|--|--------------|
| South Central Texas Regi                                |  |  | ļ  | <del> </del>                            | <u> </u>      |                         | <del></del>         | <del>:</del>                                  | <del>!</del> |  | <u></u>  | !              | <del></del>                | <u></u>                   |                            |  | <del> </del> |
| Water Supply Option Sum                                 | mary" RTED BY ENVIRONMENTAL COMPOSITE AVERAGE)   | <del> </del>   | <del> </del>   | <del> </del>                            | <del></del>   | <del></del>             | <del> </del>        | 1   | <del></del>  |  | <del> </del>                                     | <del> </del>   | <del> </del>               | <del></del>               | <u> </u>                   | <del>                                     </del> | <del></del>  |
| Environmental Matrix (50                                | KIED BY ENVIRONMENTAL COMPOSITE AVERAGE)   | <u> </u>   | <u> </u>   |   | 1             |                         |                     |   |              |  |  | <del> </del>   |                            | <u> </u>                  |                            | <u> </u>   |              |
|   |  | Type of Water Supply Option  |  | ndangered                               | Unique Stream | litative Measure Bavs A | s of Environment    | riparian                                      |              |  | Water  |                | Environmental<br>Composite | Efficiency /<br>Unit Cost | Quantity of Water          | Time to<br>Implement                             | Impacted     |
| Row Section Option No. No.                              | Water Supply Options   | Type of Water Supply Option  | Type of Water Supply                                   | Species                                 | Segment       | Estuaries               | Flows               | Forests                                       |              |  |  | Sustainability |                            |                           |                            | (years)  |              |
| 15 1.10 ISCTN-17 Desatinat                              | Treated Water Supply Options   | Land Constant Control  | Tenand History Daliment                                |   | 1 1           | 1                       | 1                   | 11 11   | 1            | 1  |  | 11             | 1 1.0                      | 564                       | 476                        | 1 10 5   |              |
|   | tion of Bradosh Groundwater<br>Reservoir Water Released to Lake Notite - Treated Water to Distribution System or Recharge Zone   | Local/Conservation/Reuse/Exchange<br>Existing Reservoirs               | Treated Water Distributed                              |   | 1             |                         | 1                   | 1   | 1            |  |  | 1              | 1 1,0                      | 672                       | 15,000<br>125,000          | 1 to 5   |              |
|   | River in Colorado County - Buy Stored Water and Imgation Rights: Firm Yield<br>be River Oliversion at Gonzales to Mid-Cities and/or Major Water Providers, with Regional Water Treatment Plant   | River Diversion with Storage River Diversion with Storage              | Treated Water Distributed Treated Water Delivered      | <del> </del>                            |               | <del> </del>            |                     |   | <del> </del> |  | <del> </del>                                     | 11             | 1 1.0                      | 736                       | 29,217                     | 1105   | <u> </u>     |
| 40 4.4 C-13C Colorado                                   | River at Bastrop - Purchase of Stored Water - Firm Yield   | Existing Reservoirs  | Treated Water Distributed                              | ‡ <del></del> ;                         |               |                         | 1                   | 1   | 1            |  |  | 1              | 1.0                        | 769<br>1 494              | 50,000<br>1,048            | 5 to 15  |              |
|   | yy and Woodcreek Water Supply from Carryon Reservoir; 2030 Demands<br>Viscox Aquifer between San Marcos and Fino Rivers (75,000 activy)  | Existing Reservoirs Carrizo and Other Aquifers                         | Treated Water Delivered<br>Treated Water Distributed   | +                                       | 1             | 1                       | 1                   | <del></del>                                   | <u> </u>     | 1  |  | 11             | 2 1.1                      | 590                       | 75,000                     | 1 to 5   |              |
| 30 3.2a SCTN-16a Lower Gu                               | addupe River Diversions  | River Diversion with Storage   | Treated Water Distributed                              | ަ                                       |               |                         | 1                   | 1   | 1 1          |  | 1  | 1              | 1 1,1                      |                           | 56.276<br>69.000           | 1 to 5   | 1.           |
|   | River in Wharton County - Buy Infgation Rights and Groundwater, Firm Yield  ALease Surface Water Imgation Rights for Municipal/Industrial Use  | River Diversion with Storage River Diversion with Storage              | Treated Water Distributed Treated Water Delivered      |   |               |                         | 1                   |   |              |  |  | 1              | 1 1.1                      | 1.007                     | 40,000                     | 5 to 15  | 2,<br>3,     |
|   | Aquifer - Bastrop, Lee, and Millam Counties with Delivery to Major Municipal Demand Center<br>elopment of Water Supply with Corpus Christi - Firm Yield  | Carrizo and Other Aquifers   | Treated Water Distributed<br>Treated Water Distributed |   | <del> </del>  |                         | 1 1                 | 1 1   | 1            | <u>                                     </u> | <del>                                     </del> | 3              | 2 12<br>1 1.2              | 1,015                     | 75,000<br>79,000           | 1 to 5   | <del> </del> |
| 3.6a SCTN-20a Lower Co                                  | plorado River Basin - Water Sales Contract for Unused Impation Water Supplies  | Existing Reservoirs River Diversion with Storage                       | Treated Water Distributed                              | <u> </u>                                |               |                         | 1                   |   | 1            |  |  | 11             | 1 12                       | 1,041                     | 100,060<br>112,016         | 5 to 15  | 5,           |
|   | tion of Seawater (100 MGD)<br>tion of Seawater (75 MGD)  | Local/Conservation/Reuse/Exchange<br>Local/Conservation/Reuse/Exchange | Treated Water Distributed Treated Water Distributed    |   |               |                         | 1                   |   | <del></del>  |  |  | 21             | 1 12                       | 1,407                     | 84,012                     | 1 to 5   |              |
| 12 1.10 SCTN-17 Desatinat                               | ion of Seawater (50 MGD)<br>ion of Seawater (25 MGD)   | Local/Conservation/Reuse/Exchange                                      | Treated Water Distributed                              | $\Gamma$ —-                             | <del> </del>  | <del> </del>            | 2) <u>1</u><br>2) 1 | 1 1   |              | 1  |  | 21             | 1 12                       | 1,447                     | 56,008<br>28,004           | 1 to 5   |              |
|   | Micox Aquifer between Cotorado and Fino Rivers   | Carrizo and Other Aquifers   | Treated Water Distributed Treated Water Distributed    |   |               |                         | 1. 1                | 11 1  |              |  |  | 11             | 3 1.3                      | 632                       | 220.000                    | 1 10 5   | 1,           |
| 32 3.2c SCTN-16c Lower Gu                               | addupe River Diversions<br>addupe River Diversions   | River Diversion with Storage<br>River Diversion with Storage           | Treated Water Distributed<br>Treated Water Distributed |   | <u> </u>      | 1                       | 1                   | 1   |              |  | 1  | 1              | 1 1.4                      |                           | 94,000<br>74,000           | 1 10 5   | 2.0          |
| 39 4.3b SCTN-14b Light Dev                              | relopment of Water Supply with Corpus Christi - Firm Yield   | Existing Reservoirs  | Treated Water Distributed                              | <u> </u>                                |               |                         | 2                   | 21 1  | 1            |  |  | 31             | 1 14                       |                           | 148,200                    | 1 to 5   |              |
|   | itorado River Basin - Diversion of Unappropriated Streamflow<br>Horado River Basin - Combined Diversion of Unused Imgation Water Supplies and Unappropriated Streamflow  | River Diversion with Storage River Diversion with Storage              | Treated Water Distributed Treated Water Distributed    |   |               |                         | 21 2                | 2 1   | 1            |  |  | 1              | 1.6                        | 1,003                     | 57,037<br>117,077          | 5 to 15  | 3.           |
| 41 5.1 S-15C Cibolo Re                                  | eservoir - Firm Yield  | Potential New Reservoirs   | Treated Water Distributed                              | Ľ!                                      |               | 1                       | 11 2                | 21 3  | 3            |  |  | 1!             | 1 1.8                      | 1,131                     | 33.200<br>4,032            | 5 to 15  | 16.          |
|   | te Reservoir - Firm Yield<br>pek Roservoir - Firm Yield  | Potential New Reservoirs Potential New Reservoirs                      | Treated Water Distributed Treated Water Distributed    | + = 3                                   |               | Si .                    | 1 2                 | 2 2   | 1            |  |  | 11             | 1 13                       | 1,016                     | 57,800                     | 5 to 15  | 2.<br>9.     |
| 60 5.15 SCTN-15 Cummins                                 | Creek Off-Channel Reservoir (Colorado River Basin)<br>eservoir with Imported Water from the San Antonio and Guadalupe Rivers - Firm Yield  | Potential New Reservoirs   | Treated Water Distributed                              | F                                       |               | 1                       | 2 2                 | 2 2   | 2            |  | 1  | 31             | 1 1.9                      | 1,111<br>773              | 45,712<br>91,942           | 5 to 15  | 17,          |
| 42 5.2a S-15Da Cibolo Re                                | eservoir with Imported Water from the San Antonio River - Firm Yield   | Potential New Reservoirs Potential New Reservoirs                      | Treated Water Distributed<br>Treated Water Distributed | <u> </u>                                |               |                         | 2 2                 | 3   | 3            |  |  | 3              | 1 21                       | 779                       | 69,925                     | 5 to 15  | 16.          |
|   | sservoir with Imported Water from the Guadatupe River Saltwater Barrier - Firm Yield<br>end Reservoir - Firm Yield (Colorado River Basin)  | Potential New Reservoirs Potential New Reservoirs                      | Treated Water Distributed Treated Water Distributed    | F                                       |               | 31                      | 2 2                 | 2! 3<br>2! 3                                  | 3            | ·  |  | 1              | 1 21                       | 1,178                     | 51,576                     | 5 to 15  | 13,0         |
| 46 5.3b S-15Eb Cibolo Re                                | eservoir with Imported Water from the Guadatupe River Sattwater Barrier and the Colorado River near Bay City   | Potential New Reservoirs   | Treated Water Distributed                              | I                                       |               | 3                       | 2 2                 | 2 3   | 3            |  |  | 1              | 1 2.1                      | 1,357                     | 79,090<br>152,606          | 5 to 15  | 17,<br>41,   |
|   | eservoir - Firm Yield<br>eservoir with Imported Water from the San Antonio, Guadatupe, and Colorado Rivers - Firm Yield  | Potential New Reservoirs Potential New Reservoirs                      | Treated Water Distributed Treated Water Distributed    |   |               |                         | 2 2                 | 2 3   | 3            |  |  | 31             | 1 2.3                      | 965                       | 106,482                    | 5 to 15  | 17,          |
|   | aservoir - Firm Yleld<br>Creek Reservoir - Firm Yleld  | Potential New Reservoirs Potential New Reservoirs                      | Treated Water Distributed<br>Treated Water Distributed | II                                      |               | <u> </u>                | 31 3                | 31 3  | 3            |  | <del> </del>                                     | 3              | 1 2.4                      | 856<br>865                | 99,687<br>80,836           | > 15   | 28.<br>27.   |
|   | Raw Water in Aquifer Water Supply Options  | Potential New Nescribins   | Theatec Water Displayed                                |   |               |                         |                     |   |              |  |  |                |                            |                           |                            |  |              |
|   | ake - Existing Rights and Contracts with Imigation Use Reduction for Recharge Enhancement<br>Aquifer Recharge from Natural Drainage - Type 2 Projects (Program 2C)   | Edwards Aquiler Recharge Edwards Aquiler Recharge                      | Raw Water in Aquifer                                   | ፗ──┼                                    |               | 1                       | 1) 1                | <u>!i                                    </u> | 1 1          | <u> </u>                                     | 1  | 1!             | 1 1,0                      | 193<br>486                | 8,136<br>13,451            |  | - 2          |
| 27 2.6 SCTN-6a Edwards                                  | Aguiler Recharge Enhancement with Guadalupe River Diversions at Lake Dunlap (SCTN-6a)  | Edwards Aquifer Recharge   | Raw Water in Aquifer<br>Raw Water in Aquifer           | <u> </u>                                |               |                         | 1 2                 | 1   | 1            |  |  | 1              | 12                         | 534                       | 42,121                     | 5 to 15  |              |
|   | e Reclaimed Water for Edwards Imigation Water<br>puller Optimization   | Local/Conservation/Reuse/Exchange<br>Carrizo and Other Aquifers        | Raw Water in Aquifer<br>Raw Water in Aquifer           | <del> </del> 2                          |               |                         | 1 1                 | 1   |              |  | <del>  </del>                                    | 31             | 1 1.2                      | 743<br>1,886              | 10.300<br>390              | 1 to 5   |              |
| 68 6.4 SCTN-7a Winterga                                 | rden Camzo Recharge Enhancement (Nueces River Alternative)   | Carrizo and Ciner Aquilers   | Raw Water in Aquifer                                   |   |               | ļ                       | 1 3                 | 1   |              |  |  | 1              | 1 1.3                      | 511<br>627                | 11,000<br>7,200            | 5 to 15<br>5 to 15                               | 1,           |
|   | rden Carrizo Recharge Enhancement (Atascosa River Atternative) Aquifer Recharge Enhancement with Guadatupe River Diversions near Gonzales (SCTN-6b)  | Carrizo and Other Aquillers Edwards Aquiller Recharge                  | Raw Water in Aquifer<br>Raw Water in Aquifer           | +                                       |               | <u> </u>                | 21 2                | 1   | <u> </u>     |  |  | 1              | 1 1.3                      | 1,941                     | - 51,133                   | 5 to 15  |              |
|   | pe River Diversion near Comfort to Recharge Zone via Medina Lotte<br>of Canyon Reservoir Flood Storage to Recharge Zone via Ciboto Creek - Long-Term Average   | Edwards Aquifer Recharge   | Raw Water in Aquiter                                   | Ţ <u>?</u>                              | !             | 3)                      | 1 2                 | 2! 1  | 1 2          | 1  | <del></del> -                                    | 1              | 1 14                       |                           | 3,902                      | 1105   |              |
| 22 2.2 L-18b Edwards                                    | Aquiller Recharge from Natural Dranage - Type 2 Projects (Program 28)  | Edwards Aquiter Recharge<br>Edwards Aquiter Recharge                   | Raw Water in Aquiter Raw Water in Aquiter              |   |               | 1                       | 1 1                 | 2   | 2            |  |  | 11             | 1 1.8                      | 800                       | 15,980<br>21,577           | 5 to 15  | 4            |
|   | Aquiter Recharge from Natural Drainage - Type 2 Projects (Program 2A)  Aquiter Recharge from Natural Crainage - Type 1 Projects (Program 18)   | Edwards Aquifer Recharge<br>Edwards Aquifer Recharge                   | Raw Water in Aquifer<br>Raw Water in Aquifer           | I - 2                                   |               | 31<br>31                | 1 1                 | 3   | 3            |  | <del></del>                                      | 3)<br>1/       | 1 1.9                      | 1,087<br>2,557            | 21,577<br>1,958<br>5,564   | 5 to 15  | 4,<br>8,     |
|   | Aquifer Recharge from Natural Drainage - Type 1 Projects (Program 1A)  | Edwards Aquifer Recharge   | Raw Water in Aquiler                                   |   |               |                         | 11 1                | 3   | 3            |  |  | 31             | 1 22                       | 3,309                     | 5,554                      | 5 to 15  | 4            |
| 9 1.9 SCTN-12b Exchange                                 | Raw (Surface) Water Supply Options  of Groundwater from the Gutf Coast Aquater for Imagaton Surface Water Rights (Colorado River Basin)  | Local/Conservation/Reuse/Exchange                                      | Raw Water at Source                                    | <b>-</b>                                |               | 1                       | 1 1                 | li <b>1</b>                                   | . 1          | 1  | 1  | 11             | 1 1.0                      | 518                       | 10,748                     | 1 to 5   |              |
| 64 6.3 SCTN-3a Simsboro                                 | Aquifer - Bastrop, Lee, and Milam Counties with Delivery to Colorado River   | Carrizo and Other Aquifers   | Raw Water Delivered                                    | <u> </u>                                |               |                         | 1 1                 | 1   | 1            |  |  | 1              | 2 1.1                      |                           | 75,000<br>75,000           | 1 to 5   |              |
| 10 1.9 SCTN-12b Exchange                                | ) Aquifer - Bastrop, Lee, and Millam Counties with Delivery to Plum Creek<br>e of Groundwater from the Gulf Coast Aquifer for Infgation Surface Water Rights (Guadalupe-San Amonio River Ba  | Carrizo and Other Aquifers si Local/Conservation/Reuse/Exchange        | Raw Water Detivered<br>Raw Water at Source             | +===i                                   | i             |                         | 1 1                 |   |              |  |  | 11             | 1 1.1                      | 437                       | 13.200                     | 1 20 5   |              |
|   | Reservoir - Raw Water at the Reservoir   | Potential New Reservoirs   | Raw Water at Reservoir                                 | <del></del>                             | <u> </u>      |                         | 1: 2                | <u> </u>                                      | 1            | 1  | 1  | 31             | 1 12                       | 764                       | 5.627<br>17.000            | 5 to 15  | 2            |
| 5]1.5 [L-14   Transfer                                  | of SAWS Reclaimed Water to Coleto Creek Reservoir (Exchange for CP&L Rights and GBRA Carryon Contract)  of Reclaimed Water to Corpus Christi through Choke Carryon Reservoir   | Local/Conservation/Reuse/Exchange                                      | Raw Water at Reservoir                                 | + = = = = = = = = = = = = = = = = = = = |               |                         | 11 2                | 21  | <u> </u>     |  |  | 31             | 1 13                       | 297                       | 23,903                     |  |              |
| 56 5.13 SCTN-13 Parmetto<br>58 5.13 SCTN-13 Parmetto    | Bend Stage II Reservoir (Delivery to Corpus Christi) Bend Stage II Reservoir (Delivery to Bay Criv)  | Potential New Reservoirs Potential New Reservoirs                      | Raw Water Delivered<br>Raw Water Delivered             | <del> </del>                            |               |                         | 2 1                 | 2   | 1            |  | 1  | <del>  </del>  | 1 1.4                      |                           | 30,200                     | 5 to 15<br>5 to 15                               | 4,           |
| 57 5.13 SCTN-13 Palmetto                                | Bend Stage II Reservoir (Delivery to Bay City)<br>Bend Stage II Reservoir (Delivery to Sartwater Barrier)  | Potential New Reservoirs   | Raw Water Delivered                                    | <u> </u>                                |               |                         | 21 1                | 2   | <u> </u>     |  |  | 11             | 1 1.4                      |                           | 28,100<br>57,080           | 5 to 15  | 31           |
| 52 5.9 G-22 Ditworth                                    | esenoir - Raw Water at the Resenoir Resenoir - Raw Water at the Resenoir   | Potential New Reservoirs Potential New Reservoirs                      | Raw Water at Reservoir<br>Raw Water at Reservoir       | ╁                                       | <del></del>   |                         | 11 3                | 2   |              |  |  | 2              | 1 1.7                      | 446                       | 19,705                     | > 15   | 15<br>21     |
|   | : Reservoir - Firm Yield<br>vossing Reservoir - Raw Water at the Reservoir   | Potential New Reservoirs   | Raw Water at Reservoir                                 | <b></b>                                 |               | <u> </u>                | 21 2                | 2 2   | 3            |  |  | 1              | 1 22                       |                           | 69,897<br>32,458           | > 15<br>> 15                                     |              |
| 49 5.6 G-19 Guardatur                                   | pe River Dam No. 7 - Firm Yield  | Potential New Reservoirs Potential New Reservoirs                      | Raw Water at Reservoir<br>Raw Water at Reservoir       |   |               | şi                      | 1 2                 | 3   | 3            |  | <u> </u>   | 11             | 1 22                       | 732                       | 30.890                     | > 15   |              |
| 1 1.1  L-10 (Mun.)   Demand                             | Other Water Supply Options Reduction (Water Consensation) - Municipal  | Local/Conservation/Reuse/Exchange                                      |  |   |               |                         | 1;                  | ı -   | ,            |  | ;  | 1              | 1 10                       | -400                      | ~43,000                    | 1 to 5   | ,            |
| 1,1 L-10 (Irr.) Demand                                  | Reduction (Water Conservation) - Impation  | Local/Conservation/Reuse/Exchange                                      |  | 上二二                                     |               |                         | 1                   |   | 1            |  |  | 1              | 1 1.0                      | -34                       | -80,000                    | 1 to 5   |              |
| 7 1.7 SCTN-5 Weather                                    | or Lease of Edwards Imigation Water for Municipal and Industrial Use Modification  | Local/Conservation/Reuse/Exchange<br>Local/Conservation/Reuse/Exchange | Raw Water in Aquifer                                   | ┌─┤                                     | 1 1           | <del> </del>            | 1 1                 | 1   | 1            |  | <del></del>                                      | 11             | 1.0                        | Undetermined              | 95430 Max.<br>Undetermined | 1 to 5   | Undetermi    |
|   | r Harvesting<br>ater Supplies for Municipal Water Systems in the Camzo-Wilcox Aquiller   | Local/Conservation/Reuse/Exchange                                      |  | $\perp =$                               |               |                         | 1 1                 |   | <u> </u>     |  |  | 11             | 1 1.0                      | 16,178                    | ,057/household<br>N/A      | 1 to 5   | i            |
| 70 6.6 SCTN-2b Groundw                                  | ater Supplies for Municipal Water Systems in the Gulf Coast Aquifer  | Carrizo and Other Aquilers Carrizo and Other Aquilers                  | <del>                                     </del>       | +==                                     | 1 1           |                         | 1                   | 1   | 1            |  |  | 1              | 1.0                        | N/A                       | N/A                        | 1 to 5   |              |
|   | ater Supplies for Municipal Water Systems in the Trinky Aquifer<br>torage and Recovery (ASR) - Regional Option   | Carrizo and Other Aquifers   |  | !                                       | 1             |                         | 1 1                 | 1   | 1 1          |  |  | 1              | 1.0                        | 2428 to 1009              | 2,792                      | 1 to 5   |              |
| 73 6.9 SCTN-1b Aquiter S                                | torage and Recovery (ASR) - Local Option   | Carrizo and Other Aquifers Carrizo and Other Aquifers                  | <del>                                     </del>       | +                                       | 1 1           |                         | 1                   | 1   | <u> </u>     | <u> </u>                                     |  | 1:             | 1 1.0                      | 2,089                     | 279<br>10.000              | 1 to 5   |              |
|   | nel Local Storage (Guadatupe River near Victoria)<br>Inapement   | Local/Conservation/Reuse/Exchange<br>Local/Conservation/Reuse/Exchange | Treated Water Delivered                                | T                                       | 1 1           |                         | 1: 1<br>1: 1        | 11 2  | · 1          |  | 1  | 11             |                            | Undetermined              | Undetermined               | > 15   | Undeterm     |
| 18 1.11 SCTN-10 Off-Chan<br>17 1.11 SCTN-10 Off-Chan    | inagement<br>net Local Storage (Medina River near Von Ormy)<br>net Local Storage (Guadatupe River near Boerne)   | Local/Conservation/Reuse/Exchange                                      | Treated Water Delivered                                | <b> -</b> ==                            | 1 1           |                         | 1                   |   | <u> </u>     | 1  | 1 :  | 31             | 1 12                       | 1,190                     | 5.000                      | 1 100  | <u> </u>     |
|   | Anna and Anna (Anna and Anna a | Local/Conservation/Reuse/Exchange                                      | Treated Water Delivered                                | 匚——                                     | 2 :           | <u>и</u>                | 11 2                | <u> </u>                                      | <u> </u>     |  | . 1  | <u> </u>       | -1.4                       | 2,001                     |                            |  |              |
| ites:!<br>This is the list of stand-alone options as pr | esented in Volume III. As these options were fitted into the Regional Water Plan, the quantities were modified (in sure based on estimates of Land Impacted (High) > 4000 as 1,000 as 1 |  | <u> </u>   | 上二二                                     |               | <u> </u>                | <u> </u>            |   |              |  |  | <del></del>    | <u> </u>                   |                           |                            | <del>                                     </del> | <del></del>  |
| Emironmental Impacts (with the exception                | o of Size / Mahitati are assed 3 and when as a solution as a smooth in 1000 dc, LOW 1000 dc,   |  | 1  | `                                       | oran          | <del></del>             |                     | <del></del>                                   |              |  |  | <u> </u>       | <u> </u>                   |                           |                            |  |              |
| r YVALOT CULALITY NORTH IS AID INDICATION OF THE        | TRISTING WATER OUTSING IN THE SIMPLE SECTION 1 has no imparison of the contract of the contrac | for TMDI & 3 has impairment with an                                    |  | ==                                      |               |                         |                     |   | -            |  |  | <del> </del>   | <u> </u>                   | <u> </u>                  |                            |  |              |
| oussemble resource. 1 = High, Renewable resources       | urce, no mining; 2 = Medium, Limited mining (<200 ft additional drawdown); and 3 = Low, Mining (>200 ft additional drawdown); and 3 = Low, Mining (>200 ft additional drawdown);   | drawdown).   | in or regin priority for (Mg)                          |   |               | 1                       | <u> </u>            |   |              | :  |  | ,              | <u> </u>                   |                           |                            | <u> </u>   |              |
|   | · · · · · · · · · · · · · · · · · · ·  |  |  |   |               |                         |                     |   |              |  |  |                |                            |                           |                            |  |              |

| Volume III                        |  |  | Nat                      | ter  | TNRCC              | Stream                                | Stream  | Water Quality                           |
|-----------------------------------|--|--|--------------------------|--|--------------------|---------------------------------------|---|---|
| Section                           | Option   | Water Supply Options (Sorted By Water Quality Score)   |                          | slity  | 1                  |                                       | _   | Impairment                              |
| No.                               | ID   | water Supply Options (Softed By Water Quality Score)   | Ι.                       |  | Priority           | Segment                               | Segment   | •                                       |
| 140.                              | 10   |  | ico                      | ote,   | Level <sup>z</sup> | Number(s) <sup>3</sup>                | Name(s) <sup>3</sup>  | Description                             |
| 1.10                              | S0701 47   | Treated Water Supply Options   |                          |  |                    |                                       |   |   |
| 6.1                               | SCTN-17<br>CZ-10C  | Desatination of Brackish Groundwater Carrizo-Wilcox Aguiter between San Marcos and Frio Rivers (75,000 activyr)  | ₽÷                       |  |                    |                                       |   |   |
| 6.2                               | CZ-10D   | Carrizo-Wilcox Aquifer between Colorado and Frio Rivers  | ╂╌╌┧                     | ;  |                    | · · · · · · · · · · · · · · · · · · · |   |   |
| 4.1                               | G-15C  | Canyon Reservoir Water Released to Lake Note - Treated Water to Distribution System or Rechame Zone  | ╇╗                       | <del>i                                    </del> |                    |                                       |   | ,                                       |
| 3.3                               | C-17A  | Colorado River in Colorado County - Buy Stored Water and Impation Rights: Firm Yield   | ╆⋾                       | 1  |                    |                                       |   |   |
| 6.3<br>5.12                       | SCTN-3c  | Simsboro Aquifer - Bastrop, Lee, and Milam Counties with Delivery to Major Municipal Demand Center   | +-1                      |  |                    |                                       |   |   |
| 3.1                               | G-16C1<br>G-38C  | Cuero Raservor - Firm Yield  Guadatupe River Diversion at Gonzales to Mid-Cities and/or Major Water Providers, with Regional Water Treatment Plant   | 17                       | -  |                    |                                       |   |   |
| 3.2c                              | SCTN-16c   | Lower Guadatupe River Diversions   | 1-1                      |  |                    |                                       |   | <del>-</del> .                          |
| 4,4                               | C-13C  | Colorado River at Bastrop - Purchase of Stored Water - Firm Yield  | ╂╾┯                      | <del>i  </del>                                   |                    |                                       |   |   |
| 3.2b                              | SCTN-16b   | Lower Guadatupe River Diversions   | ┿⋾                       | 1  |                    |                                       |   |   |
| 3.2a<br>3.6c                      | SCTN-16a<br>SCTN-20c   | Lower Guadatupe River Diversions   | 上二                       |  |                    |                                       | •   |   |
| 3.4                               | C-17B  | Lower Colorado River Basin - Combined Diversion of Unused Imigation Water Supplies & Unappropriated Streamflow Colorado River in Whatton County - Buy Imigation Rights and Groundwater; Firm Yield   | ┸╌                       | <del>}</del>                                     |                    |                                       |   |   |
| 5.3a                              | S-15Ea   | Cibolo Reservoir with Imported Water from the Guadalupe River Saltwater Barrier - Firm Yield   | <del>┦╌</del> ┊          | <del>i  </del>                                   |                    |                                       |   |   |
| 3.6b                              | SCTN-20b   | Lower Cotorado River Basin - Diversion of Unappropriated Streamflow  | <del>ऻ</del> ~⋾          |  |                    |                                       |   |   |
| 3.5<br>5.16                       | SCTN-11<br>B-10C   | Purchase/Lease Surface Water Imigation Rights for Municipal/Industrial Use   | 上三                       | 1  |                    |                                       |   |   |
| 3.6a                              | SCTN-20a   | Allens Creek Reservoir - Firm Yield  Lower Colorado River Basin - Water Sales Contract for Unused Irrigation Water Supplies  | $\mathbf{L}$             | <del>}</del>                                     |                    |                                       |   | <del></del>                             |
| 5.15                              | SCTN-15  | Cummins Creek Off-Channel Reservor (Cotorado River Basin)  | ╀┪                       | <del> </del>                                     |                    |                                       |   | <del></del>                             |
| 5.1                               | S-15C  | Cibolo Reservoir - Firm Yield  | ╄┪                       | 1  |                    |                                       |   |   |
| 5.14                              | C-18   | Shaws Bend Reservoir - Firm Yield (Colorado River Basin)   | 十三                       |  |                    |                                       |   |   |
| 5.3b<br>4.2                       | S-15Eb<br>G-24   | Citado Reservoir with Imported Water from the Guadalupe River Saltwater Barrier and the Colorado River near Bay City   | 上二                       |  |                    |                                       |   |   |
| 1.10                              | SCTN-17  | Wimberley and Woodcreek Water Supply from Canyon Reservoir; 2030 Demands  Desalination of Seawater (100 MGD)   | $-\frac{1}{2}$           |  | <del>- </del>      | 2462                                  | San Antonio, Hynes, & Guadatupe Bays                                      | Restrictions on Harvesting of Shellfish |
| 1.10                              | SCTN-17  | Desafination of Seawater (75 MGD)  | ╀╧                       |  | 1                  | 2462                                  | San Antonio, Hynes, & Guadatupe Bays San Antonio, Hynes, & Guadatupe Bays | Restrictions on Harvesting of Shellfish |
| 1.10                              | SCTN-17  | Desafination of Seawater (50 MGD)  | ┯┋                       | 2  | <u> </u>           | 2462                                  | San Antonio, Hynes, & Guadalupe Bays                                      | Restrictions on Harvesting of Shellfish |
| 1.10                              | SCTN-17  | Desatination of Seawater (25 MGD)  | T-2                      | 2  | L                  | 2462                                  | San Antonio, Hynes, & Guadalupe Bays                                      | Restrictions on Harvesting of Shellfish |
| 5.2b<br>5.2a                      | S-15Db<br>S-15Da   | Cibolo Reservoir with Imported Water from the San Antonio and Guadalupe Rivers - Firm Yield<br>Cibolo Reservoir with Imported Water from the San Antonio River - Firm Yield  | <u>_</u>                 | 3 7  | M                  | 1911                                  | Upper San Antonio River   | Bacteria (SA Only)                      |
| 5.4                               |  | Golad Reservor - Firm Yield  | 1—-≟                     | <del>;</del> -                                   | M                  | 1911<br>1901                          | Upper San Antonio River Lower San Antonio River                           | Bacteria (SA Cnty) Fecal Colform        |
| 5.11                              | G-17C1   | Sandies Creek Reservoir - Firm Yield   | ╀╌┪                      | <del>-</del> -                                   | M                  | 18038                                 | Guadalupe River Below San Marcos  | DO (Sandies Crk Only)                   |
| 4.3b                              | SCTN-14b   | Joint Development of Water Supply with Corpus Christi - Firm Yield   | <del> </del>             | 3  | M                  | 2116, 1911                            | Choke Canyon Reservoir/Upper San Antonio River                            | Bacteria in Upper Reservoir & SA River  |
| 5.2c<br>4.3a                      | S-15Dc   | Cibolo Reservoir with Imported Water from the San Antonio, Guadalupe, and Colorado Rivers - Firm Yield   | <del> </del>             | 3  | M                  | 1911                                  | Upper San Antonio River   | Bacteria (SA Cnly)                      |
| 5.5                               | SCTN-14a<br>S-14D  | Joint Development of Water Supply with Corpus Christi - Firm Yield Applewhite Reservoir - Firm Yield   | 匚릨                       | 3  | M                  | 2116                                  | Choke Canyon Reservoir  | Bacteria in Upper Reservoir             |
|                                   | <u> </u>   |  | 3                        | 5  | M                  | 1903                                  | Medina River Below Medina Diversion Lake                                  | Bacteria                                |
| 2.3                               | S-13B  | Raw Water in Aquifer Water Supply Options  Medina Lake - Existing Rights and Contracts with Imagina Use Reduction for Recharge Enhancement   | 184                      |  |                    |                                       |   | :                                       |
| 2.2                               | L-18c  | Edwards Aquifer Recharge from Natural Drainage - Type 2 Projects (Program 2C)  | <b>₽</b> ∹               | <del>}  </del>                                   |                    |                                       |   |   |
| 6.4                               | SCTN-7a  | Wintergarden Carrizo Recharge Enhancement (Nueces River Alternative)   | ╂┷╡                      | <del>i  </del>                                   |                    |                                       | · - <del></del>   | ,                                       |
| 2.6                               | SCTN-6a  | Edwards Adulfer Recharge Enhancement with Guardahme River Diversions at Lake Cumbes (SCTALSA)  | 一コ                       | 1  |                    |                                       |   |   |
| 22                                | L-18b<br>L-18a   | Edwards Aquifer Recharge from Natural Drainage - Type 2 Projects (Program 28)  Edwards Aquifer Recharge from Natural Drainage - Type 2 Projects (Program 2A)   | <u> </u>                 | 1  |                    |                                       |   |   |
| 6.10                              | SCTN-8   | Trinity Aguifer Optimization   | 드극                       | : 1  |                    |                                       |   |   |
| 2.6                               | SCTN-6b  | Edwards Aquifer Recharge Enhancement with Guadatupe River Diversions near Gonzales (SCTN-6b)   | ╂╼╴╅                     | <del>i 1</del>                                   |                    | <del></del>                           |   |   |
| 2.4                               |  | Cudualitie river Livinskin near Commit in Remains 700e via Marina Lako   | -1                       | 1  |                    |                                       |   |   |
| 2.1<br>2.5                        | L-17a<br>G-32  | Edwards Aquifer Recharge from Natural Drainage - Type 1 Projects (Program 1B)  | <u> </u>                 |  |                    |                                       |   |   |
| 6.4                               | SCTN-7b  | Diversion of Carryon Reservoir Flood Storage to Recharge Zone via Ciboto Creek - Long-Term Average Wintergarden Carrizo Recharge Enhancement (Atascosa River Alternative)  | 무냥                       | <del>! </del>                                    |                    |                                       |   |   |
| 1.2                               | L-11   | Exchange Reclaimed Water for Edwards Impation Water  | <del>∐</del> -₹          | <del>.  </del>                                   | M                  | 2107<br>1911                          | Alascosa River Upper San Antonio River                                    | Bacteria & DO Bacteria                  |
| 2.1                               | L-176  | Edwards Aquifer Recharge from Natural Drainage - Type 1 Projects (Program 1A)  | ┢╌┋                      | 3  | M                  | 2113                                  | Upper Frio River  | DO                                      |
|                                   |  | Raw (Surface) Water Supply Options   |                          |  |                    |                                       |   |   |
| 6.3                               | SCTN-3a  | Simsboro Aquifer - Bastrop, Lee, and Milam Counties with Delivery to Colorado River  | 7                        | 1 [  |                    |                                       |   |   |
| 6.3                               | G-20<br>SCTN-36  | Gonzales Reservor • Firm Yield   | ロュ                       | ╚  |                    |                                       |   |   |
| 5.13                              | SCTN-13  | Simsboro Aquifer - Bastrop, Lee, and Milam Counties with Delivery to Plum Creek Palmetto Bend Stage II Reservoir (Delivery to Corpus Christi)  | ᅜᅾ                       | <del>!                                    </del> |                    |                                       |   |   |
| 1.9                               | SCTN-12b   | Exchange of Groundwater from the Gulf Coast Aquifer for Impation Surface Water Rights (Guardanne San Antonio Page Regio)   | ┡                        | <del>;                                    </del> |                    |                                       |   |   |
| 5.10                              |  |  | ┝╸╅                      | ,  |                    |                                       | · · · · · · · · · · · · · · · · · · ·                                     |   |
| 1.9<br>5.13                       | SCTN-12b   | Exchange of Groundwater from the Gulf Coast Amiring for Impation Surface Misses Siebes (Categoric Sieb | <u> </u>                 | 1  |                    |                                       |   |   |
| 5.13                              | OCH PIS  | Palmetto Bend Stage II Reservoir (Delivery to Bay City) Palmetto Bend Stage II Reservoir (Delivery to Saltwater Barrier)   | $\Box$ $\overline{\Box}$ | <u> </u>   |                    |                                       |   |   |
| 5.6                               |  | Guadalupe River Dam No. 7 - Firm Yield   | <b>Ľ</b> ‡               | <del>!  </del>                                   |                    |                                       |   | <del></del>                             |
| 5.8                               | G-21   | Lockhart Reservoir - Raw Water at the Reservoir  | <del>├</del> ┈ᅻ          | <del>;                                    </del> |                    |                                       | - <u> </u>  | · · · · · · · · · · · · · · · · · · ·   |
| 5.9                               | G-22   | Diworth Reservoir - Raw Water at the Reservoir   | <u> </u>                 | 2  | L                  | 18048                                 | Guadatupe River Below Comal River   | Bacteria                                |
| 1.4                               | L-20<br>L-14   | Transfer of SAWS Reclaimed Water to Coleto Creek Reservoir (Exchange for CP&L Rights and GBRA Canyon Contract)   | <u> </u>                 | 3  | M                  | 1911                                  | Upper San Antonio River   | Bacteria (SA Only)                      |
| 5.17                              | L-14   | Transfer of Reclaimed Water to Corpus Christi through Choke Canyon Reservoir  Cotulia Reservoir - Raw Water at the Reservoir   | ⊏₹                       | <u> </u>   | M                  | 2116, 1911                            | Choke Canyon Reservoir/Upper San Antonio River                            | Bacteria in Upper Reservoir & SA River  |
|                                   |  |  | 3                        | ·  | M                  | 2104                                  | Nueces River Above Frio River   | На                                      |
| 1.1                               | L-10 (Mun)   | Other Water Supply Options Demand Reduction (Water Conservation) - Municipal   | بالح                     |  |                    |                                       |   |   |
| 1,1                               | L-10 (lm)  | Demand Reduction (Water Conservation) - Intestion  | ⊢╬                       | ; -  |                    |                                       |   |   |
| 1.3                               | L-15)  | Purchase or Lease of Edwards Imigation Water for Numicipal and Industrial Lieu   | ┝╌┆                      | <del>i  </del>                                   |                    |                                       |   | <del></del>                             |
| 1.6                               | SUIN-4   | Brush Management   | <u> </u>                 | 1  |                    |                                       |   |   |
|                                   |  | Weather Modification Rainwater Harvosting  |                          | <u> </u>   |                    |                                       |   |   |
| 1.8                               | SCTN-10  | Off-Channel Local Storage (Guardahine River near Memoria)  | 二!                       | <del>:  </del>                                   |                    |                                       |   | L                                       |
| 1.8<br>1.11                       |  | UT-Channel Local Storage (Guadahine Rhipt near Recept)   | ┝┤                       | ┼─┤  | <del> </del>       |                                       |   |   |
| 1.11                              | _ SCIN-10  |  |                          | -  |                    |                                       |   |   |
| 1.11<br>1.11<br>6.5               | SCTN-10<br>SCTN-2a   | Groundwater Supplies for Manicinal Water Systems in the Carries Makes Asside   | <b></b> 7                | 1 1  |                    |                                       |   |   |
| 1.11<br>1.11<br>6.5<br>6.6        | SCTN-2a<br>SCTN-2b   | Groundwater Supplies for Municipal Water Systems in the Carrizo-Wilcox Aquifer Groundwater Supplies for Municipal Water Systems in the Carl Coast Aquifer  |                          | 1  |                    |                                       |   |   |
| 1.11<br>1.11<br>6.5               | SCTN-2a<br>SCTN-2b<br>SCTN-2c                                  | Groundwater Supplies for Municipal Water Systems in the Carrizo-Wilcox Aquifer Groundwater Supplies for Municipal Water Systems in the Gulf Coast Aquifer Groundwater Supplies for Municipal Water Systems in the Torigin Aguifer  |                          | 1  |                    |                                       |   |   |
| 1.11<br>1.11<br>6.5<br>6.6<br>6.7 | SCTN-10<br>SCTN-2a<br>SCTN-2b<br>SCTN-2c<br>SCTN-1a<br>SCTN-1b | Groundwater Supplies for Municipal Water Systems in the Carrizo-Wilcox Aquifer Groundwater Supplies for Municipal Water Systems in the Carl Coast Aquifer  |                          |  |                    |                                       |   |   |

Notes:

1) Water Quality Score is an indication of the relative water quality in the stream segment: 1 has no impairment of stream use, 2 has impairment with low priority for TMDL, & 3 has a segment: 1 has no impairment of stream use, 2 has impairment with low priority for TMDL, & 3 has a segment: 1 has no impairment of stream use, 2 has impairment with low priority for TMDL, & 3 has a segment of development of Total Maximum Daily Load Assessment (TMDL) for the stream segment: 1 has no impairment with low priority for TMDL, & 3 has a segment segment segment segment segment segment: 1 has no impairment with low priority for TMDL, & 3 has a segment segment

## "EREPA"

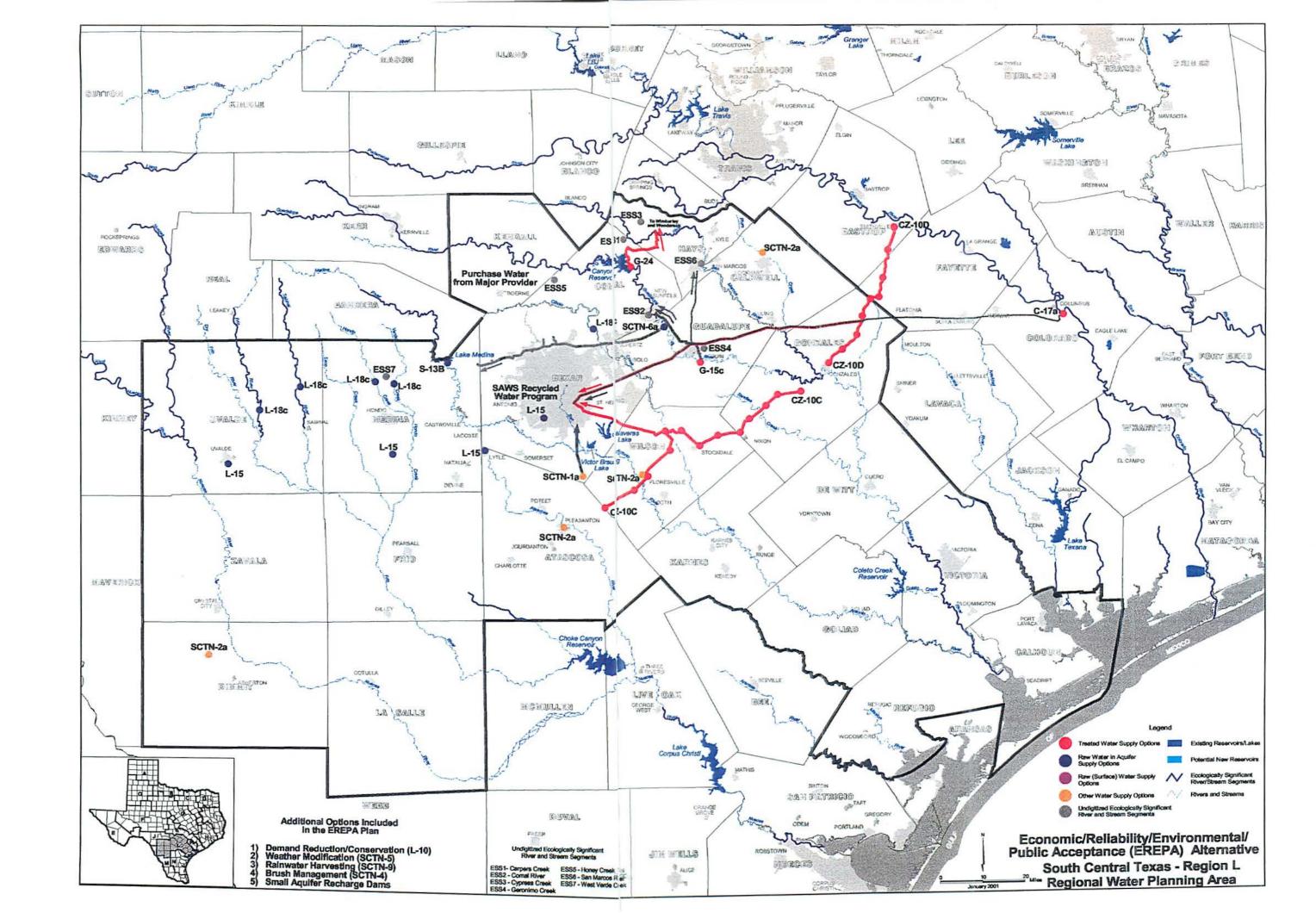
Economic/Reliability/Environmental/Public Acceptance

# Alternative Regional Water Plan

## South Central Texas Regional Water Planning Group

San Antonio River Authority

HDR Engineering, Inc. January 2001



## South Central Texas Region Alternative Water Plans

Alternative Name: Economic/Reliability/Environmental/Public Acceptance

Alternative ID: EREPA

Alternative Description: The Economic / Reliability / Environmental / Public Acceptance Alternative Regional Water Plan is predicated on the development of water supply options having the least expected annual unit cost of water. Environmental considerations are incorporated using the same qualitative measures employed for the Environmental / Conservation (E/C) Alternative Regional Water Plan. Public acceptance at the source location and reliability in drought conditions are also considered in this alternative regional water plan.

The following water supply options are included in the Economic / Reliability / Environmental / Public Acceptance Alternative Regional Water Plan (in no particular order):

- 1. Demand Reduction / Conservation (L-10)
- 2. Edwards Irrigation Transfers (L-15)
- 3. Medina Lake Recharge Enhancement (S-13B)
- 4. Edwards Recharge Type 2 Projects (L-18c)
- 5. Edwards Recharge Guadalupe R. Diversions (SCTN-6a)
- 6. Carrizo Aquifer Wilson and Gonzales Counties (CZ-10C)
- 7. Carrizo Aquifer -- Atascosa, Gonzales, and Bastrop Counties (CZ-10D)
- 8. Colorado R. @ Columbus LCRA Irrigation & Stored Water (C-17A)
- 9. Canyon Reservoir (G-15C)
- 10. Wimberley & Woodcreek Canyon (G-24)
- 11. Carrizo Aquifer Local Supply (SCTN-2a)
- 12. Brush Management (SCTN-4)
- 13. Weather Modification (SCTN-5)
- 14. Rainwater Harvesting (SCTN-9)

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## EREPA Alternative Regional Water Plan Summary of Key Information for South Central Texas Regional Water Planning Group

### Quantity, Reliability, and Cost

- Plan includes management supplies to meet projected needs, ensure reliability, and maintain springflow, resulting in a quantity of additional water supplies sufficient to meet projected needs for municipal, industrial, steam-electric power, and mining uses through the year 2050.
- Cost is the least among the five alternative plans under consideration.

### **Environmental Factors**

- Increased median annual streamflows in the San Antonio River.
- Below average concerns with respect to all environmental factors evaluated for the five alternative plans under consideration.
- Least concerns with Vegetation & Wildlife Habitat and Ecologically Significant Stream Segments among the five alternative plans under consideration.

### Impacts on Water Resources

- No unmitigated reductions in water available to existing water rights.
- Long-term reductions in water levels in the Carrizo Aquifer. Drawdown would be the greatest for the five alternative plans under consideration.

### Impacts on Agriculture and Natural Resources

- Major commitment to municipal and irrigation water Demand Reduction (Conservation) (L-10).
- Includes Brush Management (SCTN-4) and Weather Modification (SCTN-5).
- Inclusion of water supply options to meet projected irrigation needs in full is estimated to be economically infeasible at this time. Weather Modification (SCTN-5) assists irrigation and dry-land agriculture (crops and ranching).
- Includes maximum potential voluntary transfer of Edwards Aquifer irrigation permits to municipal permits through lease or purchase.
- Includes Medina Lake Recharge Enhancement (S-13B) which reduces or eliminates water supplies from the Medina Lake System for irrigation in Bexar, Medina, and Atascosa Counties.

### Other Relevant Factors per SCTRWPG

### Comparison of Strategies to Meet Needs

 Selection of water supply options comprising the alternative plan based primarily on least unit cost.

### Interbasin Transfer Issues

- Projected non-irrigation needs in basin(s) of origin are met throughout the planning period.
- Plan includes two interbasin transfers: 1) Edwards Recharge Guadalupe River Diversions (SCTN-6a) from the Guadalupe River near Lake Dunlap to the outcrop of the Edwards Aquifer in the San Antonio River Basin; and 2) LCRA Irrigation & Stored Water (C-17A) from the Colorado River at Columbus to Bexar, Comal, Guadalupe, and Hays Counties.

### Third-Party Impacts of Voluntary Redistribution of Water

- Potential positive or negative effects of Edwards Irrigation Transfers (L-15).
- Lower water levels in some portions of the Carrizo Aquifer.

### Regional Efficiency

- Edwards Irrigation Transfers (L-15) require no new facilities. Transferred water would likely be available at or very near locations having projected municipal, industrial, steam-electric power, and mining needs in Uvalde, Medina, Atascosa, and Bexar Counties.
- Terminal storage and regional water treatment facilities in Bexar and Guadalupe Counties increase efficiency, improve reliability, and reduce unit cost.
- Shared transmission facilities for Colorado River (C-17A), Carrizo Aquifer (CZ-10D), and Guadalupe River (G-15C) supplies reduce cost.
- San Antonio Water System Regional Aquifer Storage & Recovery System (SCTN-1a) substantially reduces peak summer pumpage from the Edwards Aquifer.
- Edwards Recharge Guadalupe River Diversions (SCTN-6a) provides for recovery and recirculation of enhanced Comal springflow resulting from implementation of Edwards Recharge Type 2 Projects (L-18c).

### Effect on Navigation

• Not applicable.

## South Central Texas Region, EREPA Alternitive – TWDB Evaluation Criteria Summary

| Management Strategy  | Quantity (acft/yr) 1          | Reliability <sup>2</sup> | Cost (\$/acft)3 | _ | Environmental Factors  |          | Impacts on Water Resources  | l I | mpacts on Agricultural and Natural Resources  |             | Other Relevant Factors per SCTRWPG  |
|--|-------------------------------|--------------------------|-----------------|---|--|----------|---|-----|---|-------------|---|
| Municipal Demand Reduction (Conservation) (L-10 Mun.)              | 44,566                        | Firm                     | \$173           | • | None. Supply developed through deman reduction.  | •        | Slight reductions in treated effluent discharge.  | •   | Fewer water management strategies necessary to meet projected needs.                        | ·           | Conservation is a central element of the Plan.  |
| Edwards Irrigation Transfers (L-15)                                | 81,000                        | Firm                     | . \$80          | • | None. Supply developed without new falities.   | •        | Reductions in springflow due to relocation of<br>pumpage closer to springs.   | •   | Plan includes 53 percent of potential maximum voluntary transfer through lease or purchase. | •           | Encourages beneficial use of available rights.  |
| Edwards Recharge - Type 2 Projects (L-18c)                         | 13,451                        | Firm                     | \$486           | • | Concerns with endangered & threatened species, habitat, and TPWD Ecologically Unique Stream Segments at some sites. Enhanced springflows help endangered stries. | •        | Limited, as most projects are located on streams that are frequently dry. Increased aquifer levels and springflows.                     | •   | Typically higher well levels in Uvalde & Medina Counties.                                   | •           | Positive effects on discharges from Comal and San Marcos Springs.  Mitigation of impacts on firm yield of Choke Canyon Res. / Lake Corpus Christi System. |
| Medina Lake Recharge Enhancement (S-13B)                           | 8,136                         | Firm                     | \$159           | • | Concerns with endangered & threatened species.   | •        | Increased lake levels, aquifer levels, and springflows.   | •   | Potentially eliminates irrigation from the BMA Canal System.                                | ·           | Owner of the Medina Lake System opposed to inclusion of this strategy in the Plan.  |
| Edwards Recharge – Guadalupe River Diversions (SCTN-6a)            | 42,121                        | Firm                     | \$534           | • | Concerns with endangered & threatened species, habitat, and cultural resources.  | •        | Increased springflow and reduced streamflow below Lake Dunlap.  | •   | Not applicable.   | <u>  • </u> | Downstream interests keenly opposed to this management strategy.  |
| Colorado River @ Columbus - LCRA Irrigation & Stored Water (C-17A) | 120,000 Max<br>80,000 in 2050 | Firm                     | \$622           | • | Concerns with endangered & threatened species, habitat, cultural resources, and TWD Ecologically Unique Stream Segments.   |          | Reductions in freshwater inflows to Matagorda<br>Bay associated with greater utilization of<br>existing water rights.                   | •   | Minimal   | •           | Encourages beneficial use of available rights and existing reservoirs.  |
| Canyon Reservoir – River Diversion (G-15C)                         | 15,000                        | Firm                     | \$450           | • | Minimal. Canyon Reservoir is an existin resource.  | •        | Increased instream flows associated with downstream deliveries of water supply.   | •   | Not applicable.   | :           | Encourages beneficial use of existing reservoir.  Recreational Benefits with downstream delivery.   |
| Canyon Reservoir - Wimberley & Woodcreek (G-24)                    | 1,048                         | Firm                     | \$1,586         | • | Minimal. Pipeline could encounter endantered or threatened species habitat.  | •        | Minimal, if any.  | •   | Not applicable.   | •           | Encourages beneficial use of existing reservoir.  |
| Carrizo Aquifer – Wilson & Gonzales (CZ-10C) <sup>5</sup>          | 75,000                        | Firm                     | \$653           | • | Minimal. Pipeline could encounter cultur l resource sites.   |          | Long-term reductions in well levels.  Some reductions in instream flow at outcrop.  Potential effects on discharge of small springs.    | •   | Minimal, if any.  | •           | Planned withdrawals in excess of that expressed<br>in policies of underground water conservation<br>districts.  |
| Carrizo Aquifer – Gonzales & Bastrop (CZ-10D) <sup>5</sup>         | 90,000                        | Firm                     | \$516           | • | Minimal. Pipeline could encounter cultur resource sites.   | •        | Long-term reductions in aquifer levels.  Some reductions in instream flow at outcrop.  Potential effects on discharge of small springs. | •   | Minimal, if any.  | •           | Planned withdrawals in excess of that expressed in policies of underground water conservation districts.  |
| Carrizo Aquifer - Local Supply (SCTN-2a)                           | 14,700                        | Firm                     | \$386           | • | Minimal, if any.   | <u> </u> | Modest long-term reductions in aquifer levels.  | •   | Minimal, if any.  |             |   |
| SAWS Recycled Water Program (SAWS)                                 | 52,215                        | Firm                     | \$395           | • | None. Water supply derived from increard volumes of treated wastewater.  | •        |   | •   | Not applicable.   | •           | Encourages beneficial use of available resource.  |
| Purchase of Water From Major Provider (PMP)                        | 8,000                         | Firm                     | \$877           | • | Minimal, if any. Supply developed as pa of other water management strategies.  | •.       | Minimal, if any.  | .•  | Not applicable.   |             |   |
| Aquifer Storage & Recovery (ASR) - (SCTN-1a)                       | Unquantified                  | Firm                     | Unquantified    | • | Minimal. Pipeline could encounter important habitat or encounter cultural resource site:   | •        | Reduced peak summer pumpage from Edwards<br>Aquifer increases aquifer levels and springflow.  | •   | Not applicable.   | •           | SAWS South Bexar County ASR presently in<br>implementation phase.   |
| Brush Management (SCTN-4)  | Unquantified                  | Unknown                  | Unquantified    | • | Concerns regarding endangered & threate ed species, vegetation & wildlife habitat, and cultural resources.   | •        | Potential benefit to Edwards Aquifer due to increased water for recharge.   | •   | Potential improvement of pasture for grazing.   | •           | Additional studies needed to determine quantity of dependable supply during drought   |
| Weather Modification (SCTN-5)                                      | Unquantified                  | Unknown                  | Unquantified    | • | Potential increases in water supply for willife habitat.   | •        | Potential increases in rainfall, runoff, and aquifer recharge.  | •   | Provides water for irrigated and dry-land agriculture (crops & ranching).                   | •           | Concerns regarding increased flood potential.   |
| Rainwater Harvesting (SCTN-9)                                      | Unquantified                  | Unknown                  | Unquantified    | • | Minimal, if any.   | <u> </u> | Minimal, if any.  | 1.  | Not applicable.   | •           | Consistent with conservation focus of Plan.   |
| Small Aquifer Recharge Dams  | Unquantified                  | Unknown                  | Unquantified    | • | Small potential effects on habitat.  | •        | Potential increases in local aquifer levels.  | •   | Minimal, if any.  |             |   |
| Total of New Supplies  | 525,237                       |                          | -               |   |  |          | <del>-</del>  |     | <del></del>   |             |   |

South Central Texas Region, EREPA Alternative - TWDB Evaluation Criteria Summary (Continued)

| Management Strategy   | Comparison of Strategies to Meet Needs   | Interbasin Transfer Issues                 | Third-Party Impacts of Voluntary Transfers   | Regional Efficiency  | Effect on<br>Navigation |
|---|--|--|--|--|-------------------------|
| Municipal Demand Reduction (Conservation) (L-10 Mun.)                 | Low unit cost.     Inherent environmental benefits.  | Not applicable.                            | Not applicable.  | Implementable throughout the region.   | None                    |
| Edwards Irrigation Transfers (L-15)                                   | Low unit cost  | Not applicable.                            | Maximum transfer may have potential socio-<br>economic impacts to third parties.     | Requires no new facilities.  | • None                  |
| Edwards Recharge - Type 2 Projects (L-18c)                            | Low unit cost  | Not applicable.                            | Not applicable.  | Requires no new transmission and treatment facilities.   | • None                  |
| Medina Lake Recharge Enhancement (S-13B)                              | Low unit cost.   | Not applicable.                            | Potentially significant impacts due to reduced irrigation from the BMA Canal System. | Requires no new facilities.  | • None                  |
| Edwards Recharge – Guadalupe River Diversions (SCTN-6a)               | Low to moderate unit cost.   | TNRCC Interbasin Transfer permit required  | Not applicable.  | Provides for recovery and recirculation of<br>enhanced springflow from Edwards Recharge –<br>Type 2 Projects (L-18c).  | • None                  |
| Colorado River @ Columbus – LCRA Irrigation &<br>Stored Water (C-17A) | Moderate unit cost.  | TNRCC Interbasin Transfer permit required. | Minimal. Water rights presently underutilized.                                       | <ul> <li>Shared pipeline alignment with other strategies.</li> <li>Shared water treatment and balancing storage facilities in Guadalupe County.</li> </ul>   | • None                  |
| Canyon Reservoir - River Diversion (G-15C)                            | Low unit cost.   | Not applicable.                            | Not applicable.  | <ul> <li>Additional surface water supply without construction of a new reservoir.</li> <li>Shared pipeline alignment with other strategies.</li> <li>Shared water treatment and balancing storage facilities in Guadalupe County.</li> </ul> | • None                  |
| Canyon Reservoir - Wimberley & Woodcreek (G-24)                       | High unit cost, but options to meet needs are limited.                                       | Not applicable.                            | Not applicable.  | Additional surface water supply without construction of a new reservoir.   | • None                  |
| Carrizo Aquifer – Wilson & Gonzales (CZ-10C) <sup>5</sup>             | Moderate unit cost.  | Not applicable.                            | Transfer rate could have potential socio-<br>economic impacts to third parties.      | New supply proximate to Bexar County.  | • None                  |
| Carrizo Aquifer – Gonzales & Bastrop (CZ-10D) <sup>5</sup>            | Low to moderate unit cost.   | Not applicable.                            | Transfer rate could have potential socio-<br>economic impacts to third parties.      | Shared pipeline alignment with other strategies.     Shared water treatment and balancing storage facilities in Guadalupe County.  | • None                  |
| Carrizo Aquifer - Local Supply (SCTN-2a)                              | Moderate cost.   | Not applicable.                            | Not applicable.  | New supply proximate to points of need.  | None                    |
| SAWS Recycled Water Program (SAWS)                                    | Low to moderate cost.  | Not applicable.                            | Not applicable.  | New supply proximate to points of need.  | • None                  |
| Purchase of Water From Major Provider (PMP)                           | Low to moderate cost.  | Not applicable.                            | Not applicable.  |  | None                    |
| Aquifer Storage & Recovery (ASR) – (SCTN-1a)                          | Effective means of reducing peak summer pumpage from the Edwards Aquifer.                    | Not applicable.                            | Not applicable.  | Increases reliability of current supply from the<br>Edwards Aquifer.   | • None                  |
| Brush Management (SCTN-4)   | Insufficient information at this time.   | Not applicable.                            | Not applicable.  | May contribute positively to storage and system management of supplies.  | • None                  |
| Weather Modification (SCTN-5)   | Potentially feasible management strategy to meet<br>a portion of projected irrigation needs. | Not applicable.                            | Not applicable.  | May contribute positively to storage and system management of supplies.  | • None                  |
| Rainwater Harvesting (SCTN-9)   | High unit cost; comparable to a domestic well.   | Not applicable.                            | Not applicable.  | Implementable throughout the region.   | None                    |
| Small Aquifer Recharge Dams   | High unit cost.  | Not applicable.                            | Not applicable.  | Implementable throughout the region.   | None                    |

of underground water conservation districts.

Notes:

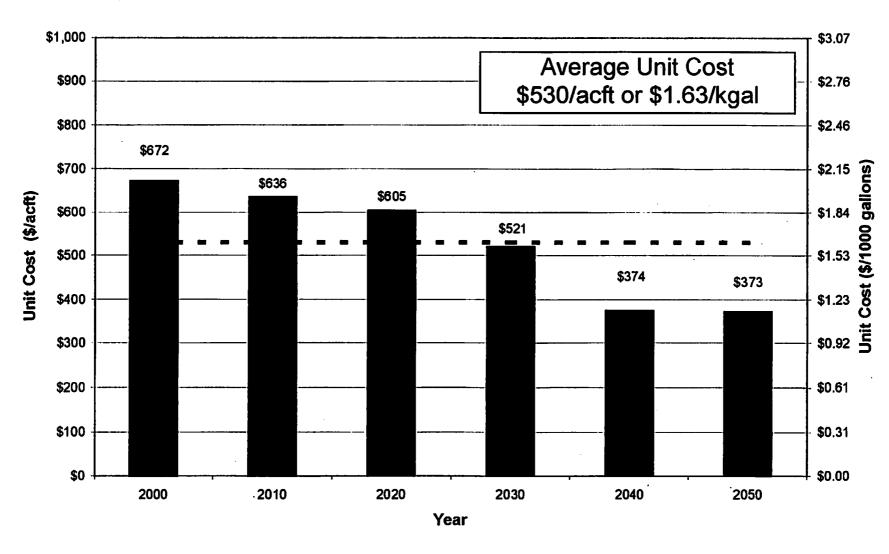
1) Quantity based on full implementation and utilization of new supplies in year 2050.

