

South Central Texas Regional Water Plan

ERRATA SHEET

This Errata Sheet is submitted by the South Central Texas Regional Water Planning Group (SCTRWPG) in response to a review of the South Central Texas (Region L) Adopted Regional Water Plan (January 4, 2001) by the Texas Water Development Board (TWDB). The TWDB review was transmitted in the form of a letter dated March 28, 2001 (Attachment 1) with an attached Interoffice Memorandum dated March 23, 2001 (Attachment 2) enumerating the detailed findings of the review. The SCTRWPG response to each of the detailed findings is presented within the text of Attachment 2 and in Attachments A through E that provide additional information regarding specific findings of the TWDB review.

July 13, 2001

Attachment 1

Texas Water Development Board Review Letter of March 28, 2001

March 28, 2001

Mr. Greg Rothe, General Manager *via facsimile: 210-227-4323*
San Antonio River Authority
Address

Ms. Evelyn Bonavita, Chairman *via facsimile: 210-828-1627*
South Central Texas Regional Water Planning Group
at her home address

Ref: Review of the South Central Texas (Region L) Adopted Regional Water Plan

Dear Mr. Rothe and Ms. Bonavita:

At the February 21, 2001 Texas Water Development Board (TWDB) meeting, TWDB staff presented a process and timeline for review of adopted regional water plans (Attachment 1). The process we laid out to our Board included an analysis of whether eight key issues are satisfactorily addressed by the adopted regional water plan. If the key issues are satisfactorily addressed, then staff could recommend approval of the adopted regional water plan. Otherwise, issues associated with each regional water plan would be forwarded to the regional water planning group and designated political subdivision.

In our communications with the regional water planning groups, staff is to indicate whether the adopted plan can be revised with or without a plan amendment. A plan revision would require favorable action by the regional water planning group at a regularly posted meeting; whereas, a plan amendment would require re-adoption of the plan by the regional water planning group in accordance with provisions of *Texas Administrative Code §357.11(e)* after a public hearing is held. Examples of revisions requiring a plan amendment include:

- (1) addition of a water management strategy to meet a need,
- (2) a significant change to a recommended water management strategy to meet a need,
- (3) addition of water management strategies to meet needs that were not previously identified in the adopted regional water plan.

At this time, Board staff has completed the review of the adopted South Central Texas Regional Water Plan. The review finds several areas where revisions, corrections, clarification, or submittal of additional information are necessary. The key findings resulting from the staff review are the following:

1. For certain planning elements, the adopted regional water plan does not satisfactorily address the general provisions for planning included in statute and rules.
 - a. 31 TAC 357.5(d)(1) and 357.7 (a)(2), regarding use of state-approved population projections; the staff review identified various instances where the adopted plan does not reflect use of TWDB approved population projections.
 - b. 31 TAC 357.5(e)(1) and 31 TAC 357.7(a)(7)(B), regarding evaluations for effect on environmental water needs, as applied to Lower Colorado River Diversions. Staff finds that the Region L plan does not comply with the state environmental consensus criteria.
 - c. 31TAC 357.7(a)(7) (G), regarding consideration of the provisions in the Texas Water Code, §11.085(k)(1) for interbasin transfers [IBT], and 31 TAC 357.5(f), requiring the regional water planning group to prepare its regional water plan to be consistent with all laws applicable to water use in the regional water planning area. Staff finds that the plan is in error in its representation of the Lower Guadalupe River Diversions as a non IBT. Also, staff finds the plan includes a water management strategy that reflects an instance of use of Edwards aquifer water in conflict with existing law.
 - d. 31 TAC 357.7 (A)(7), regarding documentation that water management strategies have been evaluated in accordance with the specified criteria; and, 357.8 (A), requiring that plans to meet needs be described in sufficient detail to allow state agencies to make financial or regulatory decisions to determine the consistency of the proposed action before the state agency with an approved regional water plan. The plan lacks documentation of the evaluation of the San Antonio Water System Recycled Water Program which is presented as a recommended water management strategy.
 - e. Consequently, as a result of the issues noted under items b though d, above, the plan does not meet 31 TAC 357.7(a)(7) (F), regarding the need for the plan to present an equitable comparison and consistent application of all water management strategies; and, 31 TAC 357.5(e)(4), requiring that the plan provide specific recommendations of water management strategies based upon identification, analysis, and comparison of all water management strategies the regional water planning group determines to be potentially feasible so that the cost effective water management strategies which are environmentally sensitive are considered and pursued, where appropriate.
2. TWDB staff finds that not all TWDB-issued comments are satisfactorily addressed. These comments range from minor corrections in TWDB-required data tables to compliance with interbasin transfer requirements.