2) Firm reliability indicates that new supply is dependable in a drought of record with full implementation of the Alternative Plan.

3) Unit cost based on full utilization of supply at ultimate capacity of planned facilities and includes treatment and distribution facilities necessary to meet peak daily needs.

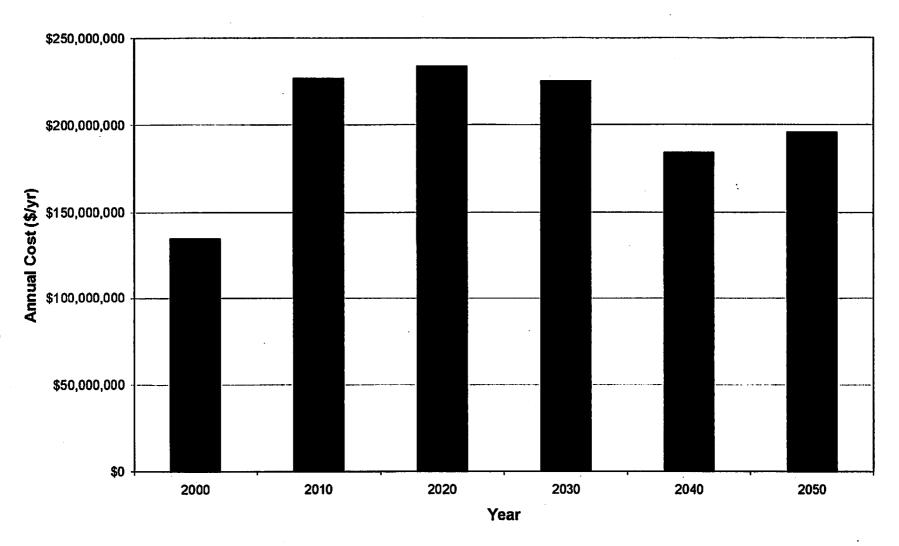
4) Management strategies in the implementation phase include Schertz-Seguin Water Supply Project, Western Canyon Regional Water Supply Project, Lake Dunlap WTP Expansion and Mid-Cities Project, and GBRA Canyon Reservoir Contract Renewals. Supplies associated with these management strategies were counted as current supply in the technical evaluation of alternative regional water plans.

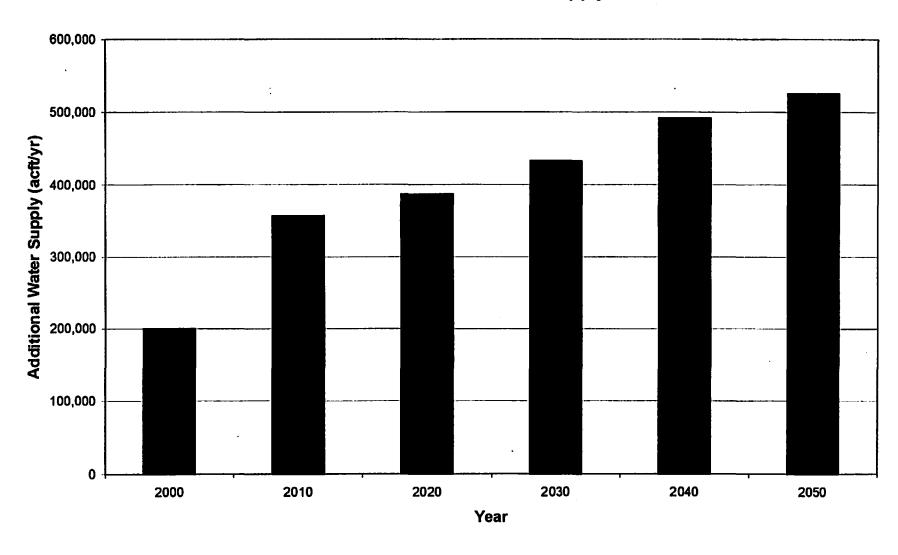
5) Subsequent to the technical evaluation of alternative regional water plans, quantity associated with this management strategy was limited in the Regional Water Plan in viel of policies associated with this management strategy was limited in the Regional Water Plan in viel of policies



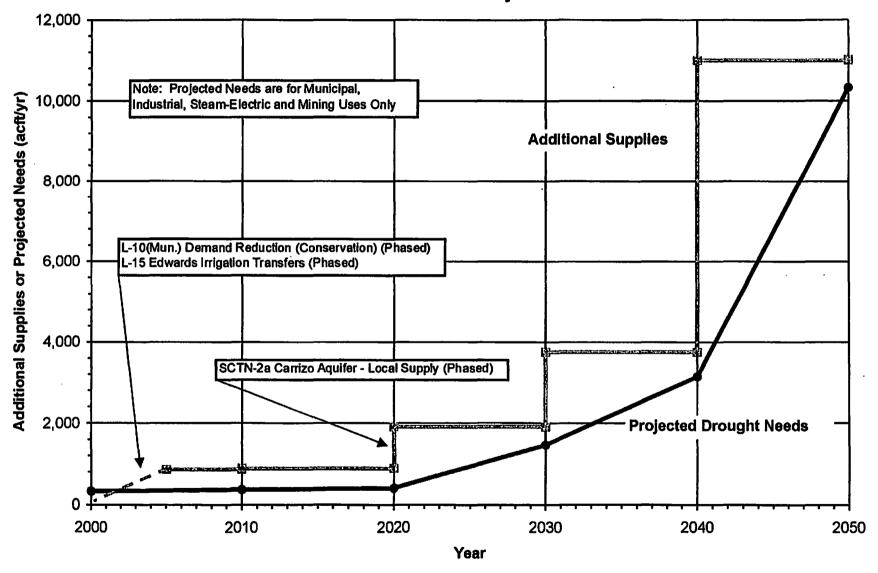
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## EREPA Alternative Regional Water Plan Annual Cost of Cumulative Additional Water Supply



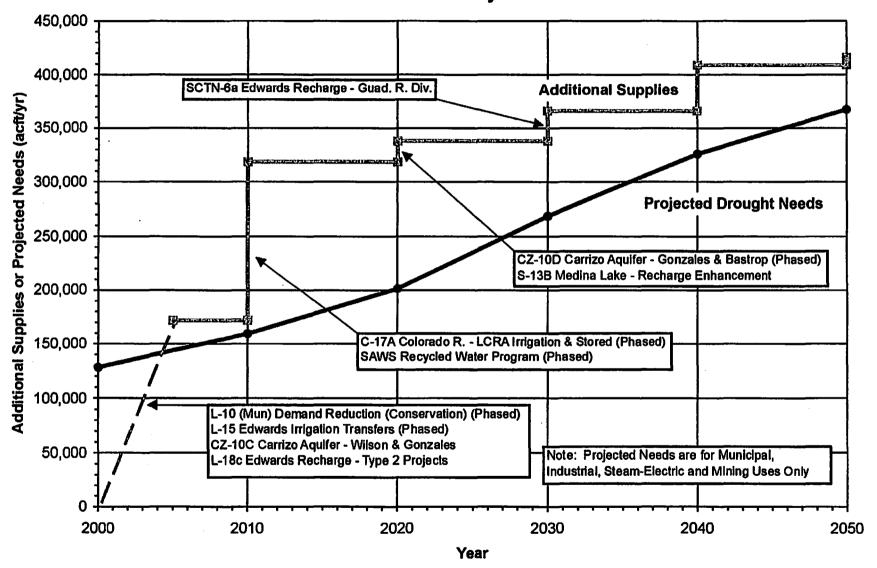


## EREPA Alternative Regional Water Plan Atascosa County



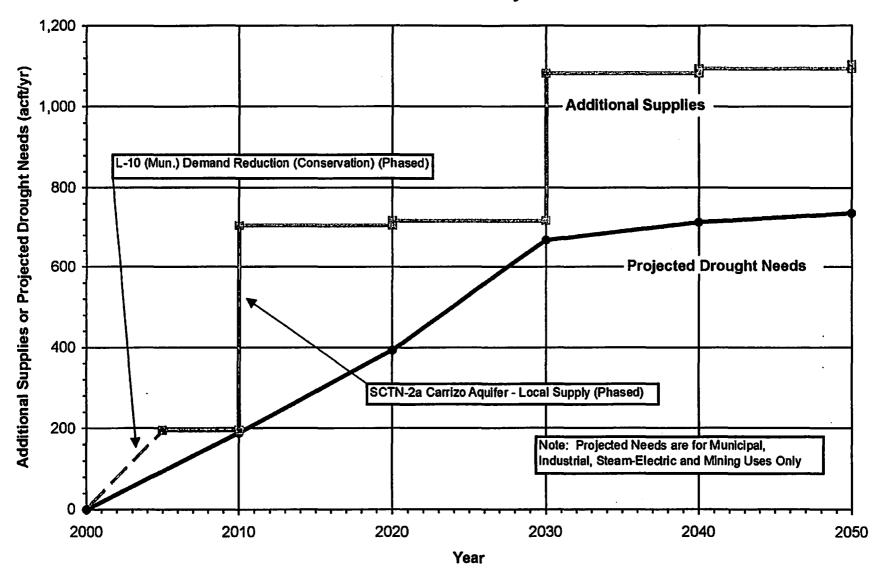
| South Co                                      | entral Texas Region  | - ::                 |                |                |                   |              | С  | ounty = A | tascosa                                 |
|---|--|----------------------|----------------|----------------|-------------------|--------------|--|-----------|---|
|   | ummary of Projected Water Needs (Shortages                 | and Water N          | /lanageme      | nt Strateg     | ies               |              |  | User Gro  |   |
|   |  |                      |                |                |                   |              |  |           |   |
| Projected                                     | Water Needs (acft/yr)                                      |                      |                |                |                   |              | -  |           |   |
|   | User Group(s)  |                      | 2000           | 2010           | 2020              | 2030         | 2040   | 2050      | Notes                                   |
|   | Municipal  |                      | 325            | 366            | 401               | 468          | 530  | 587       |   |
|   | Industrial   |                      | 0              | 0              | 0                 | 0            | 0  | 0         |   |
|   | Steam-Electric   |                      | 0              | 0              | 0                 | 0            | 1,504  | 8,504     | -                                       |
|   | Mining   |                      | 0              | 0              | 0                 | 995          | 1,109  | 1,239     |   |
|   | Irrigation   |                      | 38,418         | 36,718         | 35,170            | 43,726       | 42,190   | 40,713    |   |
|   | Total Needs  |                      | 38,743         | 37,084         | 35,571            | 45,189       | 45,333   | 51,043    |   |
|   | Mun, Ind, S-E, & Min Needs                                 |                      | 325            | 366            | 401               | 1,463        |  | 10,330    |   |
|   | Irrigation Needs   |                      | 38,418         |                |                   | 43,726       |  | 40,713    |   |
|   |  |                      |                |                |                   |              |  |           |   |
|   | nagement Strategies (acft/yr)                              | Candidate            |                |                | ļ <b>.</b>        |              |  |           |   |
| ID#   | Description  | New Supply           | 2000*          | 2010           | 2020              | 2030         | 2040   | 2050      | Notes                                   |
| L-10 (Mun.)                                   | Demand Reduction (Conservation)                            |                      | 356            | 384            | 411               | 259          | 300  | 319       |   |
| L-15  | Edwards Irrigation Transfers                               | 81,000               | 500            | 500            | 500               | 500          | 700  | 700       | 2, 3,                                   |
| SCTN-2a                                       | Carrizo Aquifer - Local Supply                             |                      |                |                |                   | 1,000        | 3,000  | 10,000    | 5,                                      |
|   |  |                      |                |                |                   |              |  |           |   |
|   |  |                      |                |                |                   |              |  | ·         |   |
|   |  |                      |                | -              |                   |              |  |           |   |
| SCTN-4  | Brush Management   |                      |                |                |                   |              |  | -         |   |
| SCTN-5  | Weather Modification                                       |                      |                | ·              |                   |              |  |           |   |
| SCTN-9  | Rainwater Harvesting                                       |                      |                |                |                   |              |  |           |   |
| 3 - 1, 1 -                                    | Small Aquiler Recharge Dams                                |                      |                |                |                   |              |  | ***       | -                                       |
| L-10 (lm.)                                    | Demand Reduction (Conservation)                            |                      | 3,962          | 3,962          | 3,962             | 3,962        | 3,962  | 3,962     | *************************************** |
|   | Total New Supplies   |                      | 4,818          | 4,846          |                   | 5,721        | 7,962  | 14,981    |   |
|   |  |                      |                |                |                   |              |  |           |   |
|   | Total System Mgmt. Supply / Deficit                        |                      | -33,925        | -32,238        | -30,698           | -39,468      | -37,371  | -36,082   |   |
|   | Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit         |                      | 531            | 518            |                   | 296          | 857  | 689       |   |
|   | Irrigation System Mgmt. Supply / Deficit                   |                      | -34,456        | -32,756        | -31,208           | -39,764      | -38,228  | -36,751   |   |
| Mater   |  |                      |                |                |                   |              |  |           |   |
| Notes:  | Candidate New Supplies shown for year 2000 are identified  | for oriority impleme | entation but w | dil not be ave | ilahia immedia    | laly         |  |           |   |
|   | Demand Reduction (Conservation) strategies assumed large   |                      |                |                | I DOOL HILLINGOID |              |  |           |   |
| 2   | Candidate New Supply to be shared among Uvalde, Medina     |                      |                |                | not be reliable   | in drought   |  |           |   |
| 3   | Pursuant to draft EAA Critical Period Management rules. Ca |                      |                |                |                   |              |  |           |   |
| <b>-</b>                                      | the estimated maximum potential annual transfer (95,430 ac |                      |                |                |                   |              |  |           |   |
| 4   | Additional Edwards supply is for City of Lytle.            |                      |                |                | 1                 |              |  |           |   |
| 5   | Additional Carrizo supply is for Steam-Electric and M      | lining use.          |                |                |                   |              |  | -         |   |
| 6   | Early implementation of facilities assumed in cost es      |                      | e sufficient   | supply durin   | a drought         |              |  |           |   |
| <del></del>                                   | Option expected to provide additional water supply in many |                      |                |                |                   | nuantified   |  | ٠         |   |
| <u>,                                     </u> | Estimates based upon use of LEPA systems on 50 percent     |                      |                |                |                   |              | annlication re   | 10        |   |
|   | Transmiss esses oben one or ret v stateme on on benegit (  | or annual militate   |                |                | ·· or an porcer   | a or impanon | The state of the s |           |   |

## EREPA Alternative Regional Water Plan Bexar County



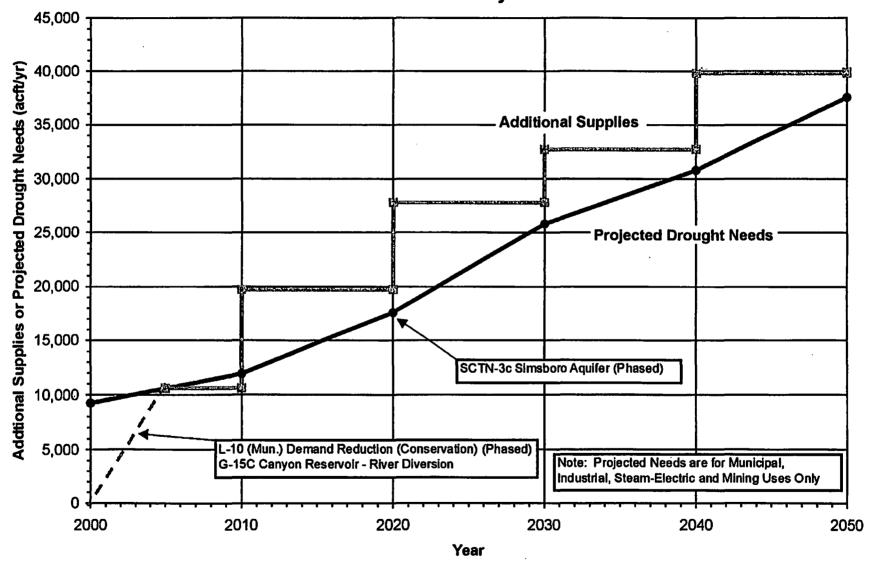
| mary of Projected Water Needs (Shortages) and ater Needs (acft/yr) | Water Manage   | ment Strate   | ales   |  |                     |                      | Hone Can                                     |  |
|--|--|---|--|--|---------------------|----------------------|--|--|
| ator Neode (arfflur)   |  |   |  |  |                     |                      | User Gro                                     | nb(s) =  |
|  |  |   | ì  |  |                     | Í                    |  |  |
| User Group(s)  |  | 2000  | 2010   | 2020   | 2030                | 2040                 | 2050   | Note   |
|  |  | 122,867   | 154,495  | 196,301  | 262,070             | 315,633              | 353,309                                      | - 11010  |
|  |  |   |  |  |                     |                      | 8 192  |  |
|  |  |   | <del>- ŏ</del> l   |  | - 1,100             |                      |  |  |
|  |  |   | 4.936  |  | 5.408               |                      |  |  |
|  | i  |   |  |  |                     |                      | 17,368                                       |  |
|  |  |   |  |  |                     |                      |  |  |
|  |  |   |  |  |                     |                      | 367.463                                      |  |
|  |  |   |  |  |                     |                      |  |  |
|  | Candidate  | ,-,-,   | 50,011,  | ,  | 10,010              | ,                    | ,  |  |
|  |  | 2000*   | 2010   | 2020   | 2030                | 2040                 | 2050   | No   |
|  |  |   |  |  |                     |                      |  |  |
| Edwards Irringlion Transfers                                       | 81.000   |   | 55,000   |  | 85 057              | 70,000               | 71 300                                       |  |
|  |  |   |  |  |                     |                      |  |  |
| Edwards Recharge - Type 2 Projects                                 |  |   | 13 451   | 13 451   | 13 451              |                      | 13 451                                       |  |
|  |  | 0,40.1  | 113 000  |  | 70,000              |                      | 23,000                                       |  |
| SAWS Recycled Water Program  |  |   | 19,826   | 26,737   | 35.824              |                      | 52 215                                       |  |
|  | 145,000  |   |  |  |                     |                      | 90.000                                       | 4, 9,  |
|  |  |   |  |  | 8,136               |                      | 8,136  |  |
|  |  |   |  |  |                     |                      | 42,121                                       |  |
| Aquifer Storage & Recovery - Regional                              |  |   |  |  |                     |                      |  |  |
|  |  |   | T t  |  | 1                   |                      |  |  |
| Weather Modification   |  |   |  |  |                     | <del></del>          |  |  |
|  |  |   |  |  |                     |                      |  |  |
|  |  |   |  |  |                     |                      |  |  |
| Demand Reduction (Conservation)                                    |  | 4,521   | 4,521  | 4,521  | 4,521               | 4,521                | 4,521  |  |
|  |  | 176,500   | 323,307  | 342,555  | 370,586             | 413.624              | 420,678                                      |  |
|  |  |   |  |  |                     |                      |  | -  |
|  | unniu / Doffelt  |   |  |  |                     |                      |  |  |
|  |  |   |  |  |                     |                      | 40,034                                       |  |
| irrigation System maint, Supply / Delicit                          |  | -10,034   | -10,000  | -10,004  | -14,454             | -13,004              | -12,041                                      |  |
|  |  | 1   | j  |  |                     | 1                    |  |  |
| Candidate New Supplies shown for year 2000 are k                   | dentified for prio   | rity impleme  | ntation, but   | will not be                                      | <u>avallable im</u> | mediately.           |  |  |
| Demand Reduction (Conservation) strategies assur                   | ned largely refle  | cted in proje   | cted water   | <u>demands.</u>                                  |                     |                      |  |  |
| Candidate New Supply to be shared among Uvalde                     | , Medina, Atasc  | osa, and Be   | xar Countie  | s. Supply n                                      | nay not be r        | <u>eliable in de</u> | ought  |  |
| Pursuant to draft EAA Critical Period Management                   | rules, Candidate   | New Suppl   | <u>y</u> represent   | s approxima                                      | ately 85 per        | cent of the          |  |  |
| estimated maximum potential annual transfer (95,43                 | 30 actt) based o   | n Proposed  | Permis pro   | rated to 40                                      | U,UUU actuy         | r.                   |  |  |
|  | 5,430 acm) base  | a on Propo  | sed Permits  | prorated to                                      | 400,000 80          | :tt/yr.              |  |  |
|  |  | 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 =   | (a) (a)  | 180 V61  | 4000000             | 10 00 Va 20          |  |  |
|  |  |   |  |  | aecteastud          | to bu Kaciy          | Yr.  |  |
| Candidate New Supply to be shared among Bexar,                     | Comai, Guadali   | ipe, and Ha   | Az Conunes   |  | -tod                |                      |  |  |
|  |  |   |  |  |                     |                      | ,I   |  |
| ruture use of recycled water for non-potable uses a                | na casea on go   | ai oi meeun   | 20 percen  | CWAC 10 I  | projectes W         | eres gemand          | <u>.                                    </u> |  |
| Portion of ZZU, UUU activyr considered under CZ-10D                | IN CONZEIES &  | AANSON COM  | ines which   | IR LIDI IUCIN                                    | 180 IN CZ-1         | <i>7</i> 0.          |  |  |
| SALIO ACRUST ITOM GONZAIES AND BASITOP COUNTIES                    | Dy 2040.   | al Education  | A suides sus   | ahi and cod                                      |                     |                      | lamanda.                                     |  |
| SAVVS ASK Program in Southern Bexar County Incr                    | eases renability   | or cowards  | wdmiet gnb   | ply and red                                      | uces seaso          | iai aquier c         | Kad  |  |
| Option expected to provide additional water supply                 | in many years, t   | ou asbayas  | DIE SUPPLY C   | ming arous                                       | alles et 44         | iny unquant          | meo.   | lastia-  |
|  | Candidate New Supplies shown for year 2000 are in Demand Reduction (Conservation) strategies assurt and date New Supply to be shared among Uvalde Pursuant to draft EAA Critical Period Management estimated maximum potential annual transfer (95,4) the estimated maximum potential annual t | Industrial Steam-Electric Mining Irrigation  Mun, Ind, S-E, & Min Needs Irrigation New Supply Description  Demand Reduction (Conservation) Edwards Irrigation Transfers  Edwards Irrigation Transfers  Edwards Recharge - Type 2 Projects  Colorado R LCRA Irrigation & Stored  SAWS Recycled Water Program  Carrizo Aquifer - Gonzales & Bastrop  Adulfer - Gonzales & Bastrop  145,000 SAWS Recycled Water Program  Carrizo Aquifer - Gonzales & Bastrop  Edwards Recharge - Guad. R. Div.  Aquifer Storage & Recovery - Regional Brush Management  Weather Modification Weather Modification Weather Modification Weather Harvesting Small Aquifer Recharge Dams Demand Reduction (Conservation)  Total System Mgmt. Supply / Deficti  Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit Irrigation System Mgmt. Supply / Deficit  Candidate New Supplies shown for year 2000 are identified for prio Demand Reduction (Conservation) strategies assumed largely refle Candidate New Supply to be shared among Uvalde, Medina, Atasc Pursuant to draft EAA Critical Period Management rules, Candidate estimated maximum potential annual transfer (95,430 acft) based on the estimated maximum potential annual transfer (95,430 acft) based on the estimated maximum potential annual transfer (95,430 acft) based on the estimated maximum potential annual transfer (95,430 acft) based on the estimated maximum potential annual transfer (95,430 acft) based on the estimated maximum potential annual transfer (95,430 acft) based on the estimated maximum potential annual transfer (95,430 acft) based on the estimated maximum potential annual transfer (95,430 acft) based on the estimated maximum potential annual transfer (95,430 acft) based on the estimated maximum potential annual transfer (95,430 acft) based on the estimated maximum potential annual transfer (95,430 acft) based on the estimated maximum potenti | Industrial Steam-Electric Mining Steam-Electric Mining A983 Irrigation Total Needs Isolates Irrigation Total Needs Irrigation New Supply Irrigation Needs Irrigation New Supply Irrigation Needs Irrigation Nee | Industrial 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | Industrial          | Industrial           | Industrial                                   | Industrial   0   0   0   1,430   4,759   6,192 |

## EREPA Alternative Regional Water Plan Caldwell County



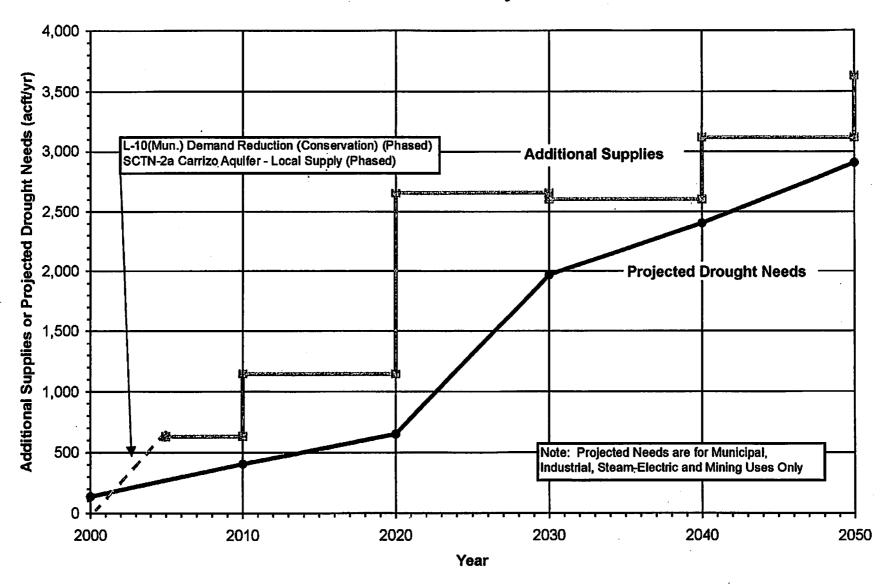
| South Ce    | ntral Texas Region   |                      |                |                 |                |             |       | ounty =   |           |
|-------------|--|----------------------|----------------|-----------------|----------------|-------------|-------|-----------|-----------|
| County St   | ummary of Projected Water Needs (Shortages                 | and Water N          | Manageme       | ent Strateg     | ies            |             |       | User Grou | p(s) = al |
| Declaried   | Mater Needs (softler)                                      |                      |                |                 |                |             |       |           |           |
| Projected   | Water Needs (acft/yr)                                      |                      | 2000           |                 |                |             |       |           |           |
|             | User Group(s)  |                      | 2000           | 2010            | 2020           | 2030        | 2040  | 2050      | Notes     |
|             | Municipal  |                      | 0              |                 | 393            | 668         | 714   | 737       |           |
|             | Industrial   |                      | . 0            | 0               | 0              | 0           | 0     | 0         |           |
|             | Steam-Electric   |                      | 0              |                 | 0              | . 0         | 0     | 0         |           |
|             | Mining   |                      | 0              |                 | 0              | 0           | 0     | 0         |           |
|             | Irrigation   |                      | 0              |                 | 0              | 0           | 0     | 0         |           |
|             | Total Needs  |                      | 0              | 188             | 393            | 668         | 714   |           |           |
|             | Mun, Ind, S-E, & Min Needs                                 |                      | 0              | 188             | 393            | 668         | 714   | 737       |           |
|             | Irrigation Needs   |                      | 0              | 0               | 0              | 0           | Ō     | 0         |           |
|             |  |                      |                |                 |                |             |       |           |           |
| Water Mar   | nagement Strategies (acft/yr)                              | Candidate            |                |                 |                |             |       |           |           |
| ID#         | Description  | New Supply           | 2000           | 2010            | 2020           | 2030        | 2040  | 2050      | Notes     |
| L-10 (Mun.) | Demand Reduction (Conservation)                            |                      | 195            | 206             | 218            | 82          | 93    | 104       |           |
| SCTN-2a     | Carrizo Aquifer - Local Supply                             |                      |                | 500             | 500            | 1,000       | 1,000 | 1.000     | 2         |
|             | _  |                      |                |                 |                |             |       |           |           |
|             |  |                      |                |                 |                |             |       |           |           |
|             |  |                      |                |                 |                |             |       |           |           |
|             |  |                      |                | ll              |                |             |       |           |           |
|             |  |                      |                |                 |                |             |       |           |           |
|             |  |                      |                |                 |                |             |       |           |           |
|             | Small Aquifer Recharge Dams                                |                      |                |                 |                |             |       |           |           |
| L-10 (ln.)  | Demand Reduction (Conservation)                            |                      |                |                 |                |             |       |           |           |
|             |  |                      |                |                 |                |             |       |           |           |
|             |  |                      |                |                 |                |             |       |           |           |
|             | Total New Supplies   |                      | 195            | 706             | 718            | 1,082       | 1,093 | 1,104     |           |
|             |  |                      |                |                 |                |             |       |           |           |
|             | Total System Mgmt. Supply / Deficit                        |                      | 195            |                 | 325            | 414         | 379   | 367       |           |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /                 |                      | 195            | 518             | 325            | 414         | 379   | 367       |           |
|             | Irrigation System Mgmt. Supply / Deficit                   |                      | Ō              | 0               | 0              | Ö           | . 0   | 0         |           |
|             | Y  |                      |                |                 |                |             |       |           |           |
| Notes:      |  |                      |                |                 |                |             |       |           |           |
| 1           | Demand Reduction (Conservation) strategies assumed large   | ly reflected in proj | ected water d  | emands.         |                |             |       |           |           |
| 2           | Additional well(s) for Lockhart.                           |                      |                |                 |                |             |       |           |           |
| 3           | Option expected to provide additional water supply in many | years, but dependa   | able supply du | ging drought is | s presently un | quantified. |       |           |           |

## EREPA Alternative Regional Water Plan Comal County



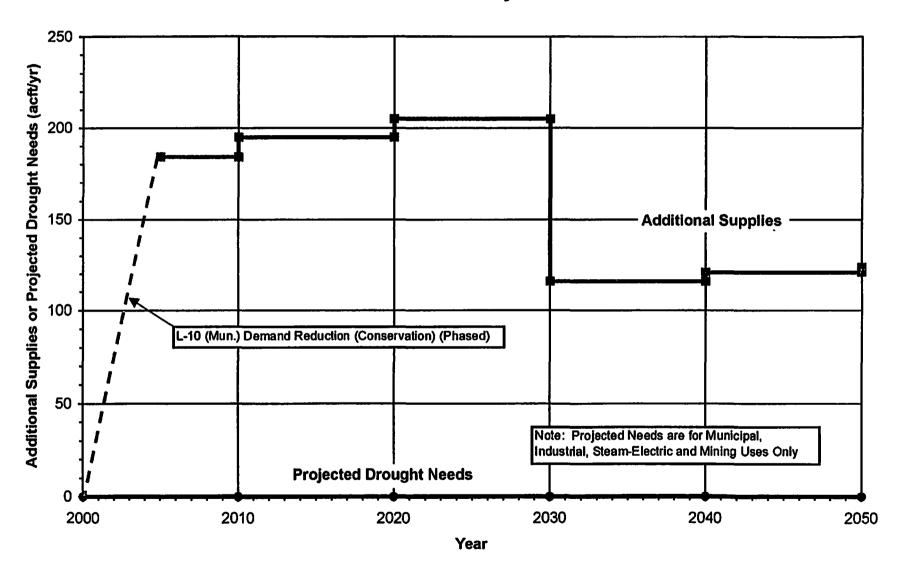
| South C         | entral Texas Region   |                          |                |                |                |             |        | County   | = Coma      |
|-----------------|---|--------------------------|----------------|----------------|----------------|-------------|--------|----------|-------------|
| County S        | Summary of Projected Water Needs (Shortage                    | s) and Water N           | lanageme       | nt Strateg     | ies            |             |        | User Gro |             |
|                 |   |                          |                |                |                |             |        |          |             |
| <b>Projecte</b> | d Water Needs (acft/yr)                                       |                          |                |                |                | į           |        |          |             |
|                 | User Group(s)   |                          | 2000           | 2010           | 2020           | 2030        | 2040   | 2050     | Notes       |
|                 | Municipal   |                          | 2,289          | 5,049          | 10,487         | 18,282      | 25,205 | 33,062   |             |
|                 | Industrial  |                          | 1,388          | 1,425          | 1,486          | 1,737       | 2,009  | 2,289    |             |
|                 | Steam-Electric  |                          | 0              | 0              | 0              | 0           | 0      | 0        |             |
|                 | Mining  |                          | 5,570          | 5,464          | 5,628          | 5,796       | 3,590  | 2,224    |             |
|                 | Irrigation  |                          | 30             | 14             | 0              | 0           | 0      | 0        |             |
|                 | Total Needs   |                          | 9,277          | 11,952         | 17,601         | 25,815      | 30,804 | 37,575   |             |
|                 | Mun, Ind, S-E, & Min Needs                                    |                          | 9,247          | 11,938         | 17,601         | 25,815      | 30,804 | 37,575   |             |
|                 | Irrigation Needs  |                          | 30             | 14             | 0              | 0           | 0      | 0.,,,,,  |             |
|                 |   |                          |                |                |                |             |        |          | هين المراجع |
| Water M         | anagement Strategies (acft/yr)                                | Candidate                |                |                |                |             |        |          |             |
| ID#             | Description   | New Supply               | 2000*          | 2010           | 2020           | 2030        | 2040   | 2050     | Notes       |
| L-10 (Mun.)     | Demand Reduction (Conservation)                               |                          | 616            | 718            | 848            | 718         | 824    | 942      |             |
| G-15C           | Canyon Reservoir - River Diversion                            | 15,000                   | 10,000         | 10.000         |                | 10.000      | 10,000 | 10,000   | 2,          |
| C-17A           | Colorado R LCRA Irrigation & Stored                           | 125,000                  |                | 3,000          | 9,000          | 17,000      | 22,000 | 29,000   | 4, 5,       |
|                 |   |                          |                |                |                |             |        | 30,000   | - 101       |
|                 |   |                          |                |                |                | <u> </u>    |        |          |             |
|                 |   |                          |                |                |                |             |        |          |             |
|                 |   |                          |                |                | _              |             |        |          |             |
|                 |   |                          |                |                |                |             |        |          |             |
|                 | Small Aquifer Recharge Dams                                   |                          |                |                |                |             |        |          |             |
| L-10 (frr.)     | Demand Reduction (Conservation)                               |                          |                |                |                |             |        |          |             |
|                 |   |                          |                |                |                |             |        |          |             |
|                 | Total New Supplies  |                          | 10,616         | 13,718         | 19,848         | 27,718      | 32,824 | 39,942   |             |
|                 |   |                          |                |                |                |             |        |          |             |
|                 | Total System Mgmt. Supply / Deficit                           |                          | 1,339          | 1,766          | 2,247          | 1,903       | 2,020  | 2.367    |             |
|                 | Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit            |                          | 1.369          | 1,780          | 2,247          | 1,903       | 2,020  | 2,367    |             |
|                 | Irrigation System Mgmt. Supply / Deficit                      |                          | -30            | -14            | 0              | 0           | 0      | 0        |             |
|                 |   |                          |                |                |                | _           |        |          |             |
| Notes:          |   |                          |                |                |                |             |        |          |             |
| •               | Candidate New Supplies shown for year 2000 are identified     | for priority impleme     | ntation, but m | nav not be av  | ailable immedi | ately.      |        |          |             |
| 1               | Demand Reduction (Conservation) strategies assumed large      |                          |                |                |                |             |        |          |             |
| 2               | Portion of Canyon firm yield (with amendment) diverted belo   |                          | . 1            |                |                |             |        |          |             |
| 3               | Candidate New Supply shared among Comal, Guadatupe, a         | nd Hays Counties.        |                |                |                |             |        |          |             |
| 4               | Supply dependent upon future water needs in Region K and      | /or interbasin transf    | er issues (12  | 0 Kacftlyr dec | reasing to 80  | Kacft/yr).  |        |          |             |
| 5               | Candidate New Supply to be shared among Bexar, Comal,         | <u>Guadalupe, and Ha</u> | ys Counties.   |                |                |             |        |          |             |
| 6               | Early implementation of facilities assumed in cost estimation | to ensure sufficien      | t supply durin |                |                |             |        |          |             |
| 7               | Option expected to provide additional water supply in many    | vears, but dependa       | ble supply du  | rina drought i | s presentiv un | guantified. |        |          |             |

## EREPA Alternative Regional Water Plan Dimmit County



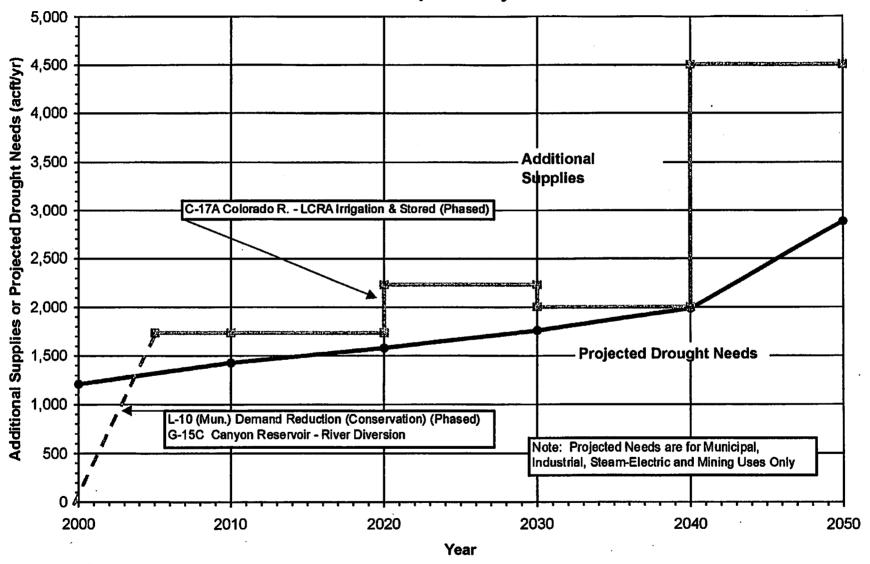
| South C     | entral Texas Region   |                    |               |                |                |               | (        | County = | Dimmit    |
|-------------|---|--------------------|---------------|----------------|----------------|---------------|----------|----------|-----------|
| County S    | ummary of Projected Water Needs (Shorta                     | ges) and Wat       | er Manag      | ement Str      | ategies        |               | <u> </u> | ser Grou | p(s) = al |
| Projected   | Water Needs (acft/yr)                                       | _                  |               |                |                |               |          |          |           |
|             | User Group(s)   |                    | 2000          | 2010           | 2020           | 2030          | 2040     | 2050     | Notes     |
|             | Municipal   | -                  | 138           | 405            | 649            | 1,054         | 1,479    | 1,959    | 110103    |
| <del></del> | Industrial  | <del></del>        | 130           | 403            | 0              | 1,0541        | 0        | 1,535    | ·         |
|             | Steam-Electric  |                    | ŏ             | ŏ              | ŏ              | ő             | ől       | ŏ        |           |
|             | Mining  |                    | - ŏl          | ōl             | Ö              | 915           | 925      | 949      |           |
|             | trrigation  |                    | 0             | ō              | 0              | 2,133         | 1,737    | 1,331    |           |
|             | Total Needs   |                    | 138           | 405            | 649            | 4,102         | 4,141    | 4,239    |           |
|             | Mun, Ind, S-E, & Min Needs                                  |                    | 138           | 405            | 649            | 1,969         | 2,404    | 2,908    |           |
|             | Irrigation Needs  |                    | 0             | 0              | 0              | 2,133         | 1,737    | 1,331    |           |
|             | ,   |                    |               | Ū              | •              | 2,000         | 1,000    | 1,001    |           |
| Water Ma    | nagement Strategies (acft/yr)                               | Candidate          |               |                |                |               |          |          |           |
| ID#         | Description   | New Supply         | 2000*         | 2010           | 2020           | 2030          | 2040     | 2050     | Notes     |
| L-10 (Mนก.) | Demand Reduction (Conservation)                             |                    | 131           | 144            | 156            | 104           | 118      | 133      |           |
| SCTN-2a     | Carrizo Aquifer - Local Supply                              |                    | 500           | 1,000          | 1,000          | 2,500         | 3,000    | 3,500    | 2,        |
|             | <u> </u>  |                    |               |                |                |               |          |          |           |
|             |   |                    |               |                | <del></del>    |               |          |          |           |
|             | <u> </u>  |                    |               |                |                |               |          |          |           |
|             |   |                    |               |                |                |               |          |          |           |
|             |   |                    |               |                |                |               |          |          |           |
| SCTN-4      | Brush Management  |                    |               |                |                |               |          |          |           |
| SCTN-5      | Weather Modification  |                    |               |                |                |               |          |          |           |
| SCTN-9      | Rainwater Harvesting  |                    |               |                |                |               | •        |          |           |
|             | Small Aquifer Recharge Dams                                 |                    |               |                |                |               |          |          |           |
| L-10 (lrr.) | Demand Reduction (Conservation)                             |                    |               |                |                |               |          |          |           |
| •           | Total New Supplies  |                    | 631           | 1,144          | 1,156          | 2,604         | 3,118    | 3,633    |           |
|             |   |                    | 400           | ===            |                | 4.400         | 4 000    |          |           |
|             | Total System Mgmt. Supply / Deficit                         |                    | 493           | 739            | 507            | -1,498        | -1,023   | -606     |           |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit       |                    | 493           | 739            | 507            | 635           | 714      | 725      |           |
|             | Irrigation System Mgmt. Supply / Deficit                    |                    | 0             | 0              | 0              | -2,133        | -1,737   | -1,331   |           |
| Notes:      |   |                    |               |                |                |               |          |          |           |
| •           | Candidate New Supplies shown for year 2000 are identifi     |                    |               |                | available im   | mediately.    |          | 1        |           |
| 1           | Demand Reduction (Conservation) strategies assumed to       | rgely reflected in | projected wat | ler demands.   |                |               |          |          |           |
| 2           | Additional well(s) for Carrizo Springs and Mining supply.   |                    |               |                |                |               |          |          |           |
| 3           | Early Implementation of facilities assumed in cost estimate |                    |               |                |                | I             |          |          |           |
| 4           | Option expected to provide additional water supply in ma    | ny years, but depe | endable supp  | ly during drou | ight is preser | tly unquantif | ied.     |          |           |

## EREPA Alternative Regional Water Plan Frio County



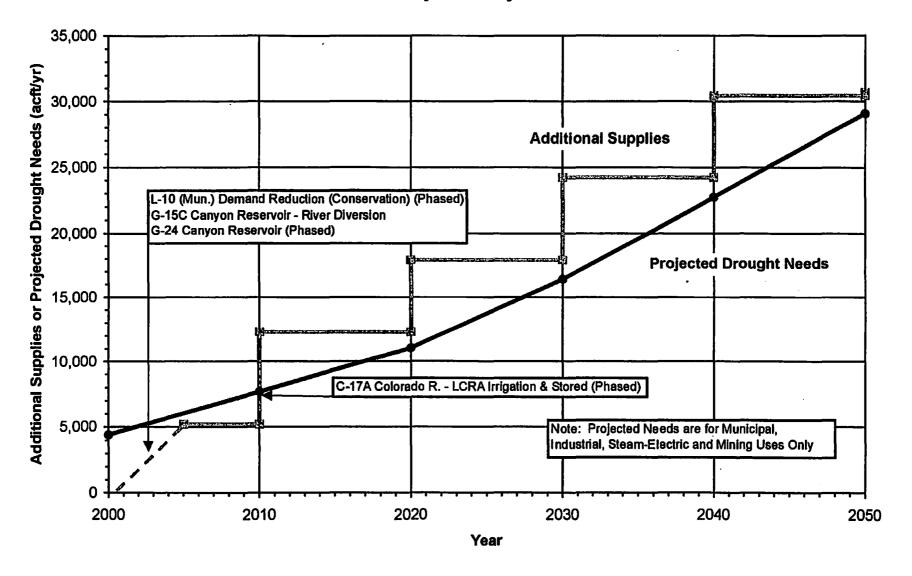
| South Ce    | entral Texas Region  |                      |                 |               |                 |               |         | Coun        | ty = Frio |
|-------------|--|----------------------|-----------------|---------------|-----------------|---------------|---------|-------------|-----------|
|             | ummary of Projected Water Needs (Shortage                  | es) and Water        | Managen         | ent Strate    | gles            |               |         | User Grou   |           |
|             |  |                      |                 |               | _               |               |         |             |           |
| Projected V | Nater Needs (acft/yr)                                      |                      |                 |               |                 |               |         |             |           |
|             | User Group(s)  |                      | 2000            | 2010          | 2020            | 2030          | 2040    | 2050        | Notes     |
|             | Municipal  |                      | 0               | 0             | 0               | 0             | 0       | 0           | _         |
|             | Industrial   |                      | 0               | 0             | 0               | 0             | 0       | 0           |           |
|             | Steam-Electric   |                      | 0               | 0             | 0               | 0             | 0       | 0           |           |
|             | Mining   |                      | 0               | 0             | 0               | 0             | 0       | 0           |           |
|             | Irrigation   | !                    | 71,126          | 67,646        | 64,365          | 76,505        | 73,519  | 70,662      |           |
|             | Total Needs  |                      | 71,126          | 67,646        | 64,365          | 76,505        | 73,519  | 70,662      |           |
|             | Mun, Ind, S-E, & Min Needs                                 |                      | 0               | 0             | 0               | 0             | Ō       | 0           |           |
|             | Irrigation Needs   |                      | 71,126          | 67,646        | 64,365          | 76,505        | 73,519  | 70,662      |           |
|             | 11118 411011 1100 420                                      |                      | 1 1,100         | 0.10.0        | 0.1,000         | 10,000        | 10,010  | 70,002      |           |
| Water Mai   | nagement Strategies (acft/yr)                              | Candidate            |                 |               |                 |               |         |             |           |
| ID#         | Description  | New Supply           | 2000            | 2010          | 2020            | 2030          | 2040    | 2050        | Notes     |
| L-10 (Mun.) | Demand Reduction (Conservation)                            |                      | 184             | 195           | 205             | 116           | 121     | 124         | 1         |
| <u> </u>    | Dollars 1.0000001 (Sanisal Adrian)                         |                      |                 |               |                 |               |         |             |           |
| <del></del> |  |                      |                 |               |                 |               |         |             |           |
|             |  |                      |                 |               |                 |               |         |             |           |
| ****        |  |                      |                 |               |                 |               |         |             |           |
|             |  |                      |                 |               |                 |               |         |             |           |
|             |  |                      |                 |               |                 |               |         |             |           |
|             |  |                      |                 |               |                 |               |         |             |           |
| SCTN-4      | Brush Management   |                      |                 |               |                 | •             |         |             | 2         |
| SCTN-5      | Weather Modification                                       |                      |                 |               |                 | **            |         |             | 2         |
| SCTN-9      | Rainwater Harvesting                                       |                      | l               |               |                 |               |         |             | 2         |
|             | Small Aquifer Recharge Dams                                |                      |                 |               |                 |               |         |             | 2         |
| L-10 (frr.) | Demand Reduction (Conservation)                            |                      | 5,947           | 5,947         | 5,947           | 5,947         | 5,947   | 5,947       | 3         |
|             | Total New Supplies   |                      | 6,131           | 6,142         | 6,152           | 6,063         | 6,088   | 6,071       |           |
|             |  |                      |                 |               |                 |               |         |             |           |
|             | Total System Mgmt. Supply / Deficit                        |                      | -64,995         | -61,504       | -58,213         | -70,442       | -67,451 | -64,591     |           |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /                 |                      | 184             | 195           | 205             | 116           | 121     | 124         |           |
|             | Deficit  |                      |                 |               | 200             | ا"نا          | '-'     | 127         |           |
|             |  |                      | 05.470          | 64 600        |                 | 70 550        | 67.570  |             |           |
|             | Irrigation System Mgmt. Supply / Deficit                   |                      | -65,179         | -61,699       | -58,418         | -70,558       | -67,572 | -64,715     |           |
| Notes:      | ,  |                      |                 |               |                 |               |         |             |           |
| 1           | Demand Reduction (Conservation) strategies assumed lar     | nety reflected in re | mierted water   | damande       |                 |               |         |             |           |
| 2           | Option expected to provide additional water supply in many |                      |                 |               | nt is presently | unnuanified   |         |             |           |
| 2           | Estimates based upon use of LEPA systems on 50 percen      |                      |                 |               |                 |               |         |             |           |
| <u> </u>    | application rate.  | o accessos illiga    | 2104 BI 1007, 1 | THE COURSE VE | USI 21 20 PSI   | cent or migat |         | <del></del> |           |
|             | Jappiication iata.   | L                    | L               |               |                 |               |         | <u>-</u>    |           |

## EREPA Alternative Regional Water Plan Guadalupe County



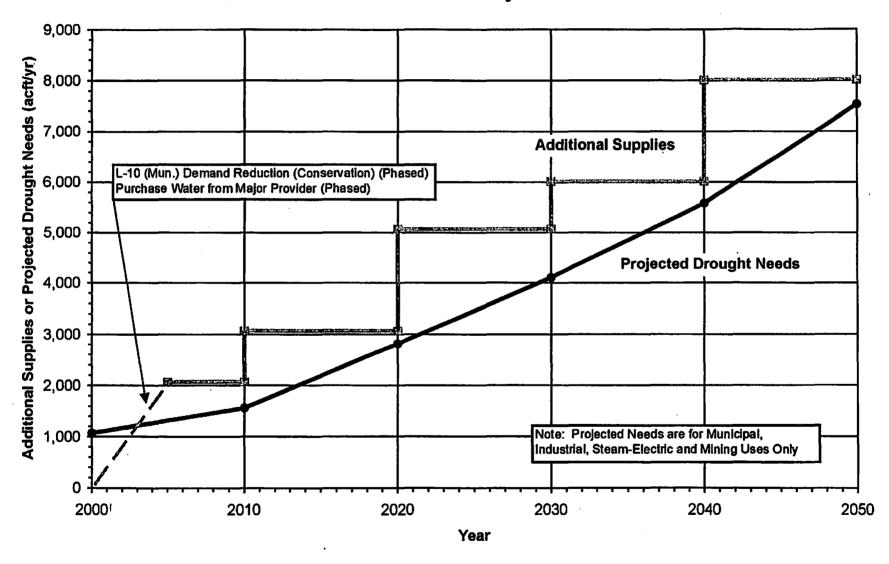
| South C     | entral Texas Region   |                       |                |                 |                |              | Cou      | nty = Gu  | adalupe       |
|-------------|---|-----------------------|----------------|-----------------|----------------|--------------|----------|-----------|---------------|
| County S    | ummary of Projected Water Needs (Shortag                      | es) and Water         | Managen        | nent Strat      | egies          |              |          | Jser Grou | p(s) = al     |
| Projected   | Water Needs (acft/yr)   |                       |                |                 |                |              |          |           |               |
|             | User Group(s)   |                       | 2000           | 2010            | 2020           | 2030         | 2040     | 2050      | Notes         |
|             | Municipal   |                       | 29             | 23              | 30             | 71           | 87       | 773       |               |
|             | Industrial  |                       | 985            | 1,204           | 1,350          | 1,487        | 1,692    | 1,899     |               |
|             | Steam-Electric  |                       | 0              | 0               | 0              | 0            | Ō        | 0         |               |
|             | Mining  |                       | 198            | 198             | 200            | 202          | 207      | 213       |               |
|             | Irrigation  |                       | 985            | 879             | 779            | 684          | 594      | 508       |               |
|             | Total Needs   |                       | 2,195          | 2,304           | 2,359          | 2,444        | 2,580    | 3,393     |               |
|             | Mun, Ind, S-E, & Min Needs                                    |                       | 1,210          | 1,425           | 1,580          | 1,760        | 1,986    | 2,885     |               |
|             | Irrigation Needs  |                       | 985            | 879             | 779            | 684          | 594      | 508       |               |
| Water Ma    | nagement Strategies (acft/yr)                                 | Candidate             |                |                 |                |              |          |           |               |
| ID#         | Description   | New Supply            | 2000*          | 2010            | 2020           | 2030         | 2040     | 2050      | Notes         |
| L-10 (Mun.) | Demand Reduction (Conservation)                               |                       | 235            | 236             | 236            | 5            | 5        | - 6       |               |
| G-15C       | Canyon Reservoir - River Diversion                            | 15,000                | 1,500          | 1,500           | 1,500          | 1,500        | 1,500    | 1,500     | 2,            |
| C-17A       | Colorado R LCRA Irrigation & Stored                           | 125,000               |                |                 | 500            | 500          | 1,000    | 3,000     | 4, 5, (       |
|             |   |                       |                |                 |                |              |          |           |               |
|             | Small Aquifer Recharge Dams                                   |                       |                |                 |                |              |          |           |               |
| L-10 (lrr.) | Demand Reduction (Conservation)                               | <del></del> -         |                |                 |                |              |          |           | <del></del>   |
|             |   |                       |                |                 |                |              |          |           |               |
|             | Total New Supplies  |                       | 1,735          | 1,736           | 2,236          | 2,005        | 2,505    | 4,506     |               |
|             | Total System Mgmt. Supply / Deficit                           | 4                     | -460           | -568            | -123           | -439         | -75      | 1,113     | · , · · · · · |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit         |                       | 525            | 311             | 656            | 245          | 519      | 1,621     |               |
|             | Irrigation System Mgmt. Supply / Deficit                      |                       | -985           | -879            | -779           | -684         | -594     | -508      |               |
| Notes:      |   |                       |                |                 |                |              |          |           |               |
|             | Candidate New Supplies shown for year 2000 are identified     | d for priority implen | nentalion, but | t will not be a | vailable imme  | diately.     |          |           |               |
| 1           | Demand Reduction (Conservation) strategies assumed large      |                       |                |                 |                |              | I        |           |               |
| 2           | Portion of Canyon firm yield (with amendment) diverted be     | low Seguin.           |                |                 |                |              |          |           |               |
| 3           | Candidate New Supply shared among Comal, Guadalupe,           | and Hays Counties     | Б              |                 |                |              |          |           |               |
| 4           | Supply dependent upon future water needs in Region K an       | d/or interbasin tran  | sfer issues (  | 120 Kacft/yr d  | ecreasing to   | 80 Kacftyr). |          |           |               |
| 5           | Candidate New Supply to be shared among Bexar, Comal,         | Guadalupe, and I-     | lays Counties  | 5.              |                |              |          |           |               |
| 6           | Early implementation of facilities assumed in cost estimation |                       |                |                 |                |              |          | I         |               |
| 7           | Option expected to provide additional water supply in many    | years, but depend     | dable supply   | during drougt   | t is presently | unquantified | <u> </u> |           |               |

## EREPA Alternative Regional Water Plan Hays County



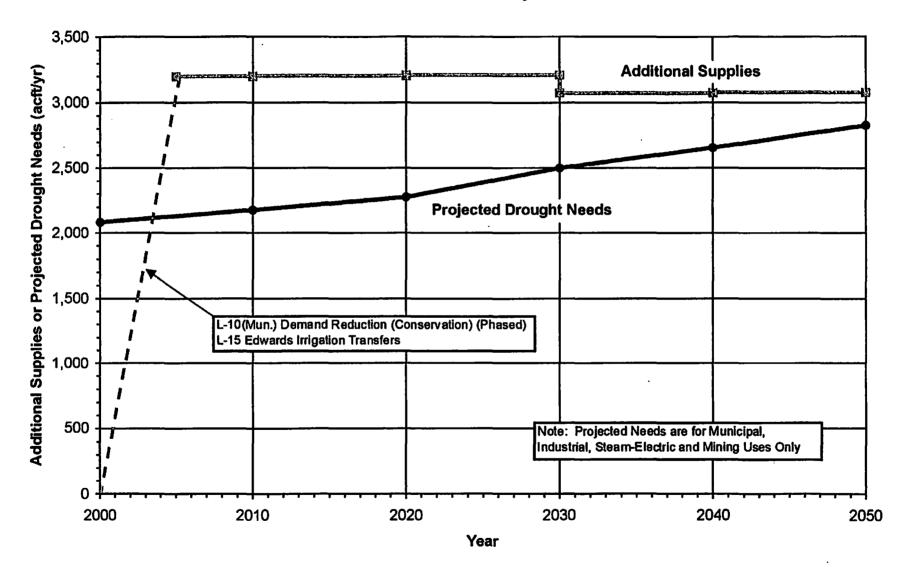
| South C       | entral Texas Region   |                      |                |                     |                 |               |        |           | y = Hays   |
|---------------|---|----------------------|----------------|---------------------|-----------------|---------------|--------|-----------|------------|
| County S      | ummary of Projected Water Needs (Shortage                     | es) and Water        | Managen        | nent Strat          | egles           |               |        | User Grou | ıp(s) = al |
| Proiected     | i Water Needs (acft/yr)                                       |                      |                |                     |                 |               |        |           |            |
|               | User Group(s)   |                      | 2000*          | 2010                | 2020            | 2030          | 2040   | 2050      | Notes      |
|               | Municipal   |                      | 4,325          | 7,609               | 10,980          | 16,349        | 22,696 | 29,059    |            |
|               | Industrial  |                      | 0              | 0                   | 0               | O             | 0      | 0         |            |
|               | Steam-Electric  |                      | 0              | 0                   | 0               | 0             | 0      | 0         |            |
|               | Mining  |                      | 84             | 82                  | 68              | 55            | 37     | 28        |            |
|               | Irrigation  |                      | 0              | 0                   | 0               | 0             | 0      | 0         |            |
|               | Total Needs   |                      | 4,409          | 7,691               | 11,048          | 16,404        | 22,733 | 29,087    | <u> </u>   |
|               | Mun, Ind, S-E, & Min Needs                                    |                      | 4,409          | 7,691               | 11,048          | 16,404        | 22,733 | 29,087    |            |
|               | Irrigation Needs  |                      | 0              | 0                   | 0               | 0             | 0      | 0         |            |
| Water Ma      | nnagement Strategies (acft/yr)                                | Candidate            |                |                     |                 |               |        |           |            |
| ID#           | Description   | New Supply           | 2000*          | 2010                | 2020            | 2030          | 2040   | 2050      | Notes      |
| L-10 (Mun.)   | Demand Reduction (Conservation)                               | new cuppiy           | 647            | 747                 | 873             | 699           | 906    | 1,174     |            |
| G-15C         | Canyon Reservoir - River Diversion                            | 15,000               | 3500           | 3500                | 3500            | 3500          | 3500   | 3500      |            |
| G-130<br>G-24 | Canyon Reservoir  | 1,048                | 1,048          | 1,048               | 1,048           | 1,048         | 1,048  | 1,048     |            |
| C-17A         | Colorado R LCRA Irrigation & Stored                           | 125,000              |                | 4,000               | 7,000           | 12,500        | 19,000 | 25,000    |            |
|               |   |                      |                |                     |                 |               |        |           |            |
| L-10 (lrr.)   | Small Aquiler Recharge Dams Demand Reduction (Conservation)   |                      |                |                     |                 |               |        |           |            |
|               |   |                      |                |                     |                 |               |        |           |            |
|               | Total New Supplies  |                      | 5,195          | 9,295               | 12,421          | 17,747        | 24,454 | 30,722    |            |
|               | Total System Mgmt. Supply / Deficit                           |                      | 786            | 1,604               | 1,373           | 1,343         | 1,721  | 1,635     |            |
|               | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit         |                      | 786            | 1,604               |                 | 1,343         | 1,721  | 1,635     |            |
|               | Irrigation System Mgmt. Supply / Deficit                      |                      | 0              | 0                   | 0               | 0             | 0      | 0         |            |
| Notes:        |   |                      | ì              |                     |                 |               | i      |           |            |
| MOTAR:        | Candidate New Supplies shown for year 2000 are identified     | d for priority imple | mentation but  | t will not be a     | vailahle immo   | diately       |        |           |            |
| 1             | Demand Reduction (Conservation) strategies assumed lan        |                      |                |                     | TONGONG HILLING | watery.       |        |           |            |
| 2             | Portion of Canyon firm yield (with amendment) diverted be     |                      | -,-5.55        |                     |                 |               |        |           |            |
| 3             | Candidate New Supply shared among Comal, Guadalupe,           | and Hays Countie     | s.             |                     |                 |               |        |           |            |
| 4             | Candidate New Supply for Wimberley and Woodcreek.             |                      |                | · · · · · - · · · · |                 |               |        |           |            |
| 5             | Supply dependent upon future water needs in Region K an       | d/or interbasin tra  | nsfer Issues ( | 120 Kacft/yr        | decreasing to   | 80 Kacftyr).  |        |           |            |
| 6             | Candidate New Supply to be shared among Bexar, Comal,         | Guadalupe, and I     | lays Counties  | 3.                  |                 | T             |        |           |            |
| 7             | Early implementation of facilities assumed in cost estimation | on to ensure suffici | ent supply du  | ring drought.       |                 |               |        |           |            |
| 8             | Option expected to provide additional water supply in many    | y years, bul depen   | dable supply   | during droug        | ht is presently | unquantified. |        |           |            |