3. The staff review finds that there are two instances of interregional conflicts to be considered in the assessment of this plan for future approval recommendation. First, a conflict due to inconsistencies in the reporting between the Regions K and L plans regarding the Colorado River Diversion; and second, a conflict resulting from the Region L proposed pumping levels out of the Simsboro aquifer in Bastrop County which exceed the limits set by the groundwater availability policy adopted by the Region K.

It is our opinion that a plan revision is necessary in order for us to recommend your plan for approval by our Board. If the revisions to the plan result in additional water management strategies being recommended, or in significant changes to the currently recommended water management strategies, then the plan will need to be re-adopted in accordance with the requirements described in 31 TAC 357.12.

Detailed findings of the review are contained in Attachment 2.

Please be advised that revisions to the adopted regional water plan will need to be corrected in the form of an errata sheet that is approved at a public meeting of the regional water planning group. The errata sheet must contain specific instructions on pages/sections in the adopted plan to be replaced, added, or deleted such that Board staff and the general public can update their adopted regional water plans. In addition, the comments contained in Attachment 2 along with your written response must be included as part of the errata sheet. The Board requires one unbound camera-ready original, one electronic copy, and nine double-sided copies of the errata sheet with all supporting documentation (if any). In addition, the errata sheet must be provided to all known recipients of the adopted regional water plan.

At this time, staff anticipates presenting your plan for to our Board for their consideration no later than our June 20, 2001 Board meeting. In order to review your revisions and meet deadlines related to the June Board meeting date, you will need to submit your errata sheets to us no later than May 18, 2001. Please contact Jorge A. Arroyo at (512) 475-3003 if you have any questions or need additional information.

I look forward to receiving the additional information from you and being able to make a favorable recommendation to our Board.

Sincerely,

Tommy Knowles, Ph.D., P.E.
Deputy Executive Administrator
Office of Planning

cc: South Central Texas Regional Water Planning Group Members

Attachments (2)

Attachment 2
Texas Water Development Board Interoffice Memorandum of March 28, 2001
and
South Central Texas Regional Water Planning Group Responses

INTEROFFICE MEMORANDUM

TO: Tommy R. Knowles, Deputy Administrator for Office of Planning

THRU: Bill Mullican, Director, Water Resources Planning

FROM: Jorge A. Arroyo, Assistant Director, Water Resources Planning

DATE: March 23 2001

SUBJECT: Initial Review of the Regional Water Plan Adopted by the South Central Texas Region.

In a memorandum to the Board dated February 14, 2001, the Water Resources Planning Division formulated a process for the review and approval of the adopted regional water plans. This memorandum reports the results of the first step of that process as applied to the review of the Regional Water Plan adopted by the South Central Texas Regional Water Planning Group (SCT RWPG) and presented to the TWDB on January 5, 2001. **The initial review of the adopted plan finds several areas where corrections or clarification of information are necessary in order to consider the plan for approval.**

The review focused on the key issues listed in the February 14, 2001 memorandum.

A. Determinations of whether the plans were developed according to the general provisions for planning included in statute and rules.

The initial review of the adopted plan finds that the following requirements have not been met.

1. 31 TAC 357.7 (a)(2) and 357.5(d)(1), regarding use of state-approved population and water demand projections.

- a. The adopted plan contains one remaining instance of a population projection differing significantly from the state approved projections [Dewitt County-other, 2040 population should be 8,631; the plan reports 11,631].

SCTRWPG Response: The data mentioned for DeWitt County, County Other are correctly included in the text of the South Central Texas Regional Water Plan, Volume I, Table 2-3, on

pages 2-7, 2-8, 2-9, and 2-10. The difference is in Exhibit B, Table 1, which has been corrected in Exhibit B, Table 1, and transmitted in electronic format to the TWDB. No changes are made to the text of the Plan.

- b. There are several instances of single-digit differences between the TWDB approved values and the reported values due to rounding errors.

SCTRWPG Response: *There is one case of population and six cases of water demand differences between TWDB projections and values included in the South Central Texas Regional Water Plan. Each is listed below, together with table and page location in the Regional Water Plan.*

The one case of a difference between TWDB population projections and a population entry in the South Central Texas Regional Water Plan is a difference of one person for Kendall County, County Other (Rural) in 2020. The TWDB projection for Kendall County, County Other is 35,498. The value in the Water Plan, which includes the sum of 3 entries (San Antonio, Guadalupe, and Colorado Basins) for Kendall County, County Other (Table 2-2, on pages 2-7 and 2-9 of the Regional Water Plan) is 35,499, or one more person than the TWDB projection. This appears to be a transcription error for 2020, since the entries for 2000, 2010, 2030, 2040, and 2050 are in agreement with the TWDB projections. Exhibit B, Table 1 has been corrected, but since the difference has no effect upon the results of the South Central Texas Regional Water Plan, no changes were made to the text of the plan.

The water demand differences are for: (1) Atascosa County, County Other; (2) Calhoun County, County Other and Mining; (3) Kendall County, County Other; (4) Comal County Irrigation; and (5) Wilson County Irrigation. The TWDB Projections and Regional Water Plan entries of differences are tabulated below, together with the table number and the pages of the text on which the entries are located.

Atascosa County, County Other

<u>Year</u>	<u>Regional Water Plan</u>	<u>TWDB</u>	<u>Difference</u>	<u>Table No.</u>	<u>Page No.</u>
2000	2,240 acft	2,239 acft	1 acft	2-12	2-32 & 2-35
2040	4,041 acft	4,040 acft	1 acft	2-12	2-32 & 2-35

Calhoun County, County Other

<u>Year</u>	<u>Regional Water Plan</u>	<u>TWDB</u>	<u>Difference</u>	<u>Table No.</u>	<u>Page No.</u>
2010	2,384 acft	2,385 acft	1 acft	2-12	2-38, 2-43 & 2-44
2030	2,706 acft	2,705 acft	1 acft	2-12	2-38, 2-43 & 2-44
2050	3,258 acft	3,257 acft	1 acft	2-12	2-38, 2-43 & 2-44

Kendall County, County Other

<u>Year</u>	<u>Regional Water Plan</u>	<u>TWDB</u>	<u>Difference</u>	<u>Table No.</u>	<u>Page No.</u>
2000	1,778 acft	1,777 acft	1 acft	2-12	2-37, 2-40, & 2-41
2020	3,924 acft	3,925 acft	1 acft	2-12	2-37, 2-40, & 2-41

Comal County, Irrigation

<u>Year</u>	<u>Regional Water Plan</u>	<u>TWDB</u>	<u>Difference</u>	<u>Table No.</u>	<u>Page No.</u>
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2050 371 acft 372 acft 1 acft 2-12 2-36 & 2-39

Wilson County, Irrigation

<u>Year</u>	<u>Regional Water Plan</u>	<u>TWDB</u>	<u>Difference</u>	<u>Table No.</u>	<u>Page No.</u>
2000	14,519 acft	14,521 acft	2 acft	2-12	2-34, 2-35, & 2-41

Calhoun County, Mining

<u>Year</u>	<u>Regional Water Plan</u>	<u>TWDB</u>	<u>Difference</u>	<u>Table No.</u>	<u>Page No.</u>
2020	13 acft	12 acft	1 acft	2-12	2-38, 2-43, & 2-44

The differences shown above appear to be transcription errors for individual decades of the planning period. Exhibit B, Table 2 has been corrected, but since the differences have no effect upon the results of the South Central Texas Regional Water Plan, no changes were made to the text of the plan.

- c. There is one instance of an apparent number transposition: The 2040 population for Pleasanton in Atascosa County should be 15,879, but is 15,897 in the Plan.

SCTRWPG Response: The datum mentioned for Pleasanton is correctly included in the text of the South Central Texas Regional Water Plan, Volume I, Table 2-3, on page 2-5. The difference is in Exhibit B, Table 1, which has been corrected in Exhibit B, Table 1, and transmitted in electronic format to the TWDB. No changes are made to the text of the Plan.

All of these items need to be corrected in order to attain compliance with 31 TAC 357(a)(2) and 357.5(d)(1).