### EREPA Alternative Regional Water Plan Kendall County



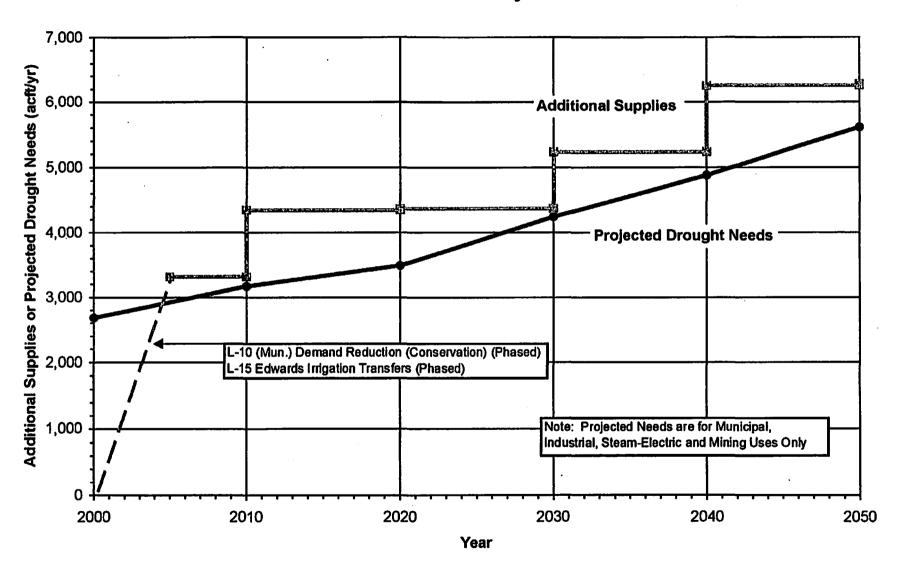
| South Co    | entral Texas Region  |                      |                 |                 | ····           |               | C        | ounty =  | Kendal |
|-------------|--|----------------------|-----------------|-----------------|----------------|---------------|----------|----------|--------|
| County S    | ummary of Projected Water Needs (Shorta                    | ges) and Wat         | er Manage       | ement Str       | ategles        |               |          | ser Grou |        |
| Projected ! | Water Needs (acft/yr)                                      |                      |                 |                 |                |               | ·        |          |        |
| riojecieu   | User Group(s)  |                      | 2000            | 2010            | 2020           | 2030          | 2040     | 2050     | Notes  |
|             | Municipal  |                      | 1.070           | 1,560           | 2,808          | 4,099         | 5,578    | 7.518    | 140(68 |
|             | Industrial   |                      | 1,070           | 1,560           | 2,800<br>A     | 4,099         | <u> </u> | 6        | ·      |
|             | Steam-Electric   |                      | - 6             |                 | - 7            |               | 0        | 0        |        |
|             | Mining   |                      | - öl            | <u>ŏ</u> l      | ŏ              | <del></del>   | ő        | <u>_</u> |        |
|             | Irrigation   |                      | ŏ               | <u>ō</u>        | - ŏ            | ő             | - ol     | ŏ        |        |
|             | Total Needs  |                      | 1,072           | 1.563           | 2,812          | 4,103         | 5.583    | 7.524    |        |
| :           | Mun, Ind, S-E, & Min Needs                                 |                      | 1,072           | 1,563           | 2,812          | 4,103         | 5,583    | 7,524    |        |
| <del></del> | Irrigation Needs   | <del></del>          | 0               | - 1,555<br>0    | - 2,0.2        | 4,100         | 0,555    | 0        |        |
|             | III I gaudii Needs   |                      | U               | - 0             | U              | - 0           | U,       |          |        |
| Water Ma    | nagement Strategies (acft/yr)                              | Candidate            |                 |                 |                |               |          |          |        |
| ID#         | Description  | New Supply           | 2000*           | 2010            | 2020           | 2030          | 2040     | 2050     | Notes  |
| L-10 (Mun.) | Demand Reduction (Conservation)                            |                      | 67              | 71              | 71             | 11            | 11       | 11       |        |
|             | Purchase Water from Major Provider                         |                      | 2,000           | 2,000           | 3,000          | 5,000         | 6,000    | 8,000    | 2,     |
|             |  |                      |                 |                 |                |               |          |          |        |
|             |  |                      |                 |                 |                |               |          |          |        |
|             |  |                      |                 |                 |                |               |          |          |        |
| SCTN-4      | Brush Management   |                      |                 |                 |                |               |          |          |        |
| SCTN-5      | Weather Modification                                       |                      |                 |                 |                |               |          |          |        |
| SCTN-9      | Rainwater Harvesting                                       |                      |                 |                 |                |               |          |          |        |
|             | Small Aquifer Recharge Dams                                |                      |                 |                 |                |               |          |          | •      |
| L-10 (lm.)  | Demand Reduction (Conservation)                            |                      |                 |                 |                |               |          | ,        |        |
|             | Total New Supplies   |                      | 2,067           | 2,071           | 3,071          | 5,011         | 6,011    | 8,011    |        |
|             |  |                      | 005             | 500             | 050            | 000           | 400      | 407      |        |
|             | Total System Mgmt. Supply / Deficit                        |                      | 995             | 508             | 259            | 908           | 428      | 487      |        |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit      |                      | 995             | 508             | 259            | 908           | 428      | 487      |        |
|             | Irrigation System Mgmt. Supply / Deficit                   |                      | 0               | 0               | 0              | 0             | 0        | 0        |        |
| Notes:      |  |                      |                 |                 |                |               |          |          |        |
|             | Candidate New Supplies shown for year 2000 are identifi    | ed for priority impl | ementation, b   | out will not be | available im:  | mediately.    |          |          |        |
| 1           | Demand Reduction (Conservation) strategies assumed la      | rgely reflected in   | projected wat   | er demands.     | I              |               |          |          |        |
| 2           | Assumed purchase from Bexar County major provider. K       |                      |                 |                 |                | ınty table.   | [        |          |        |
| 3           | Early implementation of facilities assumed in cost estimat | ion to ensure suff   | icient supply o | fguorb gairub   | nt.            |               |          |          |        |
| }           | Option expected to provide additional water supply in ma   | ny years, but depo   | endable suppl   | y during drou   | ight is presen | tly unquantif | ied.     |          |        |

# EREPA Alternative Regional Water Plan Medina County



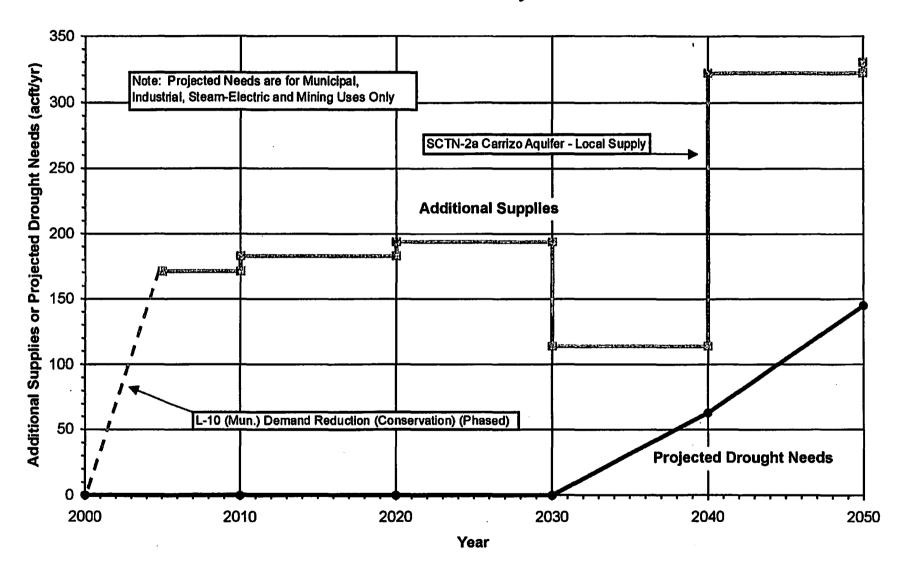
| South Co    | entral Texas Region   |  |                |            |                      |               |              | County =  | Medina      |
|-------------|---|--|----------------|------------|----------------------|---------------|--------------|-----------|-------------|
| County S    | ummary of Projected Water Needs (Shortage   | es) and Water                                | Managem        | ent Strate | egies                |               |              | User Grou | ıp(s) = all |
| Prolocted   | l Water Needs (acft/yr)   |  |                |            |                      |               |              |           |             |
| Projected   |   |  | 2000           | 2010       | - 2020               | 2020          | 2040         | 2050      | Madaa       |
|             | User Group(s)   |  |                |            | 2020                 | 2030          | 2040         | 2050      | Notes       |
|             | Municipal   |  | 2,015          | 2,110      | 2,206                | 2,427         | 2,582        | 2,750     |             |
|             | Industrial Steam-Electric   | <del></del>                                  | 0              | 0          | 0                    | 0             | <u>0</u>     | 0         |             |
|             | Mining  |  | 68             | 68         | 70                   | 72            | 74           | 76        |             |
|             | Irrigation  |  | 98,916         | 95,268     | 91,320               | 92,320        | 88,925       | 84,692    |             |
|             | Total Needs   |  | 100,999        | 97,446     | 93,596               | 94,819        | 91,581       | 87,518    |             |
|             | Mun, Ind, S-E, & Min Needs  |  | 2,083          | 2,178      | 2,276                | 2,499         | 2,656        | 2,826     |             |
|             | Irrigation Needs  |  | 98,916         | 95,268     |                      | 92,320        | 88,925       |           |             |
|             | milgation needs   |  | 30,310         | 93,200     | 91,320               | 82,320        | 00,923       | 04,082    |             |
| Water Ma    | nagement Strategies (acft/yr)   | Candidate                                    |                |            |                      |               |              |           |             |
| ID#         | Description   | New Supply                                   | 2000*          | 2010       | 2020                 | 2030          | 2040         | 2050      | Notes       |
| L-10 (Mun.) | Demand Reduction (Conservation)   |  | 200            | 205        | 211                  | 73            | 76           | 78        | 1           |
| L-15        | Edwards Irrigation Transfers  | 81,000                                       | 3,000          | 3,000      | 3,000                | 3,000         | 3,000        | 3,000     | 2, 3        |
|             |   |  |                |            |                      |               |              |           |             |
|             |   |  |                |            |                      | ·             |              |           | -           |
|             |   |  |                |            |                      |               |              |           |             |
|             |   |  |                |            | ····                 |               |              |           |             |
| SCTN-4      | Brush Management  |  |                | <u>-</u>   |                      |               | <del></del>  |           | 4           |
| SCTN-5      | Weather Modification  |  |                |            |                      |               |              |           |             |
| SCTN-9      | Rainwater Harvesting  |  |                |            |                      |               |              |           | 4           |
|             | Small Aquifer Recharge Dams   |  |                |            |                      | i             |              |           | 4           |
| L-10 (lm.)  | Demand Reduction (Conservation)   |  | 11,887         | 11,867     | 11,867               | 11,867        | 11,867       | 11,867    | 5           |
|             | Total New Supplies  |  | 15,067         | 15,072     | 15,078               | 14,940        | 14,943       | 14,945    |             |
|             | T. 10   |  | 05.000         | 00.074     | 70 540               | TO 070        | 50.000       |           |             |
|             | Total System Mgmt. Supply / Deficit   |  | -85,932        | -82,374    | -78, <u>518</u>      | -79,879       | -76,638      | -72,573   |             |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit   |  | 1,117          | 1,027      | 935                  | 574           | 420          | 252       |             |
|             | Irrigation System Mgmt. Supply / Deficit  |  | -87,049        | -83,401    | -79,453              | -80,453       | -77,058      | -72,825   |             |
|             |   |  |                |            |                      |               | ,            |           |             |
| Notes:      |   | <u>.                                    </u> |                |            |                      |               |              |           |             |
| <u>-</u>    | Candidate New Supplies shown for year 2000 are identified Demand Reduction (Conservation) strategies assumed land |  |                |            | <u>vallabie imme</u> | diately.      |              |           |             |
| 2           | Candidate New Supply to be shared among Uvalde, Medin   |  |                |            | ay not be relia      | hle in draugh | <del>,</del> |           |             |
| 3           | Pursuant to draft EAA Critical Period Management rules, C   |  |                |            |                      |               | <u>"</u>     |           |             |
|             | the estimated maximum potential annual transfer (95,430 c   |  |                |            |                      |               |              |           |             |
| 4           | Option expected to provide additional water supply in many  |  |                |            |                      |               |              |           |             |
| 5           | Estimates based upon use of LEPA systems on 80 percen   |  |                |            |                      |               |              |           |             |
|             | application rate, but applicable to only 50 percent of Edwar  | rds Aquifer irrigatio                        | n permitted qu | vantities. |                      |               |              |           |             |

# EREPA Alternative Regional Water Plan Uvalde County



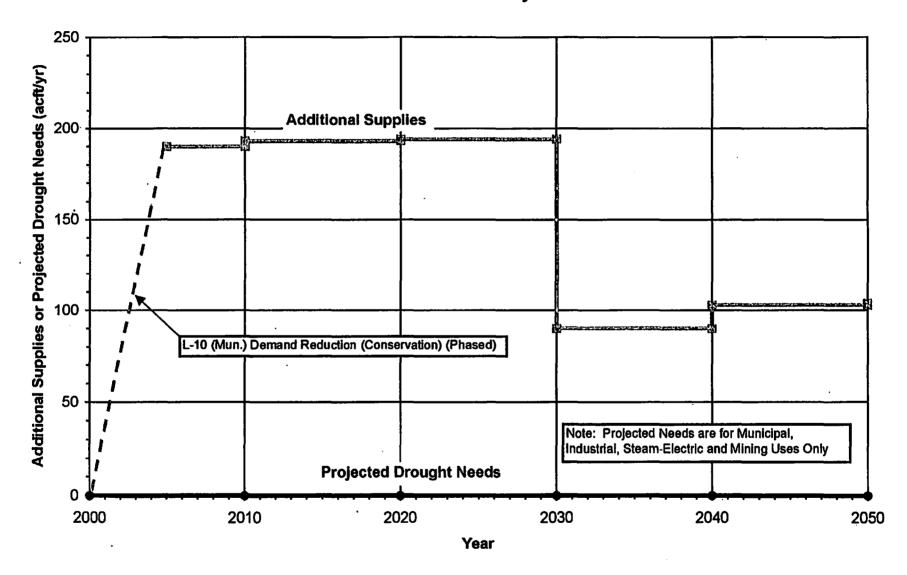
| South C         | entral Texas Region  |                       |               |                 |                |                |         | County =    | Uvalde  |
|-----------------|--|-----------------------|---------------|-----------------|----------------|----------------|---------|-------------|---------|
| <b>County S</b> | summary of Projected Water Needs (Shortage                 | ges) and Wate         | er Manage     | ment Str        | ategies        |                |         | Jser Grou   |         |
|                 |  |                       |               |                 |                |                |         |             |         |
| Projected       | d Water Needs (acft/yr)                                    | <u> </u>              |               |                 |                |                |         |             |         |
|                 | User Group(s)  |                       | 2000          | 2010            | 2020           | 2030           | 2040    | 2050        | Notes   |
| -               | Municipal  |                       | 2,682         | 3,166           | 3,493          | 4,241          | 4,880   | 5,609       |         |
|                 | Industrial   |                       | 0             | .0              | . 0            | 0              | 0       | 0           |         |
|                 | Steam-Electric   |                       | 0             | 0               | 0              | 0              | 0       | 0           |         |
|                 | Mining   |                       | 0             | 0               | 0              | 0              | 0       | 0           |         |
|                 | Irrigation   |                       | 75,263        | 72,798          | 70,154         | 71,022         | 68,880  | 65,676      |         |
|                 | Total Needs  |                       | 77,945        | 75,984          | 73,647         | 75,263         | 73,760  | 71,285      |         |
|                 | Mun, Ind, S-E, & Min Needs                                 |                       | 2,682         | 3,166           | 3,493          | 4,241          | 4,880   | 5,609       |         |
|                 | Irrigation Needs   |                       | 75,263        | 72,798          | 70,154         | 71,022         | 68,880  | 65,676      |         |
| Water Ma        | anagement Strategies (acft/yr)                             | Candidate             |               |                 |                |                |         |             |         |
| ID#             | Description  | New Supply            | 2000*         | 2010            | 2020           | 2030           | 2040    | 2050        | Notes   |
| L-10 (Mun.)     | Demand Reduction (Conservation)                            |                       | 318           | 346             | 371            | 235            | 258     | 283         | 110100  |
| L-15            | Edwards Irrigation Transfers                               | 81,000                | 3,000         | 4,000           | 4,000          | 5,000          | 5,000   | 6,000       | 2, 3, 4 |
|                 |  |                       |               | .,,===          |                |                |         |             |         |
|                 |  |                       |               |                 |                |                |         |             |         |
|                 |  |                       |               |                 |                |                |         |             |         |
| SCTN-4          | Brush Management   |                       |               |                 |                |                |         |             | 5       |
| SCTN-5          | Weather Modification                                       |                       |               |                 |                |                |         |             | 5       |
| SCTN-9          | Rainwater Harvesting                                       |                       |               |                 | l              |                |         |             | 5       |
|                 | Small Aquifer Recharge Dams                                |                       |               |                 |                |                | ]       |             | 5       |
| L-10 (lm.)      | Demand Reduction (Conservation)                            |                       | 14,143        | 14,143          | 14,143         | 14,143         | 14,143  | 14,143      | 6       |
|                 | Total New Supplies   |                       | 17,461        | 18,489          | 18,514         | 19,378         | 19,401  | 20,426      |         |
|                 | Total System Mgmt. Supply / Deficit                        |                       | -60,484       | -57,475         | -55,133        | -55,885        | -54,359 | -50,859     |         |
|                 | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit      |                       | 636           | 1,180           | 878            | 994            | 378     | 674         |         |
|                 | Irrigation System Mgmt. Supply / Deficit                   |                       | -61,120       | -58,655         | -56,011        | -56,879        | -54,737 | -51,533     | •       |
| Notes:          |  | [                     |               |                 |                |                |         | •           |         |
| •               | Candidate New Supplies shown for year 2000 are identifi    | ied for priority impl | ementation, b | out will not be | available im   | mediately.     |         | <del></del> |         |
| 1               | Demand Reduction (Conservation) strategies assumed la      |                       |               |                 | i              |                |         |             |         |
| 2               | Candidate New Supply to be shared among Uvalde, Med        |                       |               |                 |                |                | ught.   |             |         |
| 3               | Pursuant to draft EAA Critical Period Management rules,    | Candidate New S       | upply represe | nts approxim    | ately 85 perc  | ent of         | I       |             |         |
|                 | the estimated maximum potential annual transfer (95,430    |                       |               |                 |                | fl/yr.         |         |             |         |
| 4               | Early Implementation of facilities assumed in cost estima  |                       |               |                 |                |                |         |             |         |
| 5               | Option expected to provide additional water supply in ma   |                       |               |                 |                |                |         |             |         |
| 6               | Estimates based upon use of LEPA systems on 80 perce       |                       |               |                 | vation at 40 p | ercent of irri | gation  | [           |         |
|                 | application rate, but applicable to only 50 percent of Edw | ards Aquifer irrigat  | ion permitted | quantities.     | 1              |                |         |             |         |

# EREPA Alternative Regional Water Plan Wilson County

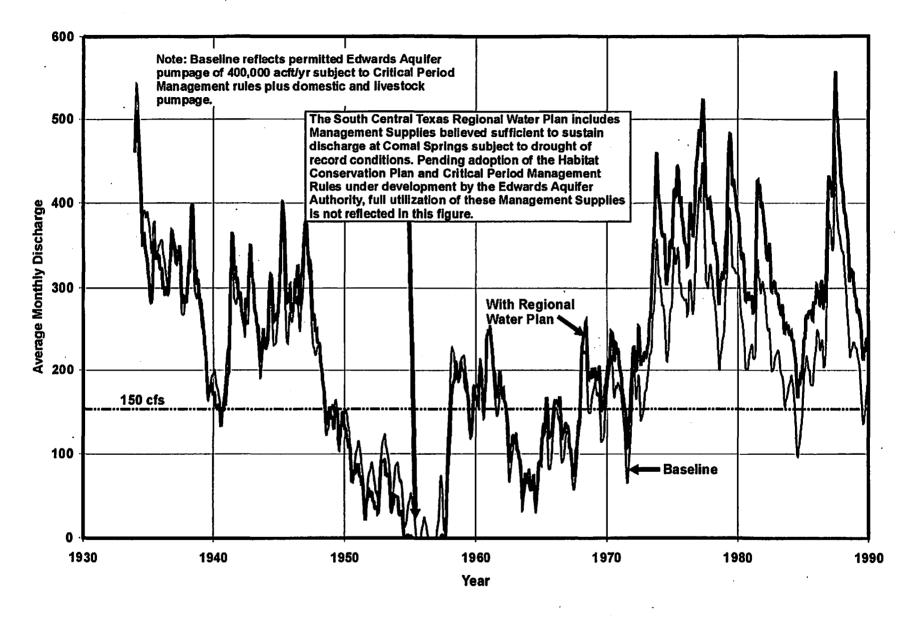


|                  | entral Texas Region  |                                       |               |              |                 |              |      | County =  |             |
|------------------|--|---------------------------------------|---------------|--------------|-----------------|--------------|------|-----------|-------------|
| County S         | ummary of Projected Water Needs (Shortag                   | es) and Wate                          | r Manager     | nent Strat   | egies           |              |      | Jser Grou | p(s) = al   |
| Projected \      | Water Needs (acft/yr)                                      |                                       |               |              | -               |              |      |           |             |
|                  | User Group(s)  |                                       | 2000          | 2010         | 2020            | 2030         | 2040 | 2050      | Notes       |
|                  | Municipal  |                                       | 0             | 0            | 0               | 0            | 63   | 145       |             |
|                  | Industrial   |                                       | 0             | 0            | 0               | Ō            | 0    | Ō         |             |
|                  | Steam-Electric   |                                       | 0             | 0            | 0               | Ö            | 0    | 0         |             |
|                  | Mining   |                                       | 0             | 0            | 0               | 0            | 0    | 0         |             |
|                  | Irrigation   |                                       | Ö             | 0            | 0               | 0.           | 0    | 0         |             |
|                  | Total Needs  |                                       | 0             | 0            | 0               | 0            | 63   | 145       |             |
|                  | Mun, Ind, S-E, & Min Needs                                 |                                       | Ō             | 0            | 0               | Ö            | 63   | 145       |             |
|                  | Irrigation Needs   |                                       | Ō             | 0            | 0               | O            | 0    | 0         |             |
|                  |  |                                       |               |              |                 |              |      |           |             |
| Water Ma         | nagement Strategies (acft/yr)                              | Candidate                             |               |              |                 |              |      |           |             |
| ID#              | Description  | New Supply                            | 2000          | 2010         | 2020            | 2030         | 2040 | 2050      | Notes       |
| L-10 (Mun.)      | Demand Reduction (Conservation)                            |                                       | 171           | 183          | 194             | 114          | 122  | 130       |             |
| SCTN-2a          | Carrizo Aquifer - Local Supply                             |                                       |               |              |                 |              | 200  | 200       | _           |
|                  |  |                                       |               |              |                 |              |      |           |             |
|                  |  |                                       |               |              |                 |              |      |           |             |
|                  |  |                                       | ļ. <u></u> .  |              |                 |              |      |           |             |
|                  |  |                                       |               |              |                 |              |      |           |             |
|                  |  |                                       |               |              |                 |              |      |           |             |
| 205114           |  |                                       |               |              |                 |              |      |           | <del></del> |
| SCTN-4<br>SCTN-5 | Brush Management Weather Modification                      |                                       |               |              |                 | <del> </del> |      |           |             |
| SCTN-9           | Rainwater Harvesting                                       | · · · · · · · · · · · · · · · · · · · |               |              |                 |              |      |           |             |
| 20114-9          | Small Aquifer Recharge Dams                                |                                       |               |              |                 |              |      |           |             |
| L-10 (lrr.)      | Demand Reduction (Conservation)                            |                                       |               |              |                 |              |      |           |             |
| L 10 (M1.)       | / Total New Supplies                                       |                                       | 171           | 183          | 194             | 114          | 322  | 330       |             |
|                  | · Ittal Rew Cupplies                                       |                                       | 171           | 100          | 104             | 114          | ŲZE, | 550       |             |
|                  | Total System Mgmt. Supply / Deficit                        |                                       | 171           | 183          | 194             | 114          | 259  | 185       |             |
|                  | Mun, Ind, S-E, & Min System Mgmt. Supply /                 |                                       | 171           | 183          | 194             | 114          | 259  | 185       |             |
|                  | Deficit  | •                                     | '''           | 103          | 194             | 1 177        | 239  | .05       |             |
|                  | Irrigation System Mgmt. Supply / Deficit                   |                                       | 0             | 0            | 0               | 0            | 0    | Ö         |             |
|                  |  |                                       |               |              |                 |              |      |           |             |
| Notes:           | •  |                                       |               |              |                 | •            |      |           |             |
| 1                | Demand Reduction (Conservation) strategies assumed lan     | gely reflected in pr                  | ojected water | demands.     |                 |              |      |           |             |
| 2                | Additional well(s) for Floresville.                        |                                       |               |              |                 |              |      |           |             |
| 3                | Option expected to provide additional water supply in many | y years, but depen                    | idable supply | during droug | nt is presently | unquantified |      |           |             |

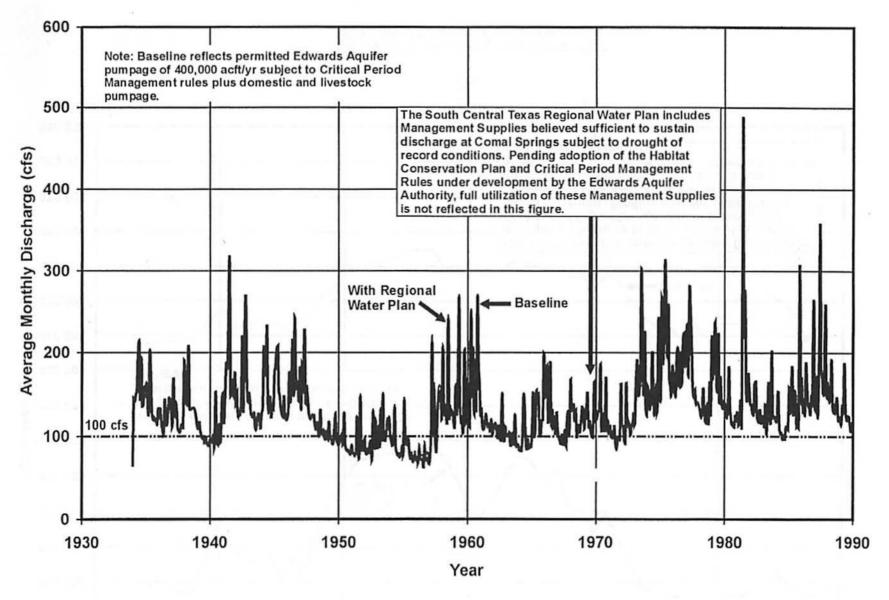
# EREPA Alternative Regional Water Plan Zavala County



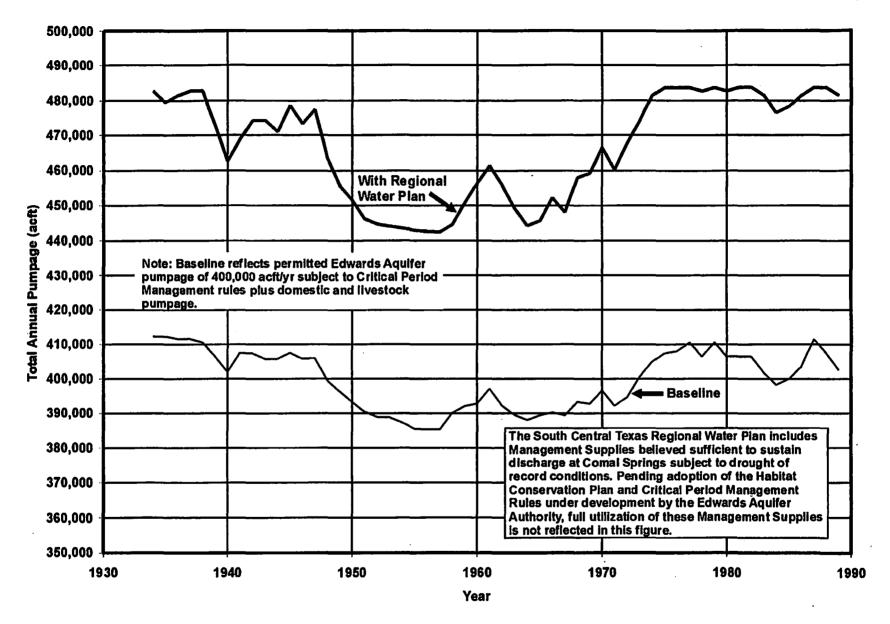
|             | entral Texas Region  |                      |               |               |                 |              |         |           |                                      |
|-------------|--|----------------------|---------------|---------------|-----------------|--------------|---------|-----------|--------------------------------------|
| County S    | ummary of Projected Water Needs (Shortage                  | es) and Water        | r Manager     | nent Strat    | egies           |              |         | User Grou | p(s) = al                            |
| Projected   | Water Needs (acft/yr)                                      |                      |               |               |                 |              |         |           |                                      |
|             | User Group(s)  |                      | 2000          | 2010          | 2020            | 2030         | 2040    | 2050      | Notes                                |
|             | Municipal  |                      | 0             | 0             | 0               | 0            | 0       | 0         |                                      |
|             | Industria!   |                      | 0             |               | ŏ               | 0            | ŏ       |           | •                                    |
|             | Steam-Electric   |                      | Ö             |               | 0               | Ō            | ō       |           |                                      |
|             | Mining   |                      | 0             |               | 0               | 0            | 0       | ō         |                                      |
|             | trrigation   |                      | 80,722        | 76,589        | 72,655          | 88,293       | 84,673  | 81,200    |                                      |
|             | Total Needs  |                      | 80,722        | 76,589        | 72,655          | 88,293       | 84,673  | 81,200    |                                      |
|             | Mun, Ind, S-E, & Min Needs                                 |                      | 0             | 0             | 0               | 0            | 0       | ō         |                                      |
|             | Irrigation Needs   |                      | 80,722        | 76,589        | 72,655          | 88,293       | 84,673  | 81,200    |                                      |
| Water Ma    | nagement Strategies (acft/yr)                              | Candidate            |               |               |                 |              |         |           |                                      |
| ID#         | Description  | New Supply           | 2000          | 2010          | 2020            | 2030         | 2040    | 2050      | 0<br>0<br>0<br>0<br>81,200<br>81,200 |
| L-10 (Mun.) | Demand Reduction (Conservation)                            | 11011 Guppiy         | 190           |               | 194             | 90           | 103     |           | 110100                               |
|             |  |                      |               |               |                 |              |         |           |                                      |
|             |  |                      |               |               |                 |              |         |           |                                      |
| SCTN-4      | Brush Management   |                      |               |               |                 |              |         |           |                                      |
| SCTN-5      | Weather Modification                                       |                      |               |               |                 |              |         |           | <del></del>                          |
| SCTN-9      | Rainwater Harvesting                                       |                      |               |               |                 |              |         |           |                                      |
|             | Small Aquifer Recharge Dams                                |                      |               |               |                 |              |         |           |                                      |
| L-10 (lrr.) | Demand Reduction (Conservation)                            |                      | 6,401         | 6,401         | 6,401           | 6,401        | 6,401   | 6,401     | 3                                    |
|             | Total New Supplies   |                      | 6,591         | 6,594         | 6,595           | 6,491        | 6,504   | 6,505     |                                      |
|             | Total System Mgmt. Supply / Deficit                        |                      | -74,131       | -69,995       | -66,060         | -81,802      | -78,169 | -74,695   |                                      |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit      |                      | 190           | 193           | 194             | 90           | 103     |           |                                      |
|             | Irrigation System Mgmt. Supply / Deficit                   | •                    | -74,321       | -70,188       | -66,254         | -81,892      | -78,272 | -74,799   |                                      |
| Notes:      |  |                      |               |               |                 |              |         |           |                                      |
| 1.          | Demand Reduction (Conservation) strategies assumed lar     | nely reflected in pa | olected water | r demands.    |                 |              |         |           |                                      |
| 2           | Option expected to provide additional water supply in many | v vears, but depen   | dable supply  | during drough | nt is presently | unquantified |         |           |                                      |
| 3           | Estimates based upon use of LEPA systems on 50 percen      |                      |               |               |                 |              |         |           |                                      |
|             | application rate.  |                      |               |               |                 |              |         |           |                                      |



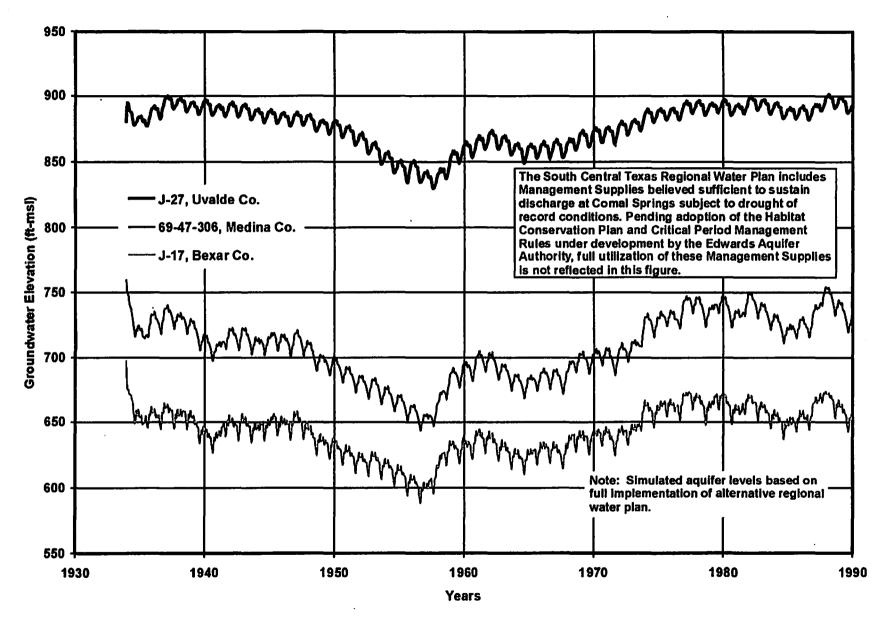
EREPA Alternative Regional Water Plan Simulated Comal Springs Discharge



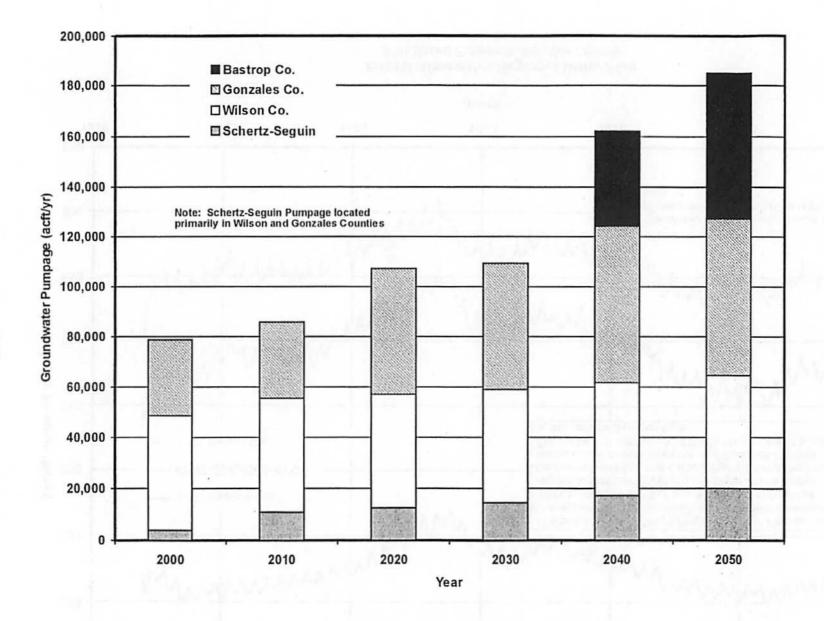
EREPA Alternative Regional Water Plan Simulated San Marcos Springs Discharge



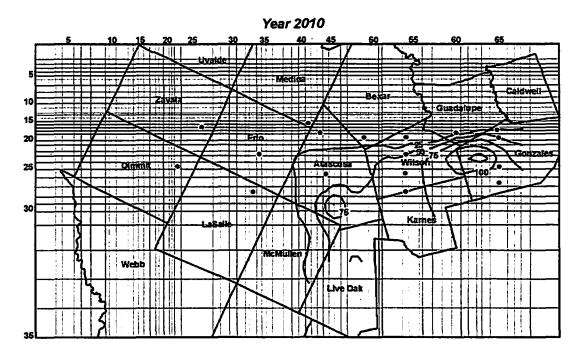
EREPA Alternative Regional Water Plan Simulated Edwards Aquifer Pumpage

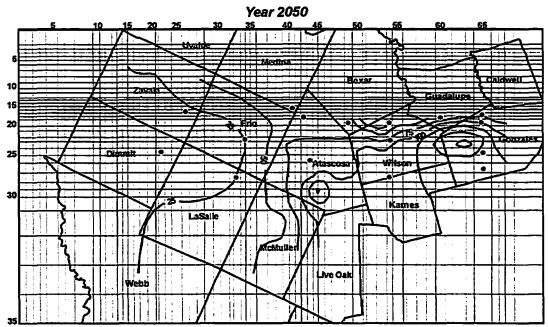


EREPA Alternative Regional Water Plan Simulated Edwards Aquifer Levels



EREPA Alternative Regional Water Plan Additional Carrizo Groundwater Pumpage

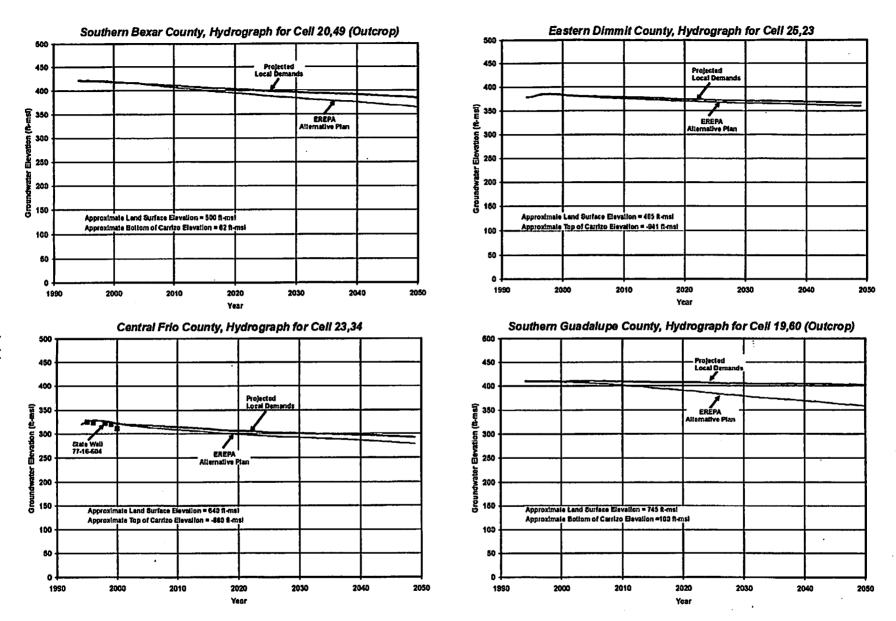




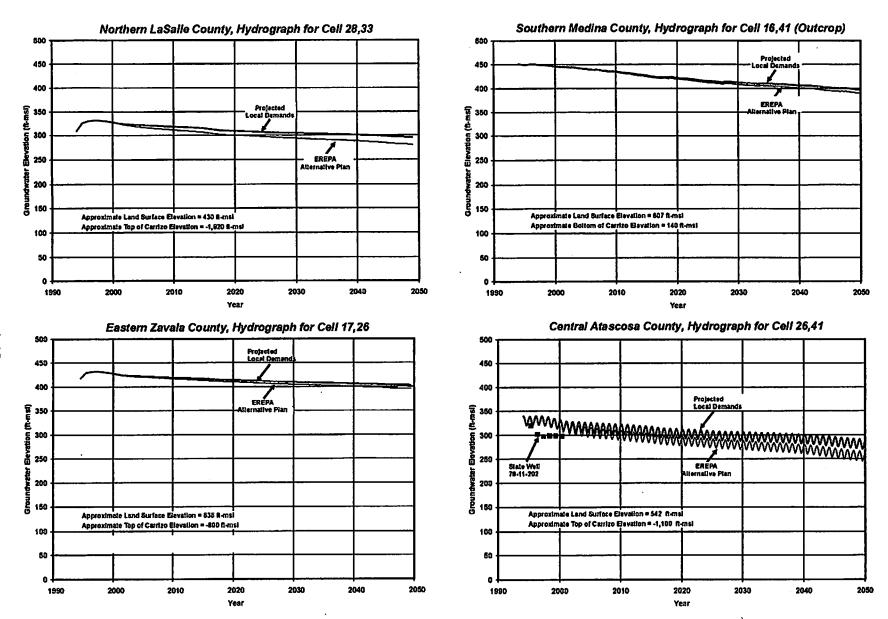
Note: Drawdown is referenced to simulated 1994 aquifer levels and includes both projected local demands and development of water supply options in this alternative regional water plan.

Monitoring Well Location

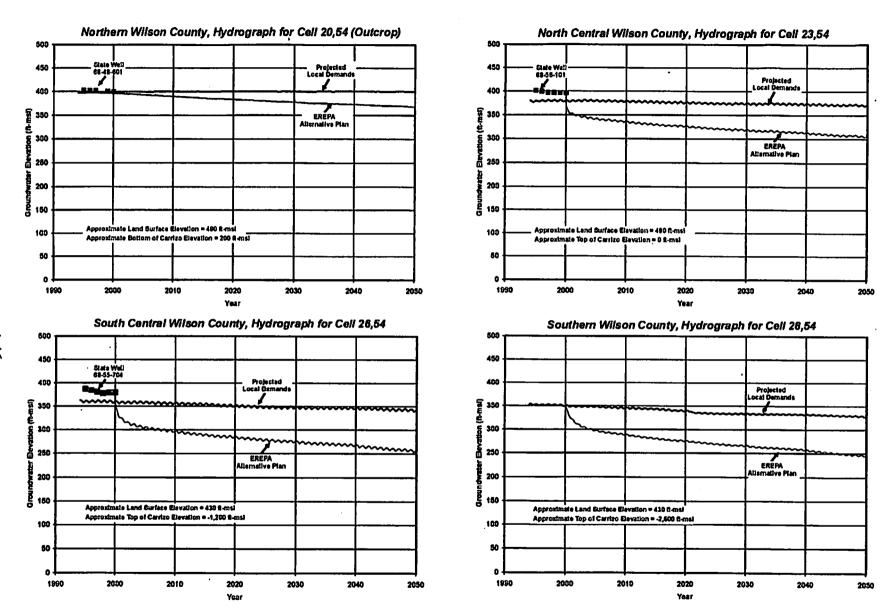
EREPA Alternative Regional Water Plan Simulated Carrizo Aquifer Drawdown



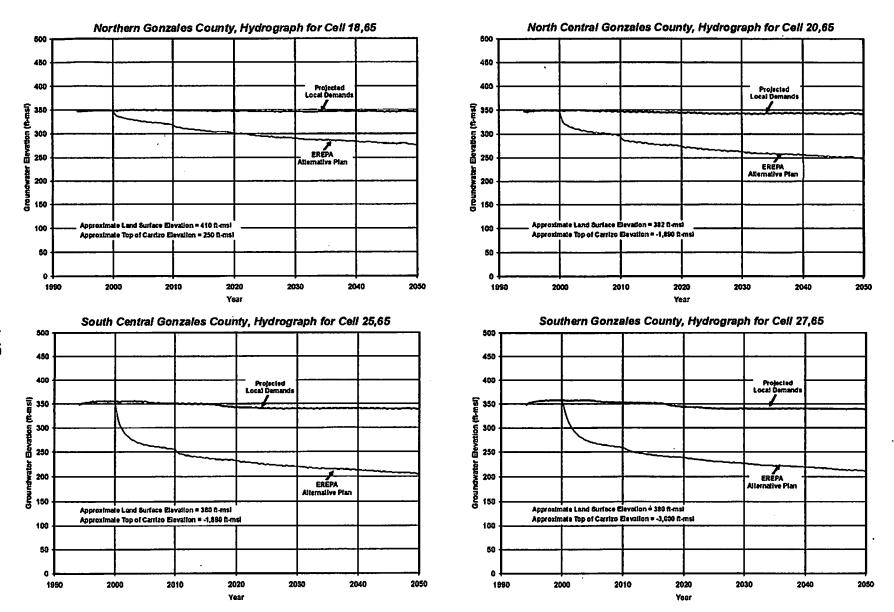
EREPA Alternative Regional Water Plan - Carrizo Aquifer



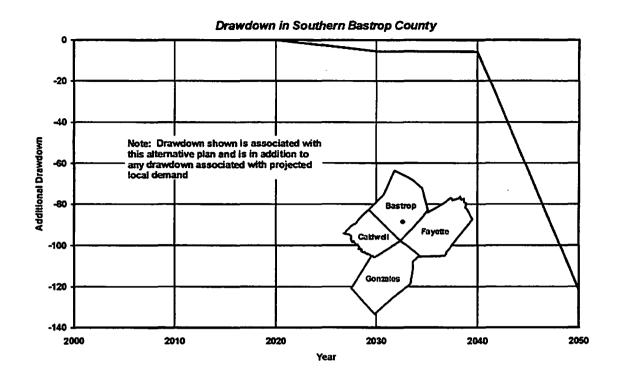
EREPA Alternative Regional Water Plan - Carrizo Aquifer

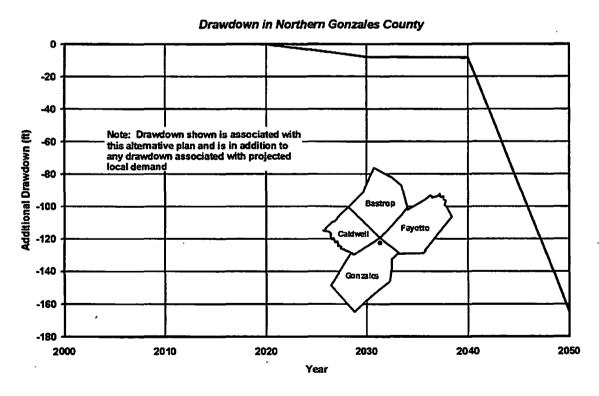


EREPA Alternative Regional Water Plan - Carrizo Aquifer

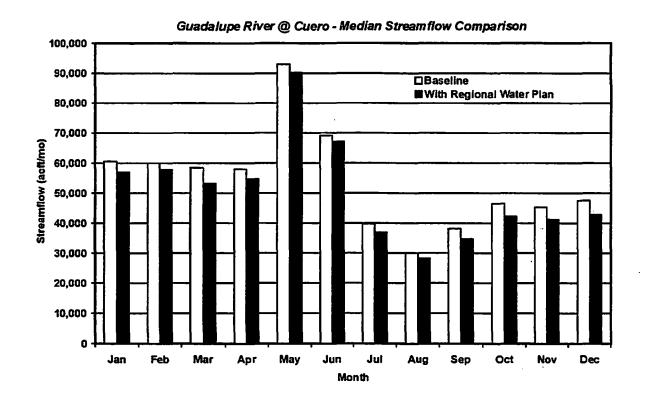


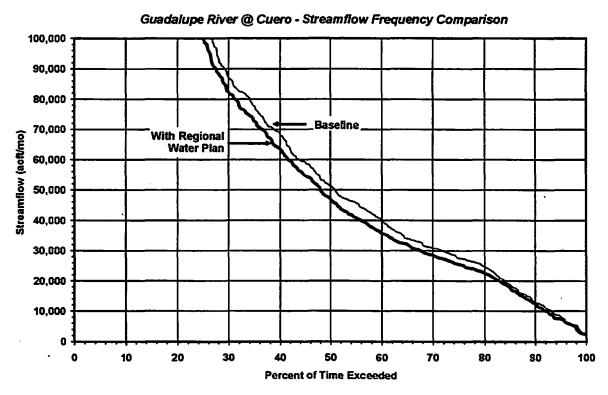
EREPA Alternative Regional Water Plan - Carrizo Aquifer



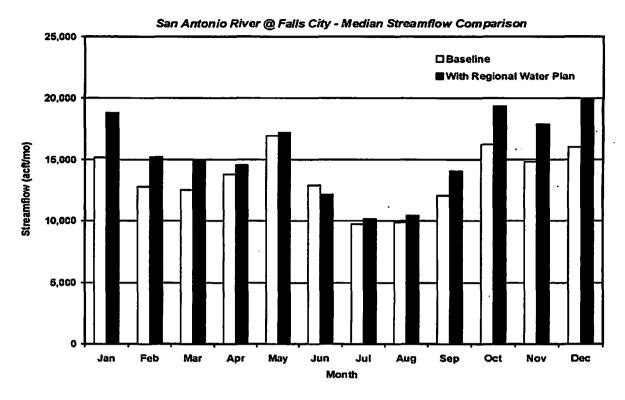


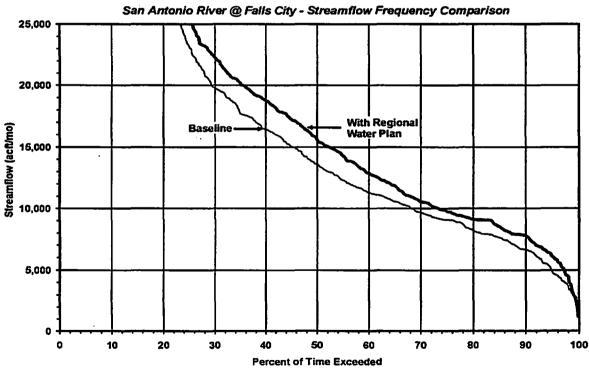
EREPA Alternative Regional Water Plan — Carrizo Aquifer



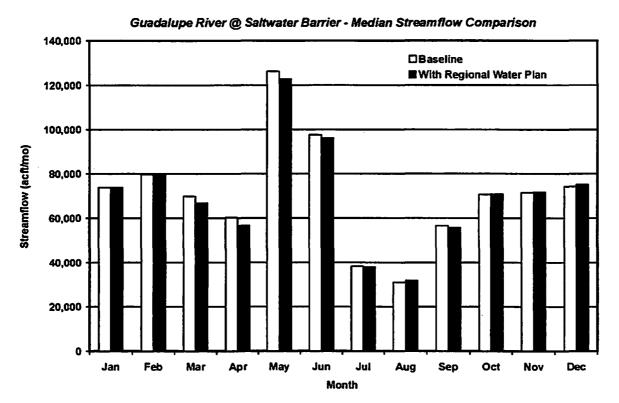


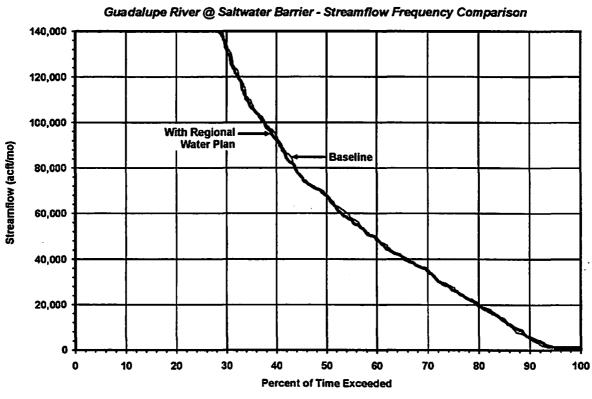
EREPA Alternative Regional Water Plan Streamflow Comparisons





EREPA Alternative Regional Water Plan Streamflow Comparisons





EREPA Alternative Regional Water Plan Streamflow Frequency Comparisons

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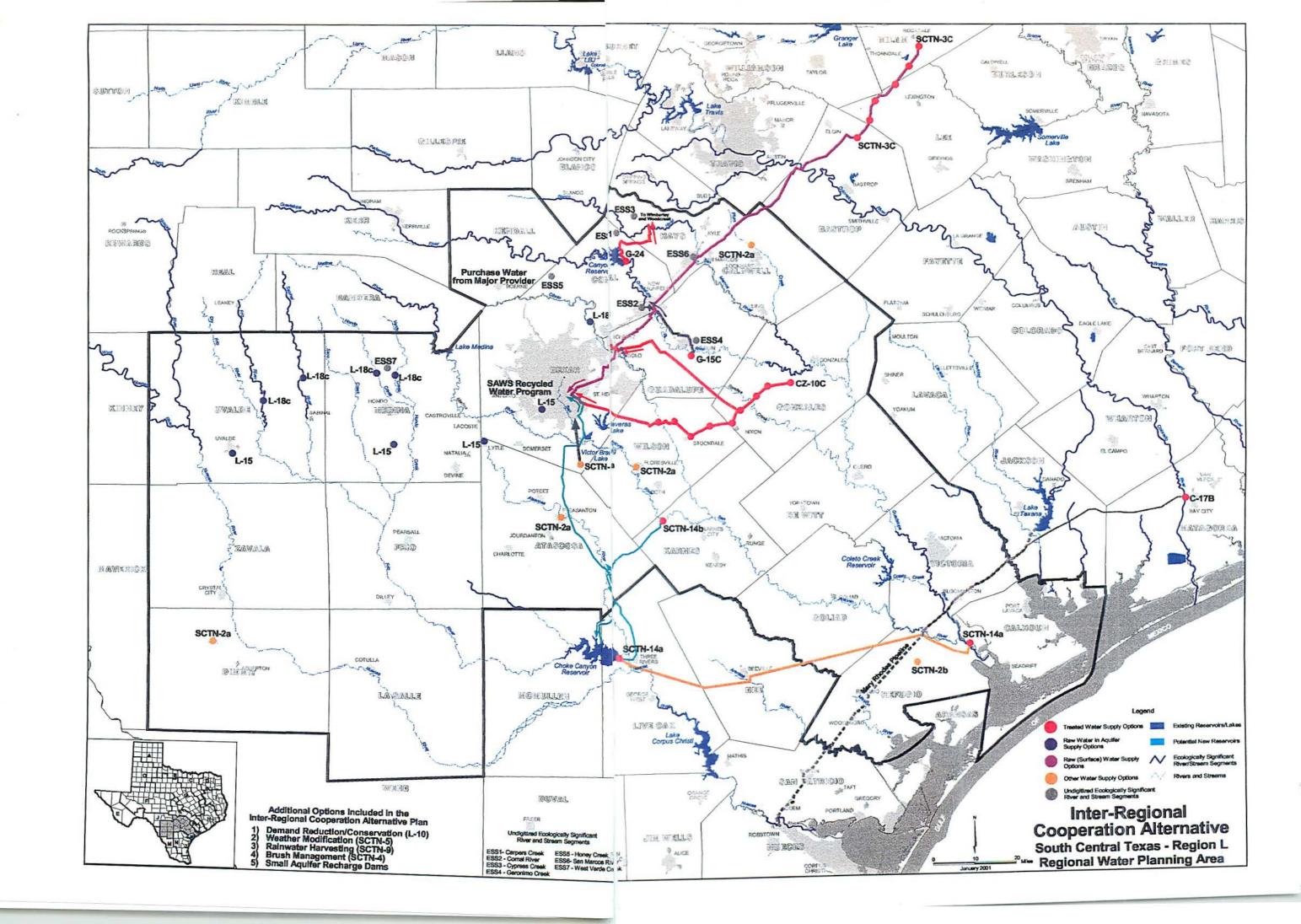
| nic /  | / Reliabil           | ity / Environmental / Public Acceptance (EREPA) Regional Water Manage  | ment Al       | emauve Plan                              |  |                       | <del> </del>             |                      | <u> </u>                |              |           |
|--------|----------------------|--|---------------|--|--|-----------------------|--------------------------|----------------------|-------------------------|--------------|-----------|
| =i     |                      |  |               |  |  |                       | Quantity of              | Environmental        | <del> </del>            | <del> </del> | Time to   |
| tion   | Option<br>No.        | Water Supply Options   | Type of       | Water Supply Option                      | Type of Water Supply                                   | Unit Cost<br>(S/acft) | Water<br>(zcft/yr)       | Composite<br>Average | Public<br>Acceptability | Dellabillad  | Implement |
|        | NQ.                  | Treated Water Supply Options   |               |  |  | (aracit)              | (acity))                 | Average              | Acceptability           | Renzenty     | (years)   |
|        | SCTN-17              | Desalination of Brackish Groundwater Carrizo-Wilcox Aquifer between San Marcos, and Frio Rivers (75,000 activy)  |               | rvation/Reuse/Exchange<br>Other Aquifers | Treated Water Delivered Treated Water Distributed      | 56-<br>59-            |                          |                      |                         |              |           |
|        | CZ-10C<br>CZ-10D     | Camzo-Wilcox Aquiler between Colorado and Frio Rivers  | Carrizo and   | Other Aquiters                           | Treated Water Distributed                              | 63                    | 2 220,000                | 1.:                  |                         |              |           |
|        | G-15C<br>C-17A       | Canyon Reservoir Water Released to Lake Notto - Treated Water to Distribution System or Recharge Zone  Colorado River in Colorado County - Buy Stored Water and Imigation Rights; Firm Yield |               | ervoirs<br>Ion with Storage              | Treated Water Distributed<br>Treated Water Distributed | 67                    |                          |                      | 1.0                     | 0 1.0        | 0 1 10 5  |
|        | SCTN-3c              | Simsboro Aquifer - Bastrop, Lee, and Milam Counties with Delivery to Major Municipal Demand Center   | Carrizo and   | Other Aquaters                           | Treated Water Distributed                              | 70                    |                          | 1.0                  |                         |              |           |
|        | G-16C1               | Cuero Reservoir - Firm Yield   | 1: 0:00:00 ;  | w Reservoirs<br>Ion with Storage         | Treated Water Distributed<br>Treated Water Delivered   | 710                   |                          | 2.3                  | 3 3.0                   | 0 1.0        | 0 > 15    |
| -      | G-38C<br>SCTN-16c    | Guadatupe River Diversion at Gonzales to Mid-Cibes and/or Major Water Providers, with Regional Water Treatment Plant<br>Lower Guadatupe River Diversions                                     | River Divers  | on with Storage                          | Treated Water Distributed                              | 75                    | 94,000                   |                      |                         |              |           |
|        | C-13C                | Colorado River at Bastrop - Purchase of Stored Water - Firm Yield  |               | ervoirs<br>w Reservoirs                  | Treated Water Distributed<br>Treated Water Distributed | 769                   |                          |                      | 3.0                     | 0 1.0        | 5 to 15   |
|        | S-15Db<br>S-15Da     | Cibolo Reservoir with imported Water from the San Antonio and Guadalupe Rivers - Firm Yield  Cibolo Reservoir with Imported Water from the San Antonio River - Firm Yield                    |               | w Reservoirs                             | Treated Water Distributed                              | 773                   |                          |                      |                         |              |           |
|        | SCTN-16b             | Lower Guadatupe River Diversions   |               | on with Storage w Reservoirs             | Treated Water Distributed<br>Treated Water Distributed | 78                    |                          | 1.4                  | 1.0                     | 1.0          | 1 10 5    |
|        | S-16C<br>G-17C1      | Goliad Reservoir - Firm Yield Sandles Creek Reservoir - Firm Yield   |               | # Reservoirs                             | Treated Water Distributed                              | 856<br>865            |                          | 2.4                  |                         |              |           |
|        | SCTN-14b             | Joint Development of Water Supply with Corpus Christi - Firm Yield   |               | encirs                                   | Treated Water Distributed                              | 869                   | 148.200                  | 1.4                  | 1.0                     | 1,0          | 1 10 5    |
| -      | SCTN-16a<br>SCTN-20c | Lower Guada'upe River Diversions  Lower Colorado River Basin - Combined Diversion of Unused Irrigation Water Supplies and Unappropriated Streamflow  |               | on with Storage<br>on with Storage       | Treated Water Distributed Treated Water Distributed    | 870<br>956            |                          |                      |                         |              |           |
|        | S-15Dc               | Cibolo Reservoir with Imported Water from the San Antonio, Guadalupe, and Colorado Rivers - Firm Yield   | Potential Na  | w Reservoirs                             | Treated Water Distributed                              | 965                   | 106,482                  | 2.3                  | 3.0                     | 1.0          | 5 to 15   |
|        | C-178<br>S-15Ea      | Colorado River in Wharton County - Buy Irrigation Rights and Groundwater; Firm Yield  Cibolo Reservoir with Imported Water from the Guadalupe River Sativater Barrier - Firm Yield           | Potential Na  | on with Storage w Reservoirs             | Treated Water Distributed Treated Water Distributed    | 974<br>993            |                          | 1.1                  |                         | 1.0          | 5 to 15   |
|        | SCTN-20b             | Lower Colorado River Basin - Diversion of Unappropriated Streamflow  | River Divers  | on with Storage                          | Treated Water Distributed                              | 1,003                 | 57,037                   | 1,6                  | 2.0                     | 1.0          |           |
|        | SCTN-11<br>SCTN-14a  | Purchase/Lease Surface Water Irrigation Rights for Municipal/Industrial Use Joint Development of Water Supply with Corpus Christi - Firm Yield   |               | on with Storage<br>ervoirs               | Treated Water Delivered<br>Treated Water Distributed   | 1,007                 |                          | 1.1                  |                         | 1.0          | 5 to 15   |
|        | B-10C                | Allens Creek Reservoir - Firm Yield  | Potential Ne  | w Reservoirs                             | Treated Water Distributed                              | 1,016                 | 57,800                   | 1.9                  | 1.0                     |              |           |
|        | SCTN-20a<br>SCTN-15  | Lower Colorado River Basin - Water Sales Contract for Unused Impation Water Supplies  Cummins Creek Off-Channel Reservoir (Colorado River Basin)   |               | on with Storage  w Reservoirs            | Treated Water Distributed<br>Treated Water Distributed | 1,041                 |                          | 1.2                  |                         | 1.0          | 5 to 15   |
|        | S-15C                | Cibolo Reservoir - Firm Yield  | Potential No  | # Reservoirs                             | Treated Water Distributed                              | 1,131                 | 33,200                   | 1.8                  | 3.0                     |              |           |
|        | C-18<br>SCTN-17      | Shaws Bend Reservoir - Firm Yield (Colorado River Basin)  Desalination of Seawater (100 MGD)   |               | Reservoirs<br>nation/Reuse/Exchange      | Treated Water Distributed<br>Treated Water Distributed | 1,178                 |                          | 2.1<br>1.2           |                         |              | 5 to 15   |
|        | S-15Eb               | Cibolo Reservoir with Imported Water from the Guadalupe River Saltwater Barrier and the Colorado River near Bay City   | Potential Ne  | v Reservoirs                             | Treated Water Distributed                              | 1,357                 | 79,090                   | 2,1                  |                         |              |           |
|        | SCTN-17<br>SCTN-17   | Desalination of Seawater (75 MGD) Desalination of Seawater (50 MGD)  |               | Nation/Reuse/Exchange                    | Treated Water Distributed<br>Treated Water Distributed | 1,407<br>1,447        |                          | 1.2                  | 1.0                     | 1.0          | 1 to 5    |
|        | G-24                 | Wimberley and Woodcreek Water Supply from Carryon Reservoir; 2030 Demands  | Existing Re   | prooirs                                  | Treated Water Delivered                                | 1,595                 |                          | 1.2                  |                         |              |           |
|        | SCTN-17<br>S-140     | Desalination of Seawater (25 MGD) Applicantite Reservoir - Firm Yield  |               | Nation/Reuse/Exchange<br>Reservoirs      | Treated Water Distributed<br>Treated Water Distributed | 1,621                 |                          | 1.2                  | 1.0                     | 1.0          | 1 to 5    |
|        | <b>3-140</b>         | Raw Water in Aquifer Water Supply Options  | I OUGINGI IN  | ,  | HOSION WALL DISCIDENCE                                 | 3,295                 | 4,032                    | 1.8                  | 3.0                     | 1.0          | 5 to 15   |
|        | S-138                | Medina Lake - Existing Rights and Contracts with irrigation Use Reduction for Recharge Enhancement   |               | der Recharge<br>der Recharge             | Raw Water in Aguiller                                  | 193                   |                          | 1.0                  |                         |              | 1 to 5    |
|        | L-18c<br>SCTN-7a     | Edwards Aquifer Recharge from Natural Drainage - Type 2 Projects (Program 2C) Wintergarden Carrizo Recharge Enhancement (Nueces River Alternative)   |               | After Aquifers                           | Raw Water in Aquifer<br>Raw Water in Aquifer           | 486<br>511            |                          | 1.2<br>1.3           | 1.0                     |              |           |
|        | SCTN-6a              | Edwards Aquifer Recharge Enhancement with Guadatupe River Diversions at Lake Duntap (SCTN-6a)  |               | der Recharge<br>Other Aquillers          | Raw Water in Aquifer                                   | 534                   | 42,121                   | 1.2                  | 1.0                     | 1.0          | 5 to 15   |
|        | SCTN-7b<br>L-11      | Wintergarden Carrizo Recharge Enhancement (Atascosa River Atternative)  Exchange Reclaimed Water for Edwards Impation Water  |               | vation/Reuse/Exchange                    | Raw Water in Aquiter Raw Water in Aquiter              | 627<br>743            |                          | 1.3                  |                         |              |           |
|        | L-18b                | Edwards Aquifer Recharge from Natural Drainage - Type 2 Projects (Program 2B)  | Edwards At    | der Recharge                             | Raw Water in Aquiter                                   | 800                   | 15,980                   | 1.8                  | 1.0                     | 1.0          |           |
|        | L-18a<br>SCTN-8      | Edwards Aquifer Recharge from Natural Drainage - Type 2 Projects (Program 2A)  Trinity Aquifer Optimization  |               | ider Recharge<br>Other Aquifers          | Raw Water in Aquifer<br>Raw Water in Aquifer           | 1,087<br>1,886        | 21,577<br>390            | 1,8<br>1,2           | 1.0                     |              | 5 to 15   |
|        | SCTN-6b              | Edwards Aquifer Recharge Enhancement with Guadatupe River Diversions near Gonzales (SCTN-6b)   | Edwards At    | der Recharge                             | Raw Water in Aquiter                                   | 1,941                 | 51,133                   | 1.3                  |                         |              |           |
|        | G-30<br>L-17a        | Guadatupe River Diversion near Comfort to Recharge Zone via Medina Lake  Edwards Aquifer Recharge from Natural Drainage - Type 1 Projects (Program 1B)                                       | 100           | der Recharge<br>der Recharge             | Raw Water in Aquiter Raw Water in Aquiter              | 2,079<br>2,557        | 3,902<br>1,958           | 1.4                  |                         |              |           |
|        | L-17b                | Edwards Aquiller Recharge from Natural Drainage - Type 1 Projects (Program 1A)   | Edwards At    | der Recharge                             | Raw Water in Aquifer                                   | 3,309                 | 5,554                    | 2.2                  | 1.0<br>1.0              |              |           |
|        | G-32                 | Diversion of Carryon Reservoir Flood Storage to Recharge Zone via Cibolo Creek - Long-Term Average  Raw (Surface) Water Supply Options   | Edwards At    | fer Recharge                             | Raw Water in Aquifor                                   | 6,198                 | 2.088                    | 1,4                  |                         |              |           |
|        | L-20                 | Transfer of SAWS Redained Water to Coleto Creek Reservoir (Exchange for CP&L Rights and GBRA Canyon Contract)  |               | ration/Reuse/Exchange                    |  | 79                    | 17,000                   | 1.3                  | 1.0                     | 1.0          | 1 50 5    |
|        | SCTN-3a<br>G-20      | Simsboro Aquifer - Bastrop, Lee, and Millam Counties with Delivery to Colorado River  Gonzales Reservoir - Firm Yield  |               | Ther Aquifers Reservoirs                 | Raw Water Delivered<br>Raw Water at Reservoir          | 203<br>260            | 75,000                   | 1.1                  | 3,0                     | 1.0          | 1 to 5    |
|        | SCTN-3b              | Simsboro Aquifor - Bastrop, Lee, and Milam Counties with Delivery to Plum Craek  | Carrizo and   | ther Aquifers                            | Raw Water Delivered                                    | 290                   | 69,897<br>75,000         | 2.2                  | 3.0                     | 1.0<br>1.0   |           |
| _      | L+14<br>SCTN-18      | Transfer of Reclaimed Water to Corpus Christi through Choke Canyon Reservoir  Cotulia Reservoir - Raw Water at the Reservoir   | Potential No  | vation/Reuse/Exchange                    | Raw Water at Reservoir Raw Water at Reservoir          | 297                   | 23.903                   | 1.3                  | 1.0                     | 1.0          | 1 to 5    |
|        | SCTN-13              | Palmetto Bend Stage II Reservoir (Delivery to Corpus Christi)  | Potential No. | Reservoirs                               | Raw Water Delivered                                    | 299<br>431            | 57,080<br>28,200         | 1,7                  | 1.0                     |              |           |
| 二      | SCTN-12b<br>G-22     | Exchange of Groundwater from the Gulf Coast Aquiter for Imigation Surface Water Rights (Guadatupe-San Antonio River Ba<br>Daworth Reservoir - Raw Water at the Reservoir                     | Potential No  | vation/Reuse/Exchange                    | Raw Water at Source<br>Raw Water at Reservoir          | 437                   | 13,200                   | 1.1                  | 1.0                     | 1.0          | 1 to 5    |
|        | G-40                 | Coptin Crossing Reservoir - Raw Water at the Reservoir   | Potential No  | Reservoirs                               | Raw Water at Reservoir                                 | 446<br>473            | 19,705<br>32,458         | 1.7                  |                         | 1.0          | > 15      |
|        | SCTN-12b             | Exchange of Groundwater from the Gulf Coast Aquiller for Imigation Surface Water Rights (Colorado River Basin)   | Local/Cons V  | /ation/Reuse/Exchange                    | Raw Water at Source                                    | 518                   | 10,748                   | 1.0                  | 1.0                     |              |           |
|        | SCTN-13<br>SCTN-13   | Palmetto Bend Stage II Reservoir (Delivery to Bay City)  Palmetto Bend Stage II Reservoir (Delivery to Saltwater Bantler)  | Potential No. |  | Raw Water Delivered Raw Water Delivered                | 560<br>585            | 30,200<br>28,100         | 1.4                  | 1.0                     | 1.0          | 5 to 15   |
|        | G-19                 | Guadatupe River Dam No. 7 - Firm Yield   | Potential No! | Reservoirs                               | Raw Water at Reservoir                                 | 732<br>764            | 30,890                   | 2.2                  | 1.0<br>1.0              | 1.0          | 5 to 15   |
|        | G-21                 | Lockhart Reservoir - Raw Water at the Reservoir Other Water Supply Options   | Potential No  | INCRETACING                              | Raw Water at Reservoir                                 | 764                   | 5,627                    | 1.2                  | 1.0                     |              |           |
|        |                      | Demand Reduction (Water Conservation) - Municipal  |               | etion/Reuse/Exchange                     |  | ~400                  | ~43,000                  | 1.0                  | 1.0                     | 1.0          | 1 to 5    |
|        | L-10 (îrr.)<br>L-15  | Demand Reduction (Water Conservation) - Irrigation Purchase or Lease of Edwards Irrigation Water for Municipal and Industrial Use  |               | ration/Reuse/Exchange                    | Raw Water in Amiles                                    | ~54<br>51             | -80,000                  | 1.0                  | 1,0                     | 1.0          | 1 to 5    |
|        | SCTN-4               | Brush Management   | Local/Cons Y  | atton/Reuse/Exchange                     |  | Undetermined          |                          | 1.0                  | 1.0                     | 3.0<br>3.0   | 1 to 5    |
|        | SCTN-5<br>SCTN-9     | Weather Modification Rainwater Harvesting  |               | ation/Reuse/Exchange                     |  | Undetermined          | Undetermined             | 1.0                  | 1.0                     | 3.0          | 1 to 5 (  |
|        | SCTN-10              | Off-Channel Local Storage (Guadatupe River near Victoria)  | Local/Cons Y  | ation/Reuse/Exchange                     | Treated Water Delivered                                | 16,178<br>587         | .057/household<br>10,000 | 1.0                  | 1.0                     | 3.0<br>3.0   | 155       |
|        | SCTN-10<br>SCTN-10   | Off-Channel Local Storage (Guadatupe River near Boerne) Off-Channel Local Storage (Medina River near Yon Ormy)   | Local/Cons    | ation/Reuse/Exchange                     | Treated Water Delivered Treated Water Delivered        | 2,681                 | 1.500                    | 1.4                  | 1,0                     | 3.0          | 1 to 5    |
|        | SCTN-2a              | Groundwater Supplies for Municipal Water Systems In the Carrizo-Wilcox Aquifer   | Carrizo anc   | ther Aquiters                            | Treates mater Delivered                                | 1,190<br>N/A          | 5,000<br>N/A             | 1.2                  | 1,0                     | 3.0<br>1.0   | 1 to 5    |
|        | SCTN-2b              | Groundwater Supplies for Municipal Water Systems in the Gulf Coast Aquifer   | Carrizo ancia | ther Aquifers                            |  | N/A                   | N/A                      | 1.0                  | 1.0                     | 1.0          | 1 to 5    |
|        | SCTN-2c<br>SCTN-1a   | Groundwater Supplies for Municipal Water Systems in the Trinity Aquifer Aquifer Storage and Recovery (ASR)   | Carrizo anc   | ther Aquifers<br>ther Aquifers           | <del></del>  | N/A<br>2428 to 1009   | N/A<br>2,792             | 1.0                  | 1.0                     | 3.0          | 1 10 5    |
|        | SCTN-1b              | Aquifer Storage and Recovery (ASR) - Local Option  |               | her Aquifers                             |  | 2,089                 | 2,792                    | 1.0                  | 1.0                     | 1.0          | 1 to 5    |
|        |                      |  | +             |  |  |                       |                          |                      |                         |              |           |
| is the | list of stand-       | alone options as presented in Volume III. As these options were fitted into the Regional Water Plan, the quantities we   | re modified ( | some cases) and the as                   | sociated costs were recal                              | Culated for the       | Quantity include         | d in the Plan        |                         |              |           |
| ~~~    | entsi Compos         | tte Average based on nine Qualitative Measures of Environmental Impacts (High = 3; Medium = 2; Low = 1) and one m  | was me of Sud | unability (High a 1- Med                 | 10 m = 2-1 mu = 21                                     |                       |                          |                      |                         |              |           |

# "Inter-Regional Cooperation" Alternative Regional Water Plan

# South Central Texas Regional Water Planning Group

San Antonio River Authority

HDR Engineering, Inc. January 2001



### South Central Texas Region Alternative Water Plans

Alternative Name: Inter-Regional Cooperation

Alternative ID: IRC

Alternative Description: The Inter-Regional Cooperation Alternative Regional Water Plan is based on the cooperative development of water supplies by Regions L. N. P. and K. This plan provides significant additional water supply to Region L without development of new reservoirs. The primary approach involves diversion and delivery of enhanced water supply in the Choke Canyon Reservoir / Lake Corpus Christi (CCR/LCC) System from Choke Canyon Reservoir to the major municipal demand center of the South Central Texas Region without impact to the water supply available to Corpus Christi. Enhanced water supply for Corpus Christi is created by purchase and delivery of water to Lake Corpus Christi from the Guadalupe River at the Saltwater Barrier under existing water rights, the delivery of groundwater from the Gulf Coast Aquifer near Refugio, and the purchase and delivery of unappropriated streamflow and treated effluent to Choke Canyon Reservoir from the San Antonio River near Falls City. Additional inter-regional supply for Region L is created by the purchase and delivery of Colorado River water diverted in Matagorda County and the delivery of groundwater pumped from the Simsboro Aquifer in Bastrop, Lee, and Milam Counties. The inter-regional supplies are augmented by pipeline linkage of Lake Corpus Christi and Choke Canyon Reservoir, pumpage of the Carrizo Aquifer in Wilson and Gonzales Counties, aquifer storage and recovery in Atascosa County, voluntary transfer of Edwards Aquifer irrigation rights to municipal use, and enhanced recharge of the Edwards Aquifer.

The following water supply options are included in the Inter-Regional Cooperation Alternative Regional Water Plan (in no particular order):

- 1 Demand Reduction / Conservation (L-10)
- 2. Joint Development of Water Supply with Corpus Christi (SCTN-14b)
- 3. Carrizo Aquifer Wilson & Gonzales Counties (CZ-10C)
- 4. Aquifer Storage & Recovery (SCTN-1a)
- 5. Carrizo Aquifer Local Supply (SCTN-2a)
- 6. Simsboro Aquifer (SCTN-3c)
- 7. Colorado River in Matagorda County (C-17B)
- 8. Edwards Irrigation Transfers (L-15)
- 9. Edwards Recharge Type 2 Projects (L-18c)
- 10. SAWS Recycled Water Program
- 11. Canyon Reservoir (G-15C)
- 12. Wimberley & Woodcreek Canyon (G-24)
- 13. Weather Modification (SCTN-5)
- 14. Rainwater Harvesting (SCTN-9)
- 15. Brush Management (SCTN-4)
- 16. Small Aquifer Recharge Dams

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# Inter-Regional Cooperation Alternative Regional Water Plan Summary of Key Information for South Central Texas Regional Water Planning Group

### Quantity, Reliability, and Cost

- Plan includes management supplies to meet projected needs, ensure reliability, and maintain springflow, resulting in a quantity of additional water supplies sufficient to meet projected needs for municipal, industrial, steam-electric power, and mining uses through the year 2050.
- Cost is the greatest among the five alternative plans under consideration.

### **Environmental Factors**

- Increased median annual streamflows in the Guadalupe River and decreased median annual streamflows in the San Antonio River.
- Least concerns with Endangered & Threatened Species and greatest concerns with Water Quality & Aquatic Habitat and Cultural Resources among the five alternative plans under consideration.

### Impacts on Water Resources

- No unmitigated reductions in water available to existing water rights.
- Long-term reductions in water levels in the Carrizo Aquifer. Drawdown would be less than the average for the five alternative plans under consideration.

### **Impacts on Agriculture and Natural Resources**

- Major commitment to municipal and irrigation water Demand Reduction (Conservation) (L-10).
- Includes Brush Management (SCTN-4) and Weather Modification (SCTN-5).
- Inclusion of water supply options to meet projected irrigation needs in full is estimated to be economically infeasible at this time. Weather Modification (SCTN-5) assists irrigation and dry-land agriculture (crops and ranching).
- Includes limited potential voluntary transfer of Edwards Aquifer irrigation permits to municipal permits through lease or purchase.

### Other Relevant Factors per SCTRWPG

 Negotiation of agreement(s) between the City of Corpus Christi, Nueces River Authority, Guadalupe-Blanco River Authority, San Antonio Water System, U.S. Bureau of Reclamation, and others.

### Comparison of Strategies to Meet Needs

 Selection of water supply options comprising the alternative plan based on cooperative development and utilization of resources by the South Central Texas and Coastal Bend Regions as well as preferences expressed by planning units.

### **Interbasin Transfer Issues**

- Projected non-irrigation needs in basin(s) of origin are met throughout the planning period.
- Plan includes four interbasin transfers that are integral to Joint Development with Corpus Christi (SCTN-14b). These interbasin transfers deliver water: 1) From the Guadalupe River Saltwater Barrier to Corpus Christi and Choke Canyon Reservoir; 2) From Choke Canyon Reservoir to Bexar County; 3) From the San Antonio River @ Falls City to Choke Canyon Reservoir; and 4) From the Colorado River @ Bay City to Corpus Christi.

### Third-Party Impacts of Voluntary Redistribution of Water

- Potential positive or negative effects of Edwards Irrigation Transfers (L-15).
- Lower water levels in some portions of the Carrizo Aquifer.

### Regional Efficiency

- Edwards Irrigation Transfers (L-15) require no new facilities. Transferred water would likely be available at or very near locations having projected municipal, industrial, steam-electric power, and mining needs in Uvalde, Medina, Atascosa, and Bexar Counties.
- Terminal storage and regional water treatment facilities in Bexar County and aquifer storage and recovery in Atascosa County increase efficiency, improve reliability, and reduce unit cost.
- San Antonio Water System Regional Aquifer Storage & Recovery System (SCTN-1a) substantially reduces peak summer pumpage from the Edwards Aquifer.

### Effect on Navigation

• Not applicable.

### South Central Texas Region (Inter-Regional Cooperation Alternative) – TWDB Evaluation Criteria Summary

| Management Strategy  | Quantity<br>(acft/yr) <sup>1</sup> | Reliability <sup>2</sup> | Unit Cost<br>(\$/acft) <sup>3</sup> |    | Environmental Factors   | 1        | Impacts on Water Resources   | lī | npacts on Agricultural and Natural Resources  |   | Other Relevant Factors per SCTRWPG  |
|--|------------------------------------|--------------------------|-------------------------------------|----|---|----------|--|----|---|---|---|
| Municipal Demand Reduction (Conservation) (L-10 Mun.)            | 44,566                             | Firm                     | \$173                               | •  | None. Supply developed through demand reduction.  | •        | Slight reductions in treated effluent discharge.   | •  | Fewer water management strategies necessary to meet projected needs.                        | • | Conservation is a central element of the Plan.  |
| Edwards Irrigation Transfers (L-15)                              | 42,500                             | Firm                     | \$80                                | •  | None. Supply developed without new facilities.  | •        | Reductions in springflow due to relocation of pumpage closer to springs.   | •  | Plan includes 53 percent of potential maximum voluntary transfer through lease or purchase. | • | Encourages beneficial use of available rights.  |
| Edwards Recharge - Type 2 Projects (L-18c)                       | 13,451                             | Firm                     | \$486                               | •  | Concerns with endangered & threatened species, habitat, and TPWD Ecologically Unique Stream Segments at some sites. Enhanced springflows help endangered species. |          | Limited, as most projects are located on streams that are frequently dry. Increased aquifer levels and springflows.  | •  | Typically higher well levels in Uvalde & Medina Counties.                                   | • | Positive effects on discharges from Comal and<br>San Marcos Springs.<br>Mitigation of impacts on firm yield of Choke<br>Canyon Res. / Lake Corpus Christi System. |
| Simsboro Aquifer (SCTN-3c)                                       | 55,000                             | Firm                     | \$937                               | •  | Concerns with endangered & threatened species, habitat, and cultural resources.   | :        | Long-term reductions in aquifer levels.  Minimal reductions in instream flow at outcrop.  Potential effects on discharge of small springs.   | •  | Minimal, if any.  | : | Beneficial use of groundwater now unused. Planned Bastrop Co. supply for Region L. exceeds 2030 availability per Region K.  |
| Joint Development of Water Supply with Corpus Christi (SCTN-14b) | 218,000                            | Firm                     | \$907                               | •  | Concerns with endangered & threatened species, habitat, cultural resources, and TIWD Ecologically Unique Stream Segment.  | •        | Some reductions in freshwater inflows to the Guadalupe Estuary associated with greater utilization of existing water rights and diversion of unappropriated flow.  Reductions in San Antonio River flows | •  | Minimal, if any.  | • | Effects of San Antonio River water on Choke<br>Canyon Water Quality<br>Encourages beneficial use of existing reservoir<br>Challenging multi-party agreements.     |
| Canyon Reservoir - River Diversion (G-15C)                       | 15,000                             | Firm                     | \$794                               | •  | Minimal. Canyon Reservoir is an existing resource.  | 1.       | Increased instream flows associated with downstream deliveries of water supply.  | •  | Not applicable.   | : | Encourages beneficial use of existing reservoir.<br>Recreational benefits with downstream<br>delivery.  |
| Canyon Reservoir – Wimberley & Woodcreek (G-24)                  | 1,048                              | Firm                     | \$1,398                             | •  | Minimal. Pipeline could encounter endantered or threatened species habitat.   | •        | Minimal, if any.   | •  | Not applicable.   | • | Encourages beneficial use of existing reservoir.  |
| Carrizo Aquifer – Wilson & Gonzales (CZ-10C) <sup>5</sup>        | 40,000                             | Firm ·                   | \$845                               | •  | Minimal. Pipeline could encounter culturil resource sites.  |          | Modest long-term reductions in aquifer levels.  Minimal reductions in instream flow at outcrop.  Potential effects on discharge of small springs.  | •  | Minimal, if any.  | • | General conformance with policies of<br>Underground Water Conservation Districts.   |
| Carrizo Aquifer - Local Supply (SCTN-2a)                         | 14,700                             | Firm                     | \$386                               | 1. | Minimal, if any.  | <b>—</b> | Modest long-term reductions in aquifer levels.   | •  | Minimal, if any.  |   |   |
| SAWS Recycled Water Program (SAWS)                               | 52,215                             | Firm                     | \$395                               | •  | None. Water supply derived from increas <sup>xd</sup> volumes of treated wastewater.  | 1        | Minimal, if any.   | •  | Not applicable.   | • | Encourages beneficial use of available resource   |
| Purchase of Water From Major Provider (PMP)                      | 8,000                              | Firm                     | \$877                               | •  | Minimal, if any. Supply developed as par of other water management strategies.  | •        | Minimal, if any.   | •  | Not applicable.   |   | _   |
| Aquifer Storage & Recovery (ASR) – (SCTN-1a)                     | Unquantified                       | Firm                     | Unquantified                        | •  | Minimal. Pipeline could encounter important habitat or encounter cultural resource sites  | •        | Reduced peak summer pumpage from Edwards<br>Aquifer increases aquifer levels and springflow.   | •  | Not applicable.   | • | SAWS South Bexar County ASR presently in implementation phase.  |
| Brush Management (SCTN-4)  | Unquantified                       | Unknown                  | Unquantified                        | •  | Concerns regarding endangered & threate ed<br>species, vegetation & wildlife habitat, and<br>cultural resources.  | •        | Potential benefit to Edwards Aquifer due to increased water for recharge.  | •  | Potential improvement of pasture for grazing.   | • | Additional studies needed to determine quantity of dependable supply during drought   |
| Weather Modification (SCTN-5)                                    | Unquantified                       | Unknown                  | Unquantified                        | •  | Potential increases in water supply for willife habitat.  | •        | Potential increases in rainfall, runoff, and aquifer recharge.   | •  | Provides water for irrigated and dry-land agriculture (crops & ranching).                   | • | Concerns regarding increased flood potential.   |
| Rainwater Harvesting (SCTN-9)                                    | Unquantified                       | Unknown                  | Unquantified                        | •  | Minimal, if any.  | •        | Minimal, if any.   | •  | Not applicable.   | • | Consistent with conservation focus of Plan.   |
| Small Aquifer Recharge Dams                                      | Unquantified                       | Unknown                  | Unquantified                        | •  | Small potential effects on habitat.   | •        | Potential increases in local aquifer levels.   |    | Minimal, if any.  |   |   |
| Total of New Supplies  | 504,480                            |                          |                                     |    |   |          |  |    |   |   |   |

| Management Strategy   | Comparison of Strategies to Meet Needs |   |    | Interbasin Transfer Issues   | Third-Party Impacts of Voluntary Transfers |  |             | Regional Efficiency  |    | Effect on<br>Navigation |
|---|--|---|----|--|--|--|-------------|--|----|-------------------------|
| Municipal Demand Reduction (Conservation) (L-10 Mun.)               |  | Low unit cost. Inherent environmental benefits.   | •  | Not applicable.  | •  | Not applicable.  | •           | Implementable throughout the region.   | 1. | None                    |
| Edwards Irrigation Transfers (L-15)                                 | •                                      | Low unit cost.  | •  | Not applicable.  | •  | Limited transfer to avoid potential socio-<br>economic impacts to third parties. | •           | Requires no new facilities.  | 1. | None                    |
| Edwards Recharge - Type 2 Projects (L-18c)                          | •                                      | Low unit cost   | •  | Not applicable.  | •  | Not applicable.  | •           | Requires no new transmission and treatment facilities.   | •  | None                    |
| Simsboro Aquifer (SCTN-3c)  | •                                      | Moderate unit cost.   | •  | Not applicable.  | •  | Limited transfer to avoid potential socio-<br>economic impacts to third parties. | •           | Beneficial use of groundwater presently produced, but unused.  | •  | None                    |
| Joint Development of Water Supply with Corpus Christi<br>(SCTN-14b) | •                                      | Moderate to high unit cost  | •  | TNRCC Interbasin Transfer Permit required: 1 Guadalupe to Corpus Christi + CCR; 2) CCR to Bexar County; 3) San Antonio River to CCR; ad 4) Colorado to Corpus Christi. | •  | Minimal  |             | Phased sharing of resources between Bexar,<br>Comal and Hays Counties<br>Significant additional surface water supply<br>without construction of a new reservoir. | •  | None                    |
| Canyon Reservoir - River Diversion (G-15C)                          | •                                      | Low to moderate unit cost.  | •  | Not applicable.  | •  | Not applicable.  | <u> </u>    | Significant additional surface water supply without construction of a new reservoir.   | •  | None                    |
| Canyon Reservoir - Wimberley & Woodcreek (G-24)                     | •                                      | High unit cost, but options to meet needs are limited.                                    | •  | Not applicable.  | •  | Not applicable.  | •           | Additional surface water supply without construction of a new reservoir.   | 1  | None                    |
| Carrizo Aquifer - Wilson & Gonzales (CZ-10C) <sup>3</sup>           | •                                      | Moderate cost.  | •  | Not applicable.  | •  | Limited transfer to avoid potential socio-<br>economic impacts to third parties. | •           | New supply proximate to Bexar County.  | •  | None                    |
| Carrizo Aquifer - Local Supply (SCTN-2a)                            | •                                      | Low unit cost.  | •  | Not applicable.  | •  | Not applicable.  | •           | New supply proximate to points of need.  | •  | None                    |
| SAWS Recycled Water Program (SAWS)                                  | •                                      | Low to moderate unit cost.  | 1. | Not applicable.  | •  | Not applicable.  | T. <u>•</u> | New supply proximate to points of need.  | •  | None                    |
| Purchase of Water From Major Provider (PMP)                         | •                                      | Low to moderate unit cost.  | •  | Not applicable.  | •  | Not applicable.  | <b>T•</b>   | Economy of participation in regional projects.   | 1. | None                    |
| Aquifer Storage & Recovery (ASR) - (SCTN-la)                        | •                                      | Effective means of reducing peak summer pumpage from the Edwards Aquifer.                 | •  | Not applicable.  | •  | Not applicable.  | 1.          | Increases reliability of current supply from the Edwards Aquifer.  | •  | None                    |
| Brush Management (SCTN-4)   | •                                      | Insufficient information at this time.  | •  | Not applicable.  | •  | Not applicable.  | 1.          | May contribute positively to storage and system management of supplies.  | •  | None                    |
| Weather Modification (SCTN-5)                                       | •                                      | Potentially feasible management strategy to meet a portion of projected irrigation needs. | •  | Not applicable.  | •  | Not applicable.  | •           | May contribute positively to storage and system management of supplies.  | •  | None                    |
| Rainwater Harvesting (SCTN-9)                                       | •                                      | High unit cost; comparable to domestic well.  | 1• | Not applicable.  | •  | Not applicable.  | •           | Implementable throughout the region.   | 1. | None                    |
| Small Aquifer Recharge Dams   | •                                      | High unit cost.   | •  | Not applicable,  | •  | Not applicable.  | •           | Implementable throughout the region.   | 1. | None                    |

- Notes:

  1) Quantity based on full implementation and utilization of new supplies in year 2050.

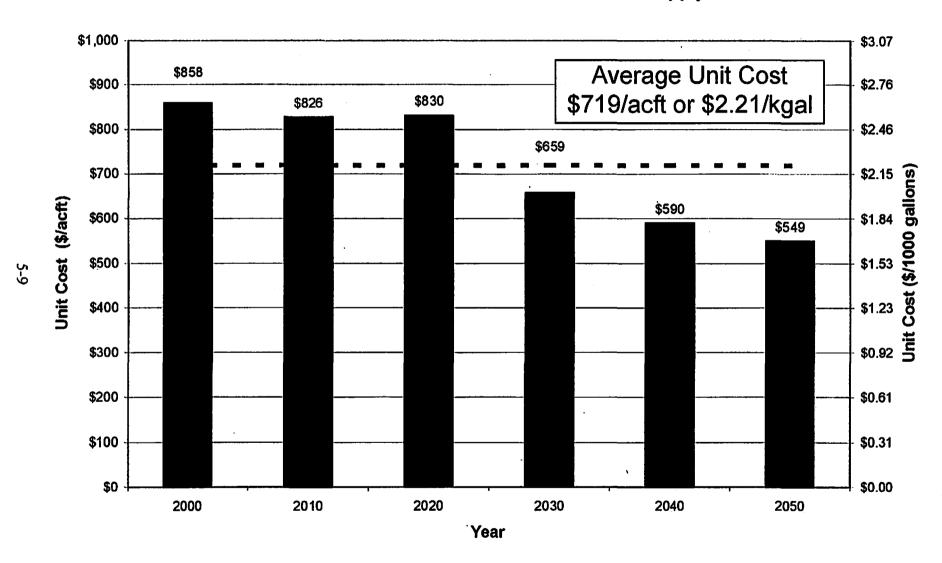
  2) Firm reliability indicates that new supply is dependable in a drought of record with full implementation of the Alternative Water Plan.

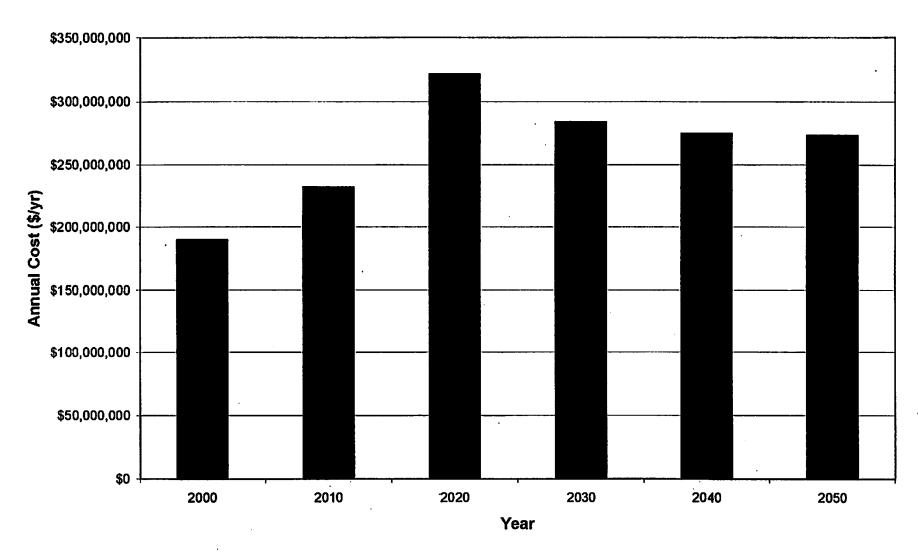
  3) Unit cost based on full utilization of supply at ultimate capacity of planned facilities and includes treatment and distribution facilities necessary to meet peak daily needs.

  4) Management strategies in the implementation phase include Schertz-Seguin Water Supply Project, Western Canyon Regional Water Supply Project, Hays/IH35 Water Suply Project, Lake Dunlap WTP Expansion and Mid-Cities Project, and GBRA Canyon Reservoir Contract Renewals. Supplies associated with these management strategies were coured as current supply in the technical evaluation of alternative regional water plans.

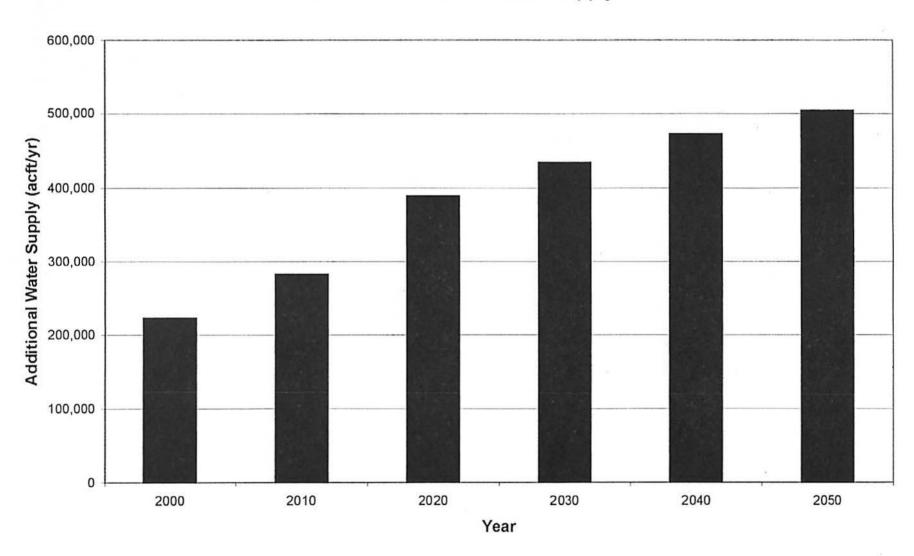
  5) Subsequent to the technical evaluation of alternative regional water plans, quantity associated with this management strategy was limited in the Regional Water Plan in vid of policies of underground water conservation districts.

## Inter-Regional Cooperation Alternative Regional Water Plan Unit Cost of Cumulative Additional Water Supply



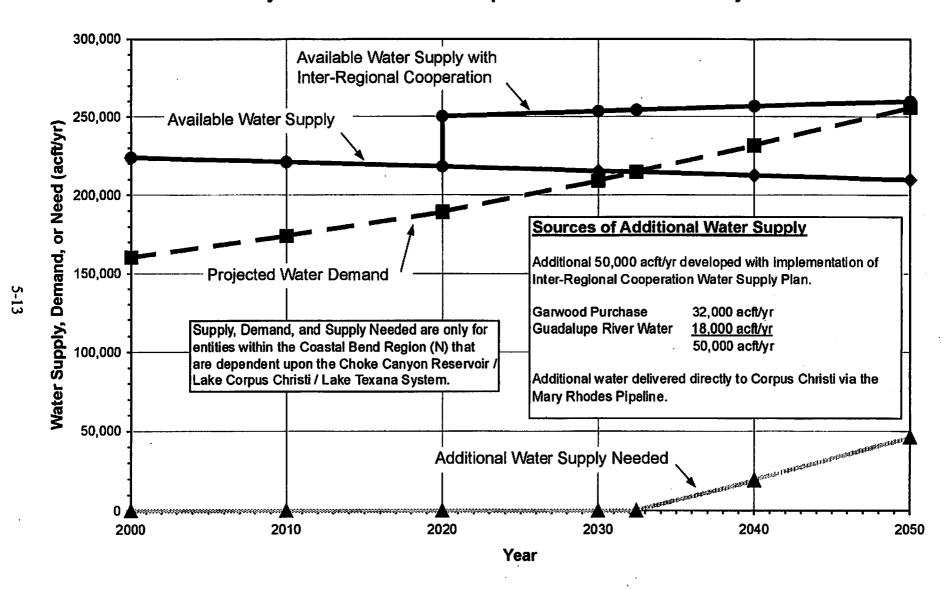


### Inter-Regional Cooperation Alternative Regional Water Plan Cumulative Additional Water Supply

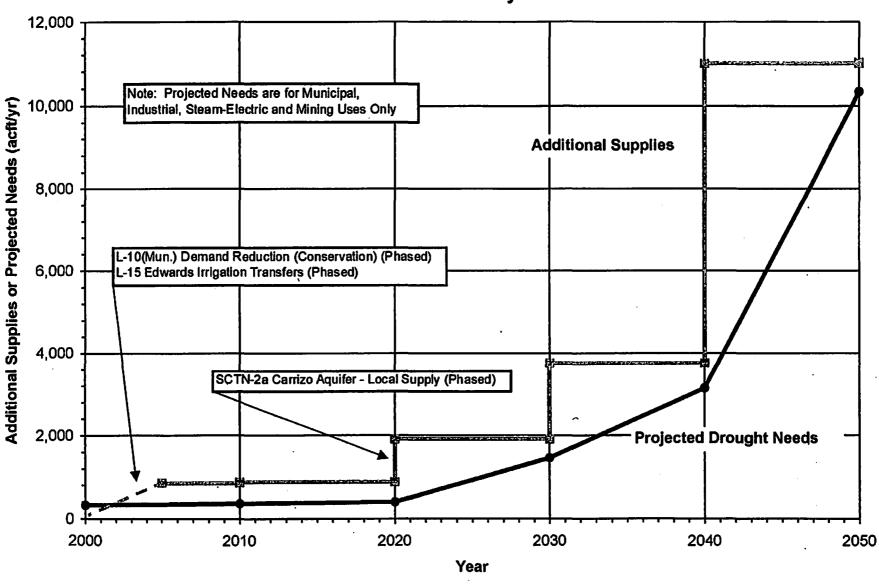


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### Choke Canyon Reservoir / Lake Corpus Christi / Lake Texana System

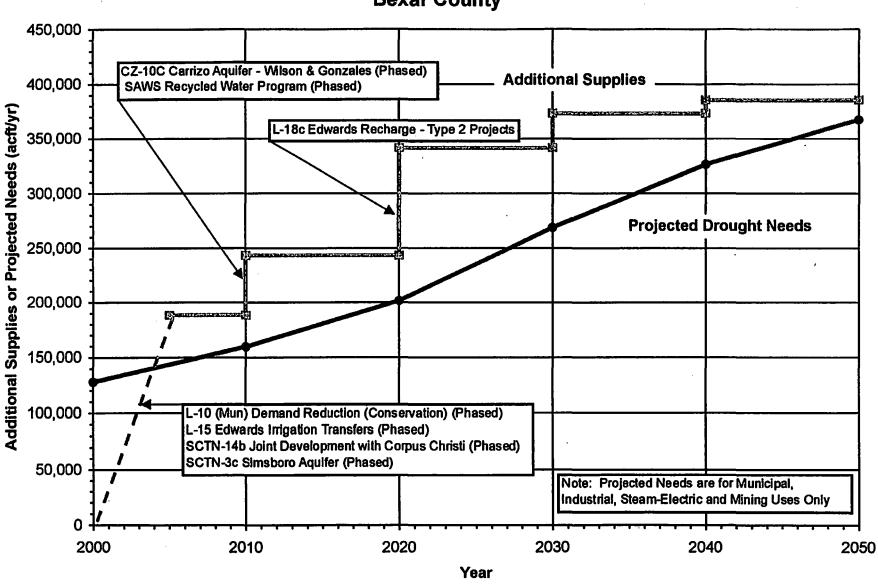


### Inter-Regional Cooperation Alternative Regional Water Plan Atascosa County



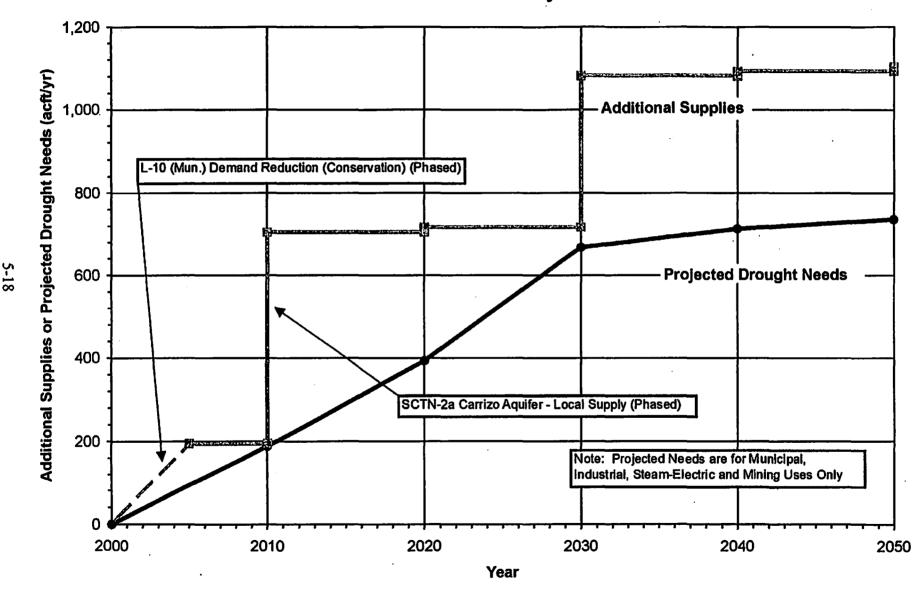
| South Co        | entral Texas Region   |                         |              |                      |                |               | Co           | unty = A      | tascosa         |
|-----------------|---|-------------------------|--------------|----------------------|----------------|---------------|--------------|---------------|-----------------|
| County S        | ummary of Projected Water Needs (Shortag                    | ges) and Wate           | er Manag     | ement St             | ategies        |               |              | ser Grou      |                 |
| Projected       | l Water Needs (acft/yr)                                     |                         |              |                      |                |               |              |               |                 |
| 1 10100100      | User Group(s)   |                         | 2000         | 2010                 | 2020           | 2030          | 2040         | 2050          | Notes           |
|                 | Municipal   |                         | 325          | 366                  | 401            | 468           | 530          | 587           | 110103          |
|                 | Industrial  | -                       | 0            | 300                  | 0              | 0             | 030          | 0             |                 |
|                 | Steam-Electric  |                         | 0            | <del>-</del>         | <u>ö</u>       | ŏ             | 1,504        | 8.504         |                 |
|                 | Mining  |                         | Ö            | <u>ŏ</u>             | ŏl             | 995           | 1,109        | 1,239         |                 |
|                 | Irrigation  |                         | 38,418       | 38,718               | 35,170         | 43,726        | 42,190       | 40,713        |                 |
|                 | Total Needs   |                         | 38,743       | 37,084               | 35,571         | 45,189        | 45,333       | 51,043        |                 |
|                 | Mun, Ind, S-E, & Min Needs                                  |                         | 325          | 366                  | 401            | 1,463         | 3,143        | 10,330        |                 |
|                 | Irrigation Needs  |                         | 38,418       | 36,718               | 35,170         | 43,726        |              | 40,713        |                 |
| Motor Mo        | nagement Strategies (acft/yr)                               | Candidate               | -            |                      |                |               |              |               |                 |
| ID#             |   |                         | 2000*        | 2010                 |                | 2030          | 2040         | 2050          | N-4             |
|                 | Description   | New Supply              |              |                      | 2020           |               | 2040         | 2050          | Notes           |
| L-10 (Mun.)     | Demand Reduction (Conservation)                             | 40.500                  | 356          | 384                  | 411            | 259           | 300          | 319           | 1               |
| L-15<br>SCTN-2a | Edwards Irrigation Transfers Carrizo Aquifer - Local Supply | 42,500                  | ,500         | 500                  | 500            | 500<br>1,000  | 700<br>3,000 | 700<br>10,000 | 2, 3, 4<br>5, 6 |
| 30114-28        | Camzo Aquilar • Cocar Soppiy                                |                         |              |                      |                | 1,000         | 3,000        |               | 3,0             |
| SCTN-4          | David Management  |                         |              | <del></del>          |                |               |              |               |                 |
| SCTN-5          | Brush Menagement Weather Modification                       |                         |              |                      |                |               |              |               |                 |
| SCTN-9          | Rainwater Harvesting  |                         |              |                      |                |               |              |               |                 |
| <u> </u>        | Small Aquifer Recharge Dams                                 |                         |              |                      |                |               |              |               | <del>-</del>    |
| L-10 (lrr.)     | Demand Reduction (Conservation)                             |                         | 3,692        | 3,692                | 3,692          | 3,692         | 3,692        | 3,692         | 8               |
|                 | Total New Supplies  |                         | 4,548        | 4,576                | 4,603          | 5,451         | 7,692        | 14,711        |                 |
|                 | Total System Mgmt. Supply / Deficit                         |                         | -34,195      | -32,508              | -30,968        | -39,738       | -37,641      | -36,332       |                 |
|                 | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit       |                         | 531          | 518                  | 510            | 296           | 857          | 689           |                 |
|                 | Irrigation System Mgmt. Supply / Deficit                    |                         | -34,726      | -33,026              | -31,478        | -40,034       | -38,498      | -37,021       |                 |
| Notes:          |   |                         |              |                      |                | .1            |              |               |                 |
| •               | Candidate New Supplies shown for year 2000 are identify     | ied for priority imp    | tementation. | but will not t       | e available i  | mmediately.   |              |               |                 |
| 1               | Damand Reduction (Conservation) strategies assumed I        |                         |              |                      |                |               |              |               |                 |
| 2               | Candidate New Supply to be shared among Uvalde, Med         |                         |              |                      |                |               | ought.       |               |                 |
| 3               | Pursuant to draft EAA Critical Period Management rules,     |                         |              |                      |                | rcent of      |              |               |                 |
|                 | an estimated potential annual transfer of 50,000 acft bas   | <u>ed on Proposed P</u> | ermils prora | <u>ted to 400,00</u> | O acit/yr.     |               |              |               |                 |
| 4               | Additional Edwards supply is for City of Lylle.             |                         |              |                      |                |               |              |               |                 |
| 5               | Additional Carrizo supply is for Steam-Electric and Minin   |                         |              | 1 2 2 4              |                |               |              |               |                 |
| 6               | Early Implementation of facilities assumed in cost estima   |                         |              |                      |                |               | Lift and     |               |                 |
| <u>/</u>        | Option expected to provide additional water supply in ma    |                         |              |                      |                |               |              | leation sate  |                 |
| 8               | Estimates based upon use of LEPA systems on 50 perce        | ini oi acreages im      | gated in 199 | r, with conse        | SIVERIOR EL 20 | heicem of the | пувнол вррі  | cauon rate    |                 |

### Inter-Regional Cooperation Alternative Regional Water Plan Bexar County



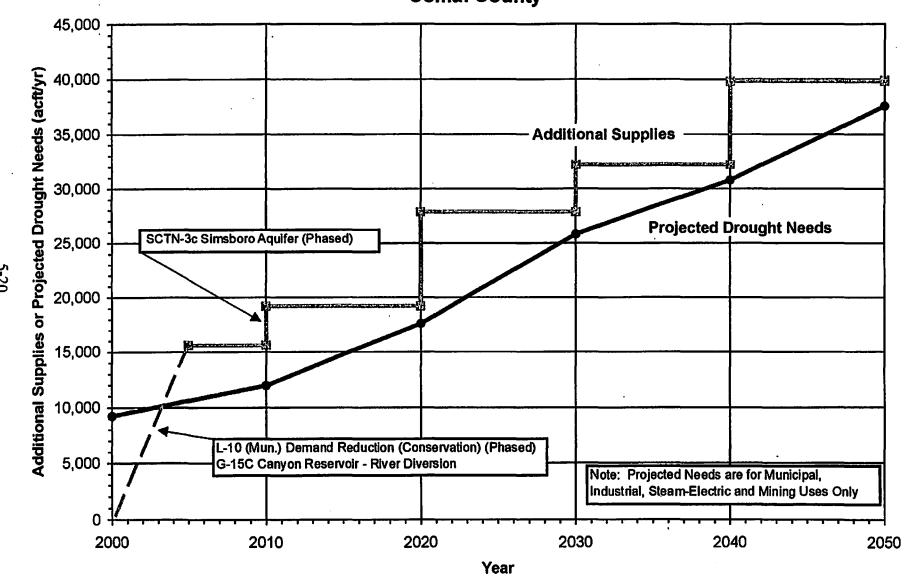
| South Cent   | tral Texas Region                                      | Tregional i          |               |               |               |                |                | County   | = Bexar |
|--------------|--|----------------------|---------------|---------------|---------------|----------------|----------------|----------|---------|
|              | mary of Projected Water Needs (Shortages)              | and Water Ma         | nagement      | Strategle     | S             | ·              |                | User Gro |         |
|              | ater Needs (acft/yr)                                   |                      |               |               | -             |                |                |          |         |
| FTOJECTEG VI | User Group(s)  |                      | 2000          | 2010          | 2020          | 2030           | 2040           | 2050     | Notes   |
| <b>.</b>     | Municipal  |                      | 122,867       | 154,495       | 196,301       | 262,070        | 315,633        | 353,309  | 110.00  |
| <del></del>  | Industrial   |                      | 0             | 0             | 190,301       | 1,430          | 4,759          | 8,192    |         |
|              | Steam-Electric   |                      | <u></u>       | ŏ             | 0             | 1,750          | 4,,00          | 0,102    |         |
|              | Mining   |                      | 4,963         | 4,938         | 5,201         | 5,408          | 5,645          | 5,982    |         |
|              | Ingalion   |                      | 18,728        | 17,297        | 15,738        | 14,245         | 12,815         | 11,444   |         |
|              | Total Needs  |                      | 146,558       | 176,728       | 217,240       |                | 338,652        | 378,907  |         |
|              | Mun, Ind, S-E, & Min Needs                             |                      | 127,830       | 159,431       | 201,502       |                | 326,037        | 367,463  |         |
|              | Irrigation Needs                                       |                      | 18,728        |               | 15,738        |                | 12,815         |          |         |
| Water Manag  | gement Strategies (acft/yr)                            | Candidate            |               |               |               |                |                | •        |         |
| ID#          | Description  | New Supply           | 2000*         | 2010          | 2020          | 2030           | 2040           | 2050     | Notes   |
| L-10 (Mun.)  | Demand Reduction (Conservation)                        |                      | 33,528        | 42,509        | 41,210        | 36,533         | 38,834         | 40,934   | 1       |
| L-15         | Edwards Impation Transfers                             | 42,500               | 25,000        | 35,000        | 35,000        | 34,000         | 33,800         | 32,800   | 2, 3    |
| SCTN-14b     | Joint Development with Corpus Christi                  | 218,000              | 79,000        | 79,000        | 155,000       | 191,000        | 204,000        | 218,000  | 4, 5    |
| SCTN-3c      | Simsboro Aquifer                                       | 55,000               | 51,000        | 48,000        | 41,000        | 27,000         | 18,500         | 0        | 6       |
| CZ-10C       | Carrizo Aquifer - Wilson & Gonzales                    | 40,000               |               | 19,000        | 29,000        | 35,500         | 35,500         | 35,500   | 7       |
|              | SAWS Recycled Water Program                            |                      |               | 19,826        | 26,737        | 35,824         | 43,561         | 52,215   | 8, 9    |
| L-18c        | Edwards Recharge - Type 2 Projects                     | 13,451               | -             |               | 13,451        | 13,451         | 13,451         | 13,451   |         |
| SCTN-1a      | Aquifer Storage & Recovery - Regional                  |                      |               |               |               |                |                |          | 10      |
| SCTN-4       | Brush Management                                       |                      |               |               |               |                |                |          | 11      |
| SCTN-5       | Weather Modification                                   |                      |               |               |               |                |                | -        | 11      |
| SCTN-9       | Rainwater Harvesting                                   |                      |               |               |               |                |                |          | 11      |
|              | Small Aquifer Recharge Dams                            |                      |               |               |               |                |                |          | 11      |
| L-10 (lrr.)  | Demand Reduction (Conservation)                        |                      | 4,521         | 4,521         | 4,521         | 4,521          | 4,521          | 4,521    | 12      |
|              | Total New Supplies                                     |                      | 193,049       | 247,856       | 345,919       | 377,829        | 390,167        | 397,421  |         |
|              | Total System Mgmt. Supply / Deficit                    |                      | 46,491        | 71,128        | 128,679       | 94,678         | 51,315         | 18,514   |         |
|              | Mun, Ind, S-E, & Min System Mgmt. Supply /             |                      | 60,698        | 83,904        | 139,896       |                | 59,609         |          | ·       |
| l            | Deficit  |                      | 55,555        |               |               |                |                |          |         |
|              | Irrigation System Mgmt. Supply / Deficit               |                      | -14,207       | -12,776       | -11,217       | -9,724         | -8,294         | -6,923   |         |
| Notes:       |  | j                    |               | Ï             |               |                |                |          |         |
| •            | Candidate New Supplies shown for year 2000 are id      | entified for priorit | y implemen    | tation, but w | il not be av  | allable imme   | diately.       |          |         |
| 1            | Demand Reduction (Conservation) strategies assum       | ed largely reflect   | ed in projec  | ted water de  | mands.        |                |                |          |         |
| 2            | Candidate New Supply to be shared among Uvalde,        | Medina, Atascos      | a, and Bexa   | r Counties.   | Supply may    | y not be relia | ble in droup   | jht.     |         |
| 3            | Pursuant to draft EAA Critical Period Management ru    |                      |               |               |               |                |                |          |         |
|              | an estimated potential annual transfer of 50,000 acft  | based on Propos      | ed Permits    | prorated to   | 400,000 acf   | tlyr.          |                |          |         |
| 4            | Candidate New Supply requires cooperative agreem       | ent(s) with City of  | f Corpus Ch   | visti, Nuece: | River Auth    | ority, & USB   | IR.            |          |         |
| 5            | Requires delivery of 32,000 actifyr of Colorado River  | water (Garwood       | ) to Corpus   | Christi in 20 | 20 and day    | elopment of    | Gulf Coast     |          |         |
|              | Aquifer (SCTN-2b) at long-term average supply of 21    |                      |               |               |               |                |                |          |         |
| 6<br>7       | Candidate New Supply shared by Bexar, Hays, and        |                      |               |               |               |                |                |          |         |
| 7            | Candidate New Supply shared by Bexar and Guadal        | upe Counties. E      | ffects on reg | ional aquife  | r levels to b | e quantified.  |                |          |         |
| 8            | Current SAWS Recycled Water Program is included        | in the 24,941 acf    | tyr (consur   | nptive reuse  | ) in estimate | d needs.       |                |          |         |
| 9            | Future use of recycled water for non-potable uses ar   |                      |               |               |               |                |                |          |         |
| 10           | SAWS ASR program in southern Bexar County incre        |                      |               |               |               |                |                |          |         |
| 11           | Option expected to provide additional water supply in  |                      |               |               |               |                |                |          |         |
| 12           | Estimates based upon use of LEPA systems on 80 p       |                      |               |               |               | on at 40 per   | cent of irriga | ition    |         |
|              | application rate, but applicable to only 50 percent of | Edwards Aquifer      | irrigation pe | rmitted quar  | ntities.      |                |                |          |         |

### Inter-Regional Cooperation Alternative Regional Water Plan Caldwell County



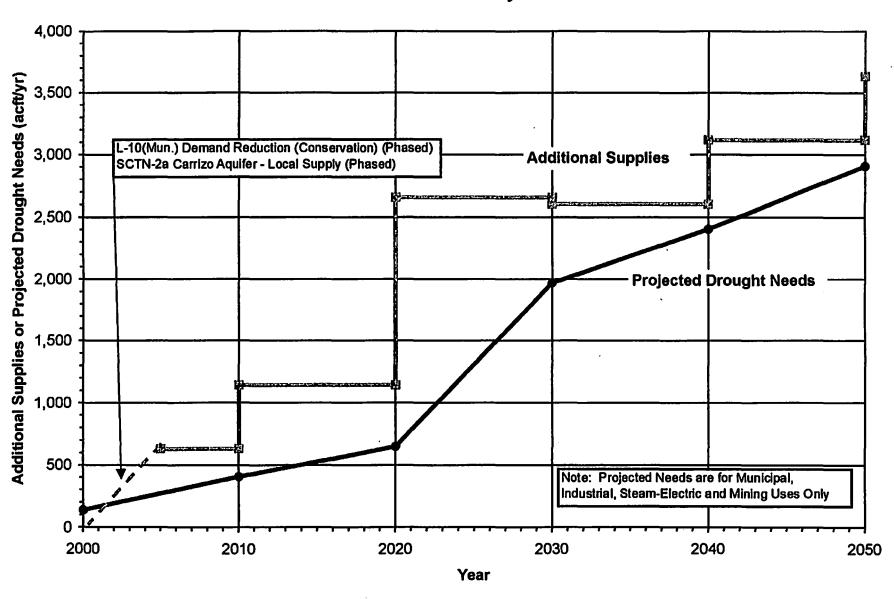
| South Cer          | ntral Texas Region  |                      |               |                |               |          | (     | County = | Caldwel |
|--------------------|---|----------------------|---------------|----------------|---------------|----------|-------|----------|---------|
| County Su          | mmary of Projected Water Needs (Shortages) and                | Water Manag          | ement Stra    | tegies         |               |          |       | User Gro |         |
|                    |   |                      |               |                |               |          |       |          |         |
| <u>Projected V</u> | Vater Needs (acft/yr)   |                      |               |                |               |          |       |          |         |
|                    | User Group(s)   |                      | 2000          | 2010           | 2020          | 2030     | 2040  | 2050     | Notes   |
|                    | Municipal   |                      | 0             | 188            | 393           | 668      | 714   | 737      |         |
|                    | Industrial  |                      | 0             | 0              | 0             | 0        | 0     | 0        |         |
|                    | Steam-Electric  |                      | 0             | 0              | 0             | . 0      | 0     | 0        |         |
|                    | Mining  |                      | 0             | 0              | 0             | 0        | 0     | 0        |         |
|                    | Irrigation  |                      | 0             | 0              | 0             | 0        | 0     | 0        |         |
|                    | Total Needs   |                      | 0             | 188            | 393           | 668      | 714   | 737      |         |
|                    | Mun, Ind, S-E, & Min Needs                                    |                      | 0             | 188            | 393           | 668      | 714   | 737      |         |
|                    | Irrigation Needs  |                      | 0             | 0              | 0             | 0        | 0     | Ō        |         |
|                    |   |                      |               |                |               |          | ,     |          |         |
| Water Mana         | agement Strategies (acft/yr)                                  | Candidate            |               |                |               |          | T T   |          |         |
| ID#                | Description   | New Supply           | 2000          | 2010           | 2020          | 2030     | 2040  | 2050     | Notes   |
| L-10 (Mun.)        | Demand Reduction (Conservation)                               |                      | 195           | 206            | 218           | 82       | 93    | 104      |         |
| SCTN-2a            | Carrizo Aquifer - Local Supply                                |                      |               | 500            | 500           | 1,000    | 1,000 | 1,000    |         |
|                    | •   |                      |               |                |               |          |       |          |         |
|                    |   |                      |               |                |               |          |       |          |         |
|                    |   |                      |               |                | _             |          |       |          |         |
|                    |   |                      |               |                |               |          |       |          |         |
|                    |   |                      |               |                |               |          |       |          |         |
|                    |   |                      |               |                |               |          |       |          |         |
|                    | Small Aquifer Recharge Dams                                   |                      |               |                |               |          |       |          |         |
| L-10 (lrr.)        | Demand Reduction (Conservation)                               |                      |               |                |               |          |       |          |         |
|                    |   |                      |               |                |               |          |       |          |         |
|                    |   |                      |               |                |               |          |       |          |         |
|                    | Total New Supplies  |                      | 195           | 706            | 718           | 1,082    | 1,093 | 1,104    |         |
|                    | T-4-1 Contain Mount Complete Definite                         |                      | 405           | 546            | 995           | 44.41    | 070   | 207      |         |
|                    | Total System Mgmt. Supply / Deficit                           |                      | 195           | 518            | 325           | 414      | 379   | 367      |         |
|                    | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit         |                      | 195           | 518            | 325           | 414      | 379   | 367      |         |
|                    | Irrigation System Mgmt. Supply / Deficit                      |                      | 0             | 0              | 0             | Ö        | ō     | 0        |         |
|                    |   |                      |               |                |               |          |       |          |         |
| Notes:             | •   |                      |               |                |               |          |       |          |         |
| 1                  | Demand Reduction (Conservation) strategies assumed largely    | reflected in project | ed water dema | nds.           | 1             |          | ·     |          | •       |
| 2                  | Additional well(s) for Lockhart.                              |                      | <u> </u>      |                |               |          | I     |          |         |
| 3                  | Option expected to provide additional water supply in many ye | ars, but dependable  | supply during | drought is pre | sently unquar | ntified. |       |          |         |

### Inter-Regional Cooperation Alternative Regional Water Plan Comal County



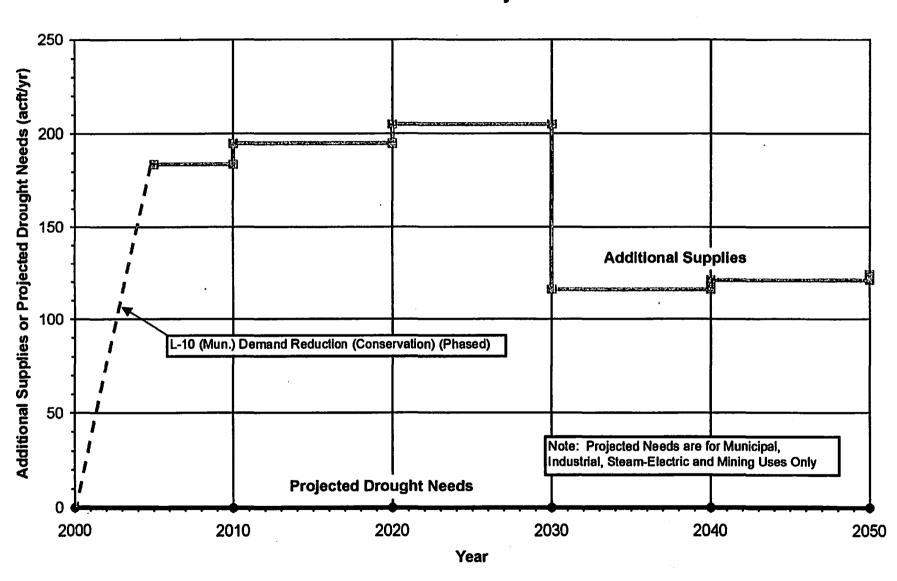
| South Cen     | tral Texas Region  |                      |                 |                 |              | Ī                                     |             | County                   | = Comal     |
|---------------|--|----------------------|-----------------|-----------------|--------------|---------------------------------------|-------------|--------------------------|-------------|
| County Sur    | nmary of Projected Water Needs (Shortages) ar  | id Water Mana        | gement S        | trategies       |              |                                       |             | User Grou                |             |
| Duningston 13 | Manager Manager Anna Manager M |                      |                 |                 |              |                                       |             | 1                        |             |
| Projected v   | Vater Needs (acft/yr)  |                      |                 |                 |              |                                       |             |                          |             |
|               | User Group(s)  |                      | 2000            | 2010            | 2020         | 2030                                  | 2040        | 2050                     | Notes       |
|               | Municipal  |                      | 2,289           | 5,049           | 10,487       | 18,282                                | 25,205      | 33,062                   |             |
|               | Industrial   |                      | 1,388           | 1,425           | 1,486        | 1,737                                 | 2,009       | 2,289                    |             |
|               | Steam-Electric   |                      | 0               | 0               | 0            | 0                                     | 0           | 0                        |             |
|               | Mining   |                      | 5,570           | 5,464           | 5,628        | 5,796                                 | 3,590       | 2,224                    |             |
|               | Irrigation   |                      | 30              | 14              | 0            | 0                                     | 0           | 0                        |             |
|               | Total Needs  |                      | 9,277           | 11,952          | 17,601       | 25,815                                | 30,804      | 37,575                   |             |
|               | Mun, Ind, S-E, & Min Needs   |                      | 9,247           | 11,938          | 17,601       | 25,815                                | 30,804      | 37,575                   |             |
|               | Irrigation Needs   |                      | 30              | 14              | . 0          | 0                                     | 0           | 0                        |             |
|               |  |                      |                 |                 |              |                                       |             |                          |             |
|               | agement Strategles (acft/yr)   | Candidate            |                 |                 |              |                                       | ·           |                          |             |
| ID#           | Description  | New Supply           | 2000*           | 2010            | 2020         | 2030                                  | 2040        | 2050                     | Notes       |
| L-10 (Mun.)   | Demand Reduction (Conservation)  |                      | 616             | 718             | 848          | 718                                   | 824         | 942                      | 1           |
| G-15C         | Canyon Reservoir - River Diversion   | 15,000               | 15,000          | 15,000          | 15,000       | 15,000                                | 15,000      | 15,000                   | 2           |
| SCTN-3c       | Simsboro Aquifer   | 55,000               |                 |                 | 3,500        | 12,000                                | 16,500      | 24,000                   | 3, 4        |
|               |  |                      |                 |                 |              |                                       |             |                          |             |
|               | Small Aquifer Recharge Dams  |                      |                 |                 |              | · · · · · · · · · · · · · · · · · · · |             |                          |             |
| L-10 (frr.)   | Demand Reduction (Conservation)  |                      |                 |                 |              |                                       |             |                          |             |
|               |  |                      |                 |                 |              |                                       |             |                          |             |
|               | Total New Supplies   |                      | 15,616          | 15,718          | 19,348       | 27,718                                | 32,324      | 39,942                   |             |
|               | Total Contain March County ID-Roll   |                      | 0.000           | 0.700           | 4 949        | 4.000                                 | 4 500       | 0.007                    |             |
|               | Total System Mgmt. Supply / Deficit  | <u></u>              | 6,339           | 3,766           | 1,747        | 1,903                                 | 1,520       | 2,367                    |             |
|               | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit  |                      | 6,369           | 3,780           | 1,747        | 1,903                                 | 1,520       | 2,367                    |             |
|               | Irrigation System Mgmt. Supply / Deficit   |                      | -30             | -14             | 0            | 0                                     | 0           | 0                        |             |
| Notes:        |  |                      |                 |                 |              | 1                                     |             | ,                        |             |
| *             | Candidate New Supplies shown for year 2000 are identified for  | or priority implemen | dation but will | I not be eveile | hla immedial | elv                                   | <del></del> | <del>. · · · · ·  </del> | <del></del> |
| 1             | Demand Reduction (Conservation) strategies assumed larget  |                      |                 |                 | ion minerial | 7-                                    |             | <del></del>              |             |
| 2             | Portion of Canyon firm yield (with amendment) diverted below   |                      | New Males Ger   | 1100.           | <del></del>  | <del></del>                           |             |                          |             |
| 3             | Candidate New Supply shared by Bexar, Hays, and Comal C  |                      | regional aggi   | fer levels to b | e quantified |                                       | <del></del> | <del></del>              |             |
| 4             | Early Implementation of facilities assumed in cost estimation  |                      |                 |                 |              | 1                                     |             |                          |             |
|               |  |                      |                 |                 |              |                                       |             |                          |             |