- 2. 31 TAC 357.5(e)(1) and 31 TAC 357.7(a)(7)(B), regarding evaluations for effect on environmental water needs. The regions K and L plans are in agreement with regards to the range of yield that could potentially be provided by the Colorado River Diversion option, 131,000 to 150,000 ac-ft/yr. However, an evaluation of this option on the basis of the environmental consensus criteria indicates that the reliable yield for the alternative is 131,000 ac-ft/yr. *The text and tables of the Region L plan need to be revised to reflect the recommended yield of 131,000 ac-ft/yr.*

SCTRWPG Response: See Attachment A.

- 3. 31 TAC 357.7(a)(7) (G), regarding consideration of the provisions in the Texas Water Code, §11.085(k)(1) for interbasin transfers [IBT], and 31 TAC 357.5(f), requiring the regional water planning group to prepare its regional water plan to be consistent with all laws applicable to water use in the regional water planning area.

- a. Plan needs to be revised to acknowledge that water management strategies SCTN-16 [a, b, and c], Lower Guadalupe River Diversions, constitute IBT under existing law. The plan needs to revise the yield of the recommended strategy to reflect compliance with Texas Water Code, 11.085(s), which reads, “Any proposed transfer of all or portion of a water rights under this section is junior in priority to water rights granted before the time application for transfer is accepted for filing”.

SCTRWPG Response: See Attachment D.

- b. For the city of Boerne, the plan includes a recommended water management strategy, Purchase water from major provider, also referenced as Purchase/participate with regional water provider(s), that is reported as providing Edwards aquifer water to Boerne. This is in conflict with the Edwards Aquifer Act, which in Article 1, Section 1.34 of, Transfer of Rights, (a), reads “Water withdrawn from the aquifer must be used within the boundaries of the authority.” This recommendation needs to be revised to comply with existing law.

SCTRWPG Response: In the South Central Texas Regional Water Plan, Table 5.3.14-2, Page 5-260, the source of 1,000 acre-feet of water for year 2050 is “Purchase from Major Provider,” whose source of water is one of the surface water diversion or ground water strategies other than the Edwards Aquifer. Exhibit B, Tables 11 and 12 were erroneously coded, and have been corrected. No other changes are needed.

4. 31 TAC 357.7 (A)(7), regarding documentation that water management strategies have been evaluated in accordance with the specified criteria; and, 357.8 (A), requiring that plans to meet needs be described in sufficient detail to allow state agencies to make financial or regulatory decisions to determine the consistency of the proposed action before the state agency with an approved regional water plan. The plan lacks documentation of the evaluation of the San Antonio Water System Recycled Water Program which is presented as a recommended water management strategy. *The Region L plan needs to include the referenced documentation.*

SCTRWPG Response: See Attachment B.

5. 31 TAC 357.7(a)(7) (F), regarding the need for the plan to present an equitable comparison and consistent application of all water management strategies the regional water planning group determines to be potentially feasible for each water supply need; and, 31 TAC 357.5(e)(4), requiring that the plan provide specific recommendations of water management strategies based upon identification, analysis, and comparison of all water management strategies the regional water planning group determines to be potentially feasible so that the cost effective water management strategies which are environmentally sensitive are considered and pursued, where appropriate. Because of the issues noted in items 2 through 4, above, these requirements are not being met. *If items 2-4 are resolved satisfactorily, then the plan would attain compliance with 31 TAC 357.7(a)(7) (F) and 31 TAC 357.5(e)(4).*

SCTRWPG Response: See responses to items 2 through 4.

B. Determinations of consistency between Regional Water Plans which include water management strategies that rely on water supply sources located outside the region and/or a shared Special Water Resource.

The Regions L and K plans reflect concurrence on the range of yield that could be allocated to Region L by the Colorado River Diversion: 131,000 to 150,000 ac-ft/yr. The Region L plan acknowledges this fact but bases its plan on 150,000 ac-ft/yr. The text and tables of the Region L plan need to be revised to reflect a yield of 131,000 ac-ft/yr and the costs associated with it.

SCTRWPG Response: See Attachment A.

C. Determination that all documented interregional conflicts have been resolved.

The adopted regional plan reports no interregional conflicts. However, staff considered two areas of potential interregional conflict as part of the present review: First, the perceived inconsistencies in the reporting between regions K and L regarding the Colorado River Diversion; and second, the conflict resulting from the Region L proposed pumping levels out of the Simsboro aquifer in Bastrop County and the groundwater availability policy adopted by the Region K.