# Inter-Regional Cooperation Alternative Regional Water Plan Dimmit County



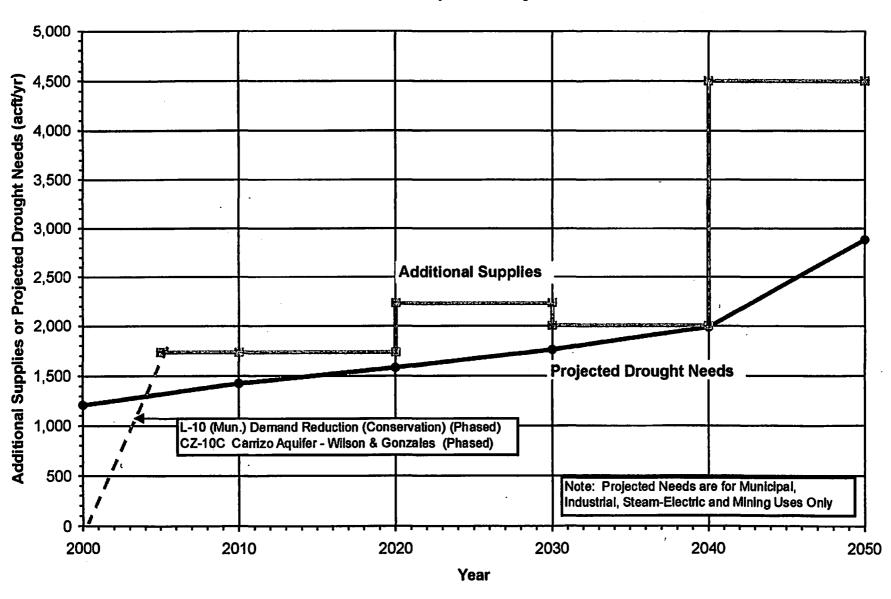
| South Cen   | tral Texas Region  |                       | 1               |                 |                   |        |         | County =    | = Dimmit      |
|-------------|--|-----------------------|-----------------|-----------------|-------------------|--------|---------|-------------|---------------|
|             |  | nd Water Man          | agement S       | trategies       |                   |        |         | User Grou   | ıp(s) ≃ all   |
| D11-1       | Value  |                       |                 |                 |                   |        |         |             |               |
| Projected v |  |                       |                 |                 |                   |        | 2045    |             |               |
|             |  |                       |                 |                 |                   |        |         | 2050        | Notes         |
|             |  |                       |                 | +               |                   |        |         | 1,959       |               |
|             |  |                       | Y               |                 |                   |        |         | 0           | ,             |
| <del></del> |  |                       |                 |                 |                   |        |         | 0           |               |
|             |  |                       |                 |                 |                   |        |         | 949         |               |
|             |  |                       | · ·             |                 |                   |        |         | 1,331       |               |
|             |  |                       |                 |                 |                   |        |         | 4,239       |               |
|             |  |                       |                 |                 |                   |        |         | 2,908       |               |
|             | Irrigation Needs   |                       | 0}              | 0               | 0                 | 2,133  | 1,737   | 1,331       |               |
| Water Mana  | agement Strategies (acft/yr)                                   | Candidate             |                 |                 |                   |        |         |             |               |
| ID#         |  | New Supply            | 2000*           | 2010            | 2020              | 2030   | 2040    | 2050        | Notes         |
| L-10 (Mun.) | Demand Reduction (Conservation)                                |                       | 131             | 144             | 156               | 104    | 118     | 133         |               |
| SCTN-2a     | Carrizo Aquifer - Local Supply                                 |                       | 500             | 1,000           | 1,000             | 2,500  | 3,000   | 3,500       | 2, 3          |
|             |  |                       |                 |                 |                   |        |         |             |               |
|             |  |                       |                 |                 |                   |        |         |             |               |
|             |  |                       |                 |                 |                   |        |         |             |               |
|             |  |                       |                 |                 |                   |        |         |             |               |
|             |  |                       |                 |                 |                   |        |         |             |               |
|             |  |                       |                 |                 |                   |        |         |             |               |
| SCTN-4      |  |                       |                 |                 |                   |        |         |             |               |
| SCTN-5      |  |                       |                 |                 |                   |        |         |             |               |
| SCTN-9      |  |                       |                 |                 |                   |        |         | <del></del> |               |
| . 40 (1)    |  |                       |                 |                 |                   |        |         |             | ; <del></del> |
| L-10 (lrr.) |  |                       |                 |                 | 4 4 7 4           | 2 22 4 |         |             |               |
|             | Total New Supplies   |                       | 631             | 1,144           | 1,156             | 2,604  | 3,118   | 3,633       |               |
|             | Total System Hamt System I Deficit                             |                       | 402             | 720             | 507               | 4 400  | 4 022   | -606        |               |
|             | Total System Mgmt. Supply / Delicit                            |                       |                 |                 |                   |        |         |             |               |
|             |  |                       | 493             | 739             | 507               | 635    | /14     | 725         |               |
|             |  |                       |                 |                 |                   |        | 4 = 50= |             | <del></del>   |
|             | irrigation System Mgmt. Supply / Deficit                       |                       | 0               | 0               |                   | -2,133 | -1,/3/  | -1,331      |               |
| Materi      |  |                       |                 |                 |                   |        | 1       | ·           |               |
| Notes:      | Condidate Name Constitute about for your 2000 and Identified A | las ariarits imata    | etetles but     | l net ha aveile | hla immadist      |        |         |             |               |
|             | u wholowe ivew supplies shown for year zoull are identified t  | or businty imbiewei   | ntadon, but Wil |                 | inia liuliuegigij | eiy.   |         |             |               |
| <u>-</u>    |  |                       | cted water de   | mande           |                   |        |         |             |               |
| 1           | Demand Reduction (Conservation) strategies assumed large       |                       | cted water de   | mands.          |                   |        |         |             |               |
| 1 2 3       | Demand Reduction (Conservation) strategies assumed large       | ly reflected in proje |                 |                 |                   |        | <u></u> |             |               |

# Inter-Regional Cooperation Alternative Regional Water Plan Frio County



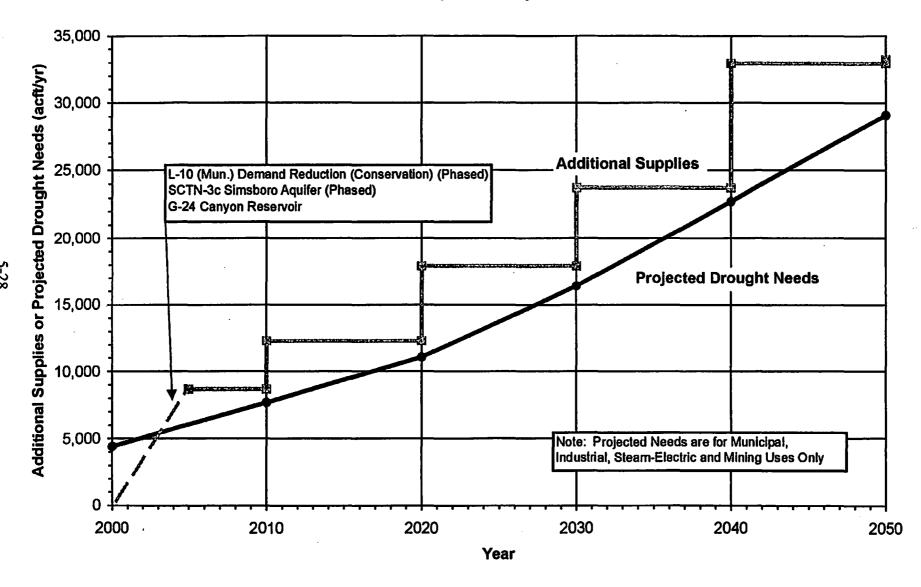
| South Cen<br>County Sun | itral Texas Region<br>nmary of Projected Water Needs (Shortages) and | d Water Manag         | gement Stra     | ategies             |               |               |             |          | nty = Frio<br>up(s) = all                        |
|-------------------------|--|-----------------------|-----------------|---------------------|---------------|---------------|-------------|----------|--|
|                         |  |                       |                 |                     |               |               |             |          |  |
| Projected V             | Vater Needs (acft/yr)  |                       | 1               | -                   |               |               |             |          |  |
|                         | User Group(s)  |                       | 2000            | 2010                | 2020          | 2030          | 2040        | 2050     | Notes  |
|                         | Municipal  |                       | ol              | 0                   | 0             | O             | Ö           | 0        |  |
|                         | Industrial   |                       | Ö               | Ō                   | Ō             | Ō             | 0           | O        |  |
|                         | Steam-Electric   |                       | 0               | 0                   | 0             | 0             | 0           | 0        |  |
|                         | Mining   |                       | 0               | . 0                 | 0             | 0             | 0           | 0        |  |
|                         | Irrigation   |                       | 71,128          | 67,646              | 64,365        | 76,505        | 73,519      | 70,662   |  |
|                         | Total Needs  |                       | 71,126          | 67,646              | 64,365        | 76,505        | 73,519      | 70,662   |  |
|                         | Mun, Ind, S-E, & Min Needs   |                       | o o             | 0                   | 0             | 0             | 0           | 0        |  |
|                         | Irrigation Needs   | ··· <del>····</del>   | 71,126          | 67,646              | 64,365        | 76,505        | 73,519      | 70,662   |  |
|                         | gation needs   |                       | ,.20            | 5.,546              | U-1,500       | ,             | . 4,510     | . 5,502  |  |
| Water Mana              | gement Strategies (acft/yr)  | Candidate             |                 |                     |               |               |             | -        |  |
| ID#                     | Description  | New Supply            | 2000            | 2010                | 2020          | 2030          | 2040        | 2050     | Notes  |
|                         |  | Maw Supply            |                 |                     |               |               |             |          |  |
| L-10 (Mun.)             | Demand Reduction (Conservation)                                      |                       | 184             | 195                 | 205           | 116           | 121         | 124      |  |
|                         | <del></del>  |                       | ├ <del>-</del>  |                     |               |               |             |          | <del>                                     </del> |
|                         |  |                       | <del> </del>    |                     |               |               |             |          |  |
|                         |  |                       | <del></del>     |                     | <del></del>   | · <del></del> |             |          |  |
| <del></del>             |  |                       | <del></del>     |                     | · <del></del> |               |             |          |  |
|                         | · · · · · · · · · · · · · · · · · · ·                                |                       | <u> </u>        |                     |               |               |             |          |  |
| <del></del>             |  | . <del></del>         | 1               |                     |               |               | <del></del> |          |  |
| SCTN-4                  | Brush Management   |                       |                 |                     |               |               |             |          | 2  |
| SCTN-5                  | Weather Modification   |                       | †——— <u></u> ;  |                     |               |               |             |          | 2  |
| SCTN-9                  | Rainwater Harvesting   |                       | [               |                     |               |               |             |          | 2  |
|                         | Small Aquifer Recharge Dams  |                       |                 |                     |               |               |             |          | 2  |
| L-10 (In.)              | Demand Reduction (Conservation)                                      |                       | 5,947           | 5,947               | 5,947         | 5,947         | 5,947       | 5,947    | 3  |
|                         | Total New Supplies   |                       | 6,131           | 6,142               | 6,152         | 6,083         | 6,068       | 6,071    |  |
|                         |  |                       |                 |                     |               |               |             |          |  |
|                         | Total System Mgmt. Supply / Deficit                                  |                       | -64,995         | -61,504             | -58,213       | -70,442       | -67,451     | -64,591  |  |
| <del></del>             | Mun, Ind, S-E, & Min System Mgmt. Supply /                           |                       | 184             | 195                 |               |               | 121         | 124      |  |
|                         | Deficit  |                       | '57             | 183                 | 203           |               |             | 127      |  |
|                         |  |                       | 66 470          | 64 600              | -58,418       | -70,558       | -87,572     | -64,715  |  |
|                         | Irrigation System Mgmt. Supply / Deficit                             |                       | -65,179         | -61,699             | -30,410       | -/ 0,535      | *01,372     | *04,7 15 |  |
| Natar                   |  |                       |                 |                     |               |               |             |          |  |
| Notes:                  | Demand Reduction (Conservation) strategies assumed largely           | reflected to period   | lod water dom   | node -              |               |               |             |          |  |
| 2                       | Option expected to provide additional water supply in many ye        | iningcian in biolec   | e encola divica | devicht is se       | oconthy unove | ntified       |             |          | i  |
| 3                       | Estimates based upon use of LEPA systems on 50 percent of            | accesses injusted     | n 1997 with ~   | neemaline el        | 20 nercent of | irination     | <del></del> |          |  |
| J                       | application rate.  | ari sollas iiriliaiga | 1997, WALL C    | NI IOUIAGIAGIOII BI | zo percent u  | milianon .    |             |          |  |
|                         | Jappineauon rate.  |                       |                 | i                   |               | L             |             |          |  |

## Inter-Regional Cooperation Alternative Regional Water Plan Guadalupe County



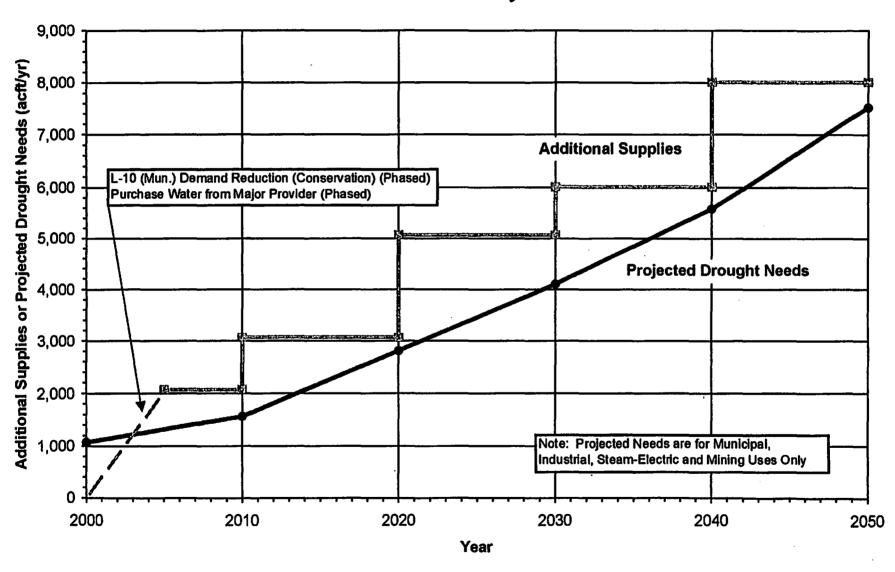
| South Cen   | tral Texas Region  |                      |                  |                 |                |            | Co    | unty = Gu | adalupe   |
|-------------|--|----------------------|------------------|-----------------|----------------|------------|-------|-----------|-----------|
|             | nmary of Projected Water Needs (Shortages) a   | nd Water Mana        | gement S         | trategies       |                |            |       | User Grou |           |
| Prolected V | Vater Needs (acft/yr)  |                      |                  |                 |                |            | ·     |           |           |
|             | User Group(s)  | <del></del>          | 2000             | 2010            | 2020           | 2030       | 2040  | 2050      | Notes     |
|             | Municipal  | ·                    | 29               | 23              | 30             | 71         | 87    | 773       | - 010.000 |
|             | Industrial   |                      | 985              | 1,204           | 1,350          | 1,487      | 1,692 | 1,899     |           |
|             | Steam-Electric   |                      | 0                | .0              | 0              | 0          | Ö     | Ō         |           |
|             | Mining   |                      | 198              | 198             | 200            | 202        | 207   | 213       |           |
|             | Irrigation   |                      | 985              | 879             | 779            | 684        | 594   | 508       |           |
|             | Total Needs  |                      | 2,195            | 2,304           | 2,359          | 2,444      | 2,580 | 3,393     |           |
|             | Mun, Ind, S-E, & Min Needs   |                      | 1,210            | 1,425           | 1,580          | 1,760      | 1,986 | 2,885     |           |
|             | Irrigation Needs   |                      | 985              | 879             | 779            | 684        | 594   | 508       |           |
|             |  |                      |                  |                 |                |            |       |           |           |
| Water Mana  | agement Strategies (acft/yr)   | Candidate            |                  |                 |                |            |       |           |           |
| ID#         | Description  | New Supply           | 2000*            | 2010            | 2020           | 2030       | 2040  | 2050      | Notes     |
| L-10 (Mun.) | Damand Reduction (Conservation)  |                      | 235              | 236             | 236            | 5          | 5     | 6         |           |
| CZ-10C      | Carrizo Aquifer - Wilson & Gonzales  | 40,000               | 1,500            | 1,500           | 2,000          | 2,000      | 2,500 | 4.500     | 2,        |
| <u> </u>    | Odniza / Maria / Village   Village |                      |                  |                 |                |            |       |           |           |
|             |  |                      |                  |                 |                |            |       |           |           |
|             |  |                      |                  |                 |                |            |       |           |           |
|             |  |                      |                  |                 |                |            |       |           |           |
|             |  |                      |                  |                 |                |            |       |           |           |
|             |  |                      |                  |                 |                |            |       |           |           |
|             | Small Aquifer Recharge Dams  |                      |                  |                 |                |            |       |           |           |
| L-10 (irr.) | Demand Reduction (Conservation)  |                      |                  |                 |                |            |       |           |           |
|             |  |                      |                  |                 |                |            |       |           |           |
|             |  |                      |                  |                 |                |            |       |           |           |
|             | Total New Supplies   |                      | 1,735            | 1,736           | 2,236          | 2,005      | 2,505 | 4,506     |           |
|             |  |                      |                  |                 |                |            |       |           |           |
|             | Total System Mgmt. Supply / Deficit  |                      | -460             | <b>-568</b>     | -123           | -439       | -75   | 1,113     |           |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /   |                      | 525              | 311             | 656            | 245        | 519   | 1,621     |           |
|             | Deficit  |                      |                  |                 | į              |            | - 1   |           |           |
|             | Irrigation System Mgmt. Supply / Deficit   |                      | -985             | -879            | -779           | -684       | -594  | -508      |           |
|             |  |                      |                  |                 |                |            |       |           |           |
| Notes:      |  |                      |                  |                 | 1              |            |       |           |           |
| •           | Candidate New Supplies shown for year 2000 are identified  | or priority impleme  | ntation, but wil | l not be avails | able immediate | elv.       |       |           |           |
| 1           | Demand Reduction (Conservation) strategies assumed large   |                      |                  |                 |                |            |       |           |           |
| 2           | Candidate New Supply shared by Bexar and Guadalupa Cou   |                      |                  |                 | quantified.    |            |       |           |           |
| 3           | Early Implementation of facilities assumed in cost estimation  | to ensure sufficient | supply during    | drought.        |                |            |       |           |           |
| 4           | Option expected to provide additional water supply in many y   | ears, but dependal   | ole supply dur   | ing drought is  | presently unq  | uantified. |       |           |           |

### Inter-Regional Cooperation Alternative Regional Water Plan Hays County



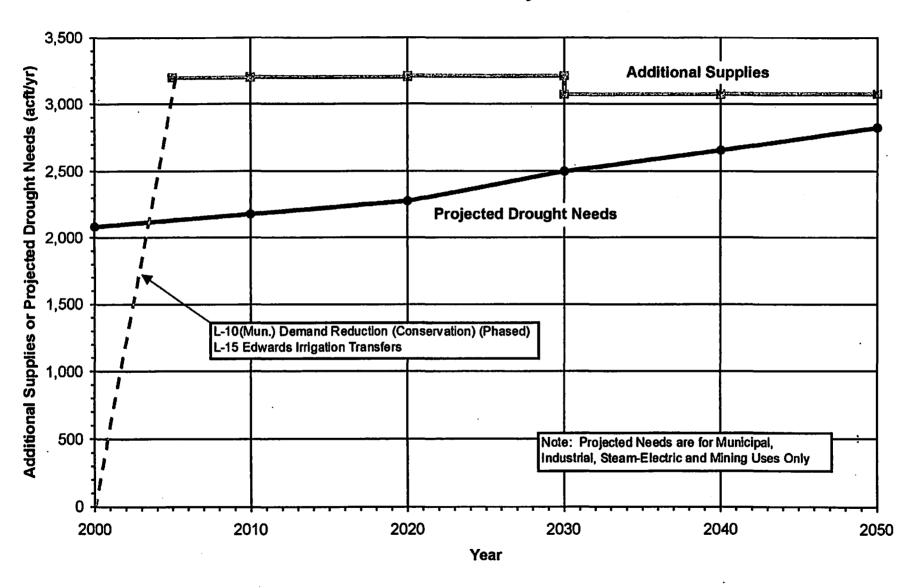
| South Cen     | tral Texas Region  |                       |                  |                 |                 |              |          | Count   | y = Hays    |
|---------------|--|-----------------------|------------------|-----------------|-----------------|--------------|----------|---------|-------------|
|               | nmary of Projected Water Needs (Shortages) and                   | Water Manag           | ement Str        | ategies         |                 |              |          |         | up(s) = all |
|               |  |                       |                  |                 |                 |              |          |         |             |
| Projected v   | /ater Needs (acft/yr)  |                       |                  |                 |                 |              |          |         |             |
|               | User Group(s)  |                       | 2000             | 2010            | 2020            | 2030         | 2040     | 2050    | Notes       |
|               | Municipal  |                       | 4,325            | 7,609           | 10,980          | 16,349       | 22,698   | 29,059  |             |
|               | Industrial   |                       | 0                | 0               | 0               | 0            | 0        | 0       |             |
|               | Steam-Electric   |                       | 0                | 0               | 0               | 0            | 0        | 0       |             |
|               | Mining   |                       | 84               | 82              | 68<br>0         | 55           | 37       | 28<br>0 |             |
|               | Irrigation   |                       | 0                | 0               |                 |              | 0        |         |             |
|               | Total Needs  |                       | 4,409            | 7,691           | 11,048          | 16,404       | 22,733   | 29,087  |             |
|               | Mun, Ind, S-E, & Min Needs                                       |                       | 4,409            | 7,691           | 11,048          | 16,404       | 22,733   | 29,087  |             |
|               | Irrigation Needs   |                       | 0                | 0               | 0               | 0            | 0        | 0       |             |
| Mater Mana    | gement Strategies (acft/yr)                                      | Candidate             |                  |                 |                 |              |          |         |             |
| ID#           | Description  | New Supply            | 2000*            | 2010            | 2020            | 2030         | 2040     | 2050    | Notes       |
| L-10 (Mun.)   | Demand Reduction (Conservation)                                  | ttott Gupping         | 647              | 747             | 873             | 699          | 906      | 1,174   | 1           |
| SCTN-3c       | Simsboro Aquifer   | 55,000                | 4,000            | 7,000           | 10,500          | 16,000       | 22,000   | 31,000  | 2. 3        |
| G-24          | Canyon Reservoir   | 1,048                 | 1,048            | 1,048           | 1,048           | 1,048        | 1.048    | 1,048   | <u></u> 4   |
| l <del></del> | Outifor Hood von   | 1,9.19                |                  | 1,0.10          | .,,,,,,,        | .,,,,,,,     | .,,,,,,, | .,,,,,, |             |
|               |  |                       |                  |                 |                 |              |          |         |             |
|               |  |                       |                  |                 |                 |              |          |         |             |
|               |  |                       |                  |                 |                 |              |          |         |             |
|               |  |                       |                  |                 |                 |              |          |         |             |
|               | Small Aquifer Recharge Dams                                      |                       |                  |                 |                 |              |          |         | 5           |
| L-10 (lrr.)   | Demand Reduction (Conservation)                                  |                       |                  |                 |                 |              |          |         |             |
|               |  |                       |                  |                 |                 |              | •        |         |             |
|               |  |                       |                  |                 |                 |              |          |         |             |
|               | Total New Supplies   |                       | 5,695            | 8,795           | 12,421          | 17,747       | 23,954   | 33,222  |             |
|               |  |                       |                  |                 |                 |              |          |         |             |
|               | Total System Mgmt, Supply / Deficit                              |                       | 1,286            | 1,104           | 1,373           | 1,343        | 1,221    | 4,135   |             |
| ,             | Mun, Ind, S-E, & Min System Mgmt. Supply /                       |                       | 1,286            | 1,104           | 1,373           | 1,343        | 1,221    | 4,135   |             |
|               | Deficit  |                       |                  |                 |                 |              |          |         |             |
|               | Irrigation System Mgmt. Supply / Deficit                         |                       | 0                | 0               | 0               | 0            | Ō        | 0       |             |
| Notes:        |  |                       |                  |                 |                 |              |          |         |             |
| *             | Candidate New Supplies shown for year 2000 are identified for    | ntiority implements   | ation but will r | not he availabl | e immediately   | <del></del>  |          |         |             |
| 1             | Demand Reduction (Conservation) strategies assumed largely       |                       |                  |                 | o miniculately. | <del>'</del> |          |         |             |
| <del> </del>  | Candidate New Supply shared by Bexar, Hays, and Comal Co         | unlies. Effects on re | egional aquife   | r levels to be  | quantified.     |              |          |         |             |
| 3             | Early implementation of facilities assumed in cost estimation to | ensure sufficient s   | upply during d   | rought.         | 1               |              |          |         |             |
| 4             | Candidate New Supply for Wimberley and Woodcreek.                |                       | •                |                 |                 |              |          |         |             |
| 5             | Option expected to provide additional water supply in many ye    | ars, but dependable   | supply during    | drought is pr   | esently unqua   | ntified.     |          |         |             |

# Inter-Regional Cooperation Alternative Regional Water Plan Kendall County



| South Cen        | tral Texas Region  |                                       |                  |                | -              |          |                                       | County =     | Kendall      |
|------------------|--|---------------------------------------|------------------|----------------|----------------|----------|---------------------------------------|--------------|--------------|
|                  | nmary of Projected Water Needs (Shortages) and                   | l Water Manag                         | ement Stra       | ategles        |                |          |                                       | User Grou    |              |
| D l 4 1 14       |  |                                       |                  |                |                |          |                                       | . (          |              |
| Projected v      | Vater Needs (acft/yr)  |                                       |                  |                |                |          |                                       |              |              |
|                  | User Group(s)  |                                       | 2000             | 2010           | 2020           | 2030     | 2040                                  | 2050         | Notes        |
|                  | Municipal  |                                       | 1,070            | 1,560          | 2,808          | 4,099    | 5,578                                 | 7,518        |              |
|                  | Industrial   |                                       | 2                | . 3            | 4              | 4        | 5                                     | 6            |              |
|                  | Steam-Electric   |                                       | 0                | 0              | 0              |          | 0                                     | 0            |              |
| <del></del>      | Mining   |                                       | 0                |                | 0              | 0        | 0                                     | 0            |              |
|                  | Imgation   |                                       | 0                | 0              | 0              | 0        | 0                                     | 0            |              |
|                  | Total Needs  |                                       | 1,072            | 1,563          | 2,812          | 4,103    | 5,583                                 | 7,524        |              |
|                  | Mun, Ind, S-E, & Min Needs                                       |                                       | 1,072            | 1,563          | 2,812          | 4,103    | 5,583                                 | 7,524        |              |
|                  | Irrigation Needs   |                                       | 0                | 0              | 0              | 0        | 0                                     | 0            |              |
| Water Mans       | agement Strategies (acft/yr)                                     | Candidate                             |                  |                |                | -        |                                       |              |              |
| ID#              | Description  | New Supply                            | 2000*            | 2010           | 2020           | 2030     | 2040                                  | 2050         | Notes        |
| L-10 (Mun.)      | Demand Reduction (Conservation)                                  |                                       | 67               | 71             | 71             | 11       | 11                                    | 11           | 1            |
| L-10 (mon.)      | Purchase Water from Major Provider                               |                                       | 2,000            | 2,000          | 3,000          | 5,000    | 6,000                                 | 8,000        | 2, 3         |
|                  |  |                                       |                  |                |                |          |                                       |              |              |
|                  |  |                                       |                  |                |                |          |                                       |              |              |
| <del> </del>     |  |                                       |                  | <del></del>    | ··             |          |                                       | <del></del>  |              |
|                  |  |                                       |                  |                |                |          |                                       |              |              |
| 00714            | Brush Management   | · · · · · · · · · · · · · · · · · · · |                  |                |                |          |                                       |              |              |
| SCTN-4<br>SCTN-5 | Weather Modification   |                                       |                  |                |                |          |                                       |              |              |
| SCTN-9           | Rainwater Harvesting   |                                       |                  |                |                |          |                                       | <del>}</del> |              |
| 20114-9          | Small Aquifer Recharge Dams                                      |                                       |                  |                |                |          |                                       |              |              |
| L-10 (lm.)       | Demand Reduction (Conservation)                                  |                                       |                  |                |                |          | · · · · · · · · · · · · · · · · · · · |              |              |
| L-10 (III.)      | Total New Supplies   |                                       | 2,067            | 2,071          | 3,071          | 5,011    | 6,011                                 | 8,011        |              |
|                  |  |                                       |                  |                |                |          |                                       |              |              |
|                  | Total System Mgmt. Supply / Deficit                              |                                       | 995              | 508            | 259            | 908      | 428                                   | 487          |              |
|                  | Mun, Ind, S-E, & Min System Mgmt. Supply /                       |                                       | 995              | 508            | 259            | 908      | , 428                                 | 487          |              |
|                  | Deficit  |                                       |                  |                |                |          |                                       |              | <del> </del> |
|                  | Irrigation System Mgmt. Supply / Deficit                         | <u> </u>                              | Ò                | 0              | 0              | 0        | 0                                     | 0            |              |
| Notes:           |  |                                       |                  |                |                |          |                                       |              |              |
| •                | Candidate New Supplies shown for year 2000 are identified for    |                                       |                  |                | e immediately. |          |                                       |              |              |
| 1                | Demand Reduction (Conservation) strategies assumed largely       |                                       |                  |                | 1              |          |                                       |              |              |
| 2                | Assumed purchase from Bexar County major provider. Kenda         | Il County water nee                   | ds are not refle | ected in Bexar | County table.  |          |                                       |              |              |
| 3                | Early implementation of facilities assumed in cost estimation to |                                       |                  |                |                |          |                                       |              |              |
| 4                | Option expected to provide additional water supply in many ye    | ars, but dependable                   | e supply during  | drought is pre | esently unqua  | ntified. |                                       |              |              |

# Inter-Regional Cooperation Alternative Regional Water Plan Medina County



County Summary of Projected Water Needs (Shortages) and Water Management Strategies

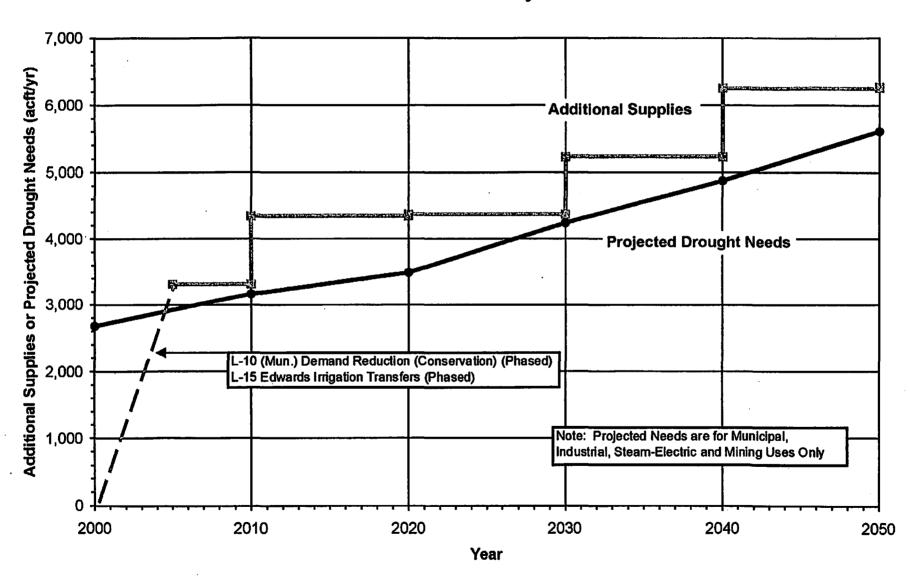
County = Medina User Group(s) = all

| riojectea t      | Water Needs (activyr)  |                      | 2000            | 2010            | 2020          | 2030         | 2040       | 2050       | Notes        |
|------------------|--|----------------------|-----------------|-----------------|---------------|--------------|------------|------------|--------------|
|                  | Municipal  |                      |                 |                 |               |              |            |            | HOTES        |
|                  | Industrial   |                      | 2,015           | 2,110           | 2,206<br>0    | 2,427        | 2,582<br>0 | 2,750<br>0 |              |
|                  | Steam-Electric   |                      | <u>ŏ</u>        | <u>_</u>        | - 0           | - 0          |            |            |              |
|                  | Mining   |                      | 68              | 68              |               | 72           | 74         | 76         |              |
|                  | Irrigation   |                      | 89,757          | 87,941          |               | 80,963       | 75,663     | 70.587     |              |
|                  | Total Needs  |                      | 91,840          | 90,119          |               | 83,462       | 78.319     | 73,413     |              |
|                  | Mun, Ind, S-E, & Min Needs                                     |                      | 2,083           | 2,178           |               | 2,499        | 2,656      | 2,826      |              |
| <del></del>      | Irrigation Needs   |                      | 89,757          | 87,941          |               | 80,963       |            |            |              |
|                  | irrigation needs   |                      | 08,737          | 01,841          | 02,101        | 60,803       | 75,663     | 70,587     |              |
| Water Man        | agement Strategies (acft/yr)                                   | Candidate            |                 |                 |               |              |            |            |              |
| ID#              | Description  | New Supply           | 2000*           | 2010            | 2020          | 2030         | 2040       | 2050       | Notes        |
| L-10 (Mun.)      | Demand Reduction (Conservation)                                |                      | 200             | 205             | 211           | 73           | 76         | 78         | 1            |
| L-15             | Edwards Irrigation Transfers                                   | 42,500               | 3,000           | 3,000           |               | 3,000        | 3,000      | 3,000      | 2. 3         |
|                  |  |                      |                 |                 |               |              |            |            |              |
|                  |  |                      |                 |                 |               |              |            |            |              |
|                  |  |                      |                 |                 |               |              |            |            |              |
|                  |  |                      |                 |                 |               |              |            |            |              |
|                  |  |                      |                 |                 |               |              |            |            | <del></del>  |
| 00731.4          | 0 1 1  |                      |                 |                 |               |              |            |            |              |
| SCTN-4<br>SCTN-5 | Brush Management Weather Modification                          |                      |                 |                 |               |              |            |            | <del></del>  |
| SCTN-9           | Rainwater Harvestino   |                      |                 |                 |               |              |            |            |              |
| 30114-8          | Small Aquifer Recharge Dams                                    |                      |                 |                 |               |              | -          |            | <del>7</del> |
| L-10 (lm.)       | Demand Reduction (Conservation)                                |                      | 11,867          | 11,867          | 11,867        | 11,867       | 11,867     | 11,867     |              |
|                  | Total New Supplies   |                      | 15,067          | 15,072          |               |              |            | 14,945     |              |
|                  |  |                      |                 | ,               |               | 1 1,0 10     | 1 1,0 10   | 1 1,0 10   |              |
|                  | Total System Mgmt. Supply / Deficit                            |                      | -76,773         | -75,047         | -69,359       | -68,522      | -63,376    | -58,468    |              |
| ·                | Mun, Ind, S-E, & Min System Mgmt. Supply /                     |                      | 1,117           | 1,027           | 935           | 574          | 420        | 252        |              |
|                  | Deficit  | İ                    | .,              |                 |               | 1            |            |            |              |
|                  | Irrigation System Mgmt. Supply / Deficit                       |                      | -77,890         | -76,074         | -70,294       | -69,096      | -63,796    | -58,720    |              |
|                  |  |                      | ,               |                 |               |              |            | 22,        |              |
| Notes:           |  |                      |                 |                 |               |              |            |            | •            |
| •                | Candidate New Supplies shown for year 2000 are Identified f    | or priority implemen | ntation, but wi | I not be availa | able immediat | ely.         | <u>;</u>   |            |              |
| 1                | Demand Reduction (Conservation) strategies assumed large       |                      |                 |                 |               |              |            |            |              |
| 2                | Candidate New Supply to be shared among Uvalde, Medina,        |                      |                 |                 |               | in drought.  |            |            |              |
| 3                | Pursuant to draft EAA Critical Period Management rules, Car    |                      |                 |                 |               |              |            |            |              |
|                  | an estimated potential annual transfer of 50,000 acft based of |                      |                 |                 |               |              |            |            |              |
| 4                | Option expected to provide additional water supply in many y   |                      |                 |                 |               |              |            |            |              |
| 5                | Estimates based upon use of LEPA systems on 80 percent o       |                      |                 |                 | at 40 percent | of imigation |            |            |              |
|                  | application rate, but applicable to only 50 percent of Edwards | Aquiter Imigation p  | ermitted guar   | tities.         |               |              |            |            |              |

South Central Texas Region

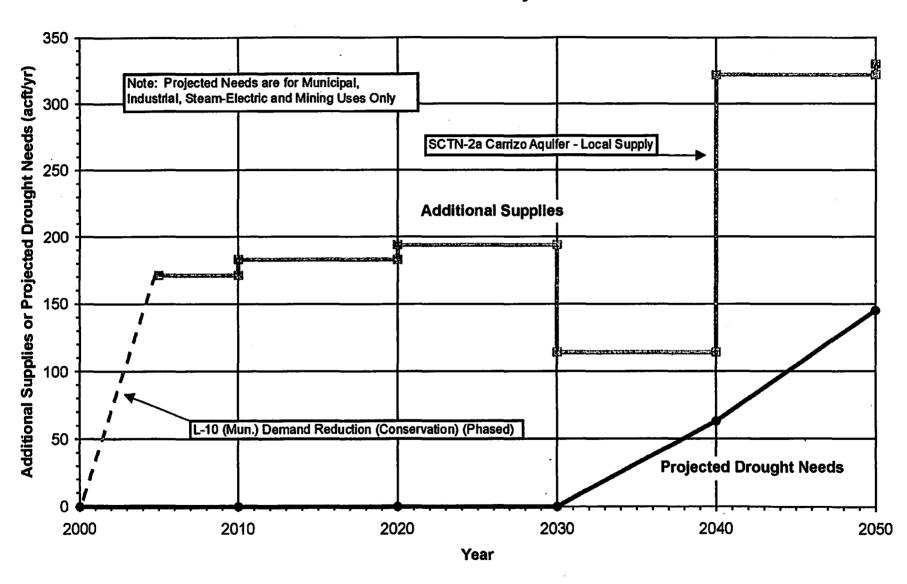
Projected Water Needs (acft/yr)

# Inter-Regional Cooperation Alternative Regional Water Plan Uvalde County



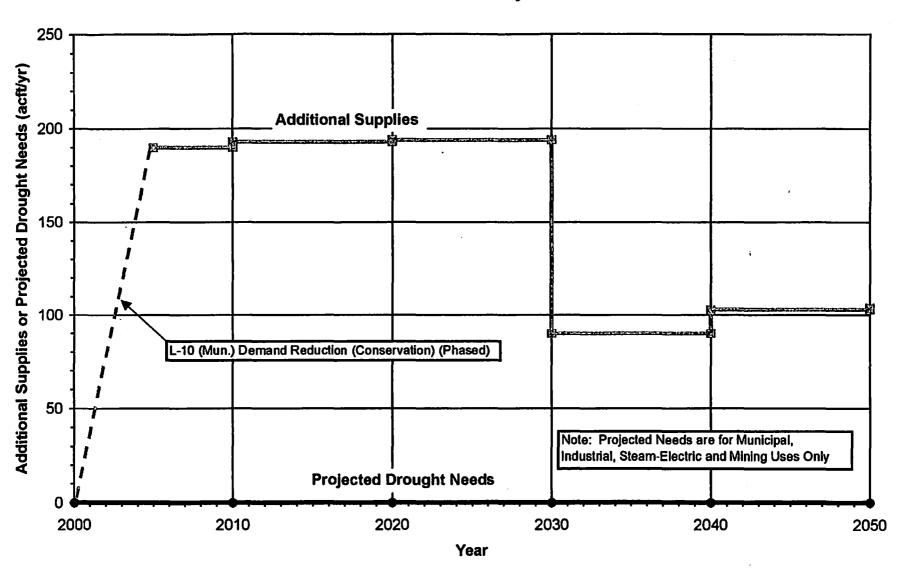
| South Cen    | tral Texas Region  |                       |                   |                 |                  |            |            | County          |            |
|--------------|--|-----------------------|-------------------|-----------------|------------------|------------|------------|-----------------|------------|
| County Sun   | nmary of Projected Water Needs (Shortages) and                   | Water Manag           | ement Str         | ategies         |                  |            |            | <b>User Gro</b> | up(s) = al |
| Projected W  | Vater Needs (acft/yr)  |                       | ı                 |                 |                  |            |            |                 |            |
| i iojecteu v | User Group(s)  |                       | 2000              | 2010            | 2020             | 2030       | 2040       | 2050            | Notes      |
|              | Municipal Municipal  |                       | 2,682             | 3,166           | 3,493            | 4,241      |            |                 | 110168     |
|              | Industrial   |                       | 2,002             | 3,100           | 3,493            | 4,241      | 4,880<br>0 | 5,609<br>0      |            |
|              | Steam-Electric   |                       | <del></del>       | 0               |                  |            | 0          | <u>0</u>        |            |
|              | Mining   | <del></del> -         |                   | 0               |                  |            |            | 0               |            |
|              | Irrigation   |                       | 63,443            | 63,343          | 58,335           | 56,366     | 51,766     | 47,475          |            |
|              |  |                       |                   |                 |                  |            |            |                 |            |
|              | Total Needs  |                       | 66,125            | 66,509          | 61,828           | 60,607     | 56,646     | 53,084          |            |
|              | Mun, Ind, S-E, & Min Needs                                       |                       | 2,682             | 3,166           | 3,493            | 4,241      | 4,880      | 5,609           |            |
|              | Irrigation Needs   |                       | 63,443            | 63,343          | 58,335           | 56,366     | 51,766     | 47,475          |            |
| Nater Mans   | gement Strategies (acft/yr)                                      | Candidate             |                   |                 |                  |            |            |                 |            |
| D#           | Description  | New Supply            | 2000*             | 2010            | 2020             | 2030       | 2040       | 2050            | Notes      |
| -10 (Mun.)   | Demand Reduction (Conservation)                                  |                       | 318               | 346             | 371              | 235        | 258        | 283             |            |
| -15 (W.GH.)  | Edwards Irrigation Transfers                                     | 42,500                | 3,000             | 4,000           | 4,000            | 5,000      | 5,000      | 6,000           | 2, 3,      |
|              |  |                       |                   |                 |                  |            |            |                 |            |
|              |  |                       |                   |                 |                  |            |            |                 |            |
| ·            |  |                       |                   |                 |                  |            |            |                 |            |
|              |  |                       |                   |                 |                  |            |            |                 |            |
|              |  |                       |                   |                 |                  |            |            |                 |            |
| SCTN-4       | Brush Management   |                       |                   |                 |                  |            |            |                 | ·          |
| SCTN-5       | Weather Modification   |                       |                   |                 |                  |            |            |                 |            |
| SCTN-9       | Rainwater Harvesting   |                       |                   |                 |                  |            |            |                 |            |
| 40.0         | Small Aquifer Recharge Dams                                      |                       |                   | 4444            |                  |            |            |                 |            |
| L-10 (lrr.)  | Demand Reduction (Conservation)                                  |                       | 14,143            | 14,143          | 14,143           | 14,143     | 14,143     | 14,143          |            |
|              | Total New Supplies   |                       | 17,461            | 18,489          | 18,514           | 19,378     | 19,401     | 20,426          |            |
|              | Total System Mgmt. Supply / Deficit                              |                       | -48,664           | -48,020         | -43,314          | -41,229    | -37,245    | -32,658         | L          |
|              | Mun, Ind, S-E, & Min System Mgmt. Supply /                       |                       | 636               | 1,180           | 878              | 994        | 378        | 674             |            |
|              | Deficit  | i                     | 955               | 1,100           | 5,0              | 334        | 3,9        | 0/-             |            |
|              | Irrigation System Mgmt. Supply / Deficit                         |                       | -49,300           | -49,200         | -44,192          | -42,223    | 27 622     | 22 222          |            |
|              | irrigation System Mgmt. Supply / Dencit                          |                       | -48,300           | -48,200         | -44, 192         | -42,223    | -37,623    | -33,332         |            |
| lotes:       | ·  |                       |                   |                 |                  |            |            |                 | <b>——</b>  |
|              | Candidate New Supplies shown for year 2000 are identified for    | priority implements   | ation, but will n | not be availabl | e immediately.   |            |            |                 |            |
| 1            | Demand Reduction (Conservation) strategies assumed largely       | reflected in projecte | ed water dema     | ands.           |                  |            |            |                 |            |
|              | Candidate New Supply to be shared among Uvalde, Medina, A        | tascosa, and Bexar    | Counties. Su      | upply may not   | be reliable in o | drought.   |            |                 |            |
| 3            | Pursuant to draft EAA Critical Period Management rules, Cand     | idate New Supply re   | epresents app     | roximately 85   | percent of       |            |            |                 |            |
|              | an estimated potential annual transfer of 50,000 acft based on   | Proposed Permits      | prorated to 400   | 0,000 acft/yr.  |                  |            |            |                 |            |
|              | Early implementation of facilities assumed in cost estimation to |                       |                   |                 |                  |            |            |                 |            |
|              | Option expected to provide additional water supply in many ye    | ars, bul dependable   | supply during     | drought is pr   |                  |            |            |                 |            |
| 3            | Estimates based upon use of LEPA systems on 80 percent of        | acreages irrigated in | n 1997, wilh co   | onservation at  | 40 percent of    | irrigation |            |                 |            |
|              | application rate, but applicable to only 50 percent of Edwards / |                       |                   |                 |                  |            | _          |                 |            |

## Inter-Regional Cooperation Alternative Regional Water Plan Wilson County



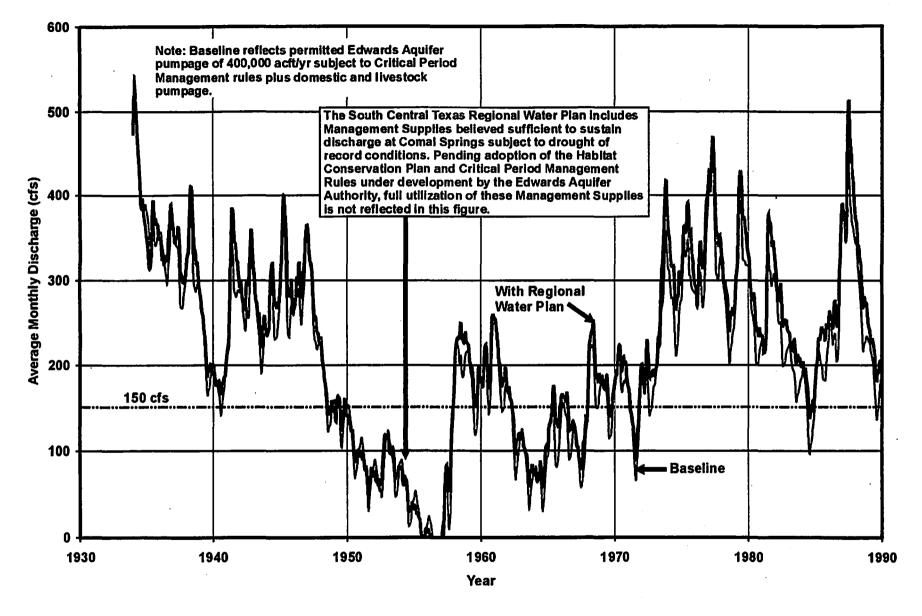
| South Cen         | tral Texas Region   |                      |                 |               |               |                                      |              | County         | = Wilson    |
|-------------------|---|----------------------|-----------------|---------------|---------------|--------------------------------------|--------------|----------------|-------------|
|                   | nmary of Projected Water Needs (Shortages) and                | Water Manag          | ement Stra      | tegles        |               |                                      |              | User Grou      |             |
| Projected V       | Vater Needs (acft/yr)   | -                    |                 |               |               |                                      |              |                |             |
| r rojectou v      | User Group(s)   |                      | 2000            | 2010          | 2020          | 2030                                 | 2040         | 2050           | Notes       |
|                   | Municipal Municipal   |                      | . 0             | 0             | ol            | 0                                    | 63           | 145            | 110100      |
|                   | Industrial  |                      | <del></del>     | ŏ             | - ŏ           | - 6                                  | 0            | 0              | · · · · · · |
|                   | Steam-Electric  |                      | 0               | <del></del>   | ől            | <del>o</del> l                       | ŏ            | <del>o</del> l |             |
|                   | Mining  |                      | ŏ               | Ö             | Ŏ             | Ŏ                                    | 0            | ol ol          |             |
|                   | Irrigation  |                      | o               | 0             | Ŏ             | Ö                                    | Ö            | ol ol          |             |
|                   | Total Needs   |                      | 0               | 0             | 0             | 0                                    | 63           | 145            |             |
|                   | Mun, Ind, S-E, & Min Needs                                    |                      | 0               | 0             | <del>-</del>  | ō                                    | 63           | 145            |             |
|                   | Irrigation Needs  |                      | Ö               | <u>_</u>      |               | <u>o</u>                             | 0            | 0              |             |
|                   |   |                      |                 |               |               |                                      |              |                |             |
| <b>Water Mana</b> | agement Strategies (acft/yr)                                  | Candidate            |                 |               |               |                                      |              |                |             |
| ID#               | Description   | New Supply           | 2000            | 2010          | 2020          | 2030                                 | 2040         | 2050           | Notes       |
| -10 (Mun.)        | Demand Reduction (Conservation)                               |                      | 171             | 183           | 194           | 114                                  | 122          | 130            |             |
| SCTN-2a           | Carrizo Aquifer - Local Supply                                |                      |                 |               |               |                                      | 200          | 200            |             |
|                   |   |                      |                 |               |               |                                      |              |                |             |
|                   |   |                      |                 |               |               |                                      |              |                |             |
|                   |   |                      |                 |               |               |                                      |              |                |             |
|                   |   |                      |                 |               |               |                                      |              |                |             |
| SCTN-4            | Brush Management Weather Modification                         |                      |                 |               |               | ···································· | <del> </del> |                | ·           |
| SCTN-5<br>SCTN-9  |   |                      |                 |               |               |                                      |              |                |             |
| 2C114-à           | Rainwater Harvesting Small Aquiler Recharge Dams              | ··········           |                 |               |               |                                      |              |                |             |
| L-10 (lm.)        | Demand Reduction (Conservation)                               |                      |                 |               |               | <del></del>                          |              |                |             |
| L-10 (III.)       | Total New Supplies  |                      | 171             | 183           | 194           | 114                                  | 322          | 330            | ·           |
|                   | total New Supplies  |                      | 171             | 103           | 184           | 1 14                                 | 322          | _330           |             |
|                   | Total System Mgmt. Supply / Deficit                           |                      | 171             | 183           | 194           | 114                                  | 259          | 185            |             |
|                   | Mun, Ind, S-E, & Min System Mgmt. Supply /                    |                      | 171             | 183           | 194           | 114                                  | 259          | 185            |             |
|                   | Deficit   |                      |                 |               |               |                                      |              |                |             |
|                   | Irrigation System Mgmt. Supply / Deficit                      |                      | 0               | 0             | 0             | 0                                    | 0            | C              |             |
| lotes:            |   |                      |                 |               |               | i                                    | •            |                |             |
|                   | Demand Reduction (Conservation) strategies assumed largely    | reflected in project | ed water dema   | inds.         |               | I                                    |              |                |             |
| ?                 | Additional well(s) for Floresville.                           |                      |                 |               |               |                                      |              |                |             |
| 3                 | Option expected to provide additional water supply in many ye | ars, but dependable  | e supply during | drought is pr | esently unqua | ntified.                             |              |                |             |

# Inter-Regional Cooperation Alternative Regional Water Plan Zavala County

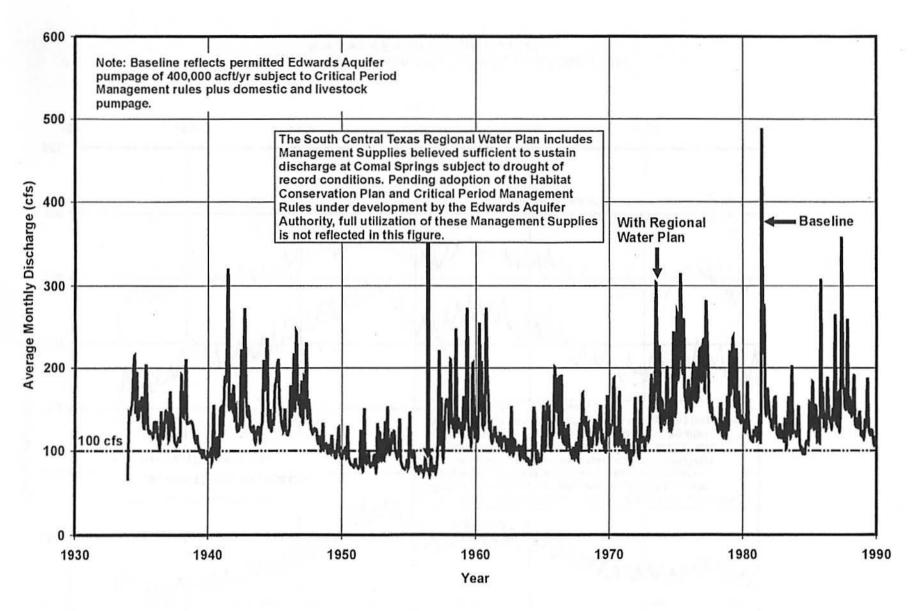


5-38

| Projected Water Needs (acft/yr)         2000         2010         2020         2030         2040         2050         No           Municipal         0   |   | tral Texas Region   |                   |              |            |         |  |                     |         | = Zavala    |
|--|---|---|-------------------|--------------|------------|---------|--|---------------------|---------|-------------|
| User Group(s)  | County Summary of Projected Water Needs (Shortages) and Water Management Strategies |   |                   |              |            |         |  | User Group(s) = all |         |             |
| User Group(s)  | Projected M   | ator Noode (acfflur)  |                   |              |            |         |  |                     |         |             |
| Municipal   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  | FIOJECIEU V   |   |                   | 2000         | 2010       | 2020    | 2030   | 2040                | 2050    | Notes       |
| Industrial   |   |   |                   |              |            |         |  |                     |         | 110105      |
| Steam-Electric   |   |   |                   | I            |            |         |  |                     |         |             |
| Mining   | <del></del>   |   |                   | 1            |            |         |  |                     |         |             |
| Irrigation   |   |   |                   |              |            |         |  |                     |         |             |
| Total Needs   80,722   76,589   72,655   88,293   84,673   81,200  |   |   |                   | 80.722       | 76.589     | 72.655  | 88,293   | 84.673              | 81,200  |             |
| Mun, Ind, S-E, & Min Needs   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0   |   |   |                   |              |            |         |  |                     |         | -           |
| Irrigation Needs   80,722   76,589   72,655   88,293   84,673   81,200   |   |   |                   |              | 70,555     |         | 00,250   |                     | 01,200  |             |
| Water Management Strategies (acft/yr)   Candidate   ID#   Description   New Supply   2000   2010   2020   2030   2040   2050   Not   |   |   |                   | 80,722       | 76,589     |         | 88,293   | 84,673              | 81,200  |             |
| ID#   Description   New Supply   2000   2010   2020   2030   2040   2050   Notes:  |   |   |                   |              |            | 1-,440  |  | 5.,,575             |         |             |
| ID#   Description   New Supply   2000   2010   2020   2030   2040   2050   Notes:  | Water Mana  | gement Strategies (acft/vr)   | Candidate         |              | -          |         |  |                     |         |             |
| L-10 (Mun.) Demand Reduction (Conservation) 190 193 194 90 103 104  SCTN-4 Brush Management SCTN-5 Weather Modification SCTN-9 Rainwater Harvesting Small Aquifer Recharge Dams L-10 (irr.) Demand Reduction (Conservation) 6,401 6,401 6,401 6,401 6,401 Total New Supplies 6,591 6,594 6,595 6,491 6,504 6,505  Total System Mgmt. Supply / Deficit -74,131 -69,995 -66,060 -81,802 -78,169 -74,895 Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit 190 193 194 90 103 104 Deficit 190 193 194 90 103 104 Deficit -74,321 -70,188 -66,254 -81,892 -78,272 -74,799  Notes:   |   |   |                   | 2000         | 2010       | 2020    | 2030   | 2040                | 2050    | Notes       |
| SCTN-4   Brush Management   SCTN-5   Weather Modification   SCTN-9   Rainwater Harvesting   Small Aquifer Recharge Dams   Sm   | L-10 (Mun.)   |   |                   |              |            |         |  |                     |         | 1           |
| SCTN-5   Weather Modification   SCTN-9   Rainwater Harvesting   Small Aquifer Recharge Dams   Small Aquifer Recharge Dams   L-10 (Irr.)   Demand Reduction (Conservation)   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,505  |   |   |                   |              |            |         |  |                     |         | <del></del> |
| SCTN-5   Weather Modification   SCTN-9   Rainwater Harvesting   Small Aquifer Recharge Dams   Small Aquifer Recharge Dams   L-10 (Irr.)   Demand Reduction (Conservation)   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,505  |   |   |                   | i            |            |         |  |                     |         |             |
| SCTN-5   Weather Modification   SCTN-9   Rainwater Harvesting   Small Aquifer Recharge Dams   Small Aquifer Recharge Dams   L-10 (Irr.)   Demand Reduction (Conservation)   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,505  |   |   |                   |              |            |         |  |                     |         |             |
| SCTN-5   Weather Modification   SCTN-9   Rainwater Harvesting   Small Aquifer Recharge Dams   Small Aquifer Recharge Dams   L-10 (Irr.)   Demand Reduction (Conservation)   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,505  |   |   |                   |              |            |         |  |                     |         |             |
| SCTN-5   Weather Modification   SCTN-9   Rainwater Harvesting   Small Aquifer Recharge Dams   Small Aquifer Recharge Dams   L-10 (Irr.)   Demand Reduction (Conservation)   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,505  |   |   |                   |              |            |         |  |                     |         |             |
| SCTN-5   Weather Modification   SCTN-9   Rainwater Harvesting   Small Aquifer Recharge Dams   Small Aquifer Recharge Dams   L-10 (Irr.)   Demand Reduction (Conservation)   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,505  |   |   |                   |              |            |         |  |                     |         |             |
| SCTN-5   Weather Modification   SCTN-9   Rainwater Harvesting   Small Aquifer Recharge Dams   Small Aquifer Recharge Dams   L-10 (Irr.)   Demand Reduction (Conservation)   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,505  |   |   |                   |              |            |         |  |                     |         |             |
| SCTN-9   Rainwater Harvesting   Small Aquifer Recharge Dams   L-10 (Irr.)   Demand Reduction (Conservation)   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,401   6,505  | SCTN-4  | Brush Management  |                   |              |            |         |  |                     |         | 2           |
| Small Aquifer Recharge Dams  | SCTN-5  |   |                   |              |            |         |  |                     |         | 2           |
| L-10 (Irr.) Demand Reduction (Conservation) 6,401 6,40 | SCTN-9  |   |                   |              |            |         |  | ·                   |         | 2           |
| Total New Supplies 6,591 6,594 6,595 6,491 6,504 6,505  Total System Mgmt. Supply / Deficit -74,131 -69,995 -66,060 -81,802 -78,169 -74,695  Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit 190 193 194 90 103 104  Deficit -74,321 -70,188 -66,254 -81,892 -78,272 -74,799  Notes:  Demand Reduction (Conservation) strategies assumed largely reflected in projected water demands.  |   | Small Aquifer Recharge Dams   |                   |              |            |         |  |                     |         | 2           |
| Total System Mgmt. Supply / Deficit -74,131 -69,995 -66,060 -81,802 -78,169 -74,695  Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit 190 193 194 90 103 104  Period 190 190 190 190 190 190 190 190 190 190   | L-10 (lrr.)   | Demand Reduction (Conservation)   |                   | 6,401        | 6,401      | 6,401   | 6,401  | 6,401               | 6,401   | 3           |
| Mun, Ind, S-E, & Min System Mgmt. Supply / 190 193 194 90 103 104   Deficit   Prigation System Mgmt. Supply / Prigation System Mgmt. Supply    |   | Total New Supplies  |                   | 6,591        | 6,594      | 6,595   | 6,491  | 6,504               | 6,505   |             |
| Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit 190 193 194 90 103 104 104 105 105 105 105 105 105 105 105 105 105  |   | 7-4-1 Qual-to- 11-10-10-10-10-10-10-10-10-10-10-10-10-1   |                   | 74.464       | 00 000     | 00.000  | 04.000   | 70.400              | 74.005  |             |
| Deficit   Irrigation System Mgmt. Supply / Deficit   -74,321   -70,188   -66,254   -81,892   -78,272   -74,799   | ļ   |   |                   |              |            |         |  |                     |         | <del></del> |
| Irrigation System Mgmt. Supply / Deficit -74,321 -70,188 -66,254 -81,892 -78,272 -74,799  Notes:  Demand Reduction (Conservation) strategies assumed largely reflected in projected water demands.   |   |   |                   | ן טפר        | 193        | 194     | 90   | 103                 | 104     |             |
| Notes:  Demand Reduction (Conservation) strategies assumed largely reflected in projected water demands.   |   |   |                   | 74 224       | 70 400     | 66 264  | 94 902   | 70 070              | 74 700  |             |
| 1 Demand Reduction (Conservation) strategies assumed largely reflected in projected water demands.   |   | irrigation System mgmt. Supply / Deficit  |                   | -/4,321      | •/U,105    | -00,234 | -01,092]   | -10,414             | -14,199 |             |
| 1 Demand Reduction (Conservation) strategies assumed largely reflected in projected water demands.   | Notes:  |   |                   |              |            |         |  |                     |         |             |
| 2 Option expected to provide additional water supply in many years, but dependable supply during drought is presently unquantified.  | 1   | Demand Reduction (Conservation) strategies assumed  | largely reflected | in projected | water dema | ınds.   | <del>                                     </del> |                     |         |             |
|  | 2   | Option expected to provide additional water supply in many years, but dependable supply during drought is presently unquantified. |                   |              |            |         |  |                     |         |             |
| 3 Estimates based upon use of LEPA systems on 50 percent of acreages irrigated in 1997, with conservation at 20 percent of Irrigation  | 3   |   |                   |              |            |         |  |                     |         |             |
| application rate.  |   |   |                   |              |            |         | 1  |                     |         |             |



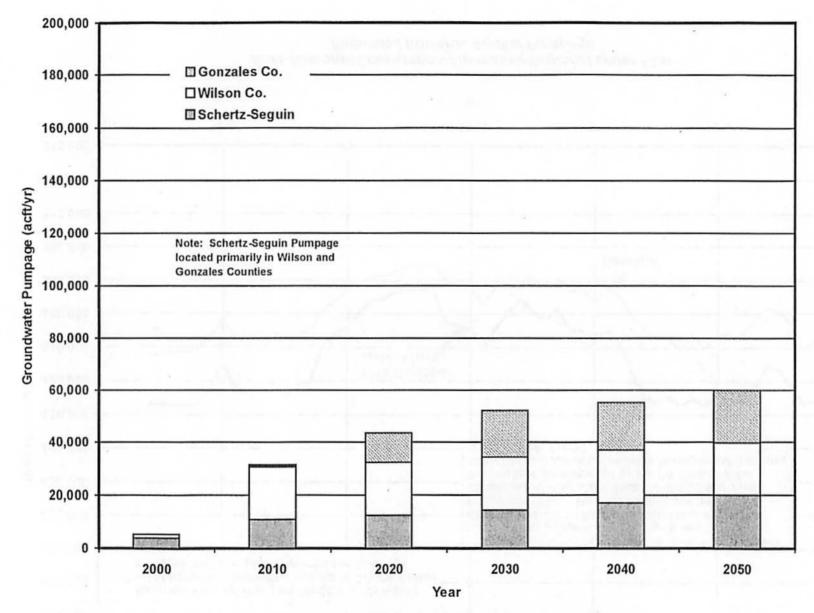
Inter-Regional Cooperation Alternative Regional Water Plan Simulated Comal Springs Discharge



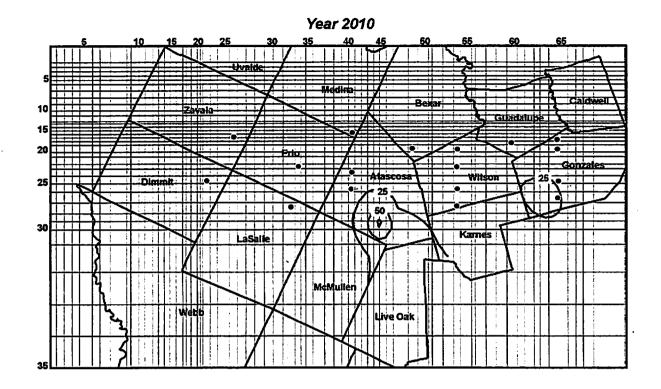
Inter-Regional Cooperation Alternative Regional Water Plan Simulated San Marcos Springs Discharge

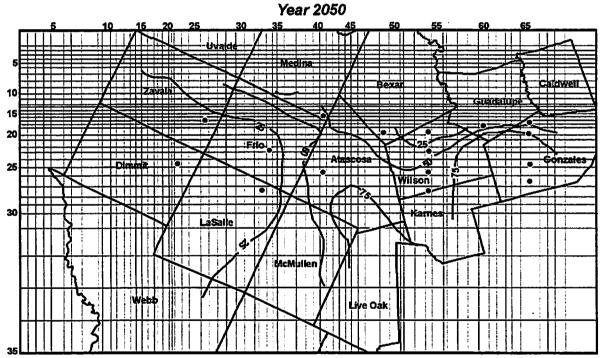
Inter-Regional Cooperation Alternative Regional Water Plan Simulated Edwards Aquifer Levels

Inter-Regional Cooperation Alternative Regional Water Plan Simulated Edwards Aquifer Pumpage



Inter-Regional Cooperation Alternative Regional Water Plan Additional Carrizo Groundwater Pumpage

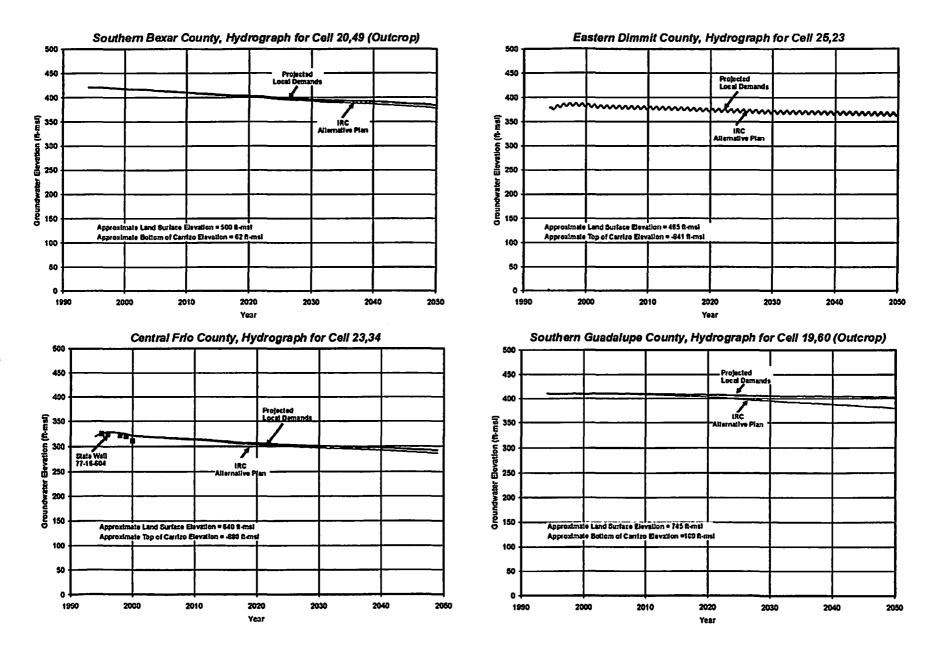




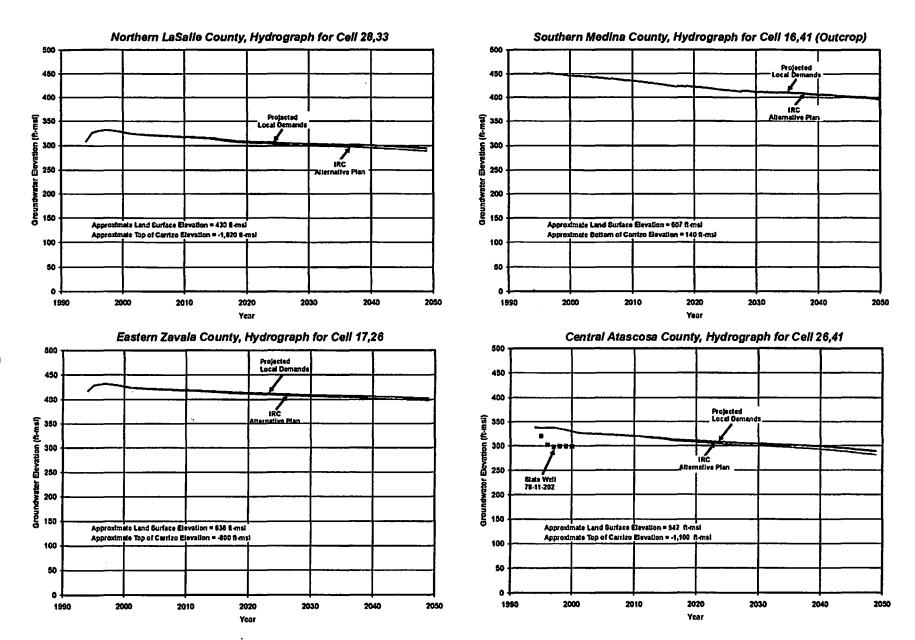
Note: Drawdown is referenced to simulated 1994 aquifer levels and includes both projected local demands and development of water supply options in this alternative regional water plan.

Monitoring Well Location

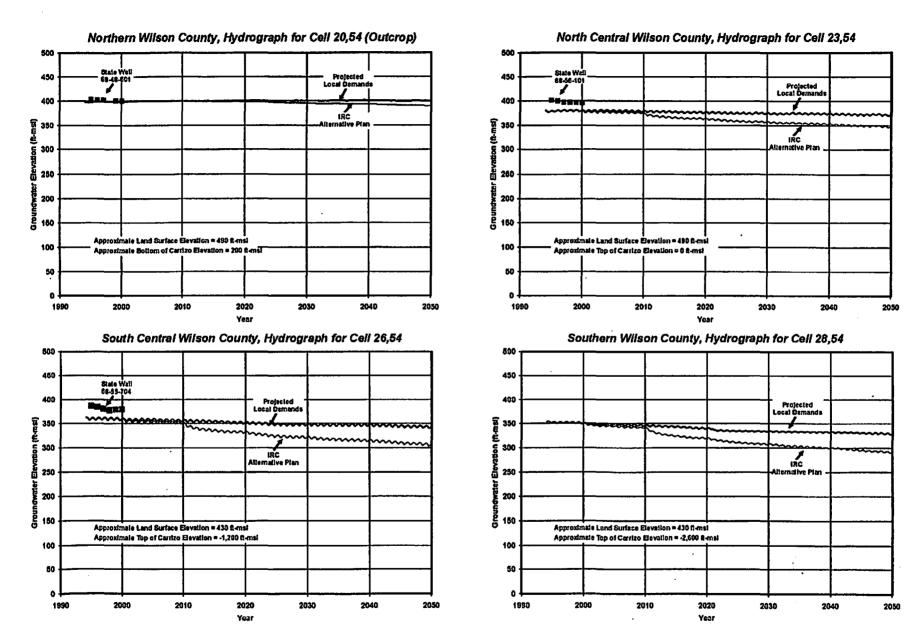
Inter-Regional Cooperation Alternative Regional Water Plan Simulated Carrizo Aquifer Drawdown



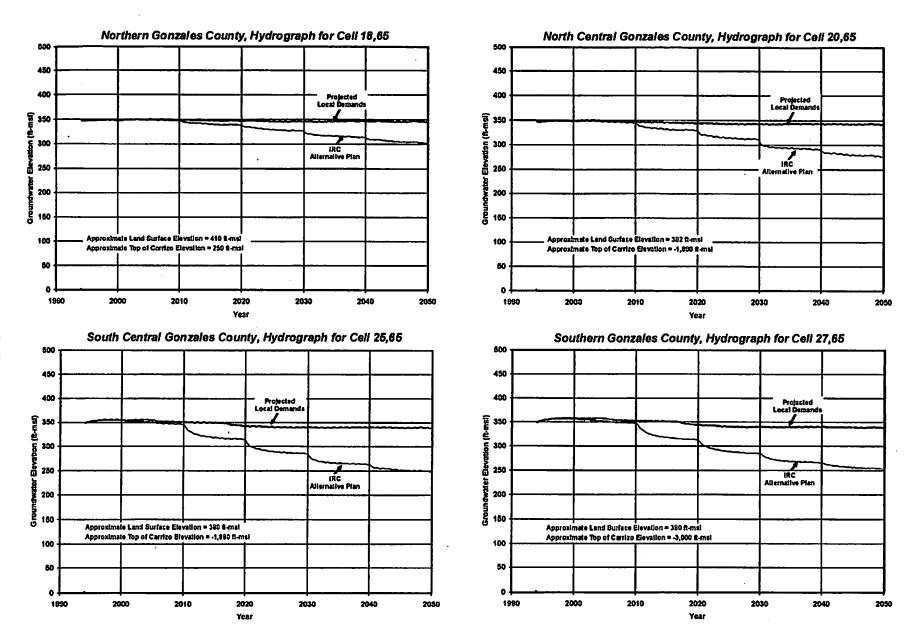
Inter-Regional Cooperation Alternative Regional Water Plan - Carrizo Aquifer



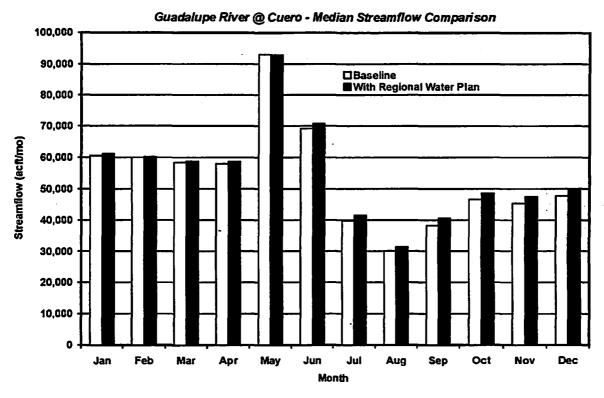
Inter-Regional Cooperation Alternative Regional Water Plan - Carrizo Aquifer

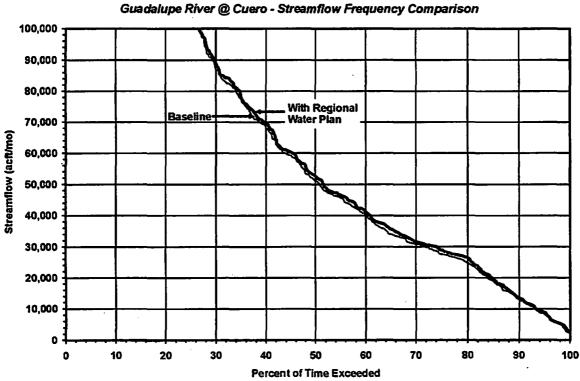


Inter-Regional Cooperation Alternative Regional Water Plan - Carrizo Aquifer

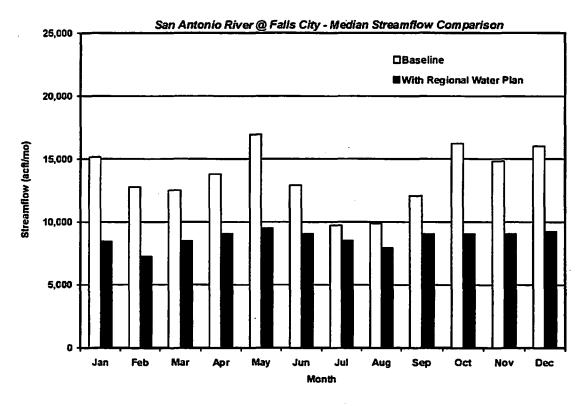


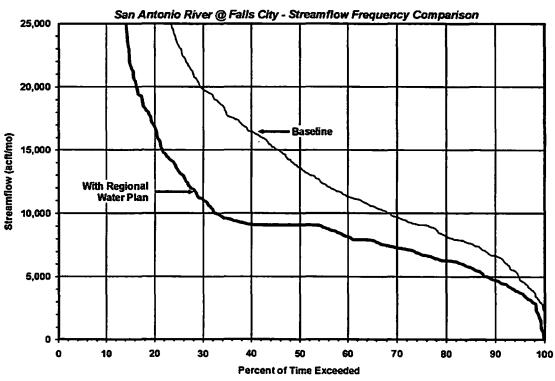
Inter-Regional Cooperation Alternative Regional Water Plan - Carrizo Aquifer



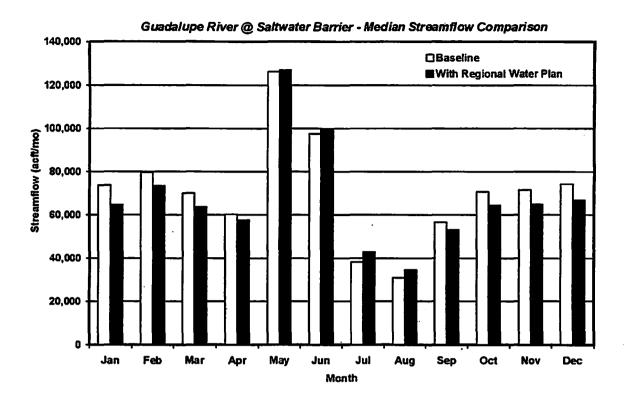


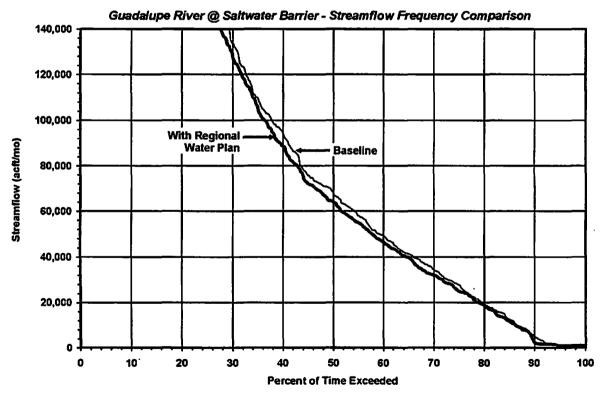
Inter-Regional Cooperation Alternative Regional Water Plan Streamflow Comparisons





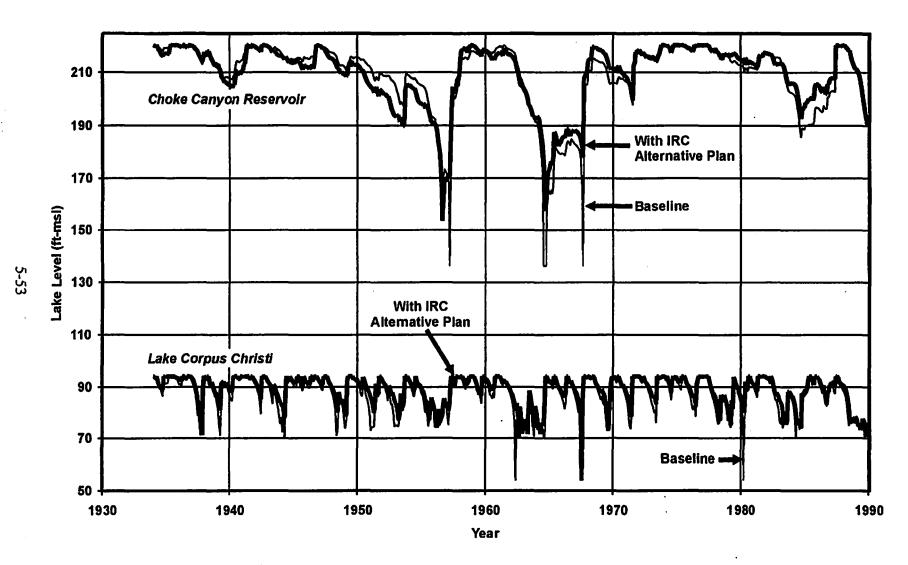
Inter-Regional Cooperation Alternative Regional Water Plan Streamflow Comparisons





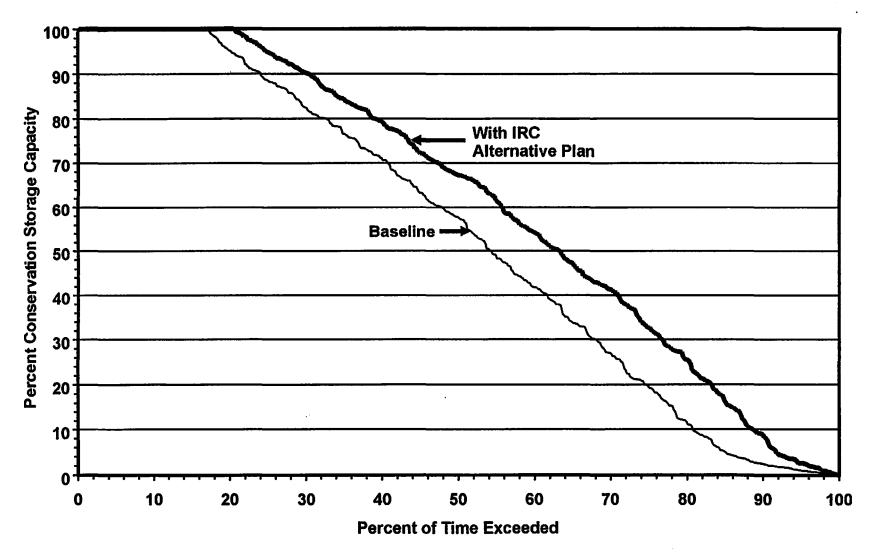
Inter-Regional Cooperation Alternative Regional Water Plan Streamflow Frequency Comparisons

# Choke Canyon Reservoir/Lake Corpus Christi — Lake Level Trace Year 2050



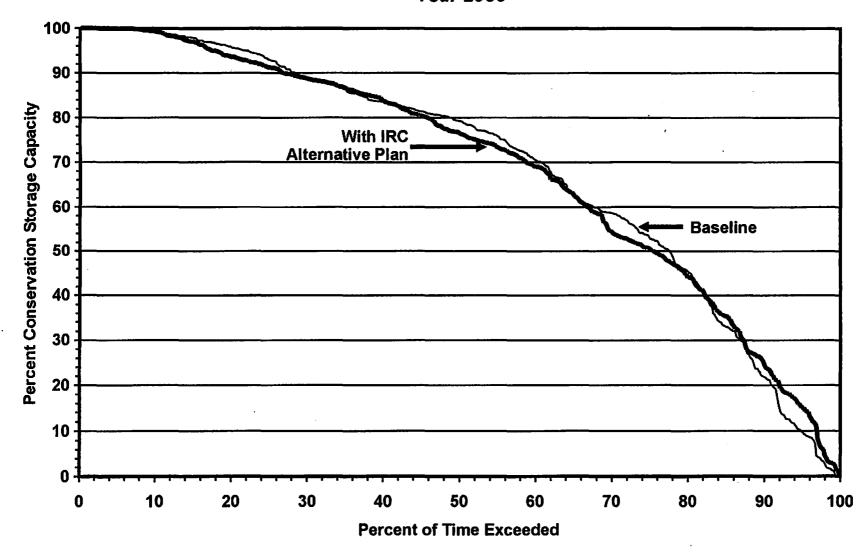
Inter-Regional Cooperation Alternative Plan

# Lake Corpus Christi — Storage Frequency Comparison Year 2050



Inter-Regional Cooperation Alternative Plan

# Choke Canyon Reservoir — Storage Frequency Comparison Year 2050



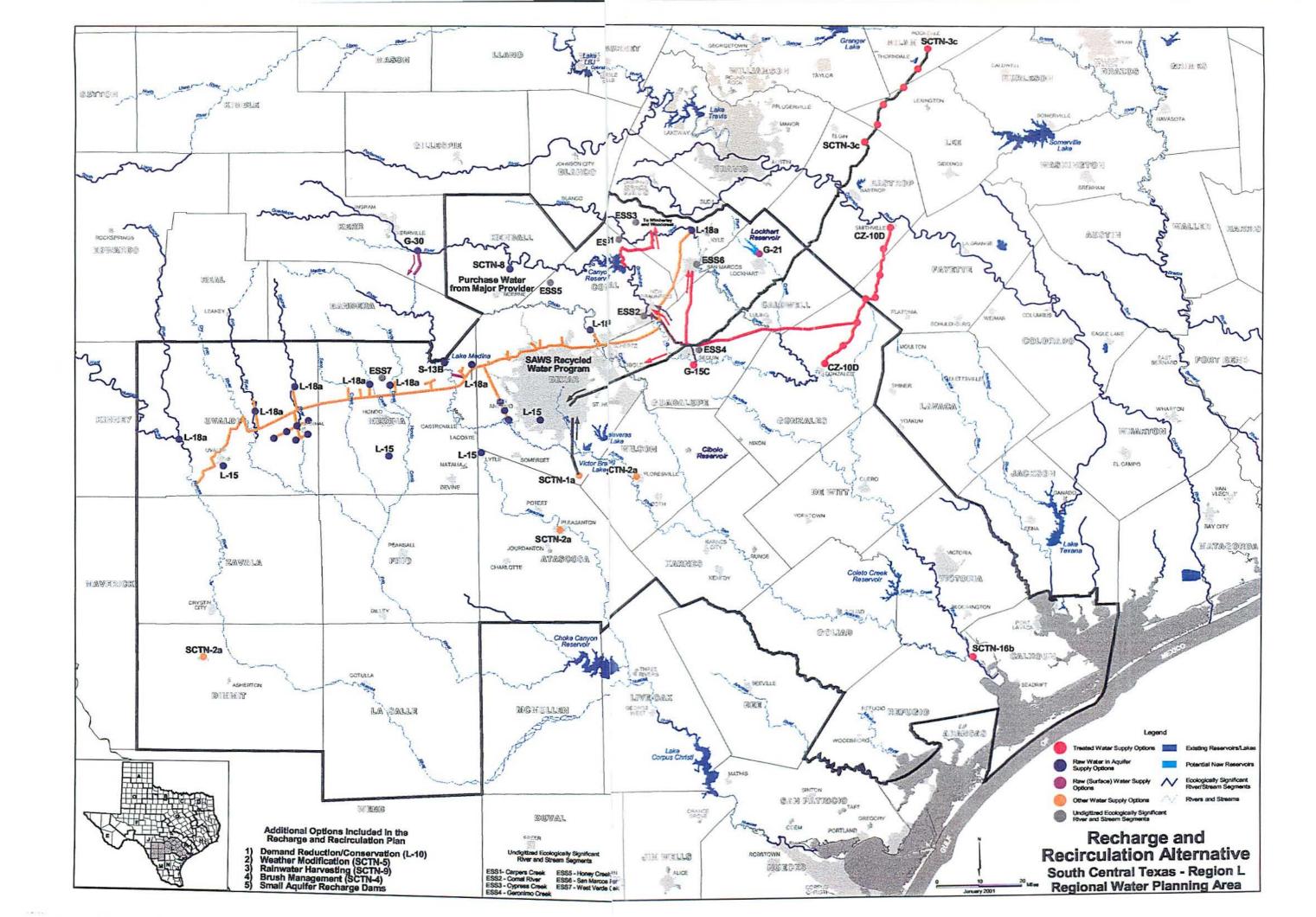
Inter-Regional Cooperation Alternative Plan

# "Recharge & Recirculation" Alternative Regional Water Plan

South Central Texas
Regional Water Planning Group

San Antonio River Authority

HDR Engineering, Inc. January 2001





Alternative Name: Recharge and Recirculation Alternative

Alternative ID: R&R

Alternative Description: The Recharge and Recirculation Alternative Regional Water Plan, proposes a comprehensive integration of recharge enhancement and recirculation to maximize supply available from the Edwards Aquifer. One test for a maximized supply is conditioned on not allowing an increase in pumpage to reduce flow from Comal Springs below baseline conditions (400,000 acft/yr of permitted pumpage); and, a second test maintains a minimum flow from Comal Springs at 60 cfs (which is not subject to diversion for recirculation).

The objectives of this plan are to be accomplished through:

- 1. Developing all reasonably economical recharge enhancement options;
- Increasing recharge to the aquifer by diverting unappropriated flow at Lake Dunlap and recirculating enhanced springflow from Comal Springs back to streams and recharge structures on the Edwards Aquifer Recharge Zone in Bexar, Medina, and Uvalde Counties; and
- 3. Transferring groundwater from west to east to maintain water levels, municipal pumpage, and springflow in the eastern part of the aquifer during drought conditions.

The following simulations are proposed to determine the maximized water supply for this recharge and recirculation alternative. Two tests, as described above, will be performed for each Run.

- Run 1: Include all recharge enhancement features, voluntary transfer of Edwards irrigation rights to municipal use, and transfer and recirculate available water from Lake Dunlap to the recharge zone in Bexar, Medina, and Uvalde Counties;
- Run 2: Include same recharge enhancement and recirculation features in Run 1 and add the feature of transferring all the available flow from Lake Dunlap to Cibolo Creek when flow from Comal Springs approaches critical conditions (assumed to be about 150 cfs);
- Run 3: Include same recharge enhancement and recirculation features in Run 1 and 2
  and add the feature of transferring groundwater from the western part of the aquifer to
  Cibolo Creek when flow from Comal Springs approaches critical conditions (assumed to
  be about 150 cfs); and
- Run 4: Include same recharge enhancement and recirculation features in Run 1, 2, and 3
  and add a feature of transferring groundwater from the western part of the aquifer to
  Bexar County when flow from Comal Springs approaches critical conditions (assumed to
  be about 150 cfs).

The following water supply options are included in the Recharge & Recirculation Alternative Regional Water Plan (in no particular order):

- 1. Demand Reduction / Conservation (L-10)
- 2. Edwards Irrigation Transfers (L-15)
- 3. Edwards Recharge Type 2 Projects (L-18a)
- 4. Guadalupe River Diversion to Recharge Zone (G-30)
- 5. Medina Lake Recharge Enhancement (S-13B)
- 6. Edwards Aquifer Recirculation Systems
- 7. Carrizo Aquifer Gonzales & Bastrop Counties (CZ-10D)
- 8. Carrizo Aquifer Local Supply (SCTN-2a)

- 9. Canyon Reservoir (G-15C)
- 10. Wimberley and Woodcreek Canyon (G-24)
- 11. Lockhart Reservoir (G-21)
- 12. Trinity Aquifer Optimization (SCTN-8)
- 13. Rainwater Harvesting (SCTN-9)
- 14. Weather Modification (SCTN-5)
- 15. Brush Management (SCTN-4)
- 16. Simsboro Aquifer (SCTN-3c)
- 17. SAWS Recycle Program
- 18. Transfers of Conserved Irrigation Water (L-10 Irr) to Bexar County Municipal Pumpage
- 19. Term Pumpage Permits
- 20. SAWS Aquifer Storage & Recovery (SCTN-1a)

# Recharge and Recirculation Alternative Regional Water Plan Summary of Key Information for South Central Texas Regional Water Planning Group

## Quantity, Reliability, and Cost

- Plan includes management supplies to meet projected needs, ensure reliability, and maintain springflow, resulting in a quantity of additional water supplies sufficient to meet projected needs for municipal, industrial, steam-electric power, and mining uses only through the year 2050.
- Unit cost is below the average of the five alternative plans and the Regional Water Plan.

#### **Environmental Factors**

- Greatest decrease in median annual streamflow in the Guadalupe River at Cuero and at the Guadalupe River Saltwater Barrier among the five alternative plans and the Regional Water Plan.
- Greatest concerns with respect to Endangered & Threatened Species among the five alternative plans and the Regional Water Plan.
- Least concerns with Water Quality & Aquatic Habitat among the five alternative plans and the Regional Water Plan.

### Impacts on Water Resources

- No unmitigated reductions in water available to existing water rights.
- Long-term reductions in water levels in the Carrizo Aquifer in Gonzales and Bastrop Counties.

#### Impacts on Agriculture and Natural Resources

- Major commitment to municipal and irrigation water Demand Reduction (Conservation) (L-10).
- Includes Brush Management (SCTN-4) and Weather Modification (SCTN-5).
- Inclusion of water supply options to meet projected irrigation needs in full is estimated to be economically infeasible at this time. Weather Modification (SCTN-5) assists irrigation and dry-land agriculture (crops and ranching).
- Includes maximum potential voluntary transfer of Edwards Aquifer irrigation permits to municipal permits through lease or purchase.
- Includes Medina Lake Recharge Enhancement (S-13B) which reduces or eliminates water supplies from the Medina Lake System for irrigation in Bexar, Medina, and Atascosa Counties.

#### Other Relevant Factors per SCTRWPG

- Greatest percentage of time during which Critical Period Management Rules require reductions in municipal pumpage from the Edwards Aquifer among the five alternative plans and the Regional Water Plan.
- Simulated Edwards Aquifer levels well below the lowest on record at the Bexar County monitoring well (J-17) raising significant concerns regarding feasibility.

### Comparison of Strategies to Meet Needs

 Selection of water supply options comprising the alternative plan based on integration of recharge enhancement and recirculation to maximize supply available from the Edwards Aquifer, preferences expressed by planning units, and closest available supply.

### **Interbasin Transfer Issues**

- Projected non-irrigation needs in basin(s) of origin are met throughout the planning period.
- Plan includes two interbasin transfers: 1) Recirculation Systems from the Guadalupe River near Lake Dunlap and the Blanco River near Kyle to the outcrop of the Edwards Aquifer in the San Antonio and Nueces River Basins; and 2) Diversions from the Guadalupe River at Comfort to the Medina River Basin.

# Third-Party Impacts of Voluntary Redistribution of Water

- Potential positive or negative effects of Edwards Irrigation Transfers (L-15).
- Lower water levels in some portions of the Carrizo Aquifer.

## Regional Efficiency

- Edwards Irrigation Transfers (L-15) require no new facilities. Transferred water would likely be available at or very near locations having projected municipal, industrial, steam-electric power, and mining needs in Uvalde, Medina, Atascosa, and Bexar Counties.
- Recirculation Systems provide for recovery and recirculation of enhanced Comal springflow resulting from implementation of Edwards Recharge – Type 2 Projects (L-18a), Medina Lake
   Recharge Enhancement (S-13B), and Guadalupe River Diversions to Recharge Zone (G-30).
- Consider reduced transmission capacity in the Recirculation Systems and elimination of Guadalupe River Diversions to Recharge Zone (G-30) to moderate unit cost.

## **Effect on Navigation**

• Not applicable.

# South Central Texas Region, Recharge & Recirculation Alternative – TWDB Evaluation Criteria Summary

| Management Strategy   | Quantity (acft/yr) | Reliability <sup>2</sup> | Cost (\$/acft) <sup>3</sup> | T | Environmental Factors  |           | Impacts on Water Resources   | l I | npacts on Agricultural and Natural Resources   | T  | Other Relevant Factors per SCTRWPG   |
|---|--------------------|--------------------------|-----------------------------|---|--|-----------|--|-----|--|--|--|
| Municipal Demand Reduction (Conservation) (L-10 Mun.)   | 44,566             | Firm                     | \$173                       | • | None. Supply developed through deman reduction.  | •         | Slight reductions in treated effluent discharge.   | •   | Fewer water management strategies necessary to meet projected needs.                         | •  | Conservation is a central element of the Plan.   |
| Edwards Irrigation Transfers (L-15)   | 81,000             | Firm                     | . \$80                      | • | None. Supply developed without new farilities  | •         | Reductions in springflow due to relocation of pumpage closer to springs.   | •   | Plan includes 100 percent of potential of max. voluntary transfer through lease or purchase. | •  | Encourages beneficial use of available rights.   |
| Transfer of Conserved Irrigation Water (L-10 Irr) to<br>Bexar County Municipal Pumpage  | 30,531             | Firm                     | \$1                         | • | None. Supply developed through deman reduction.  | •         | Reductions in springflow due to relocation of pumpage closer to springs.   | •   | Installation of LEPA systems on 53 percent of applicable acreage in Uvalde, Medina, & Bexar. | •  | Consistent with conservation focus of Plan.  |
| Edwards Aquifer Recirculation Systems (Recirculation System, Edwards Recharge – Type 2 Projects (L-18a), Medina Lake Recharge Enhancement (S-13B), & Guadalupe River Diversion to Recharge Zone (G-30)) | 227,080            | Firm                     | \$689                       | • | Concerns with endangered & threatened species, habitat, cultural resources, and T?WD Ecologically Unique Stream Segment. | •         | Reduced Comal Springs discharge and Guadalupe River flows.  Bexar County aquifer levels well below record lows.  Limited on streams with Recharge Dams, as most are located on frequently dry streams. Increased lake levels in Medina Lake Reduced streamflow below Guadalupe River Diversions. | •   | Uncertain effects on natural performance of Edwards Aquifer.                                 | •  | High percentage of time in drought contingency.  Numerous significant regulatory, legal, institutional, and technical uncertainties.  Mitigation of impacts on firm yield of Choke Canyon Res. / Lake Corpus Christi System.  Requires upstream contract for Canyon Reservoir. |
| Lockhart Reservoir (G-21)   | 6,048              | Firm                     | \$1,361                     | • | Concerns regarding habitat & cultural resources.   | •         | Reduced streamflow immediately below dam.  | •   | Minimal.   | :  | Questions regarding economic feasibility.  Strong local government support.  |
| Trinity Aquifer Optimization (SCTN-8)   | 390                | Firm                     | \$1,885                     | • | Concerns with water quality & aquatic habitat.   | •         | Minimal reductions in instream flow.  Locally increased aquifer levels.  | •   | Minimal, if any.   |  | outing rocal government support.   |
| Simsboro Aquifer (SCTN-3c)  | 55,000             | Firm                     | \$844                       | • | Concerns with endangered & threatened species, habitat, and cultural resources.  |           | Long-term reductions in aquifer levels.  Minimal reductions in instream flow at outcrop.  Potential effects on discharge of small springs.   | •   | Minimal, if any.   | :  | Beneficial use of groundwater now unused. Planned Bastrop Co. supply for Region L exceeds 2030 availability per Region K.  |
| Canyon Reservoir – River Diversion (G-15C)  | 15,000             | Firm                     | \$794                       | • | Minimal. Canyon Reservoir is an existini resource.   | •         | Increased instream flows associated with downstream deliveries of water supply.  | •   | Not applicable.  | :  | Encourages beneficial use of existing reservoir. Recreational benefits with downstream delivery.   |
| Canyon Reservoir – Wimberley & Woodcreek (G-24)   | 1,048              | Firm                     | \$1,586                     | • | Minimal. Pipeline could encounter endargered or threatened species habitat.  | •         | Minimal, if any.   | •   | Not applicable.  | •  | Encourages beneficial use of existing reservoir.   |
| Carrizo Aquifer - Gonzales & Bastrop (CZ-10D) <sup>5</sup>  | 58,500             | Firm                     | \$1,066                     | • | Minimal. Pipeline could encounter cultu al resource sites.   |           | Long-term reductions in well levels.  Some reductions in instream flow at outcrop.  Potential effects on discharge of small springs.   | •   | Minimal, if any.   | •  | Planned withdrawals in excess of that expresser in policies of underground water conservation districts.   |
| Carrizo Aquifer - Local Supply (SCTN-2a)  | 13,700             | Firm                     | \$343                       | • | Minimal, if any.   | •         | Modest long-term reductions in aquifer levels.   | •   | Minimal, if any.   | $\vdash$   |  |
| SAWS Recycled Water Program (SAWS)  | 52,215             | Firm                     | \$395                       | • | None. Water supply derived from increaed volumes of treated wastewater.  | •         | Minimal, if any.   | •   | Not applicable.  | •  | Encourages beneficial use of available resource  |
| Purchase of Water From Major Provider (PMP)   | 8,000              | Firm                     | \$877                       | • | Minimal, if any. Supply developed as pat of other water management strategies.   | 1.        | Minimal, if any.   | •   | Not applicable.  |  |  |
| Aquifer Storage & Recovery (ASR) – (SCTN-1a)  | Unquantified       | Firm                     | Unquantified                | • | Minimal. Pipeline could encounter impotant<br>habitat or encounter cultural resource site.                               | •         | Reduced peak summer pumpage from Edwards Aquifer increases aquifer levels and springflow.  | •   | Not applicable.  | •  | SAWS South Bexar County ASR presently in implementation phase.   |
| Brush Management (SCTN-4)   | Unquantified       | Unknown                  | Unquantified                | • | Concerns regarding endangered & threat red species, vegetation & wildlife habitat, an cultural resources.                | •         | Potential benefit to Edwards Aquifer due to increased water for recharge.  | •   | Potential improvement of pasture for grazing.  | •  | Additional studies needed to determine quantity of dependable supply during drought  |
| Weather Modification (SCTN-5)   | Unquantified       | Unknown                  | Unquantified                | • | Potential increases in water supply for willife habitat.   |           | Potential increases in rainfall, runoff, and aquifer recharge.   | •   | Provides water for irrigated and dry-land agriculture (crops & ranching).                    | •  | Concerns regarding increased flood potential.  |
| Rainwater Harvesting (SCTN-9)   | Unquantified       | Unknown                  | Unquantified                | • | Minimal, if any.   | <u> •</u> | Minimal, if any.   | •   | Not applicable.  | •  | Consistent with conservation focus of Plan   |
| Small Aquifer Recharge Dams   | Unquantified       | Unknown                  | Unquantified                | • | Small potential effects on habitat.  | •         | Potential increases in local aquifer levels.   | •   | Minimal, if any.   |  | THE TANK THE PROPERTY OF A PAIL  |
| Term Pumpage Permits  | Unquantified       | Unknown                  | Unquantified                | • | Minimal, if any.   | •         | Unknown at this time.  | •   | Unknown at this time.  | <del>                                     </del> | <del></del>  |
| Total of New Supplies   | 593,078            |                          |                             |   |  |           |  |     |  |  |  |

| Management Strategy   |    | Comparison of Strategies to Meet Needs  |   | Interbasin Transfer Issues                  |    | Third-Party Impacts of Voluntary Transfers  |   | Regional Efficiency  |   | Effect on<br>Navigation |
|---|----|---|---|---|----|---|---|--|---|-------------------------|
| Municipal Demand Reduction (Conservation) (L-10 Mun.)   | 1: | Low unit cost. Inherent environmental benefits.   | ٠ | Not applicable.                             | •  | Not applicable.   | • | Implementable throughout the region.   | • | None                    |
| Edwards Irrigation Transfers (L-15)   | •  | Low unit cost.  | • | Not applicable.                             | •  | Maximum transfer may have potential socio-<br>economic impacts to third parties.  | • | Requires no new facilities.  | • | None                    |
| Transfer of Conserved Irrigation Water (L-10 Irr) to<br>Bexar County Municipal Pumpage  | •  | Low unit cost.  | • | Not applicable.                             | •  | Limited transfer allows irrigators to install high<br>efficiency systems so irrigation can continue at<br>present levels and avoid impact to local economy. | • | Requires no new facilities other than LEPA equipment on farms.   | 4 | None                    |
| Edwards Aquifer Recirculation Systems (Recirculation System, Edwards Recharge - Type 2 Projects (L-18a), Medina Lake Recharge Enhancement (S-13B), & Guadalupe River Diversion to Recharge Zone (G-30)) | •  | Moderate unit cost, with substantial initial investment.                                  | • | TNRCC Interbasin Transfer permits required. | •  | Not applicable  | • | Provides for recovery and recirculation of<br>enhanced springflow from various recharge<br>enhancement projects. | • | None                    |
| Lockhart Reservoir (G-21)   | •  | High unit cost.   | • | Not applicable.                             | •  | Not applicable  | • | Shared pipeline alignment with Lower Guadalupe<br>River Diversion (SCTN-16)                                      | • | None                    |
| Trinity Aquifer Optimization (SCTN-8)   | 1. | High unit cost.   | • | Not applicable.                             |    |   | • | Implementable at various locations.  | • | None                    |
| Simsboro Aquifer (SCTN-3c)  | •  | Moderate unit cost.   | • | Not applicable.                             | •  | Limited transfer to avoid potential socio-<br>economic impacts to third parties.  | • | Beneficial use of groundwater presently produced, but unused.  | • | None                    |
| Canyon Reservoir - River Diversion (G-15C)  | •  | Moderate unit cost.   | ٠ | Not applicable.                             | 1. | Not applicable.   | • | Significant additional surface water supply without construction of a new reservoir.                             | • | None                    |
| Canyon Reservoir - Wimberley & Woodcreek (G-24).  | 1. | High unit cost, but options to meet needs are limited.                                    | • | Not applicable.                             | •  | Not applicable.   | • | Additional surface water supply without construction of a new reservoir.   | • | None                    |
| Carrizo Aquifer - Gonzales & Bastrop (CZ-10D) <sup>3</sup>  | •  | Moderate to high unit cost.   | • | Not applicable.                             | •  | Transfer rate could have potential socio-<br>economic impacts to third parties.   | • | New supply reasonably proximate to Comal,<br>Guadalupe, and Hays Counties.                                       | • | None                    |
| Carrizo Aquifer Local Supply (SCTN-2a)  | •  | Low unit cost.  | • | Not applicable.                             | •  | Not applicable.   | • | New supply proximate to points of need.  | • | None                    |
| SAWS Recycled Water Program (SAWS)  | •  | Low to moderate unit cost.  | • | Not applicable.                             | •  | Not applicable.   | • | New supply proximate to points of need.  | • | None                    |
| Purchase of Water From Major Provider (PMP)   | •  | Low to moderate unit cost.  | • | Not applicable.                             | •  | Not applicable.   | • | Economy of participation in regional projects.   | • | None                    |
| Aquifer Storage & Recovery (ASR) – (SCTN-1a)  | •  | Effective means of reducing peak summer pumpage from the Edwards Aquifer.                 | • | Not applicable.                             | •  | Not applicable.   | • | Increases reliability of current supply from the Edwards Aquifer.  | • | None                    |
| Brush Management (SCTN-4)   | •  | Insufficient information at this time.  | • | Not applicable.                             | 1. | Not applicable.   | • | May contribute positively to storage and system management of supplies.  | • | None                    |
| Weather Modification (SCTN-5)   | •  | Potentially feasible management strategy to meet a portion of projected irrigation needs. | • | Not applicable.                             | •  | Not applicable.   | • | May contribute positively to storage and system management of supplies.  | • | None                    |
| Rainwater Harvesting (SCTN-9)   | •  | High unit cost; comparable to domestic well.  | • | Not applicable.                             | 1. | Not applicable.   | • | Implementable throughout the region.   | • | None                    |
| Small Aquifer Recharge Dams   | •  | High unit cost.   | • | Not applicable.                             | •  | Not applicable.   | • | Implementable throughout the region.   | • | None                    |
| Term Pumpage Permits  | •  | Insufficient information at this time.  | • | Not applicable.                             | •  | Not applicable.   |   | Insufficient information at this time.   | • | None                    |

of underground water conservation districts.

Notes:

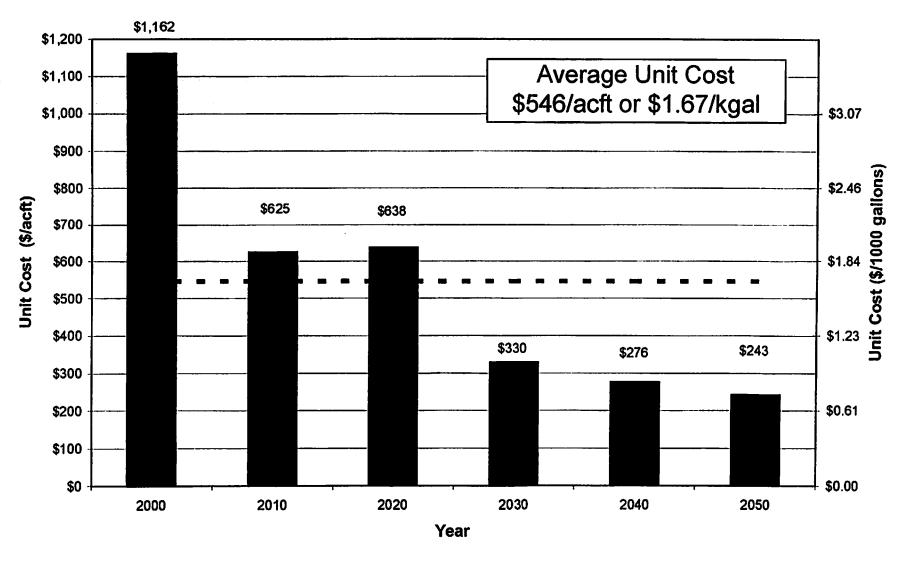
1) Quantity based on full implementation and utilization of new supplies in year 2050.

2) Firm reliability indicates that new supply is dependable in a drought of record with full implementation of the Alternative Plan.

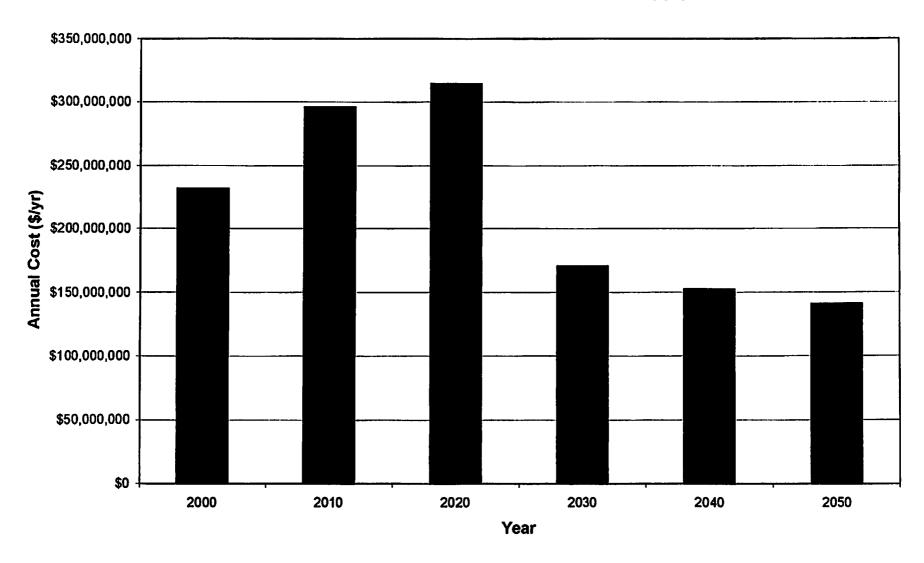
3) Unit cost based on full utilization of supply at ultimate capacity of planned facilities and includes treatment and distribution facilities necessary to meet peak daily needs.

4) Management strategies in the implementation phase include Schertz-Seguin Water Supply Project, Western Canyon Regional Water Supply Project, Hays/IH35 Water Suply Project, Lake Dunlap WTP Expansion and Mid-Cities Project, and GBRA Canyon Reservoir Contract Renewals. Supplies associated with these management strategies were cound as current supply in the technical evaluation of alternative regional water plans.

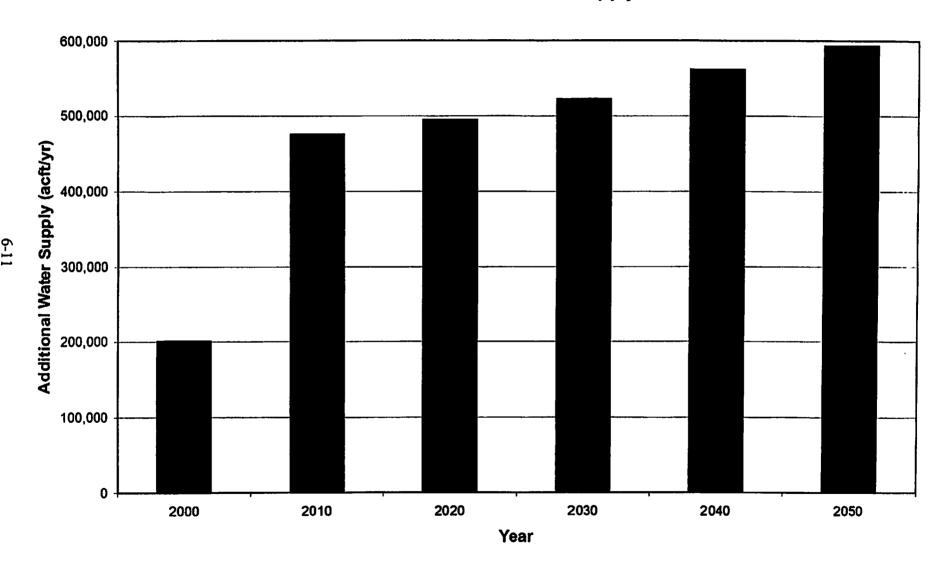
5) Subsequent to the technical evaluation of alternative regional water plans, quantity associated with this management strategy was limited in the Regional Water Plan in vist of policies of independent water conservation districts.



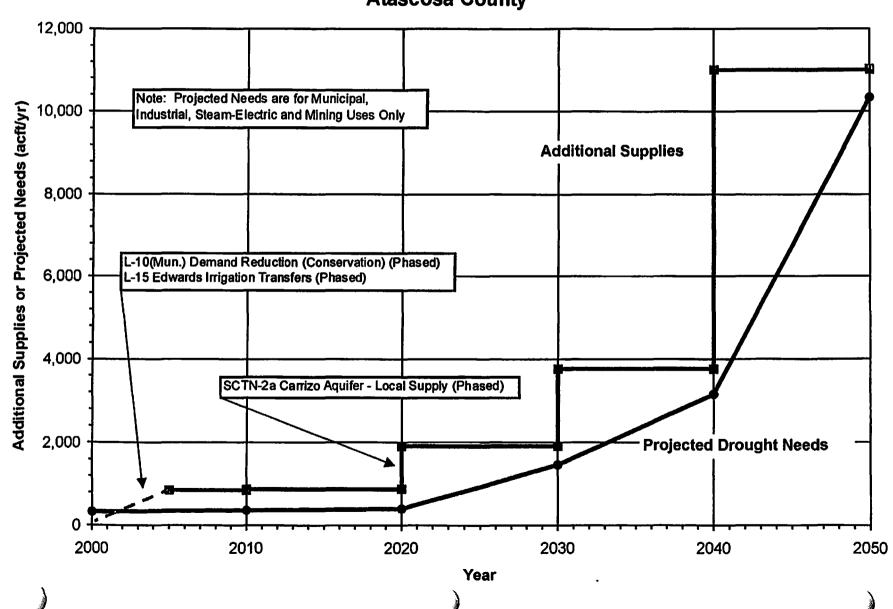
# Recharge & Recirculation Alternative Regional Water Plan Annual Cost of Cumulative Additional Water Supply



Recharge & Recirculation Alternative Regional Water Plan Cumulative Additional Water Supply

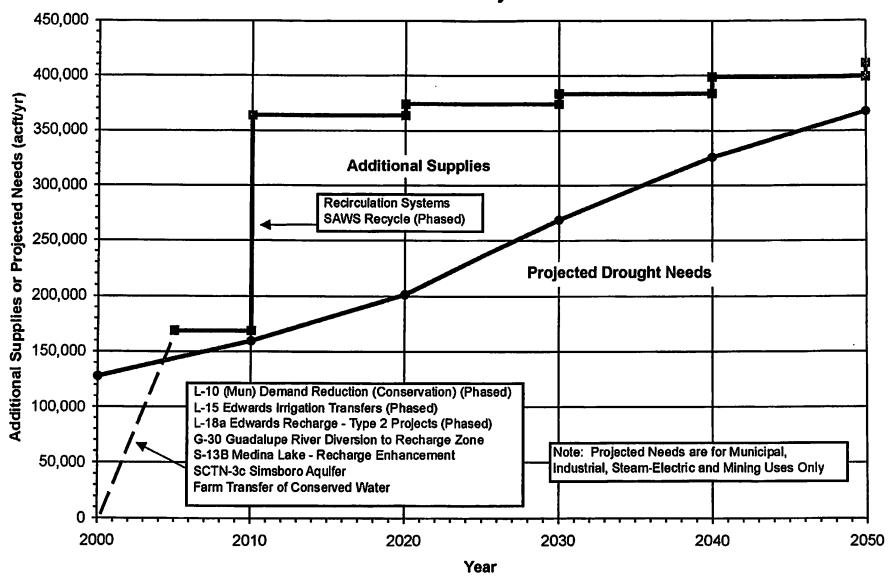


# Recharge and Recirculation Alternative Regional Water Plan Atascosa County



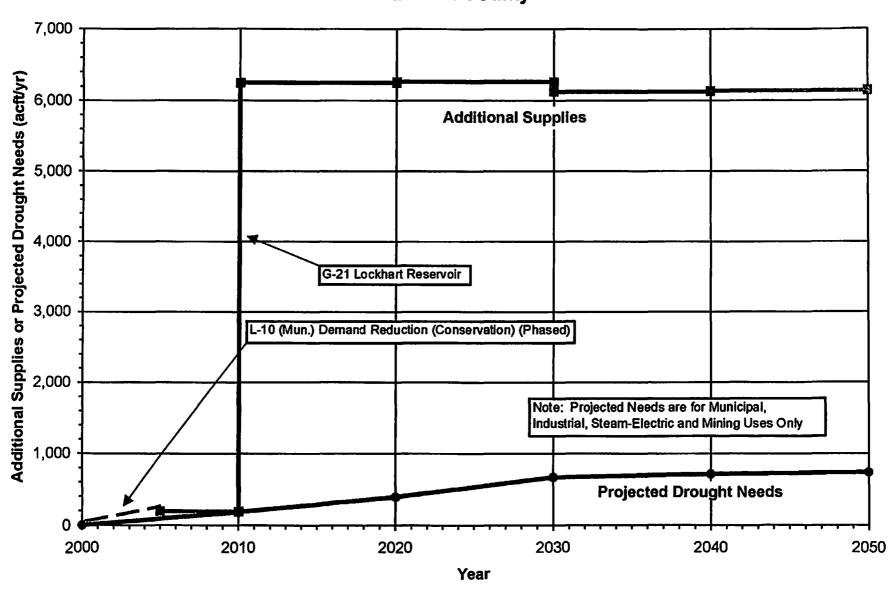
| South C          | entral Texas Region                                       |                     |               |               |               |               | Co            | unty = A       | tascosa                    |
|------------------|---|---------------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------------------|
| County S         | Summary of Projected Water Needs (Shor                    | tages) and V        | later Man     | agement       | Strategie     | 8             | Ü             | ser Grou       | p(s) = al                  |
| Projector        | d Water Needs (acft/yr)                                   |                     |               |               |               |               |               |                |                            |
| Fiojectet        | User Group(s)   |                     | 2000          | 2010          | 2020          | 2030          | 2040          | 2050           | Notes                      |
|                  |   |                     |               | 366           |               |               |               |                | NOTES                      |
|                  | Municipal Industrial                                      |                     | 325<br>0      |               | 401<br>0      | 468<br>0      | 530<br>0      | 587            |                            |
|                  | Steam-Electric  |                     | 0             |               |               | 0             | 1,504         | 8,504          |                            |
|                  | Mining  |                     | <u>ŏ</u>      |               |               | 995           | 1,109         | 1,239          | -                          |
|                  | Irrigation  |                     | 38,418        |               | 35,170        | 43,726        | 42,190        | 40,713         |                            |
|                  | Total Needs   |                     | 38,743        |               | 35,571        |               |               |                |                            |
|                  |   |                     |               |               |               | 45,189        | 45,333        | 51,043         |                            |
|                  | Mun, Ind, S-E, & Min Needs                                |                     | 325           | 366           | 401           | 1,463         |               | 10,330         |                            |
|                  | Irrigation Needs  |                     | 38,418        | 36,718        | 35,170        | 43,726        | 42,190        | 40,713         |                            |
| Water Ms         | anagement Strategies (acft/yr)                            | Candidate           |               |               |               |               |               |                |                            |
| ID#              | Description   | New Supply          | 2000*         | 2010          | 2020          | 2030          | 2040          | 2050           | Notes                      |
| L-10 (Mun.)      | Demand Reduction (Conservation)                           | July 1919           | 356           | 384           | 411           | 259           | 300           | 319            | 110103                     |
| L-15 (Mail.)     | Edwards Impation Transfers                                | 81,000              | 500           | 500           | 500           | 500           | 700           | 700            | 2, 3, 4                    |
| SCTN-2a          | Carrizo Aquifer - Local Supply                            | 0.,000              |               |               |               | 1,000         | 3,000         | 10,000         | <del>2, 3, 4</del><br>5, 6 |
|                  |   |                     |               |               |               |               |               |                |                            |
|                  |   |                     |               |               |               |               |               |                |                            |
| SCTN-4           | Brush Management  | ļ                   |               |               |               |               |               |                |                            |
| SCTN-5<br>SCTN-9 | Weather Modification Rainwater Harvesting                 |                     |               |               |               |               | <b>-</b>      |                |                            |
| 2C114-8          | Small Aquifer Recharge Dams                               |                     | <del></del>   |               |               |               |               |                | <del></del>                |
| L-10 (lrr.)      | Demand Reduction (Conservation)                           |                     | 3,692         | 3,692         | 3,692         | 3,692         | 3,692         | 3,692          | <u>/</u> 8                 |
| L-10 (III.)      | Total New Supplies  |                     | 4,548         | 4,576         | 4,603         | 5,451         | 7,692         | 14,711         |                            |
|                  | Total New Supplies  |                     | 4,040         | 4,57          | 4,005         | 0,101         | 1,032         | 14,7 1 1       |                            |
|                  | Total System Mgmt. Supply / Deficit                       |                     | -34,195       | -32,508       | -30,968       | -39,738       | -37,641       | -36,332        |                            |
|                  | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit     |                     | 531           | 518           | 510           | 296           | 857           | 689            |                            |
|                  | Irrigation System Mgmt. Supply / Deficit                  |                     | -34,726       | -33,026       | -31,478       | -40,034       | -38,498       | -37,021        |                            |
| Notes:           |   |                     |               |               |               |               |               |                |                            |
| •                | Candidate New Supplies shown for year 2000 are iden       |                     |               |               |               | e immediate   | ly.           |                |                            |
| 1                | Demand Reduction (Conservation) strategies assumed        | l largely reflected | in projected  | water demar   | ıds.          |               |               |                |                            |
| 2                | Candidate New Supply to be shared among Uvalde, M         | edina, Atascosa,    | and Bexar C   | ounties. Sup  | ply may not   | be reliable i | n drought.    |                |                            |
| 3                | Pursuant to draft EAA Critical Period Management rule     | s, Candidate Nev    | Supply rep    | resents appro | oximately 85  | percent of    |               |                |                            |
|                  | the estimated maximum potential annual transfer (95,4     | 30 acft) based on   | Proposed P    | ermits prorat | ed to 400,00  | 0 acfl/yr.    |               |                |                            |
| 4                | Additional Edwards supply is for City of Lytle.           |                     |               |               |               |               |               |                |                            |
| 5                | Additional Carrizo supply is for Steam-Electric and Min   | ing use.            |               | 1             |               |               | 1             |                |                            |
| 6                | Early implementation of facilities assumed in cost esting | nation to ensure s  | ufficient sup | bih dnijud qu | ught.         |               |               |                |                            |
| 7                | Option expected to provide additional water supply in n   | nany years, but d   | ependable si  | upply during  | arought is pr | esently unqu  | entified.     |                |                            |
| 8                | Estimates based upon use of LEPA systems on 50 per        | cent of acreages    | imigated in 1 | 997, With COI | iservation at | 20 percent of | or Impation a | pplication rat | <b>e</b>                   |