The review and comparison of the information contained in both plans regarding the Colorado River Diversion considered the proposed yield and the diversion points. The review did not find any inconsistencies of significance in these areas or any other. *Nevertheless, as noted previously, the Region L plan needs to be revised to accurately represent the yield determined by the LCRA studies.*

In the case of the disparities between the Region L proposed pumping schedules and the groundwater availability policy of the Region K, staff finds that both plans fully acknowledge and disregard the differences in their plans in view of the fact that the completion of the GAM study will provide a more reliable basis for determining the availability of the aquifer. The review of the Region K plan will address the need for Region K to consider revisions to this policy to clarify its preliminary nature. *In the absence of an appropriate change by Region K RWPG in its adopted groundwater availability policy, this will constitute an interregional conflict.*

SCTRWPG Response: See Attachments A and C.

D. Determination that no water supply sources in a region have been over allocated, both from an intraregional and a interregional perspective.

As a result of the current groundwater availability policy adopted by Region K, the Region L plan reflects an over allocation of 4,900 ac-ft ac-ft/yr after 2030 of the Simsboro aquifer at Bastrop county. As described under item C, above, *in the absence of an appropriate change by Region K in its adopted groundwater availability policy, resolution of this issue may need to be addressed in the context of an interregional conflict resolution process.*

SCTRWPG Response: See Attachment C.

E. Determination that environmental planning criteria were used to appropriately provide instream and bay and estuary inflow for water management strategies utilizing surface water.

TWDB Environmental staff reviewed the analysis and representations contained in the plan and determined that the evaluations contained in the adopted plan have considered the environmental consensus criteria. However, as currently documented in the adopted plan, the Lower Colorado River Diversion, with a yield of 150,000 ac-ft/yr, does not reflect appropriate consideration of the

environmental consensus criteria. *To address this issue, the plan needs to be revised as discussed under item A-2 of this memorandum.*

SCTRWPG Response: See Attachment A.

F. Determination that cost estimates developed in the plan were prepared in accordance with the provisions of the Contract.

The Region L cost estimates were developed in compliance with TWDB requirements.

SCTRWPG Response: Acknowledged.

G. Determination that all comments received by the RWPG on the initially prepared plans from the TWDB, other state and federal agencies, and the public within the specified comment period have been satisfactorily addressed.

The TWDB provided 4 letters of comment to the SCT RWPG on its initially prepared plan. Not all comments have been satisfactorily addressed.

TWDB Letter #1, October 11, 2000.

This letter #1 included 9 level I comments. Eight of those comments have been satisfactorily addressed. Comment #7 refers to the review for verification that the plan used state-approved population and water demand projections; this comment was supplemented by a tabulated appendix where staff found differences between the state approved figures and those reported in the IPP. The adopted plan documents that most corrections were made. The few remaining discrepancies may be attributed to rounding, with the exception of the 2040 population reported for Dewitt County, where the plan reports 11,631 people and the TWDB projections show 8,631.

Additionally, the TWDB comment pointed to discrepancies on various irrigation and steam-electric demands; those differences were addressed via a revision to the state-approved projections adopted by the TWDB in January 2001.

SCTRWPG Response: See response to item 1.a.

TWDB Letter #2, October 23, 2000.

Letter of comments on data table required as per TWDB contract.

- a. Tables 1 and 2, population and water demand projections; errors noted under item #1s of this memorandum.
- b. Table # 4, Record #210, reports an instance of run-of-the river [Nueces] for 102 ac-ft/yr that exceed the TNRCC permitted volume which is 74 ac-ft/yr.
- c. Table #11, Records #179 and #269, lack the source of supply information.

SCTRWPG Response: For item a, see response to 1.b. Pursuant to Certificate of Adjudication #21-3093, diversion of 102 acft/yr from Bermuda Reservoir (Soldier Slough) is authorized and Exhibit B Table 4 is accurate (item b). Item c, Exhibit B, Table 11, records #179 and #269 are included in the text of the Regional Water Plan on pages 5-206 and 5-249, Tables 5.3.5-4 and 5.3.12-5, respectively. These are storage facilities for meeting peak demands, and are included in order to take peaking storage costs into account. The sources of supply are identified for each strategy implemented, as appropriate. No changes are needed in either the text of the Regional Water Plan, nor the Exhibit B tables.