# Recharge and Recirculation Alternative Regional Water Plan Bexar County



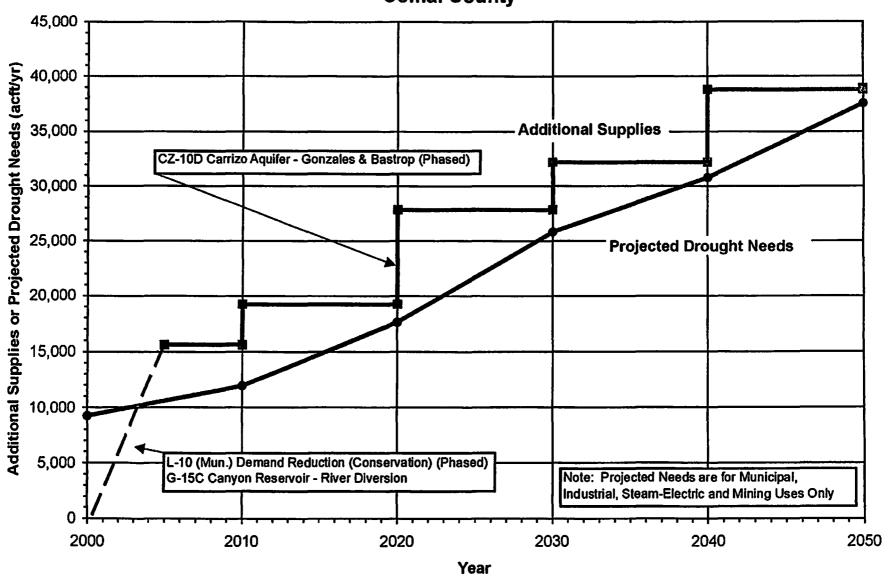
| South C               | entral Texas Region  |  |   |   |   |  | C  | ounty =  | Bexa   |
|-----------------------|--|--|---|---|---|--|--|--|--------|
| County Su             | ımmary of Projected Water Needs (Shorta  | ges) and Wa  | ter Manaç   | gement S  | trategies   |  |  | ser Grou   |        |
| Projected             | Water Needs (acft/yr)  |  |   |   |   |  |  | _  |        |
| riojecteu             | User Group(s)  | <del></del>  | 2000  | 2010  | 2020  | 2030   | 2040                                       | 2050   | Notes  |
|                       | Municipal  |  | 122,867   | 154,495   | 198,301   | 262,070  |  | 353,309  | 110108 |
|                       | Industrial   |  | 122,007   | 0   | 130,301   | 1,430  | 4,759                                      | 8,192  |        |
|                       | Steam-Electric   |  | 0   | Ö   | Ö   | 0  |  | 0,102  |        |
|                       | Mining   |  | 4,983   | 4,936   | 5,201   | 5,406  |  | 5,962  |        |
|                       | Irrigation   |  | 22,575  | 20,374  | 19,585  | 19,015   |  | 17,368   |        |
|                       | Total Needs  |  | 150,405   | 179,805   |   | 287,921  |  | 384.831  |        |
|                       | Mun, Ind, S-E, & Min Needs   |  | 127,830   |   |   |  |  |  |        |
|                       | Irrigation Needs   |  | 22,575  |   |   |  |  | 17,368   |        |
| Water Mar             | nagement Strategies (acft/yr)  | Candidate  |   |   |   |  |  |  |        |
| ID#                   | Description  | New Supply   | 2000*   | 2010  | 2020  | 2030   | 2040                                       | 2050   | Notes  |
|                       | Demand Reduction (Conservation)  |  | 33,528  | 42,509  | 41,210  | 38,533   | 38,834                                     | 40,934   |        |
| L-15                  | Edwards Impation Transfers   | 81,000   | 50,000  | 55,000  | 60,000  | 65,000   |  | 71,300   | 2, 3   |
| L-18a                 | Edwards Recharge - Type 2 Projects   | 21,577   | 13,451  | 21,577  | 21,577  | 21,577   | 21,577                                     | 21,577   |        |
| G-30                  | Guadalupe River Diversion to Recharge Zone   | 3,902  | 3,902   | 3,902   | 3,902   | 3,902  | 3,902                                      | 3,902  | - 4    |
| S-13B                 | Medina Lake - Recharge Enhancement   | 8,136  | 8,138   | 8,136   | 8,136   | 8,136  | 8,136                                      | 8,138  | 4      |
|                       | Recirculation Systems  |  |   | 193,465   | 193,465   | 193,465  | 193,465                                    | 193,465  | 5      |
|                       | SAWS Recycled Water Program  |  |   | 19,826  | 26,737  | 35,824   | 43,561                                     | 52,215   | 6,7    |
| SCTN-3c               | Simsboro Aquifer   | 55,000   | 55,000  | 55,000  | 55,000  | 55,000   | 55,000                                     | 55,000   | 8      |
| L-10 (lm.)            | Transfer of Conserved Irrigation Water   | 30,531   | 30,531  | 30,531  | 30,531  | 30,531   | 30,531                                     | 30,531   | 10     |
| SCTN-1a               | SAWS ASR   |  |   |   |   |  |  |  |        |
| SCTN-4                | Brush Management   |  |   |   |   |  |  |  | 9      |
| SCTN-5                | Weather Modification   |  |   |   |   |  |  |  | 9      |
| SCTN-9                | Rainwater Harvesting   |  |   |   |   |  |  |  |        |
|                       | Small Aquifer Recharge Dams  |  |   |   |   |  |  |  | 8      |
| L-10 (lrr.)           | Demand Reduction (Conservation)  |  |   |   |   |  |  |  | 10     |
|                       | Total New Supplies   |  | 194,548   | 429,948   | 440,558   | 449,968  | 465,006                                    | 477,060  |        |
|                       | Total System Mgmt. Supply / Deficit  |  | 44,143  |   |   |  | 120,584                                    | 92,229   |        |
| Mun, Ind, S           | -E, & Min System Mgmt. Supply / Deficit  |  | 68,718  |   |   |  |  | 109,597  | 11     |
|                       | Irrigation System Mgmt. Supply / Deficit   |  | -22,575   | -20,374   | -19,585   | -19,015  | -18,385                                    | -17,368  |        |
| Notes:                |  |  |   |   |   |  |  |  |        |
| •                     | Candidate New Supplies shown for year 2000 are   | identified for pr  | iority impler   | nentation, t  | out will not b  | oe available   | immediate                                  | ly.  |        |
| 1                     | Demand Reduction (Conservation) strategies assi  |  |   |   |   |  |  |  |        |
| 2                     | Candidate New Supply to be shared among Uvalo  | le, Medina, Atas   | cosa, and f   | Bexar Coun  | itles. Suppl  | y may not l  | be reliable li                             | n drought.                                       |        |
| 3                     | Pursuant to draft EAA Critical Period Managemen  |  |   |   |   |  |  |  |        |
|                       | the estimated maximum potential annual transfer  | (95,430 acft) ba   | sed on Prop   | osed Perm   | rils prorated   | l to 400,000   | Dacflyr.                                   |  |        |
|                       | Supply values shown for this option are based on   |  | chnical eval  | uations. O  | <u>ption was si</u>   | mulated in   | combination                                | n with   |        |
| 4                     |  |  |   | i   |   |  |  |  |        |
|                       | Recirculation Systems for alternative plan evaluati  | ons.   |   |   |   |  |  |  |        |
| 5                     | The basis of this alternative plan is to meet the pro-   | ected needs o  |   |   |   | recirculatio   | n projects.                                | ine  |        |
| 5                     | The basis of this alternative plan is to meet the pro-<br>Recirculation Systems were simulated in combina  | pjected needs or<br>tion with Option   | s L-18a, G-   | 30, and S-1   | 38.   |  |  | ine  |        |
| 5                     | The basis of this alternative plan is to meet the pro<br>Recirculation Systems were simulated in combina<br>Current SAWS Recycled Water Program is include   | pjected needs of<br>tion with Option<br>and in the 24,941  | s L-18a, G-   | 30, and S-1<br>rsumplive r  | euse) in esi  | limated nee  | rds.                                       |  |        |
| 5<br>6<br>7           | The basis of this alternative plan is to meet the pro-<br>Recirculation Systems were simulated in combina<br>Current SAWS Recycled Water Program is including<br>Future use of recycled water for non-potable uses   | pjected needs of<br>tion with Option<br>and in the 24,941  | s L-18a, G-   | 30, and S-1<br>rsumplive r  | euse) in esi  | limated nee  | rds.                                       |  |        |
| 5<br>6<br>7<br>8      | The basis of this alternative plan is to meet the pro-<br>Recirculation Systems were simulated in combina<br>Current SAWS Recycled Water Program is includ-<br>Future use of recycled water for non-potable uses<br>Effects on regional aquifer levels to be quantified.   | pjected needs o<br>tion with Option<br>ed in the 24,941<br>and based on o  | s L-18a, G-<br>activyr (cor<br>poal of meet                                 | 30, end S-1<br>sumplive r<br>ling 20 perc                               | 3B.<br>euse) in est<br>ent of SAW                                     | limated nea<br>/S projected  | ds.<br>d water dem                         | and.   |        |
| 5<br>6<br>7<br>8<br>9 | The basis of this alternative plan is to meet the pro-<br>Recirculation Systems were simulated in combina<br>Current SAWS Recycled Water Program is includ-<br>Future use of recycled water for non-potable uses<br>Effects on regional aquifer levels to be quantified.<br>Option expected to provide additional water supply   | pjected needs o<br>tion with Option<br>ed in the 24,941<br>and based on c<br>y in many years   | s L-18a, G-<br>activyr (cor<br>goal of meet<br>but depen-                   | 30, and S-1 sumplive r ling 20 perc dable supp                          | 38.<br>euse) in est<br>cent of SAW                                    | limated nee<br>/S projected<br>j<br>ought is pre   | ds.<br>d water dem                         | and.   |        |
| 5<br>6<br>7<br>8      | The basis of this alternative plan is to meet the pro-<br>Recirculation Systems were simulated in combina<br>Current SAWS Recycled Water Program is includ-<br>Future use of recycled water for non-potable uses<br>Effects on regional aquifer levels to be quantified.<br>Option expected to provide additional water suppli-<br>Estimates based upon use of LEPA systems on 8 | pjected needs o<br>tion with Option<br>ed in the 24,941<br>and based on o<br>y in many years<br>o percent of acr   | s L-18a, G-<br>activyr (cor<br>poal of meet<br>but depen-<br>eages imga     | 30, and S-1 sumplive r ling 20 perc dable supplited in 1997             | 38.<br>euse) in esi<br>cent of SAW<br>by during dra<br>dry with conse | limated nas<br>/S projected<br>bought is pre   | ds.<br>d water dem<br>sently unqu          | and.<br>antified.                                | 9).    |
| 5<br>6<br>7<br>8<br>9 | The basis of this alternative plan is to meet the pro-<br>Recirculation Systems were simulated in combina<br>Current SAWS Recycled Water Program is includ-<br>Future use of recycled water for non-potable uses<br>Effects on regional aquifer levels to be quantified.<br>Option expected to provide additional water supply   | pjected needs on the pilon with Option with Option ed in the 24,941 and based on a pilon with the pilon with th | s L-18a, G-<br>act/yr (cor<br>pal of meet<br>but depen-<br>eages irrigation | 30, and S-1 sumplive r ling 20 perc dable supplited in 1997 n permitted | 38.<br>euse) in est<br>cent of SAW<br>ly during dra<br>, with conse   | ilmated nase/S projected S pro | ds. d water dem esently unqu 40 percent of | and.<br>antified.<br>If irrigation<br>bal pumpag | в).    |

# Recharge and Recirculation Alternative Regional Water Plan Caldwell County

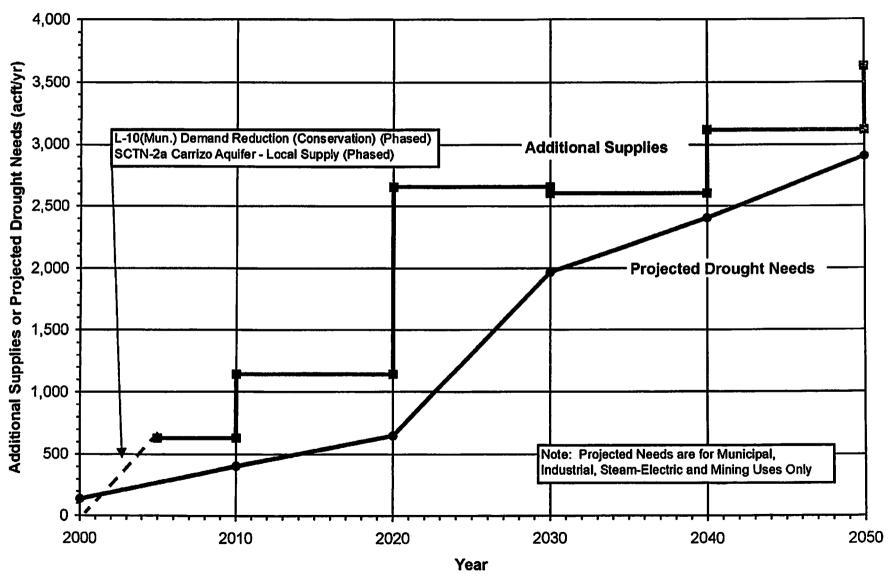


| South Ce    | entral Texas Region  |                       |                   |                 |                 |             |              | County =    | Caldwell    |
|-------------|--|-----------------------|-------------------|-----------------|-----------------|-------------|--------------|-------------|-------------|
| County St   | immary of Projected Water Needs (Shortages) a                    | nd Water Mana         | agement St        | rategies        |                 |             |              |             | up(s) = all |
|             |  |                       |                   |                 |                 |             |              |             |             |
| Projected   | Water Needs (acft/yr)  |                       |                   |                 |                 |             |              |             |             |
|             | User Group(s)  |                       | 2000              | 2010            | 2020            | 2030        | 2040         | 2050        | Notes       |
|             | Municipal  |                       | 0                 | 188             | 393             | 668         | 714          | 737         |             |
|             | Industrial   |                       | 0                 | 0               | 0               | 0           | 0            | 0           |             |
|             | Steam-Electric   |                       | 0                 | 0               | 0               | Ö           | 0            | 0           |             |
|             | Mining   |                       | 0                 | 0               | 0               | 0           | 0            | 0           |             |
|             | Irrigation   |                       | 0                 | 0               | 0               | 0           | 0            | 0           |             |
|             | Total Needs  |                       | 0                 | 188             | 393             | 668         | 714          | 737         |             |
|             | Mun, Ind, S-E, & Min Needs                                       |                       | 0                 | 188             | 393             | 668         | 714          | 737         |             |
|             | Irrigation Needs   |                       | 0                 | 0               | 0               | 0           | 0            | 0           |             |
|             |  |                       |                   |                 |                 | ·           |              |             |             |
| Water Mar   | nagement Strategies (acft/yr)                                    | Candidate             |                   |                 |                 |             |              |             |             |
| ID#         | Description  | New Supply            | 2000              | 2010            | 2020            | 2030        | 2040         | 2050        | Notes       |
| L-10 (Mun.) | Demand Reduction (Conservation)                                  |                       | 195               | 208             | 218             | 82          | 93           | 104         | 1           |
| G-21        | Lockhart Reservoir   |                       |                   | 6,048           | 6,048           | 6,048       | 6,048        | 6,048       | 2           |
|             |  |                       |                   |                 |                 |             |              |             |             |
|             |  |                       |                   |                 |                 |             |              |             |             |
|             |  |                       |                   |                 |                 | Į           |              | <del></del> |             |
|             |  |                       |                   |                 |                 |             |              |             |             |
| <u> </u>    | Conflict Var Dankara Danka                                       |                       |                   |                 |                 |             |              |             |             |
| 1000        | Small Aquifer Recharge Dams Demand Reduction (Conservation)      |                       |                   |                 |                 |             |              |             |             |
| L-10 (lm.)  | Demano Reduction (Conservation)                                  |                       |                   |                 |                 |             |              |             |             |
|             | <del></del>  |                       |                   |                 |                 |             |              |             |             |
| -           | Total New Supplies   |                       | 195               | 6,254           | 6,266           | 6,130       | 6,141        | 6,152       |             |
|             | Total New Supplies   |                       | 100               | 0,204           | 0,200           | 0,130       | 0,147        | 0,102       |             |
|             | Total System Mgmt. Supply / Deficit                              |                       | 195               | 6,086           | 5,873           | 5,462       | 5,427        | 5,415       |             |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply / Deficit               |                       | 195               | 6,066           | 5,873           | 5,462       | 5,427        | 5,415       |             |
|             | Irrigation System Mgmt. Supply / Deficit                         |                       | 193               | 0,000           | 3,613           | 0,462       | 0            | 0,413       | <del></del> |
|             | intigation System inginit. Supply / Delicit                      |                       | U U               | V <sub>I</sub>  | V)              | U           | - 01         | <u>_</u>    |             |
| Noton       |  |                       |                   |                 |                 |             |              |             |             |
| Notes:      | Damand Reduction (Conservation) strategies assumed largely r     | eflected in projected | l water deman     | ne l            | <del></del>     |             |              |             |             |
|             | Water supply for City of Lockhart and/or other users downstream  |                       | - 113(0) UG:11811 | <del></del>     |                 |             |              |             |             |
| 3           | Option expected to provide additional water supply in many year  |                       | nonly during d    | rought is prese | ntiv unquantifi | ed.         | <del>-</del> | ·           |             |
| <u> </u>    | Inhini avhence in highing againstial states sobbit in utalit sea | at an anhangana       |                   | H-11 10 P1001   | y wirdwellell   | <del></del> |              |             |             |

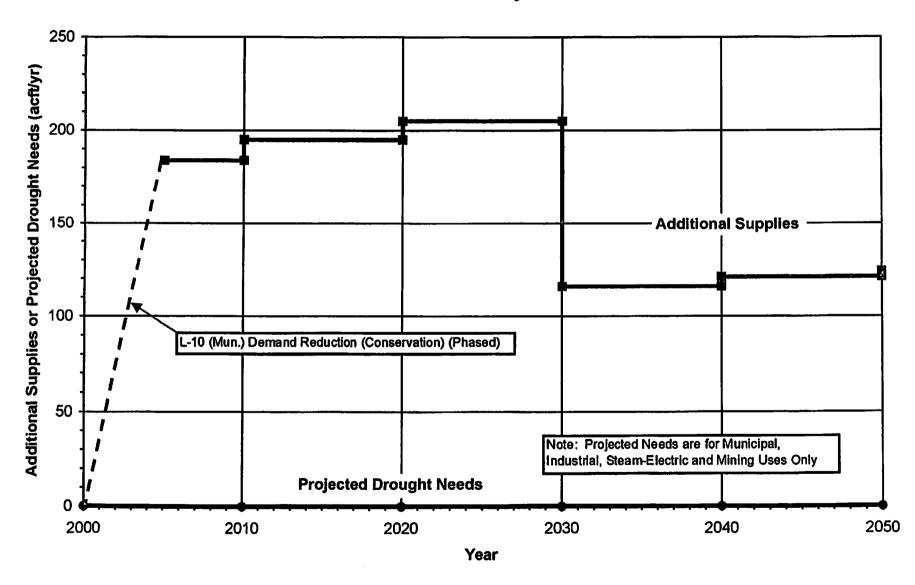
# Recharge and Recirculation Alternative Regional Water Plan Comal County



| South Ce     | entral Texas Region  |                       |                   |                 |                 |             |          | County   | = Comal     |
|--------------|--|-----------------------|-------------------|-----------------|-----------------|-------------|----------|----------|-------------|
| County St    | ummary of Projected Water Needs (Shortages)                      | and Water Ma          | nagement          | Strategies      |                 |             |          | User Gro | up(s) = all |
| Designate of | Mister Needs (softler)   |                       |                   |                 |                 |             |          |          |             |
| Projected    | Water Needs (acft/yr)  |                       | 2000              | 2010            | 2020            |             | 2040     | 0050     | - N-4       |
|              | User Group(s)  |                       |                   |                 |                 | 2030        | 2040     | 2050     | Notes       |
|              | Municipal  |                       | 2,289             | 5,049           | 10,487          | 18,282      | 25,205   | 33,082   |             |
|              | Industrial   |                       | 1,388             | 1,425           | 1,486           | 1,737       | 2,009    | 2,289    | <del></del> |
|              | Steam-Electric   | ··· · <del>-</del>    | 5,570             | 5,464           | 0<br>5,628      | 5,798       | 0        | 0 0004   |             |
| <del></del>  | Mining Irrigation  |                       | 30                | 5,404<br>14     | 5,028           | 5,785       | 3.590    | 2,224    |             |
|              | Total Needs  |                       |                   |                 |                 | 07.045      |          | 0        |             |
|              |  |                       | 9,277             | 11,952          | 17,601          | 25,815      | 30,804   | 37,575   |             |
|              | Mun, Ind, S-E, & Min Needs                                       |                       | 9,247             | 11,938          | 17,601          | 25,815      | 30,804   | 37,575   |             |
|              | Irrigation Needs   |                       | 30                | 14              | 0               | .0          | 0        | 0        |             |
| Water Ma     | nagement Strategies (acft/yr)                                    | Candidate             | }                 |                 |                 |             |          |          |             |
| ID#          | Description  | New Supply            | 2000*             | 2010            | 2020            | 2030        | 2040     | 2050     | Notes       |
| L-10 (Mun.)  | Demand Reduction (Conservation)                                  |                       | 616               | 718             | 848             | 718         | 824      | 942      | 110100      |
| G-15C        | Canyon Reservoir - River Diversion                               | 15,000                | 15,000            | 15,000          | 15,000          | 15,000      | 15,000   | 15,000   |             |
| CZ-10D       | Carrizo Aquifer - Gonzales & Bastrop                             | 90,000                |                   |                 | 3,500           | 12,000      | 16,500   | 23,000   | 3, 4, 5     |
|              |  |                       |                   |                 |                 |             | - 12/222 |          |             |
|              |  |                       |                   |                 |                 |             |          |          |             |
|              |  |                       |                   |                 |                 |             |          |          |             |
|              |  |                       |                   |                 |                 |             |          |          |             |
|              | Small Aquifer Recharge Dams                                      |                       |                   | i               |                 |             |          |          | 6           |
| L-10 (lrr.)  | Damand Reduction (Conservation)                                  |                       |                   |                 |                 |             |          |          |             |
|              |  |                       |                   |                 |                 |             |          |          |             |
|              |  |                       |                   |                 |                 |             |          |          |             |
|              | Total New Supplies   |                       | 15,616            | 15,718          | 19,348          | 27,718      | 32,324   | 38,942   |             |
| <u>-</u> .   | Table Out and Complete Deficial                                  |                       | 0.000             | 0.700           | 4 = 4=1         | 4 000       | 4 700    |          |             |
|              | Total System Mgmt. Supply / Deficit                              |                       | 6,339             | 3,766           | 1,747           | 1,903       | 1,520    | 1,367    |             |
|              | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit            |                       | 6,369             | 3,780           | 1,747           | 1,903       | 1,520    | 1,367    |             |
|              | Irrigation System Mgmt. Supply / Deficit                         |                       | -30               | -14             | 0               | 0           | 0        | 0        |             |
|              |  |                       |                   |                 |                 |             |          |          |             |
| Notes:       |  |                       |                   |                 |                 |             |          |          |             |
| •            | Candidate New Supplies shown for year 2000 are identified for    | r priority implements | ation, but will n | ot be available | immediately.    |             |          |          |             |
| 1            | Demand Reduction (Conservation) strategies assumed largely       |                       | ed water dema     | inds.           |                 |             |          |          |             |
| 2            | Portion of Canyon firm yield (with amendment) diverted below     | Seguin.               |                   |                 |                 |             |          |          |             |
| 3            | Candidate New Supply to be shared among Comal, Guadalup          | e, and Hays Countie   | es. Effects on    | regional aquif  | er levels to be | quantified. |          |          |             |
| 4            | Portion of 90,000 activyr available from northern Gonzales and   | southern Bastrop C    | Conuțies nudei    | CZ-10D.         |                 |             |          |          |             |
| 5            | Early Implementation of facilities assumed in cost estimation to | ensure sufficient s   | upply during d    | rought.         |                 | ive a       |          |          | [           |
| 6            | Option expected to provide additional water supply in many ye    | ars, but dependable   | supply during     | arought is pre  | isently unquan  | uned.       | 1        |          |             |

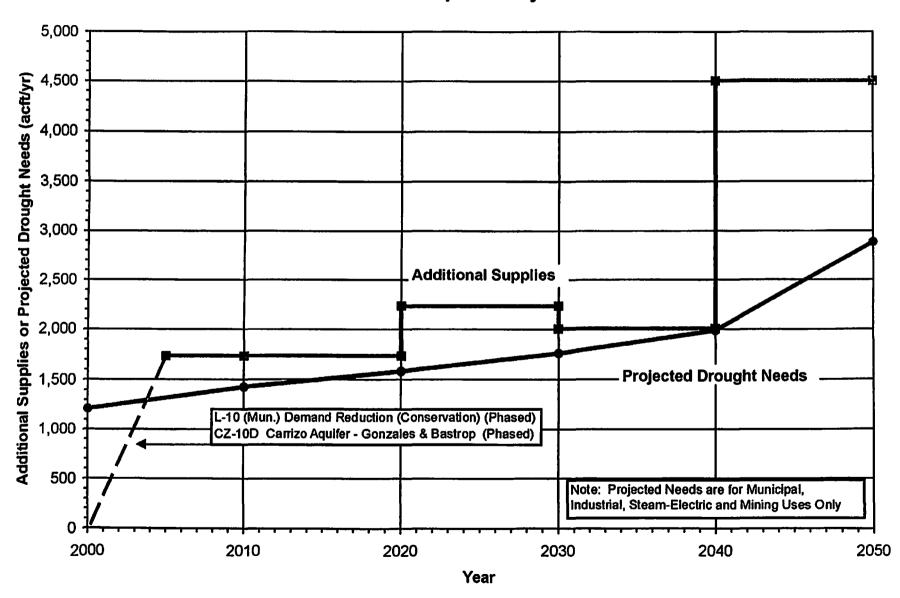


| South Ce    | entral Texas Region   |                       |                  |                |               |             |             | County:     | = Dimmi    |
|-------------|---|-----------------------|------------------|----------------|---------------|-------------|-------------|-------------|------------|
| County Si   | ummary of Projected Water Needs (Shortages                    | ) and Water M         | lanagemer        | t Strategie    | BS            |             |             | User Gro    | up(s) = al |
| Projected   | Water Needs (acft/yr)   |                       |                  |                |               | 1           |             |             |            |
| riojecieu   | User Group(s)   |                       | 2000             | 2010           | 2020          | 2030        | 2040        | 2050        | Notes      |
|             |   |                       | 138              | 405            |               |             |             |             | Notes      |
|             | Municipal Industrial  |                       | 138              | 405            | 649           | 1,054       | 1,479       | 1,959       |            |
|             | Steam-Electric  |                       | 0                | 0              | - 0           | 0           | 0           | 0           |            |
| <del></del> | Mining  |                       | 0                |                | <del></del>   | 915         | 925         | 949         |            |
|             | Irrigation  |                       | 0                | <del>   </del> |               | 2,133       | 1,737       | 1.331       |            |
|             | Total Needs   |                       | 138              | 405            | 649           |             |             |             |            |
|             |   |                       |                  |                |               | 4,102       | 4,141       | 4,239       |            |
| <del></del> | Mun, Ind, S-E, & Min Needs                                    |                       | 138              | 405            | 649           | 1,969       | 2,404       | 2,908       |            |
|             | Irrigation Needs  |                       | 0                | 0              | 0             | 2,133       | 1,737       | 1,331       |            |
|             |   |                       |                  |                |               |             | <u> </u>    |             |            |
|             | nagement Strategles (acft/yr)                                 | Candidate             |                  |                | l             |             |             |             |            |
| ID#         | Description   | New Supply            | 2000°            | 2010           | 2020          | 2030        | 2040        | 2050        | Notes      |
| L-10 (Mun.) | Demand Reduction (Conservation)                               |                       | 131              | 144            | 156           | 104         | 118         | 133         |            |
| CTN-2a      | Carrizo Aquifer - Local Supply                                |                       | 500              | 1,000          | 1,000         | 2,500       | 3,000       | 3,500       | 2,         |
|             |   |                       |                  | 1              |               |             |             |             |            |
|             |   |                       |                  |                |               |             |             |             |            |
|             |   |                       |                  |                |               |             |             |             |            |
|             |   |                       |                  |                |               |             |             |             |            |
|             |   |                       |                  |                |               |             |             |             |            |
| SCTN-4      | Brush Management  |                       |                  |                |               |             |             |             |            |
| SCTN-5      | Weather Modification  |                       |                  |                |               |             |             |             |            |
| SCTN-9      | Rainwater Harvesting  |                       |                  |                |               |             |             |             |            |
|             | Small Aquifer Recharge Dams                                   |                       |                  |                |               |             |             |             |            |
| L-10 (lrr.) | Demand Reduction (Conservation)                               |                       |                  |                | 1             |             |             |             |            |
|             | Total New Supplies  |                       | 631              | 1,144          | 1,156         | 2,604       | 3,118       | 3,633       |            |
|             |   |                       |                  |                |               |             |             |             |            |
|             | Total System Mgmt. Supply / Deficit                           |                       | 493              | 739            | 507           | -1,498      | -1,023      | -606        |            |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /                    |                       | 493              | 739            | 507           | 635         | 714         | 725         |            |
|             | Deficit   |                       |                  |                | •••           | 350         | '''         | 725         |            |
|             | Irrigation System Mgmt. Supply / Deficit                      |                       | 0                | 0              | 0             | -2,133      | -1,737      | -1,331      |            |
|             | migation system maint supply? Dencit                          |                       | 01               | <u> </u>       | <u> </u>      | -2,100      | -1,131      | -1,331      |            |
| Notes:      |   |                       | 1                |                |               |             |             |             |            |
| •           | Candidate New Supplies shown for year 2000 are identified     | or priority impleme   | ntation, but wil | not be availa  | bie immediate | Iv.         | <del></del> | <u>-</u>    |            |
| 1           | Demand Reduction (Conservation) strategies assumed large      | ly reflected in prois | cted water der   | nands.         |               | ·           |             |             |            |
| <u>.</u>    | Additional well(s) for Carrizo Springs and Mining supply.     | ,                     | 1                |                |               |             |             | <del></del> |            |
| 3           | Early Implementation of facilities assumed in cost estimation | to ensure sufficient  | supply during    | drought.       | <del></del>   | <del></del> | <del></del> |             |            |
|             | Option expected to provide additional water supply in many y  |                       |                  |                |               | - 10        | <del></del> |             |            |



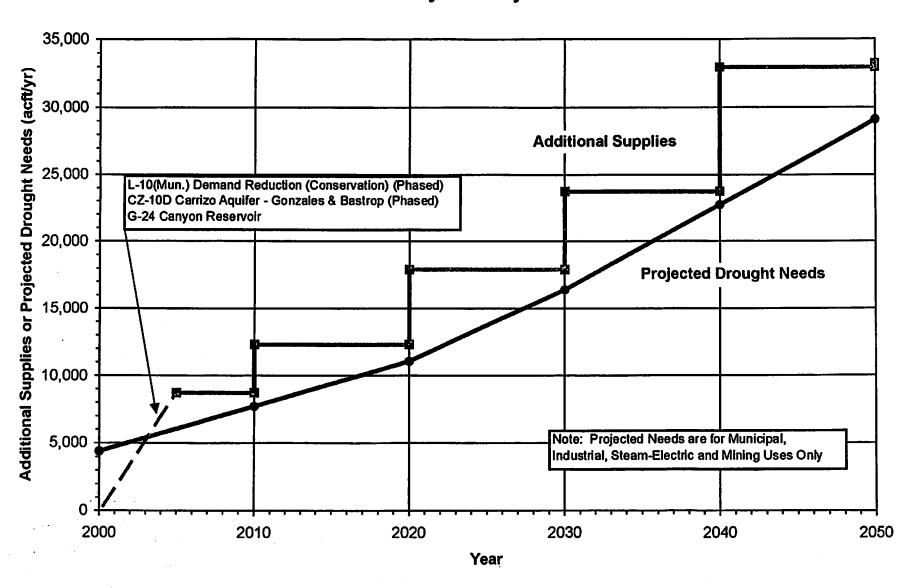
| South Ce    | entral Texas Region   |                      |                 |                 | -             |          |         | Cour     | ty = Frio   |
|-------------|---|----------------------|-----------------|-----------------|---------------|----------|---------|----------|-------------|
| County Su   | ummary of Projected Water Needs (Shortages)                   | and Water Ma         | nagement        | Strategies      |               |          |         | User Gro | up(s) ≈ all |
| Projected   | Water Needs (acft/yr)   |                      |                 |                 |               |          |         |          |             |
| i rojecteu  | User Group(s)   |                      | 2000            | 2010            | 2020          | 2030     | 2040    | 2050     | Notes       |
|             | Municipal   |                      | 0               |                 | 0             | ō        | 0       |          |             |
|             | Industrial  | -                    | ŏ               |                 | <u>ö</u>      | Ö        | Ö       | 0        |             |
|             | Steam-Electric  |                      | Ō               | Ö               | 0             | Ö        | ŏ       | ŏ        |             |
|             | Mining  |                      | 0               | 0               | 0             | Ö        | 0       | ŏ        |             |
|             | Irrigation  |                      | 71,128          | 67,646          | 64,365        | 76,505   | 73,519  | 70,662   |             |
|             | Total Needs   |                      | 71,126          | 67,646          | 64,365        | 76,505   | 73,519  | 70,662   |             |
|             | Mun, Ind, S-E, & Min Needs                                    |                      | 0               |                 | 0             | 0        | 0       |          |             |
|             | Irrigation Needs  |                      | 71,126          | 67,646          | 64,365        | 76,505   | 73,519  | 70,662   |             |
|             | 111844011110000   |                      | 11,120          | 5. 15 15        | 2-1,000       | 10,000   | 70,010  | 70,002   |             |
| Motor Ma    | nagement Strategies (acft/yr)                                 | Candidate            |                 |                 | _             |          |         |          |             |
|             |   |                      | 2000            | 2010            | 2020          | 2030     |         | 0000     |             |
| ID#         | Description   | New Supply           |                 |                 |               |          | 2040    | 2050     | Notes       |
| L-10 (Mun.) | Demand Reduction (Conservation)                               |                      | 184             | 195             | 205           | 116      | 121     | 124      | 1           |
|             |   |                      |                 |                 |               |          |         |          |             |
|             |   |                      |                 |                 |               |          |         |          |             |
| <del></del> |   |                      |                 |                 |               |          |         |          |             |
|             |   |                      |                 | <del></del>     |               |          |         |          | <del></del> |
|             |   |                      |                 | <del>  </del>   | <del>-</del>  |          |         |          |             |
| SCTN-4      | Brush Management  |                      |                 | <del> </del>    |               |          |         |          |             |
| SCTN-5      | Weather Modification  |                      |                 |                 |               |          |         |          |             |
| SCTN-9      | Rainwater Harvesting  |                      |                 |                 |               |          |         |          |             |
| 301143      | Small Aquifer Recharge Dams                                   |                      |                 |                 |               |          | ~       |          |             |
| L-10 (ln.)  | Demand Reduction (Conservation)                               |                      | 5,947           | 5,947           | 5,947         | 5,947    | 5,947   | 5,947    |             |
| L-10 (M.)   | Total New Supplies  |                      | 6,131           |                 | 6,152         | 6,063    | 6,068   | 6,071    |             |
|             | Total New Supplies  |                      | 0,131           | 0,172           | _0,132        | 0,003    | 0,000   | 0,07 1   |             |
|             | Total Quaters Mant Quanty / Deficit                           |                      | 64 005          | 64 604          | E0 242        | 70 442   | 07.454  | 04.504   |             |
|             | Total System Mgmt. Supply / Deficit                           |                      | -64,995         |                 | -58,213       | -70,442  | -67,451 | -64,591  |             |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /                    |                      | 184             | 195             | 205           | 116      | 121     | 124      |             |
|             | Deficit   |                      | 95.455          |                 |               |          |         |          |             |
|             | Irrigation System Mgmt. Supply / Deficit                      |                      | -65,179         | -61,699         | -58,418       | -70,558  | -67,572 | -64,715  | ]           |
|             |   |                      |                 |                 |               |          |         |          |             |
| Notes:      |   |                      | L               | L               |               |          |         |          |             |
| 1           | Demand Reduction (Conservation) strategies assumed largely    | reflected in project | ied water dem   | ands.           |               |          |         |          |             |
| 2           | Option expected to provide additional water supply in many ye | are, but dependabl   | e supply during | d acondui is bu | sently unqua  | ntified. |         |          |             |
| 3           | Estimates based upon use of LEPA systems on 50 percent of     | acreages impated i   | n 1997, with c  | onservation at  | 20 percent of | imgation |         |          |             |
|             | epplication rate.   |                      |                 |                 |               |          |         |          |             |

# Recharge and Recirculation Alternative Regional Water Plan Guadalupe County



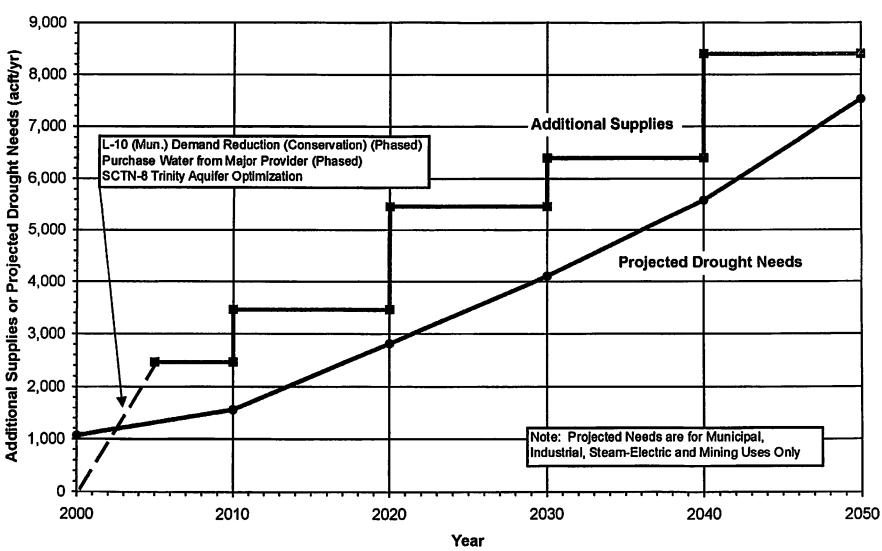
| South Ce     | entral Texas Region  |                      |                  |                  |                     |            | Co          | unty = Gı |             |
|--------------|--|----------------------|------------------|------------------|---------------------|------------|-------------|-----------|-------------|
| County Su    | ummary of Projected Water Needs (Shortages)                      | and Water Ma         | nagement         | Strategies       |                     |            |             | User Grou | ıp(s) = all |
| Projected    | Water Needs (acft/yr)  |                      |                  |                  |                     |            |             |           |             |
| <del>-</del> | User Group(s)  |                      | 2000             | 2010             | 2020                | 2030       | 2040        | 2050      | Notes       |
|              | Municipal  |                      | 29               | 23               | 30                  | 71         | 87          | 773       |             |
|              | Industrial   |                      | 985              | 1,204            | 1,350               | 1,487      | 1,692       | 1,899     | <del></del> |
|              | Steam-Electric   |                      | 0                | 0                | 0                   | Ō          | 0           | 0         |             |
|              | Mining   |                      | 196              | 198              | 200                 | 202        | 207         | 213       |             |
|              | Irrigation   |                      | 985              | 879              | 779                 | 684        | 594         | 508       |             |
|              | Total Needs  |                      | 2,195            | 2,304            | 2,359               | 2,444      | 2,580       | 3,393     |             |
|              | Mun, Ind, S-E, & Min Needs                                       |                      | 1,210            | 1,425            | 1,580               | 1,760      | 1,986       | 2,885     |             |
|              | Irrigation Needs   | ··                   | 985              | 879              | 779                 | 684        | 594         | 508       |             |
|              | 1118841011110000   |                      | 000              |                  | 170                 | 004        | - 004       | 000       |             |
|              | nagement Strategies (acft/yr)                                    | Candidate            |                  |                  |                     |            |             |           |             |
| ID#          | Description  | New Supply           | 2000*            | 2010             | 2020                | 2030       | 2040        | 2050      | Notes       |
| L-10 (Mun.)  | Demand Reduction (Conservation)                                  |                      | 235              | 236              | 236                 | 5          | 5           | 6         | 1           |
| CZ-10D       | Carrizo Aquifer - Gonzales & Bastrop                             | 90,000               | 1,500            | 1,500            | 2,000               | 2,000      | 2,500       | 4,500     | 2, 3, 4     |
|              |  |                      |                  |                  |                     |            |             |           |             |
|              |  |                      |                  |                  |                     |            |             |           |             |
|              |  |                      |                  |                  |                     |            |             |           |             |
|              |  |                      |                  |                  |                     |            |             |           |             |
|              |  |                      |                  |                  |                     |            |             |           |             |
|              | Small Aquifer Recharge Dams                                      |                      |                  |                  |                     |            |             |           | 5           |
| L-10 (lrr.)  | Demand Reduction (Conservation)                                  |                      |                  |                  | 1                   |            |             |           |             |
|              |  |                      |                  |                  |                     |            |             |           |             |
|              |  |                      |                  |                  |                     | ľ          |             |           |             |
|              | Total New Supplies   |                      | 1,735            | 1,736            | 2,236               | 2,005      | 2,505       | 4,508     |             |
|              |  |                      |                  |                  |                     |            |             |           |             |
|              | Total System Mgmt. Supply / Deficit                              |                      | -460             | -568             | -123                | -439       | -75         | 1,113     |             |
|              | Mun, Ind, S-E, & Min System Mgmt. Supply /                       |                      | 525              | 311              | 656                 | 245        | 519         | 1,621     |             |
|              | Deficit  |                      |                  | ا'''             |                     |            | ١٠٠٠        | .,02.     |             |
| }            | Irrigation System Mgmt. Supply / Deficit                         |                      | -985             | -879             | -779                | -684       | -594        | -508      |             |
|              | irrigation System mynnt Supply / Deficit                         |                      | -900             | -013             | -119                | -004       | -034        | •506      |             |
| Notes:       |  |                      |                  |                  |                     |            |             |           |             |
| MOIS:        | Candidate New Supplies shown for year 2000 are identified for    | nrinrity implement   | ation but will a | not he avallable | Immediately         |            |             |           |             |
| 1            | Demand Reduction (Conservation) strategies assumed largely       |                      |                  |                  | , плинославну.<br>Т |            |             |           |             |
| 1            | Candidate New Supply to be shared among Comal, Guadalup          | and Havs Country     | es Filecte on    | regional acuif   | er levels to be     | ouantified |             |           |             |
| 2            | Portion of 90,000 activer available from northern Gonzales and   | southern Basima      | Counties unde    | r C7-10D         | J. 131013 to 08     | quaninos.  | <del></del> |           |             |
| <u> </u>     | Early implementation of facilities assumed in cost estimation to | ensure sufficient s  | unniv durino d   | rought           | <del>-</del>        |            |             |           |             |
| 5            | Option expected to provide additional water supply in many ye    | ars, but dependable  | supply during    | drought is on    | sentiv unovan       | tified     | <del></del> |           |             |
| <del></del>  | Tohing avhacian in higher anguinner seres subbit in ment to      | aral ani anharingoni | - cabbit aniiil  | ought to but     | owing andnou        |            |             |           |             |

# Recharge and Recirculation Alternative Regional Water Plan Hays County

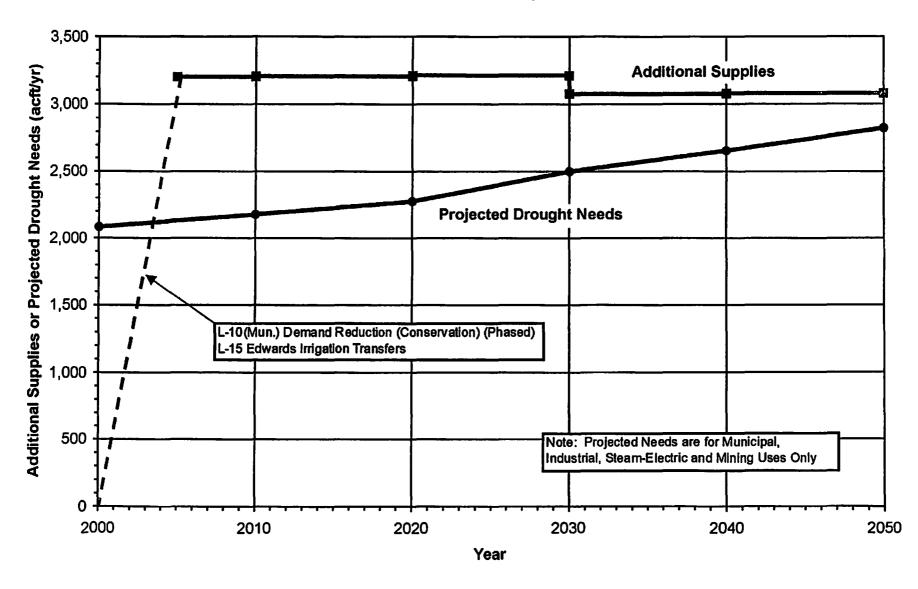


| South Ce    | entral Texas Region  |                       |                   |                 |                |             |              | Count       | y = Hays |
|-------------|--|-----------------------|-------------------|-----------------|----------------|-------------|--------------|-------------|----------|
| County Si   | ummary of Projected Water Needs (Shortages)                      | and Water Mar         | nagement          | Strategies      |                |             |              | User Gro    |          |
|             |  |                       |                   |                 |                |             |              |             |          |
| Projected   | Water Needs (acft/yr)  |                       |                   |                 |                |             |              |             |          |
|             | User Group(s)  |                       | 2000              | 2010            | 2020           | 2030        | 2040         | 2050        | Notes    |
|             | Municipal  |                       | 4,325             | 7,609           | 10,980         | 16,349      | 22,698       | 29,059      |          |
|             | Industrial   |                       | 0                 | 0               | 0              | 0           | 0            | 0           |          |
|             | Steam-Electric   |                       | 0                 | 0               | 0              | 0           | 0            | 0           |          |
|             | Mining   |                       | 84                | 82              | 68             | 55          | 37           | 28          | _        |
|             | Irrigation   |                       | 0                 | 0               | 0              | 0           | 0            | 0           |          |
|             | Total Needs  |                       | 4,409             | 7,691           | 11,048         | 16,404      | 22,733       | 29,087      |          |
|             | Mun, Ind, S-E, & Min Needs                                       |                       | 4,409             | 7,691           | 11,048         | 16,404      | 22,733       | 29,087      |          |
|             | Irrigation Needs   |                       | 0                 | O               | 0              | 0           | 0            | 0           |          |
|             | 11118  |                       |                   |                 |                | •           | -            |             | -        |
| Water Mai   | nagement Strategies (acft/yr)                                    | Candidate             |                   |                 |                |             |              | Ī           |          |
| ID#         | Description  | New Supply            | 2000*             | 2010            | 2020           | 2030        | 2040         | 2050        | Notes    |
| L-10 (Mun.) | Demand Reduction (Conservation)                                  |                       | 647               | 747             | 873            | 699         | 906          | 1,174       | -110100  |
| CZ-10D      | Carrizo Aquiler - Gonzales & Bastrop                             | 90,000                | 4,000             | 7,000           | 10,500         | 16,000      | 22,000       | 31,000      | 2, 3, 4  |
| G-24        | Canyon Reservoir   | 1,048                 | 1,048             | 1,048           | 1,048          | 1,048       | 1,048        | 1,048       | 2, 3, 4  |
| G-24        | Cenyon Nosorvon  | 1,040                 | 1,040             |                 | 1,040          | 1,040       | 1,040        | 1,040       |          |
|             |  |                       |                   |                 |                |             |              |             |          |
|             |  |                       |                   |                 |                |             |              | <del></del> |          |
|             |  |                       |                   |                 |                |             |              |             |          |
|             | Small Aquifer Recharge Dams                                      |                       |                   |                 |                |             |              |             |          |
| L-10 (lrr.) | Demand Reduction (Conservation)                                  |                       |                   |                 |                |             | <del>-</del> |             |          |
| L-10 (III.) | Scriping (Vedecues) (Serios Vedecus)                             |                       |                   | i               |                |             |              |             |          |
|             |  |                       |                   |                 |                |             |              |             | _        |
|             | Total New Supplies   |                       | 5,695             | 8,795           | 12,421         | 17,747      | 23,954       | 33,222      |          |
| -           | Total Gundani Harrid Gunda I Deficial                            |                       | 4 000             | 4.404           | 4 070          | 4 040       | 4.004        | 4.400       |          |
|             | Total System Mgmt. Supply / Deficit                              |                       | 1,286             | 1,104           | 1,373          | 1,343       | 1,221        | 4,135       |          |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit            |                       | 1,286             | 1,104           | 1,373          | 1,343       | 1,221        | 4,135       |          |
|             | Irrigation System Mgmt. Supply / Deficit                         |                       | 0                 | 0               | 0              | 0           | 0            | 0           |          |
|             |  |                       |                   |                 |                |             |              |             |          |
| Notes:      |  |                       |                   |                 |                |             |              |             |          |
| •           | Candidate New Supplies shown for year 2000 are identified for    | r priority implements | ation, but will n | ot be available | immediately.   |             |              |             |          |
| 1           | Demand Reduction (Conservation) strategies assumed largely       | reflected in projecte | ed water dema     | ends.           |                |             |              |             |          |
| 2           | Candidate New Supply to be shared among Comal, Guadalup          | e, and Hays Countie   | s. Ellects on     | regional aquife | r levels to be | quantified. |              |             |          |
| 3           | Portion of 90,000 acft/yr available from northern Gonzales and   | southern Bastrop C    | counties under    | CZ-10D.         |                |             |              |             |          |
| 4           | Early implementation of facilities assumed in cost estimation to | ensure sufficient si  | upply during d    | rought.         |                |             |              |             |          |
| 5           | Candidate New Supply for Wimberley and Woodcreek.                |                       |                   |                 |                |             |              |             |          |
| 6           | Option expected to provide additional water supply in many ye    | ars, but dependable   | supply during     | drought is pre  | sently unquan  | tified.     |              |             |          |

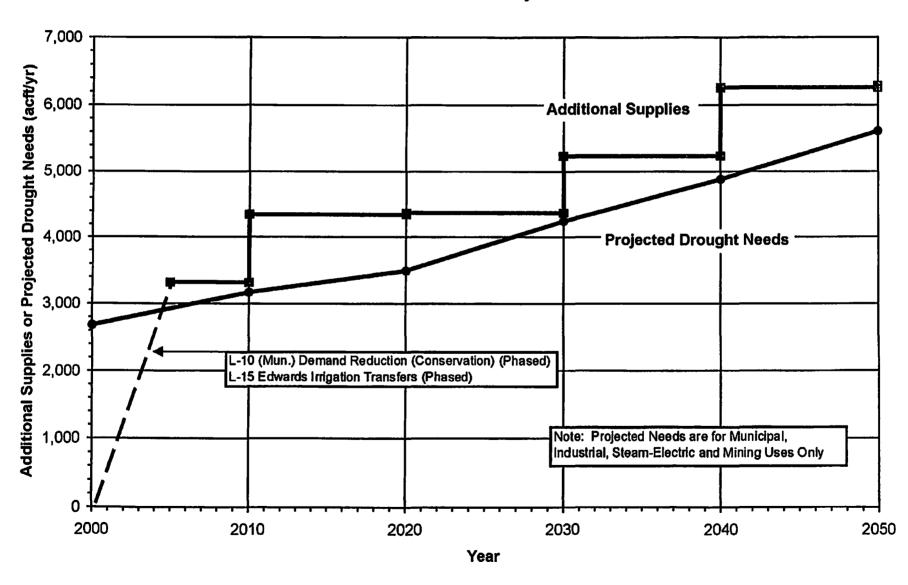
6-28



| South Ce         | entral Texas Region   |                       |                 |                  |                | ·     |       | County = | Kendall |
|------------------|---|-----------------------|-----------------|------------------|----------------|-------|-------|----------|---------|
| County St        | ummary of Projected Water Needs (Shortages                    | ) and Water M         | anagemer        | nt Strategi      | es             |       |       | User Gro |         |
|                  |   |                       |                 |                  |                |       |       |          |         |
| <b>Projected</b> | Water Needs (acft/yr)   |                       |                 |                  |                |       |       |          |         |
|                  | User Group(s)   |                       | 2000            | 2010             | 2020           | 2030  | 2040  | 2050     | Notes   |
|                  | Municipal   |                       | 1,070           | 1,580            | 2,808          | 4,099 | 5,578 | 7,518    |         |
|                  | Industrial  |                       | 2               | 3                | 4              | 4     | 5     | 6        |         |
|                  | Steam-Electric  |                       | 0               | 0                | 0              | 0     | 0     | 0        |         |
|                  | Mining  |                       | 0               | 0                | 0              | 0     | 0     | 0        |         |
|                  | Irrigation  |                       | 0               | 0                | Ö              | 0     |       | 0        |         |
|                  | Total Needs   |                       | 1,072           | 1,563            | 2,812          | 4,103 | 5,583 | 7,524    |         |
|                  | Mun, Ind, S-E, & Min Needs                                    |                       | 1,072           | 1,563            | 2,812          | 4,103 | 5,583 | 7,524    |         |
|                  | Irrigation Needs  |                       | 0               | 0                | 0              | 0     | 0,000 | 7,524    |         |
|                  | ungation reces  |                       |                 | 0                | V              |       |       |          |         |
| Water Ma         | nagement Strategies (acft/yr)                                 | Candidate             |                 |                  |                |       |       |          |         |
| ID#              | Description   | New Supply            | 2000*           | 2010             | 2020           | 2030  | 2040  | 2050     | Notes   |
| L-10 (Mun.)      | Demand Reduction (Conservation)                               |                       | 67              | 71               | 71             | 11    | 11    | 11       | 1       |
|                  | Purchase Water from Major Provider                            |                       | 2,000           | 2,000            | 3,000          | 5,000 | 6,000 | 8,000    | 2, 3    |
| SCTN-8           | Trinity Aquifer Optimization                                  | 390                   | 390             | 390              | 390            | 390   | 390   | 390      |         |
|                  |   |                       |                 |                  |                |       |       |          |         |
| SCTN-4           | Brush Management  |                       |                 |                  |                |       |       |          | 4       |
| SCTN-5           | Weather Modification  |                       |                 |                  |                |       |       |          | 4       |
| SCTN-9           | Rainwater Harvesting  |                       |                 |                  |                |       |       |          | 4       |
|                  | Small Aquifer Recharge Dams                                   |                       |                 |                  |                |       | _     |          | 4       |
| L-10 (lrr.)      | Demand Reduction (Conservation)                               |                       |                 |                  |                |       |       |          |         |
|                  | Total New Supplies  |                       | 2,457           | 2,461            | 3,461          | 5,401 | 6,401 | 8,401    |         |
|                  | Total System Mgmt. Supply / Deficit                           |                       | 1,385           | 898              | 649            | 1,298 | 818   | 877      |         |
|                  | Mun, Ind, S-E, & Min System Mgmt. Supply /                    |                       | 1,385           |                  | 649            | 1,298 | 818   | 877      |         |
|                  | Deficit   |                       | 1,505           | 050              | 043            | 1,230 |       | 077      |         |
|                  | Irrigation System Mgmt. Supply / Deficit                      |                       | 0               | 0                | Õ              | 0     | 0     | 0        |         |
| Notes:           |   |                       |                 |                  |                |       |       |          |         |
| •                | Candidate New Supplies shown for year 2000 are identified f   | or priority implemen  | ntation, but wi | ll not be availa | ble immediate  | ely.  |       |          |         |
| 1                | Demand Reduction (Conservation) strategies assumed large      | ly reflected in proje | cted water de   | mands.           |                |       |       |          |         |
| 2                | Assumed purchase from Bexar County major provider. Kend       | lall County water no  | eds are not n   | eflected in Bex  | car County tab | le.   |       |          |         |
| 3                | Early implementation of facilities assumed in cost estimation | to ensure sufficient  | supply during   | drought.         |                |       |       |          |         |
|                  |   | ears, but dependat    |                 |                  |                |       |       |          |         |

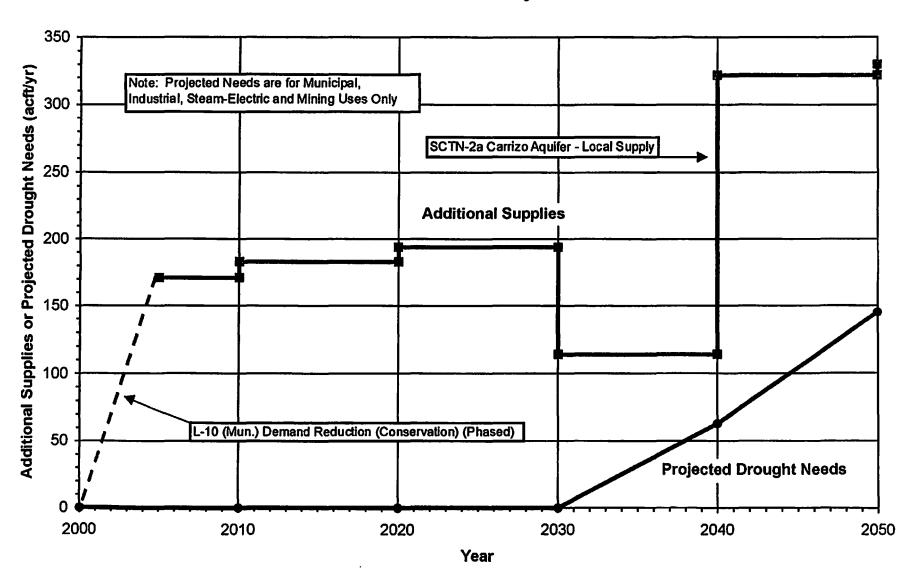


| South Ce      | entral Texas Region  |                        |                  |                                       |                   |              |                | County =    | = Medina    |
|---------------|--|------------------------|------------------|---------------------------------------|-------------------|--------------|----------------|-------------|-------------|
| County Su     | ımmary of Projected Water Needs (Shortages)                      | and Water Mar          | nagement         | Strategies                            |                   |              |                | User Gro    |             |
| Projected     | Water Needs (acft/yr)  |                        |                  |                                       |                   |              |                |             |             |
| riojecieu     | User Group(s)  |                        | 2000             | 2010                                  | 2020              | 2030         | 2040           | 2050        | Notes       |
|               |  |                        |                  |                                       |                   |              |                |             | Mofez       |
|               | Municipal  |                        | 2,015            | 2,110                                 | 2,208             | 2,427<br>0   | 2,582          | 2,750       |             |
|               | Industrial<br>Steam-Electric                                     |                        |                  | <del></del>                           | 0                 | Ö            | - 0            | 0           |             |
|               | Mining   |                        | 68               | 68                                    | 70                | 72           | 74             | 76          | <del></del> |
|               | Irrigation   |                        | 98,916           | 95,268                                | 91,320            | 92,320       | 88,925         | 84,692      |             |
|               | Total Needs  |                        | 100,999          | 97,446                                | 93,596            | 94,819       | 91,581         |             |             |
|               |  |                        |                  |                                       |                   |              |                | 87,518      |             |
|               | Mun, Ind, S-E, & Min Needs                                       |                        | 2,083            | 2,178                                 | 2,276             | 2,499        | 2,656          | 2,826       |             |
|               | Irrigation Needs   |                        | 98,916           | 95,268                                | 91,320            | 92,320       | 88,925         | 84,692      |             |
| Water Mar     | nagement Strategies (acft/yr)                                    | Candidate              |                  |                                       | _                 |              | -              | _           |             |
| ID#           | Description  | New Supply             | 2000°            | 2010                                  | 2020              | 2030         | 2040           | 2050        | Notes       |
| L-10 (Mun.)   | Demand Reduction (Conservation)                                  |                        | 200              | 205                                   | 211               | 73           | 76             | 78          | 1           |
| L-15 (M.C.I.) | Edwards Irrigation Transfers                                     | 81,000                 | 3,000            | 3,000                                 | 3,000             | 3,000        | 3.000          | 3,000       | 2. 3        |
|               |  |                        |                  | · · · · · · · · · · · · · · · · · · · |                   |              |                |             |             |
|               |  |                        |                  |                                       |                   |              | ·              |             |             |
|               |  |                        |                  |                                       |                   |              |                |             |             |
|               |  |                        |                  |                                       |                   |              |                |             |             |
|               |  |                        |                  |                                       |                   |              |                |             |             |
| SCTN-4        | Brush Management   |                        |                  |                                       |                   |              |                |             | 4           |
| SCTN-5        | Weather Modification   |                        |                  |                                       |                   |              |                |             | 4           |
| SCTN-9        | Rainwater Harvesting   |                        |                  |                                       |                   |              |                |             | 4           |
|               | Small Aquiler Recharge Dams                                      |                        |                  | l                                     |                   |              |                |             | 4           |
| L-10 (lrr.)   | Demand Reduction (Conservation)                                  |                        |                  |                                       |                   |              |                |             | 5, 6        |
|               | Total New Supplies   |                        | 3,200            | 3,205                                 | 3,211             | 3,073        | 3,076          | 3,078       |             |
|               | Total System Mgmt. Supply / Deficit                              |                        | -97,799          | -94,241                               | -90,385           | -91,746      | -88,505        | -84,440     |             |
|               | Mun, Ind, S-E, & Min System Mgmt. Supply /                       |                        | 1,117            | 1,027                                 | 935               | 574          | 420            | 252         |             |
|               | Deficit  |                        | .,               | .,                                    |                   | ۱,           | ,_,            |             |             |
|               | Irrigation System Mgmt. Supply / Deficit                         |                        | -98,916          | -95,268                               | -91,320           | -92,320      | -88,925        | -84,692     |             |
|               | inigation oystem ingint outpry / bench                           |                        | -50,010          | -50,200                               | -51,020           | -02,020      | -00,525        | -04,082     |             |
| Notoci        |  |                        |                  |                                       |                   |              |                |             |             |
| Notes:        | Candidate New Supplies shown for year 2000 are identified to     | r oriently implements  | ation but will o | not he available                      | immediately       | <del></del>  |                | <del></del> |             |
| 1             | Demand Reduction (Conservation) strategies assumed largety       | reflected in protect   | ed water dema    | ands I                                | i arminouscially. | <del></del>  | <del></del>    |             |             |
| <del>:</del>  | Candidate New Supply to be shared among Uvalde, Medina, A        | Mascosa, and Reva      | Counties. Su     | ingly may not i                       | ne reliable in d  | rought       | <del></del>    | +           |             |
| <u>*</u><br>3 | Pursuant to draft EAA Critical Period Management rules, Cand     |                        |                  |                                       |                   | · vog·n.     |                | <del></del> |             |
| <del></del>   | the estimated maximum potential annual transfer (95,430 acft)    | based on Proposed      | Permits prore    | ated to 400 000                       | acft/vr.          | <del>-</del> | <del></del>    |             |             |
| 4             | Option expected to provide additional water supply in many ve    | ars, but dependable    | entrub vlaque    | drought is pre                        | sently unquan     | ilified.     |                |             |             |
| 5             | Estimates based upon use of LEPA systems on 80 percent of        | acreages irrigated in  | n 1997, with co  | onservation at                        | 10 percent of i   | rrigation    | <del></del>  - |             |             |
| <del></del>   | application rate, but applicable to only 50 percent of Edwards / | Aquifer Irrigation per | mitted quantiti  | 85.                                   |                   |              |                |             |             |
| 6             | Demand Reduction (Conservation) transferred to Bexar Count       | y in the R&R Plan      |                  |                                       |                   |              | - i            |             |             |



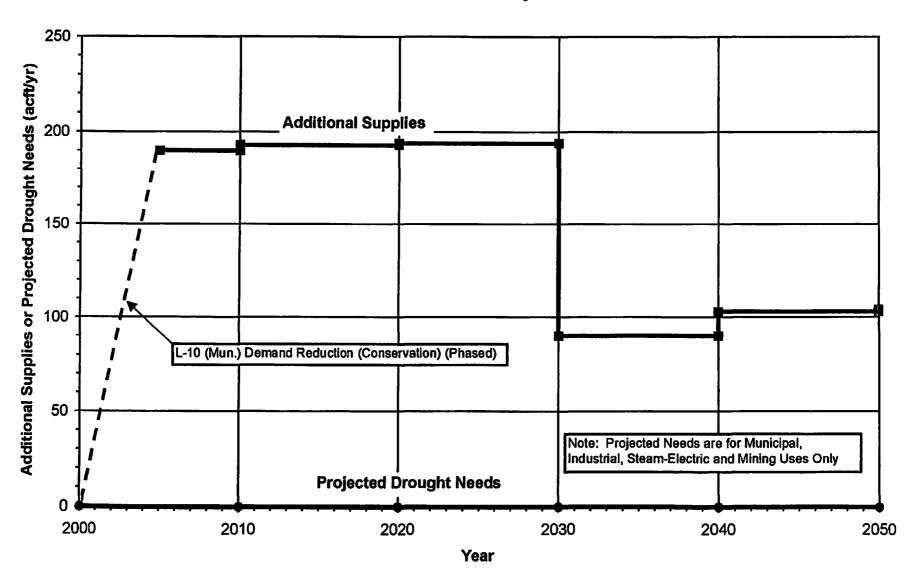
| South C     | entral Texas Region   |                     |                |               |                      |              |             | County      | = Uvald |
|-------------|---|---------------------|----------------|---------------|----------------------|--------------|-------------|-------------|---------|
| County S    | ummary of Projected Water Needs (Shortages  | ) and Water M       | anagemer       | t Strategic   | 98                   |              | <del></del> | User Gro    |         |
|             |   |                     |                |               |                      |              |             |             | 1       |
| Projected   | l Water Needs (acft/yr)   |                     |                |               |                      | -            |             | _           |         |
|             | User Group(s)   |                     | 2000           | 2010          | 2020                 | 2030         | 2040        | 2050        | Notes   |
|             | Municipal   |                     | 2,682          | 3,168         | 3,493                | 4,241        | 4,880       | 5,609       |         |
| <del></del> | Industrial  |                     | 0              | 0             | 0                    | 0            | O           | 0           |         |
|             | Steam-Electric  |                     | 0              | 0             | 0                    | 0            | 0           | 0           |         |
|             | Mining  |                     | 0              | 0             | 0                    | 0            | 0           | Ö           |         |
|             | Irrigation  |                     | 75,263         | 72,798        | 70,154               | 71,022       | 68,880      | 65,676      |         |
|             | Total Needs   |                     | 77,945         | 75,984        | 73,647               | 75,263       | 73,760      | 71,285      |         |
|             | Mun, Ind, S-E, & Min Needs  | _                   | 2,682          | 3,166         | 3,493                | 4,241        | 4,880       | 5,609       |         |
|             | Irrigation Needs  |                     | 75,263         | 72,798        | 70,154               | 71,022       | 68,880      | 65,676      |         |
| Notes Ma    | anagement Stantagles (aufilia)  | Candidate           |                |               |                      |              |             |             |         |
|             | nagement Strategles (acft/yr)   |                     |                |               | 2000                 |              |             |             | 11-1    |
| D#          | Description   | New Supply          | 2000*          | 2010          | 2020                 | 2030         | 2040        | 2050        | Notes   |
| -10 (Mun.)  | Demand Reduction (Conservation)   |                     | 318            | 346           | 371                  | 235          | 258         | 283         |         |
| L-15        | Edwards Irrigation Transfers  | 81,000              | 3,000          | 4,000         | 4,000                | 5,000        | 5,000       | 6,000       | 2, 3    |
|             |   |                     |                |               |                      |              |             |             |         |
|             |   |                     |                |               |                      |              |             |             |         |
|             |   |                     |                | -             |                      |              |             |             |         |
| SCTN-4      | Brush Management  |                     |                |               | ·····                |              |             |             |         |
| CTN-5       | Weather Modification  |                     |                |               |                      |              |             |             |         |
| SCTN-9      | Rainwater Harvesting  |                     |                |               |                      |              |             |             |         |
|             | Small Aquifer Recharge Dams   |                     |                |               |                      |              |             |             |         |
| L-10 (lrr.) | Demand Reduction (Conservation)   |                     |                |               |                      |              |             |             | 6,      |
|             | Total New Supplies  |                     | 3,318          | 4,346         | 4,371                | 5,235        | 5,258       | 6,283       |         |
|             | Total System Mgmt. Supply / Deficit   |                     | -74,627        | -71,618       | -69,276              | -70,028      | -68,502     | -65,002     |         |
|             | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit   |                     | 636            | 1,180         | 878                  | 994          | 378         | 674         |         |
|             | Irrigation System Mgmt. Supply / Deficit  |                     | -75,263        | -72,798       | -70,154              | -71,022      | -68,880     | -65,676     |         |
|             |   |                     |                |               |                      |              |             |             |         |
| lotes:      |   |                     | 4-11           |               | 1                    |              |             |             |         |
|             | Candidate New Supplies shown for year 2000 are identified f   |                     |                |               | <u>pie immediate</u> | iy.          |             |             |         |
|             | Demand Reduction (Conservation) strategies assumed large<br>Candidate New Supply to be shared among Uvalde, Medina, | Atorogo and Co      | crea Marer der | nanos.        | al he collection!    | a draviabl   |             |             |         |
|             | Pursuant to draft EAA Critical Period Management rules, Car   |                     |                |               |                      |              |             |             |         |
| 3           | the estimated maximum potential annual transfer (95,430 act   |                     |                |               |                      |              |             |             |         |
| <del></del> | Early implementation of facilities assumed in cost estimation   | <del></del>         | <del></del>    |               |                      |              |             |             |         |
| <u> </u>    | Option expected to provide additional water supply in many y  | debrench tild sneg  | ile sunniv dud | na drought is | onesentiv uppri      | rantified    |             |             |         |
| <u> </u>    | Estimates based upon use of LEPA systems on 80 percent of   | acresoes impated    | in 1997, with  | conservation  | at 40 percent        | of infoation | ···         |             |         |
| <u>'</u>    | application rate, but applicable to only 50 percent of Edwards  | Aguifer intestion o | ermitted quan  | tities.       | 1                    |              | <del></del> |             |         |
| ,           | Demand Reduction (Conservation) transferred to Bexar Cour   | ty in the R&R Pian  | 1              |               | <del></del>          |              |             | <del></del> |         |

# Recharge and Recirculation Alternative Regional Water Plan Wilson County

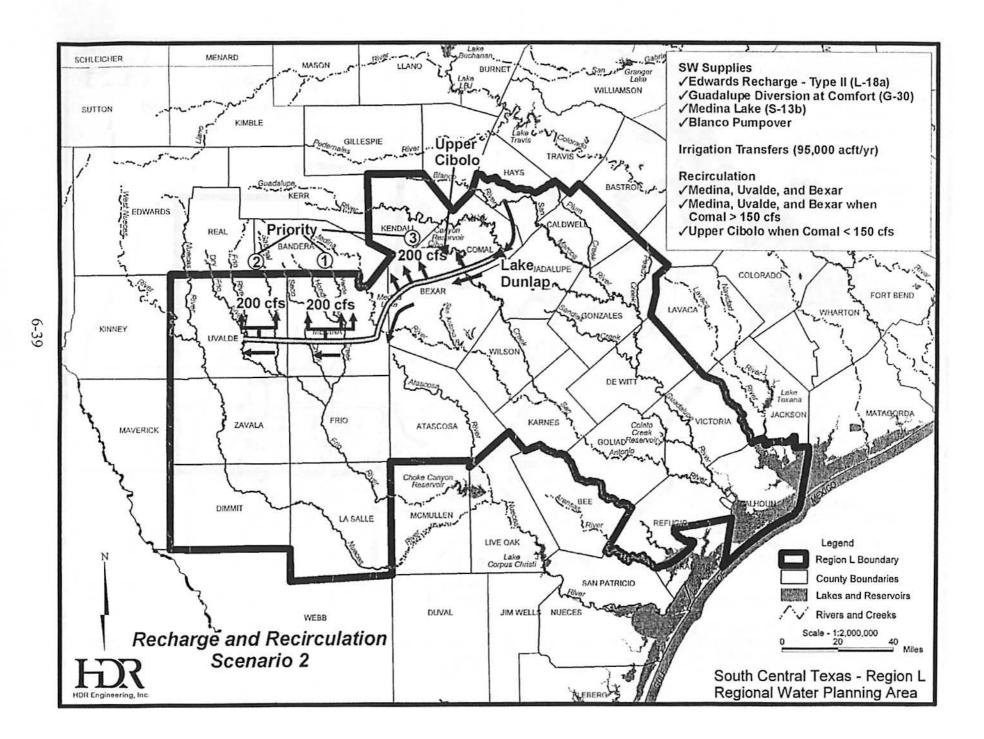


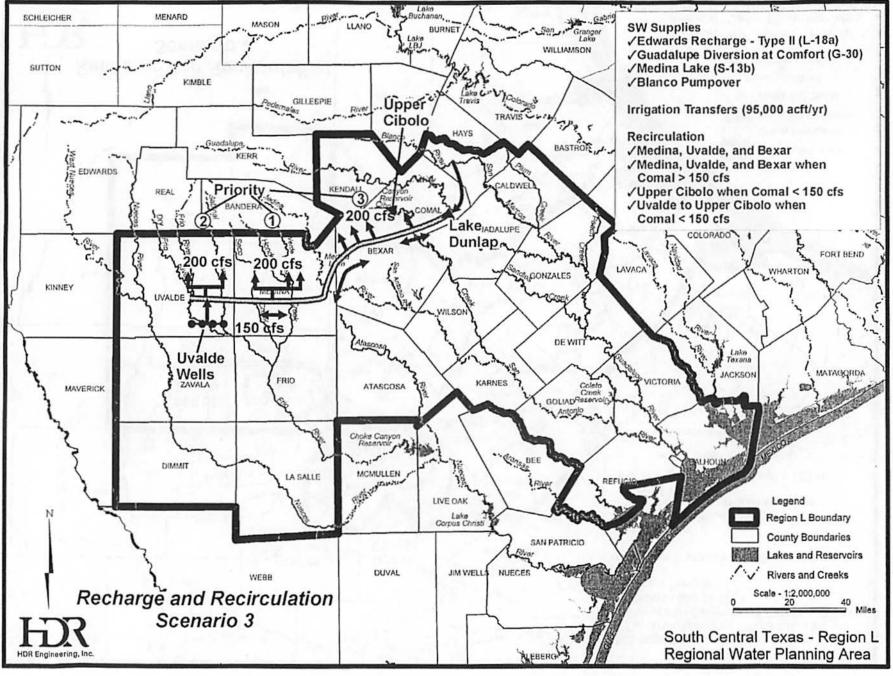
| South Ce                               | entral Texas Region   |                     | T  |                  |                |          |      | County | = Wilsor    |
|--|---|---------------------|--|------------------|----------------|----------|------|--------|-------------|
| County Su                              | ımmary of Projected Water Needs (Shortages) a                   | and Water Ma        | nagement                                     | Strategies       |                |          |      |        | up(s) = al  |
|  |   |                     |  |                  |                |          |      |        |             |
| Projected                              | Water Needs (acft/yr)   |                     |  |                  |                |          |      |        |             |
|  | User Group(s)   |                     | 2000   | 2010             | 2020           | 2030     | 2040 | 2050   | Notes       |
|  | Municipal   | <u>-</u>            | 0  | 0                | 0              | 0        | 63   | 145    |             |
|  | Industrial  |                     | 0  | 0                | 0              | 0        | 0    | Ō      |             |
|  | Steam-Electric  |                     | 0  | 0                | 0              | 0        | 0    | 0      |             |
|  | Mining  |                     | 0  | 0                | 0              | 0        | 0    | 0      |             |
| ······································ | Irrigation  |                     | Ō  | 0                | 0              | 0        | 0    | 0      |             |
|  | Total Needs   |                     | 0  | 0                | 0              | 0        | 63   | 145    |             |
|  | Mun, Ind, S-E, & Min Needs                                      |                     | 0  | 0                | 0              | 0        | 63   | 145    |             |
|  | Irrigation Needs  |                     | 0  | 0                | 0              | 0        | 0    | 0      |             |
|  |   |                     |  |                  |                |          |      |        |             |
| Water Mar                              | nagement Strategies (acft/yr)                                   | Candidate           |  |                  |                |          |      |        | <del></del> |
| ID#                                    | Description   | New Supply          | 2000   | 2010             | 2020           | 2030     | 2040 | 2050   | Notes       |
| L-10 (Mun.)                            | Demand Reduction (Conservation)                                 |                     | 171  | 183              | 194            | 114      | 122  | 130    | -           |
| SCTN-2a                                | Carrizo Aquiller - Local Supply                                 |                     |  |                  |                |          | 200  | 200    |             |
|  |   |                     |  |                  |                |          |      |        |             |
|  |   |                     |  |                  |                |          |      |        |             |
| SCTN-4                                 | Brush Management  |                     |  |                  |                |          |      |        | 3           |
| SCTN-5                                 | Weather Modification  |                     |  |                  |                | ·        |      |        |             |
| SCTN-9                                 | Rainwater Harvesting  |                     |  |                  |                |          |      |        | ;           |
|  | Small Aquifer Recharge Dams                                     |                     |  |                  |                |          |      |        |             |
| L-10 (lm.)                             | Demand Reduction (Conservation)                                 |                     |  |                  |                |          |      |        |             |
|  | Total New Supplies  |                     | 171  | 183              | 194            | 114      | 322  | 330    |             |
|  |   |                     | 454  | 400              | 15.1           |          | 200  |        |             |
|  | Total System Mgmt. Supply / Deficit                             |                     | 171  | 183              | 194            | 114      | 259  | 185    |             |
|  | Mun, Ind, S-E, & Min System Mgmt. Supply /<br>Deficit           |                     | 171  | 183              | 194            | 114      | 259  | 185    |             |
|  | Irrigation System Mgmt. Supply / Deficit                        |                     | 0  | 0                | 0              | 0        | 0    |        | · · · - · · |
|  |   |                     |  |                  |                |          |      |        |             |
| Notes:                                 |   |                     | <u>                                     </u> |                  |                |          |      |        |             |
| 1                                      | Demand Reduction (Conservation) strategies assumed largely      | reflected in projec | led water demi                               | ands.            |                |          |      |        |             |
| 2                                      | Additional well(s) for Floresville.                             | , j.,               | <u> </u>                                     | l                |                |          |      |        |             |
| 3                                      | Option expected to provide additional water supply in many year | ars, but dependabl  | e supply during                              | g drought is pro | esently unquar | ntified. |      |        |             |

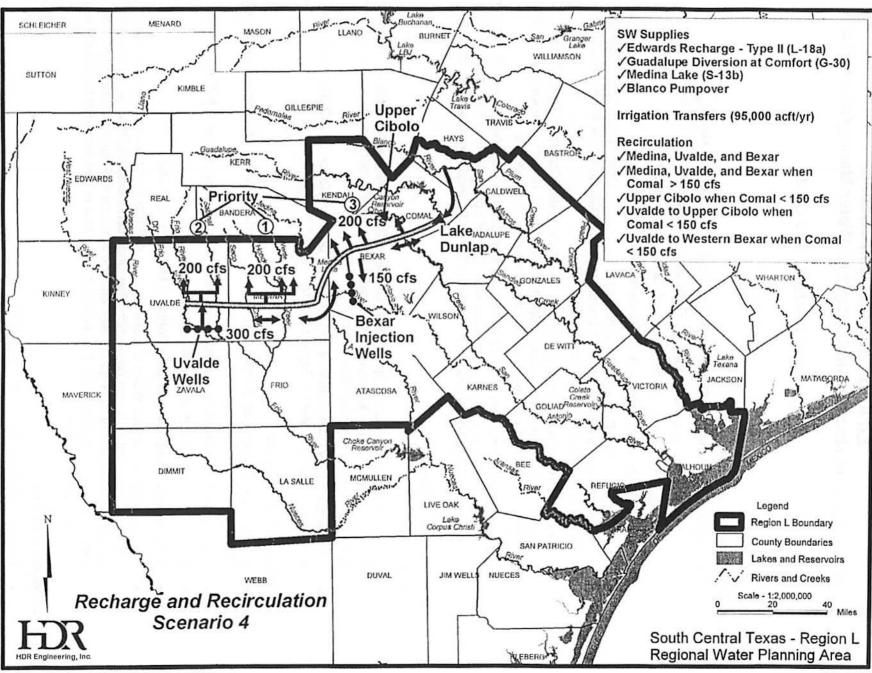
# Recharge and Recirculation Alternative Regional Water Plan Zavala County



| South Ce     | ntral Texas Region   |                     |                 |                |               |           |         |          | = Zavala  |
|--------------|--|---------------------|-----------------|----------------|---------------|-----------|---------|----------|-----------|
| County Su    | immary of Projected Water Needs (Shortages)  | and Water Mai       | nagement        | Strategies     |               |           |         | User Gro | up(s) = a |
| Projected    | Water Needs (acft/yr)  |                     |                 |                |               |           |         |          |           |
|              | User Group(s)  |                     | 2000            | 2010           | 2020          | 2030      | 2040    | 2050     | Notes     |
|              | Municipal  |                     | 0               |                | 0             | 0         | 0       | 0        |           |
|              | Industrial   |                     | 0               |                | ŏ             | ŏ         | Ö       | Ö        |           |
|              | Steam-Electric   |                     | 0               | 0              | ō             | ō         | Ö       | ő        |           |
|              | Mining   |                     | Ö               | O              | Ö             | Ö         | ŏ       | ŏ        |           |
|              | Irrigation   |                     | 80,722          | 76,589         | 72,655        | 88,293    | 84,673  | 81,200   |           |
|              | Total Needs  |                     | 80,722          | 76,589         | 72,655        | 88,293    | 84,673  | 81,200   |           |
|              | Mun, Ind, S-E, & Min Needs   |                     | 00,122          | 7 0,000        | 12,000        | 00,230    | 07,073  | 01,200   |           |
|              | irrigation Needs   |                     | 80,722          |                | 72,655        | 88,293    | 84,673  | 81,200   |           |
|              | 111921011110020  | , ,                 | 00  -02         | 1 0,000        | 1=1000        | 00,200    | 04,010  | 01,200   |           |
| Water Mai    | nagement Strategies (acft/yr)  | Candidate           |                 |                |               |           |         |          | ,         |
| ID#          | Description  | New Supply          | 2000            | 2010           | 2020          | 2030      | 2040    | 2050     | Notes     |
| L-10 (Mun.)  | Demand Reduction (Conservation)  |                     | 190             | 193            | 194           | 90        | 103     | 104      |           |
|              |  |                     |                 |                |               |           |         |          |           |
|              |  |                     |                 |                |               |           |         |          |           |
|              |  |                     |                 |                |               |           |         |          |           |
|              |  |                     |                 |                |               |           |         |          |           |
|              |  |                     |                 |                |               |           |         |          |           |
|              |  |                     |                 |                |               |           |         |          |           |
| SCTN-4       | Brush Management   |                     |                 |                |               |           |         |          |           |
| SCTN-5       | Weather Modification   |                     |                 |                |               |           |         |          |           |
| SCTN-9       | Rainwater Harvesting   |                     |                 |                |               |           |         |          |           |
|              | Small Aquifer Recharge Dams  |                     |                 |                |               |           |         |          |           |
| L-10 (lm.)   | Demand Reduction (Conservation)  |                     | 6,401           | 6,401          | 6,401         | 6,401     | 6,401   | 6,401    |           |
|              | Total New Supplies   |                     | 6,591           | 6,594          | 6,595         | 6,491     | 6,504   | 6,505    |           |
| ·            |  |                     |                 |                |               |           |         |          |           |
|              | Total System Mgmt. Supply / Deficit  |                     | -74,131         | -69,995        | -66,080       | -81,802   | -78,169 | -74,695  | -         |
|              | Mun, Ind, S-E, & Min System Mgmt. Supply /   |                     | 190             | 193            | 194           | 90        | 103     | 104      |           |
| <del></del>  | Irrigation System Mgmt. Supply / Deficit   |                     | -74,321         | -70,188        | -66,254       | -81,892   | -78,272 | -74,799  |           |
|              | angulon oystem maint outphy i benefit  |                     | 1.41451         | -10,100        | -00,204       | -01,002   | -10,212 | -1-41100 |           |
| Notes:       |  |                     |                 | 1              |               | i         |         |          |           |
| 1            | Demand Reduction (Conservation) strategies assumed largely reflected in projected water demands. |                     |                 |                |               |           |         |          |           |
| <del></del>  | Option expected to provide additional water supply in many ye                                    | ars, but dependable | e supply during | drought is pre | sently unquar | ntified.  |         |          |           |
| 3            | Estimates based upon use of LEPA systems on 50 percent of  | acreages impaled i  | n 1997, with c  | onservation at | 20 percent of | rrigation |         |          |           |
| <del>-</del> | application rate.  |                     |                 |                |               |           |         |          |           |







# Edwards Aquifer Component of Recharge and Recirculation Regional Water Management Plan

## Summary of Features and Costs

June 28, 2000

#### Scenario 5

- Recirculate from Lake Dunlap at a maximum capacity of 600 cfs to:
  - Medina County (maximum = 200 cfs and first priority)
  - Uvalde County (maximum = 200 cfs and second priority)
  - Bexar County (maximum = 200 cfs and third priority)
- Transfer all Lake Dunlap recirculation to Upper Cibolo Creek when flow in Comal Springs is less than 150 cfs. The transfer to Upper Cibolo Creek is turned OFF when the flow in Comal Springs exceeds 200 cfs.
- Transfer groundwater, at a rate of 150 cfs, from Uvalde County to Upper Cibolo Creek when the flow from Comal Springs is less than 150 cfs. The transfer is turned OFF when the flow from Comal Springs is greater than 200 cfs.
- Transfer groundwater, at a rate of 150 cfs, from Uvalde County to Edwards Aquifer in western Bexar County when the flow from Comal Springs is less than 150 cfs. The transfer is turned OFF when the flow from Comal Springs is greater than 200 cfs.

#### > Surface Water Rights

- Honored
- Enhanced flow from Comal Springs is unavailable for meeting water rights or meeting Environmental Criteria. However, enhanced flow from the other springs is available for water rights and environmental critera.
- The baseline flow from Comal Springs is based on a simulation of 412,312 pumpage without irrigation transfers to Bexar County.

#### Surface Water Supplies

- Edwards Recharge-Type 2 Projects (L-18a: Frio, Sabinal, Verde, Hondo, Cibolo, Blanco, and Indian Creek Pumpover)
- Guadalupe River Diversion to Recharge Zone (G-30) with recharge in NW Bexar County
- Medina Lake Recharge Enhancements (S-13b)
- Blanco River Pump Over to Lake Dunlap (Maximum of 75 cfs)
- Unappropriated Surface Water at Lake Dunlap. Availability for recirculation is subject to making up a deficit between base springflow and scenario springflow. In other words, when flow from Comal Springs is lower with the Alternative Regional Water Plan than during the baseline conditions, the unappropriated flow is first allocated to surface water rights to cover this deficit.

#### Water Transfers

Edwards Irrigation (L-15: 95,000 acft/yr)

- Irrigation Demand Reductions (L-10 (Irr))
- > Other Management
  - ASR
  - Critical Period Management. Only pumpage within the 400K base cap is subjected to reductions.
  - Term Permits (evaluated but not included)
- ➤ Increase in Water Supply: The increase is attributed to all the R&R projects and is based on the difference between the total pumpage for the 400K Base with Scenario 5 total pumpage before applying the reductions due to CPM.
- Costs Estimates:
- Capital:
- · Recharge, water transfer, and recirculation facilities
- Connections to distribution system at 50 percent of the outside water supply rate.
- O&M: Based on average flow of water through the facilities
- Water Purchased (Guadalupe River at Comfort) Test
- > Tests
  - All baseline pumpage was set to a multiplier of 1.00. Municipal pumpage was increased above the baseline until the number of months with average flow from Comal Springs being less than 60 cfs was the same as during the 400K Base conditions. The total was 92 months.

## Flux for Sustained Yield Simulations (Minimum Flow from Comal Springs is 60 cfs) (acft/year)

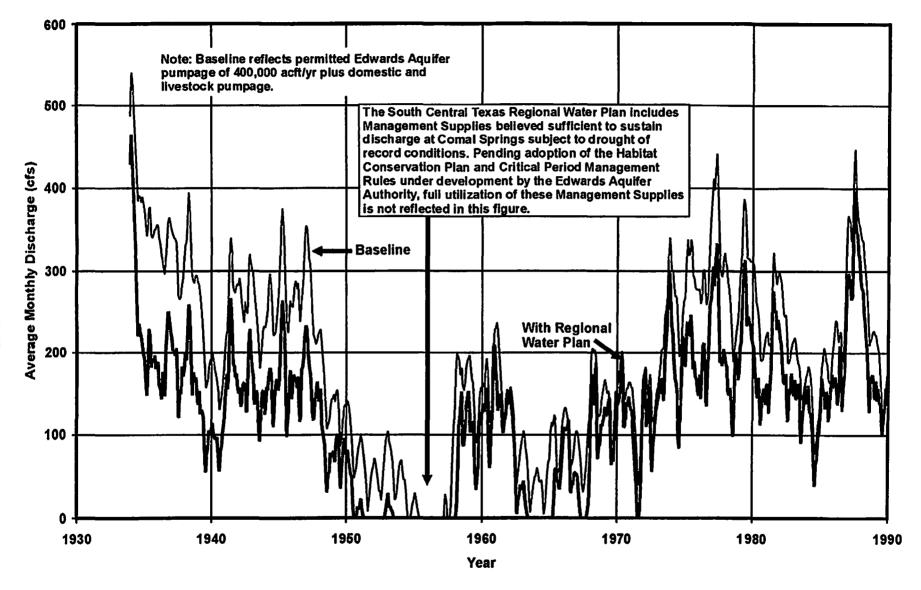
|   | Baseline with<br>95,000 irrigation<br>transfers | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 |
|---|---|------------|------------|------------|------------|
| Pumpage                                   |   |            |            |            |            |
| Total                                     | 272,538   | 389,642    | 405,139    | 450,411    | 482,454    |
| Change                                    |   | 117,104    | 132,601    | 177,873    | 209,916    |
| Recirculation                             |   |            |            |            |            |
| Lake Dunlap to Medina County              | 0   | 131,617    | 127,452    | 115,371    | 102,588    |
| Lake Dunlap to Uvalde County              |   | 53,269     | 49,031     | 38,680     | 31,263     |
| Lake Dunlap to Bexar County               |   | 45,406     | 43,280     | 35,877     | 28,964     |
| Lake Dunlap to Cibolo Creek               |   | 0          | 2,176      | 12,947     | 21,655     |
| Uvalde County Transfer to Cibolo Creek    |   | 0          | 0          | 8,732      | 14,069     |
| Uvalde County Transfer to W. Bexar County |   | 0          | 0          | 0          | 14,069     |
| Springflow                                |   |            |            |            |            |
| Comal Springs                             | 216,168   | 262,464    | 253,896    | 224,376    | 200,837    |
| All Springs except Leona                  | 337,021   | 461,286    | 445,504    | 397,121    | 360,574    |
| Leona Springs                             | 20,854  | 28,419     | 27,917     | 25,871     | 23,477     |

## Flux for 400K Base Simulations (Number of Months of Flow Below 60 cfs at Comal Springs is Unchanged) (acft/year)

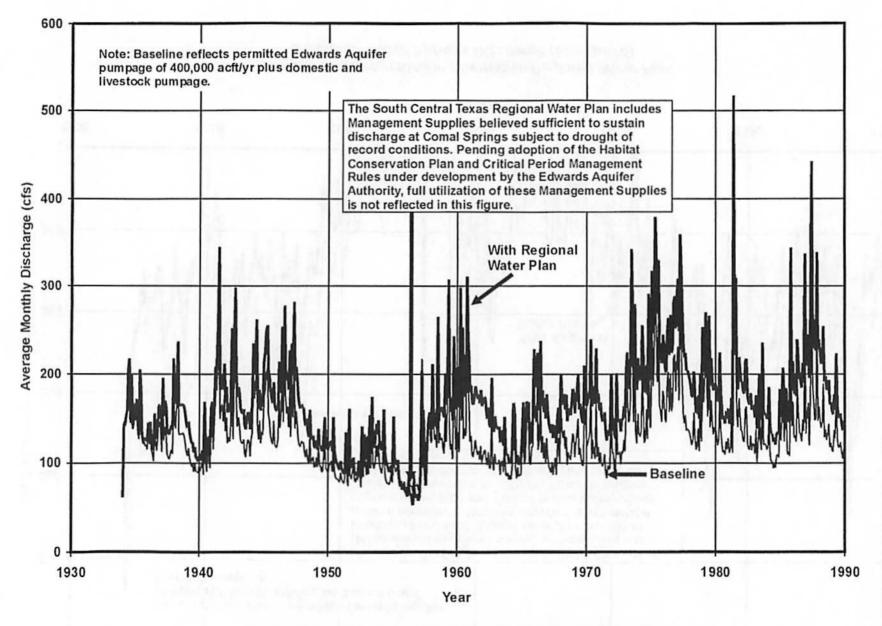
|   | Baseline with<br>95,000 irrigation<br>transfers | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 |
|---|---|------------|------------|------------|------------|
| Pumpage                                   |   |            |            |            |            |
| Total                                     | 412,312   | 512,323    | 524,703    | 567,667    | 599,226    |
| Change                                    |   | 100,011    | 112,391    | 155,355    | 186,912    |
| Recirculation                             |   |            |            |            |            |
| Lake Dunlap to Medina County              | 0   | 92,239     | 79,936     | 67,882     | 59,062     |
| Lake Dunlap to Uvalde County              | 0   | 27,920     | 26,668     | 20,710     | 17,694     |
| Lake Dunlap to Bexar County               | 0   | 25,272     | 23,583     | 17,111     | 12,704     |
| Lake Dunlap to Cibolo Creek               | 0   | 0          | 11,902     | 54,331     | 64,389     |
| Uvalde County Transfer to Cibolo Creek    | 0   | 0          | 0          | 39,458     | 45,118     |
| Uvalde County Transfer to W. Bexar County | 0   | 0          | 0          | 0          | 45,118     |
| Springflow                                |   |            |            |            |            |
| Comal Springs                             | 126,540   | 169,800    | 165,600    | 140,424    | 122,124    |
| All Springs except Leona                  | 224,963   | 321,655    | 314,180    | 278,876    | 254,186    |
| Leona Springs                             | 16,194  | 22,879     | 22,089     | 18,212     | 14,523     |

## Flux for 400K Base, Scenario 5 Simulations (Number of Months of Flow Below 60 cfs at Comal Springs is Unchanged) (acft/year)

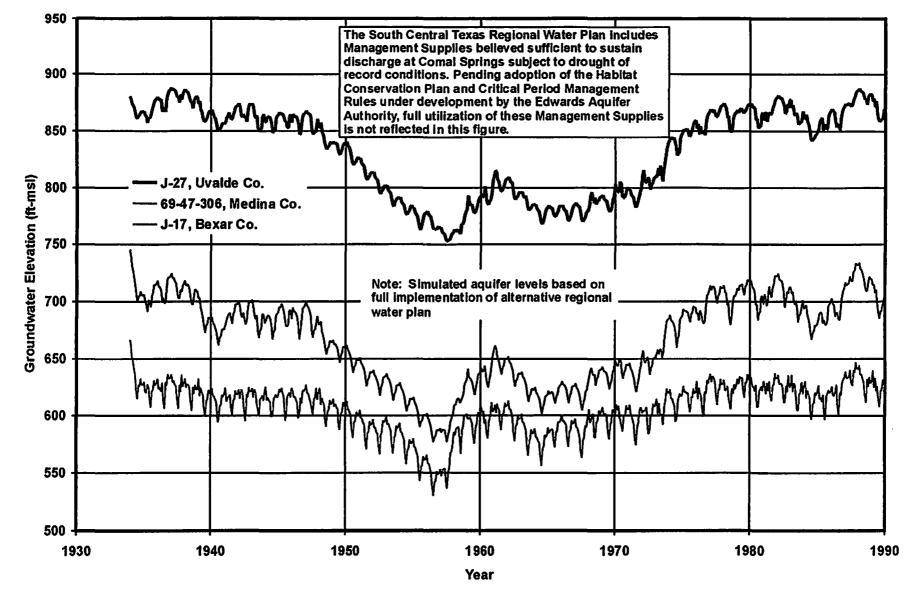
|  | Baseline | Scenario 5 |
|--|----------|------------|
| Pumpage  |          |            |
| Total  | 412,312  | 639,392    |
| Change   |          | 227,080    |
| Recirculation                                      |          |            |
| Lake Dunlap to Medina County                       | 0        | 56,466     |
| Lake Dunlap to Uvalde County                       | 0        | 16,861     |
| Lake Dunlap to Bexar County                        | 0        | 12,509     |
| Lake Dunlap to Cibolo Creek                        | 0        | 69,711     |
| Uvalde County Transfer to Cibolo Creek             | 0        | 48,190     |
| Uvalde County Transfer to W. Bexar County          | 0        | 48,190     |
| Springflow   |          |            |
| Comal Springs                                      | 139,466  | 116,217    |
| San Marcos Springs                                 | 95,955   | 124,127    |
| Lake Duniap  |          |            |
| Blanco Pumpover                                    |          | 33,582     |
| Available Unappropriated flow for R&R              |          | 70,506     |
| Enhanced flow from Comal Springs                   |          | -23,195    |
| Enhanced flow from Comal Springs available for R&R |          | 2,553      |



Recharge and Recirculation Alternative Regional Water Plan Simulated Comal Springs Discharge (Scenario 5)

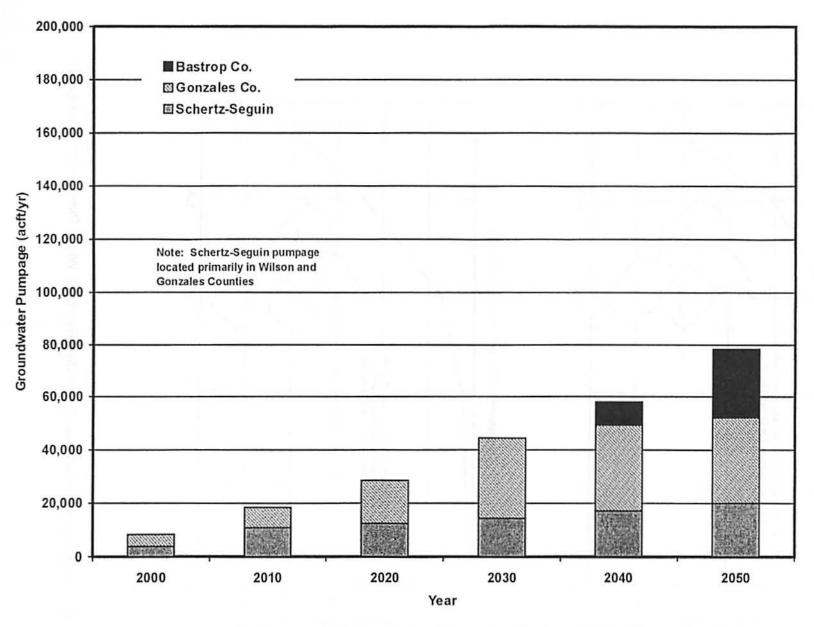


Recharge and Recirculation Alternative Regional Water Plan Simulated San Marcos Springs Discharge (Scenario 5)



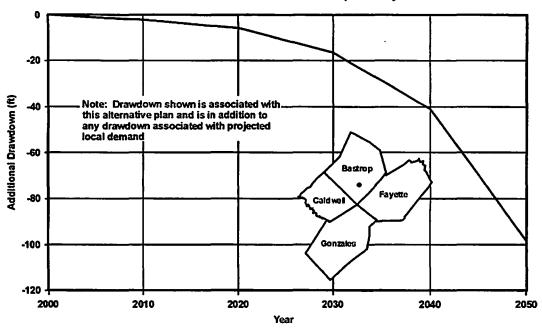
Recharge and Recirculation Alternative Regional Water Plan Simulated Edwards Aquifer Levels

Recharge and Recirculation Alternative Regional Water Plan Additional Edwards Aquifer Wells



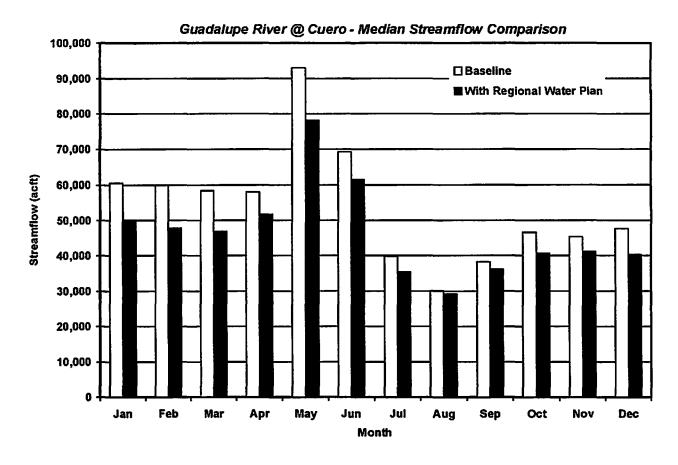
Recharge and Recirculation Alternative Regional Water Plan Additional Carrizo Groundwater Pumpage

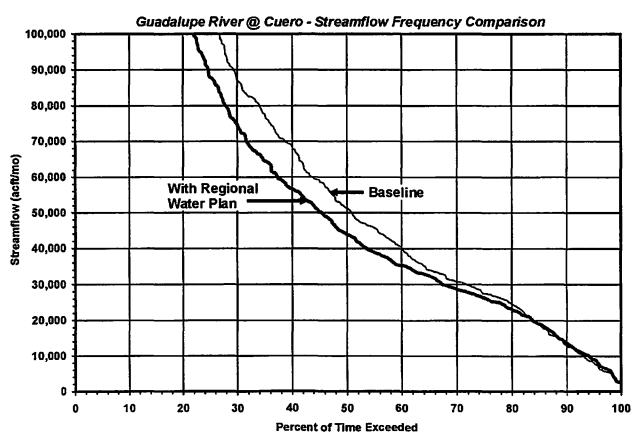
#### Drawdown in Southern Bastrop County



### Drawdown in Northern Gonzales County -20 Note: Drawdown shown is associated with this alternative plan and is in addition to any drawdown associated with projected Additional Drawdown (ft) -40 local demand -60 Bastrop Fayette -80 Caldwell -100 -120 2000 2010 2020 2030 2040 2050 Year

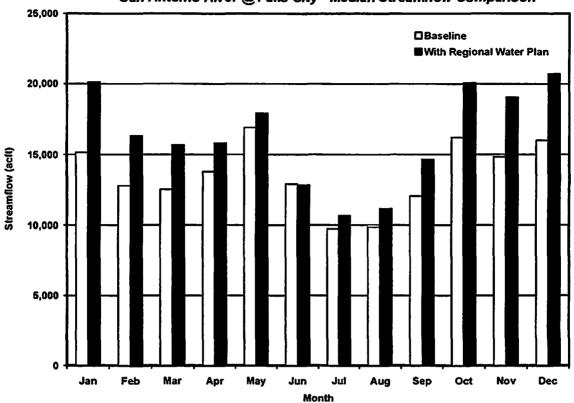
Recharge and Recirculation Alternative Regional Water Plan — Carrizo Aquifer

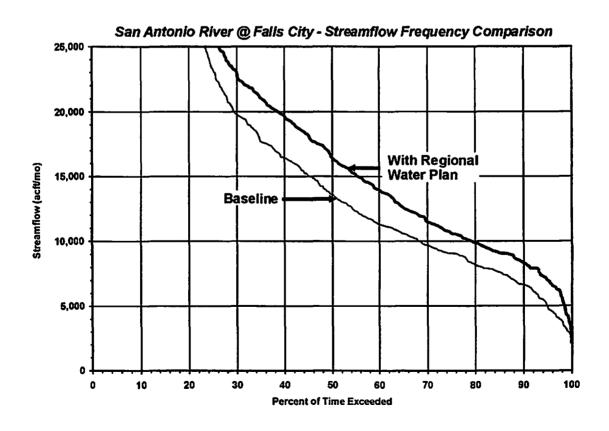




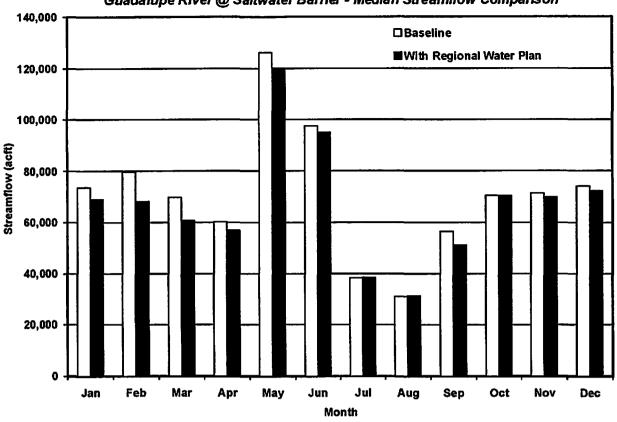
Recharge and Recirculation Alternative Regional Water Plan Streamflow Frequency Comparison

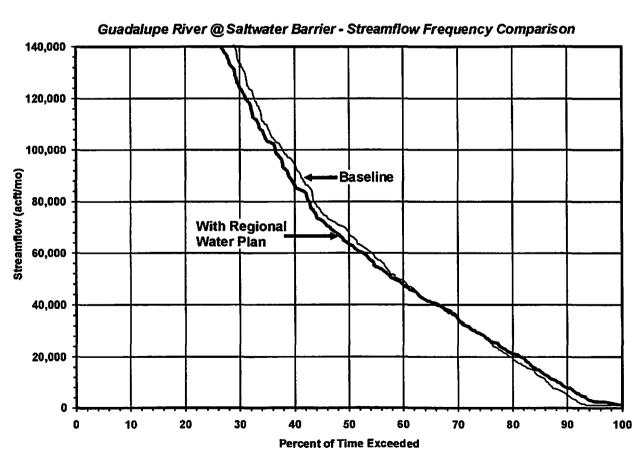






# Guadalupe River @ Saltwater Barrier - Median Streamflow Comparison



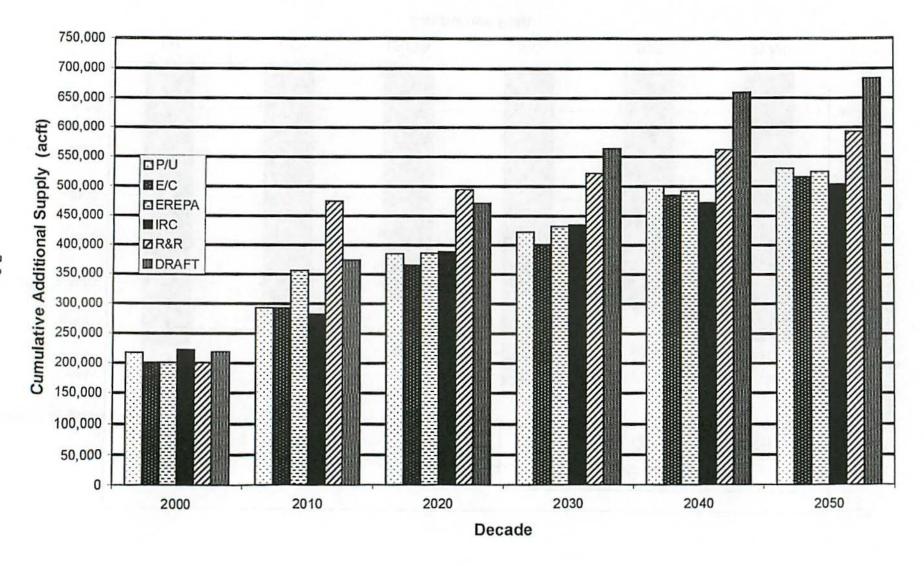


Recharge and Recirculation Alternative Regional Water Plan Streamflow Frequency Comparison

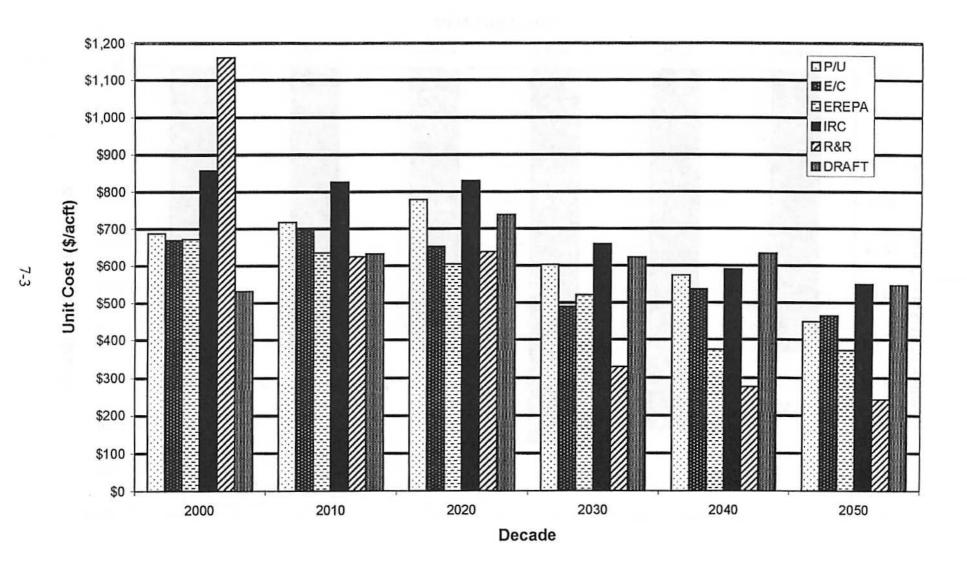
\$3.07

\$1,000

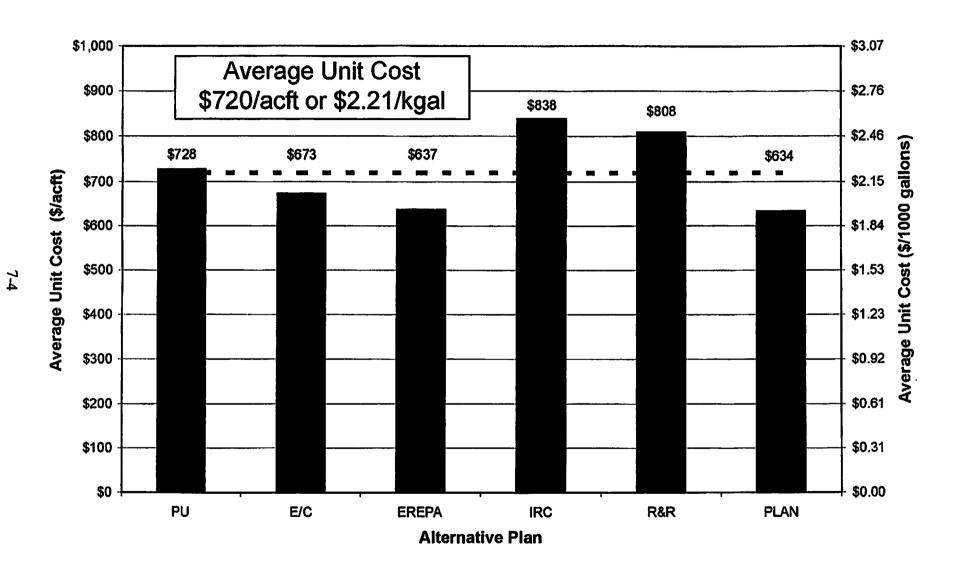
**Alternative Plan** 



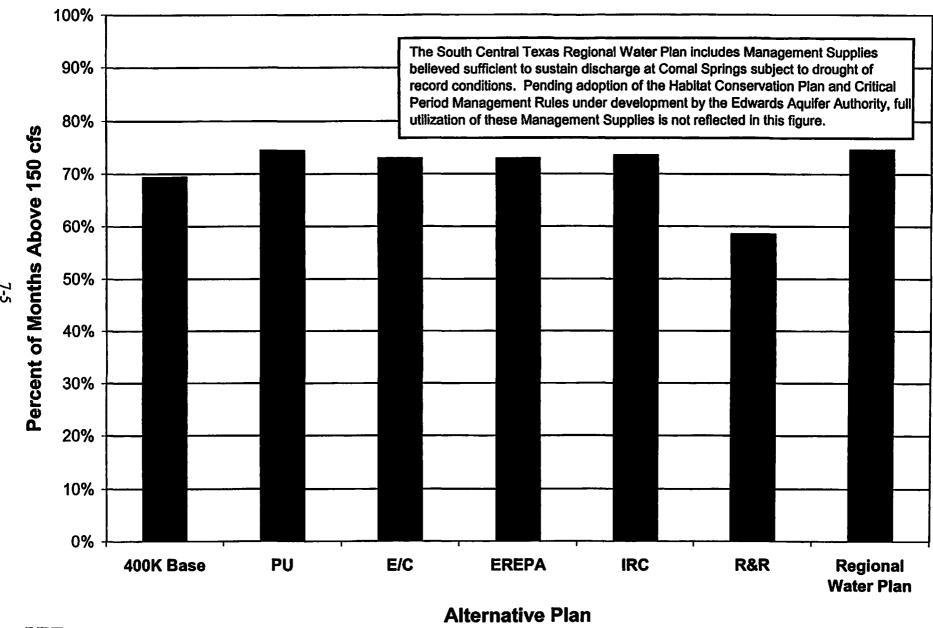
## Unit Cost by Decade Comparison of Alternative Regional Water Plans



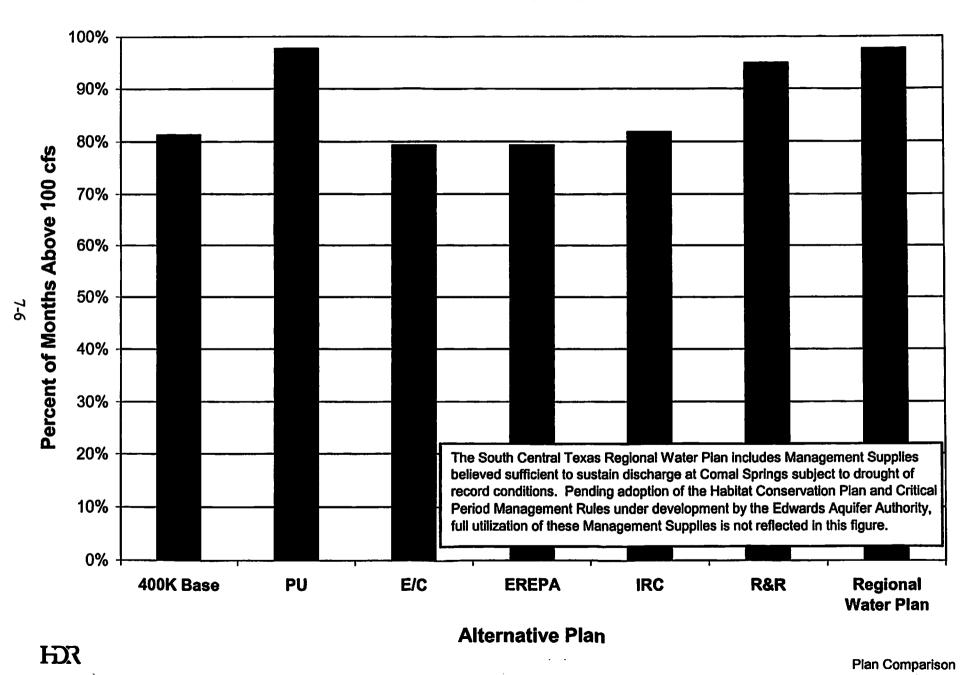
## 2030 Average Unit Cost Comparison of Alternative Regional Water Plans



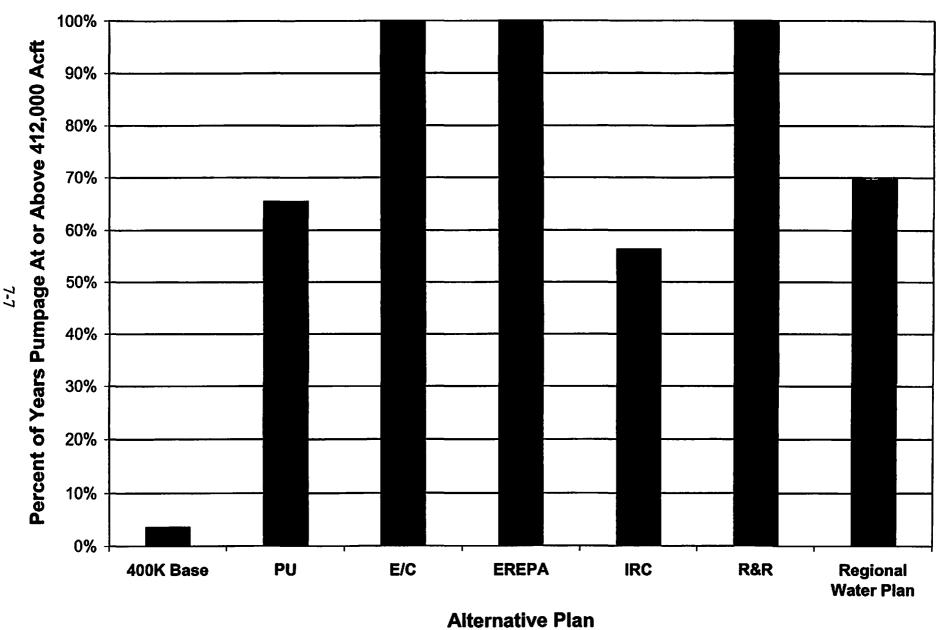
# **Comal Springs**



# **San Marcos Springs**

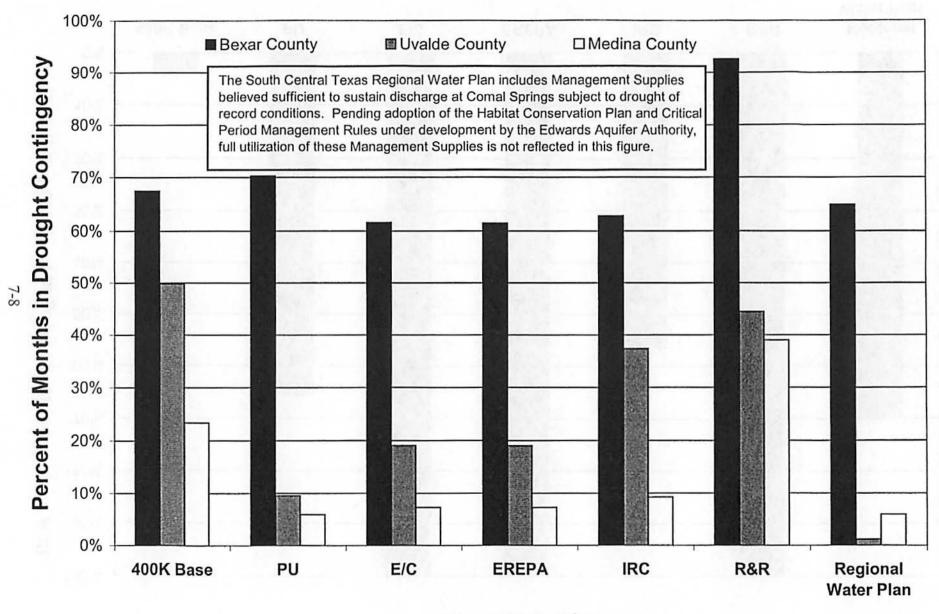


# Pumpage At or Above 412,000 Acft/yr



HDR

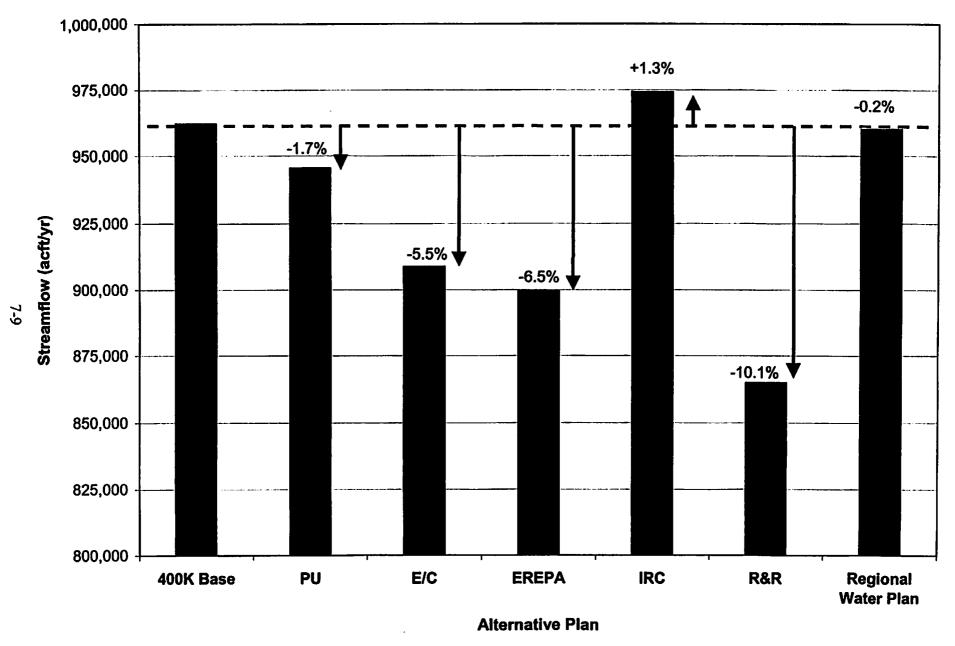
# **County Comparisons of Months in Drought Contingency**



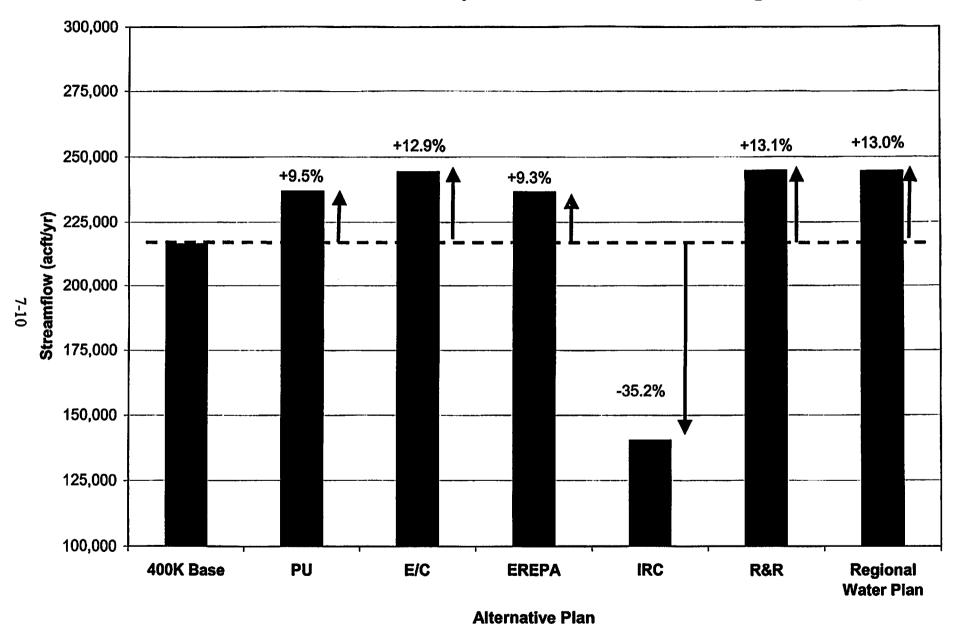
**Alternative Plan** 

HDR.

# Median Annual Streamflow Comparison - Guadalupe River @ Cuero



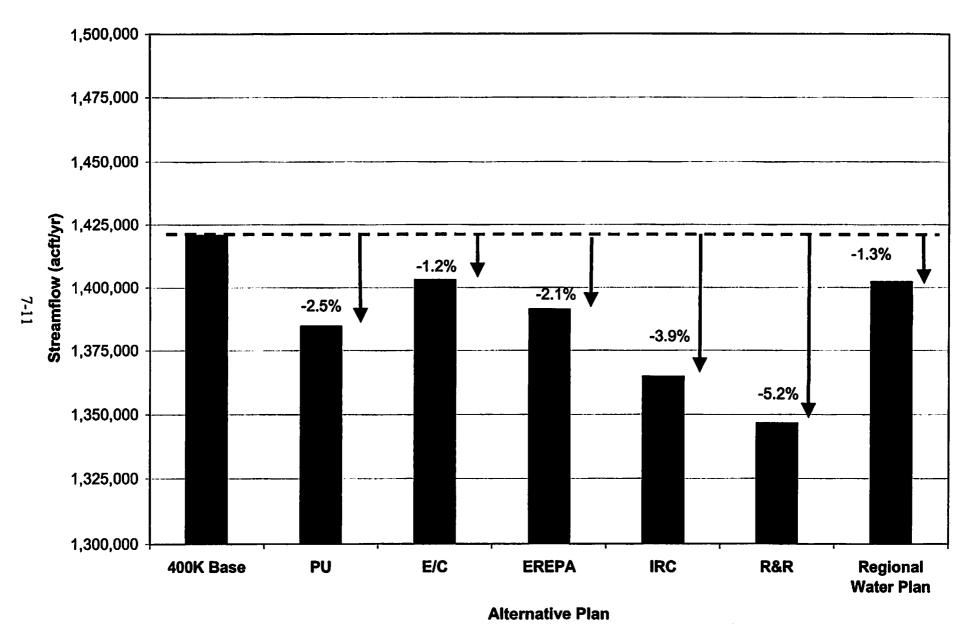
# Median Annual Streamflow Comparison - San Antonio River @ Falls City



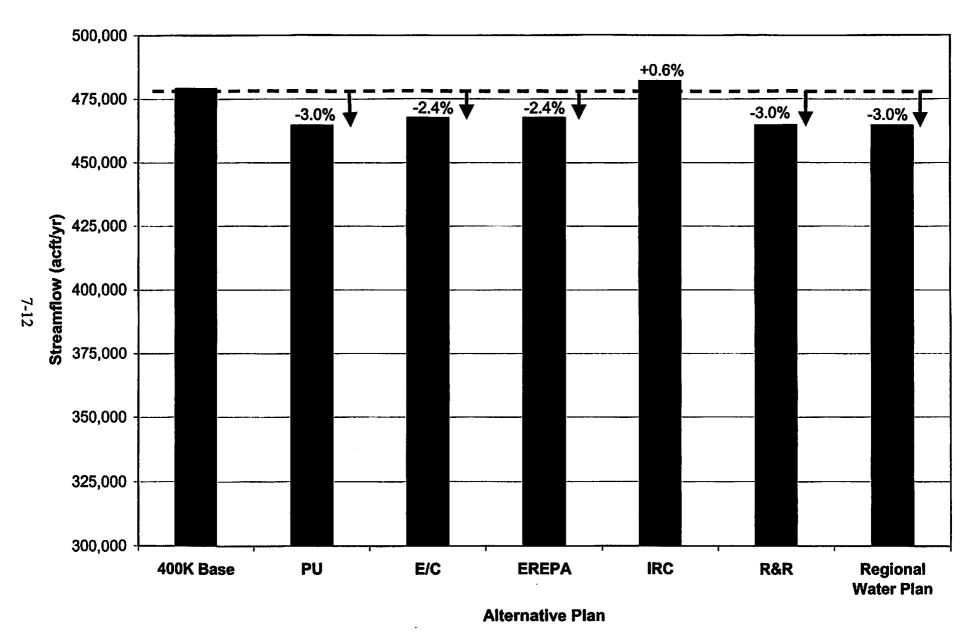
HR

Plan Comparison

# Median Annual Streamflow Comparison - Guadalupe R. Saltwater Barrier



# Mean Annual Streamflow Comparison - Nueces River @ Estuary



ЮR

Plan Comparison