TWDB Letter #3, November 21, 2000.

This letter refers to need for documentation of the plan's compliance with 31 TAC 357.7(a)(7) (A)-(H) . Not all comments have been satisfactorily addressed.

Comment #1, a, iii, regarding WMS # L-10, Municipal Conservation. The response accurately indicates that additional information was provided to staff to clarify the calculations to estimate the yield of this strategy; however, TWDB staff review of the additional data indicates that this is not sufficient to ascertain the reliability of the volumes estimated for this water management strategy. Therefore, additional supporting documentation will be required.

SCTRWPG Response: See Attachment E.

Comment #1, f, iii, regarding WMS # SCTN-16 [a, b, and c], Lower Guadalupe River Diversions, relative to the 31 TAC 357.7(a)(7)(G), consideration of the provisions in Texas Water Code, §11.085(k)(1) for interbasin transfers; and, 31 TAC 357.5(f), requiring the regional water planning group to prepare its regional water plan to be consistent with all laws applicable to water use in the

regional water planning area. **This comment is not satisfactorily addressed.** *The plan needs to be revised to document that the evaluation of this strategy has been performed in compliance with IBT requirements.*

SCTRWPG Response: See Attachment D.

Comment #1, i, regarding WMS entitled SAWS Recycled water program, relative to documentation of evaluations conducted to comply with 31 TAC 357.7(A)(7) and inclusion of detailed description of the WMS as required in 31 TAC 357.7(A)(8). **This comment is not satisfactorily addressed.** *The adopted plan needs to be revised to include the evaluation of this water management strategy on the basis of 31 TAC 357.7(A)(7).*

SCTRWPG Response: See Attachment B.

The adopted plan includes summaries of all comments received from the public and the responses provided by the RWPG explaining if and how the plan was revised or why changes were not warranted.

SCTRWPG Response: Acknowledged.

H. Determination that there is consistency between the selected water management strategies contained in the Regional Water Plans and the supporting electronic data submitted by the regions.

The review has found no inconsistencies between the data tables and the information represented in the text of the plan.

SCTRWPG Response: Acknowledged.

**TABLE 2:
Water Demand by City and Category**

WUGNAME	COUNTYNAME	BASINNAME	DATA CAT	WUGNUM	RWPG	SEQ#	CITY#	COUNTY#	BASIN#	h1996	d2000	d2010	d2020	d2030	d2040	d2050
CHARLOTTE	ATASCOSA	NUECES	MUN	120160000	L	160	107	7	21	319	409	436	464	510	547	568
JOURDANTON	ATASCOSA	NUECES	MUN	120454000	L	454	309	7	21	559	815	863	899	988	1047	1124
LYTLE	ATASCOSA	NUECES	MUN	120553000	L	553	374	7	21	431	559	600	635	701	754	811
PLEASANTON	ATASCOSA	NUECES	MUN	120705000	L	705	473	7	21	1915	2486	2649	2784	3074	3273	3523
POTEET	ATASCOSA	NUECES	MUN	120716000	L	716	483	7	21	742	1285	1325	1369	1479	1549	1629
COUNTY-OTHER	ATASCOSA	SAN ANTONIO	MUN	120996007	L	996	757	7	19	105	101	106	111	123	132	132
COUNTY-OTHER	ATASCOSA	NUECES	MUN	120996007	L	996	757	7	21	1923	2138	2395	2825	3335	3908	4100
MANUFACTURING	ATASCOSA	SAN ANTONIO	MFG	121001007	L	1001	1001	7	19	0	0	0	0	0	0	0
MANUFACTURING	ATASCOSA	NUECES	MFG	121001007	L	1001	1001	7	21	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	ATASCOSA	SAN ANTONIO	PWR	121002007	L	1002	1002	7	19	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	ATASCOSA	NUECES	PWR	121002007	L	1002	1002	7	21	5848	12000	12000	12000	12000	15000	22000
MINING	ATASCOSA	SAN ANTONIO	MIN	121003007	L	1003	1003	7	19	0	0	0	0	0	0	0
MINING	ATASCOSA	NUECES	MIN	121003007	L	1003	1003	7	21	1377	1558	1583	1693	1804	1918	2048
IRRIGATION	ATASCOSA	SAN ANTONIO	IRR	121004007	L	1004	1004	7	19	488	1363	1311	1261	1214	1167	1123
IRRIGATION	ATASCOSA	NUECES	IRR	121004007	L	1004	1004	7	21	48339	49652	47980	46371	44822	43333	41900
LIVESTOCK	ATASCOSA	SAN ANTONIO	STK	121005007	L	1005	1005	7	19	66	66	66	66	66	66	66
LIVESTOCK	ATASCOSA	NUECES	STK	121005007	L	1005	1005	7	21	1764	1742	1742	1742	1742	1742	1742
ALAMO HEIGHTS	BEXAR	SAN ANTONIO	MUN	120006000	L	6	4	15	19	2184	2799	2732	2686	2706	2728	2742
BALCONES HEIGHTS	BEXAR	SAN ANTONIO	MUN	120050000	L	50	34	15	19	538	731	739	759	798	843	885
CASTLE HILLS	BEXAR	SAN ANTONIO	MUN	120149000	L	149	100	15	19	1165	1714	1743	1765	1786	1769	1751
CHINA GROVE	BEXAR	SAN ANTONIO	MUN	120167000	L	167	843	15	19	273	259	276	293	344	393	416
CONVERSE	BEXAR	SAN ANTONIO	MUN	120198000	L	198	131	15	19	1349	2127	2837	3529	4498	5365	6456
ELMENDORF	BEXAR	SAN ANTONIO	MUN	120280000	L	280	862	15	19	70	64	65	65	75	85	94
FAIROAKS RANCH	BEXAR	SAN ANTONIO	MUN	120290000	L	290	771	15	19	1071	1365	1368	1205	1209	1214	1213
FORT SAM HOUSTON	BEXAR	SAN ANTONIO	MUN	120309000	L	309	211	15	19	3413	4073	3804	3575	3549	3522	3508
HELOTES	BEXAR	SAN ANTONIO	MUN	120392000	L	392	777	15	19	381	360	387	415	494	534	577
HCV/HP	BEXAR	SAN ANTONIO	MUN	120405000	L	405	778	15	19	1882	2395	2633	2901	3307	3664	4079
HOLLYWOOD PARK	BEXAR	SAN ANTONIO	MUN	120412000	L	412	281	15	19							
KIRBY	BEXAR	SAN ANTONIO	MUN	120474000	L	474	325	15	19	1149	1586	1693	1839	2099	2343	2614
LACKLAND AFB	BEXAR	SAN ANTONIO	MUN	120493000	L	493	331	15	19	3777	3960	3708	3488	3467	3446	3436
LEON VALLEY	BEXAR	SAN ANTONIO	MUN	120516000	L	516	353	15	19	1949	2288	2135	1958	1956	1954	2040
LIVE OAK	BEXAR	SAN ANTONIO	MUN	120530000	L	530	361	15	19	1545	1101	1141	1218	1389	1554	1738
LYTLE	BEXAR	NUECES	MUN	120553000	L	553	374	15	21	1	1	1	1	1	1	1
OLMOS PARK	BEXAR	SAN ANTONIO	MUN	120654000	L	654	440	15	19	378	519	520	530	553	579	603
RANDOLPH AFB	BEXAR	SAN ANTONIO	MUN	120734000	L	734	492	15	19	1207	1877	1761	1658	1649	1644	1635
SAN ANTONIO	BEXAR	SAN ANTONIO	MUN	120789000	L	789	530	15	19	180999	220405	242339	272507	312695	349957	391640
SCHERTZ	BEXAR	SAN ANTONIO	MUN	120808000	L	808	543	15	19	84	251	550	913	997	1092	1192
SCHERTZ (OUTSIDE CITY)	BEXAR	SAN ANTONIO	MUN	120996015	L	996	757	15	19	713	819	1115	1243	1455	1667	1880

**TABLE 2:
Water Demand by City and Category**

WUGNAME	COUNTYNAME	BASINNAME	DATA CAT	WUGNUM	RWPG	SEQ#	CITY#	COUNTY#	BASIN#	h1996	d2000	d2010	d2020	d2030	d2040	d2050
SHAVANO PARK	BEXAR	SAN ANTONIO	MUN	120823000	L	823	744	15	19	827	1088	1163	1192	1232	1284	1342
SOMERSET	BEXAR	SAN ANTONIO	MUN	120839000	L	839	747	15	19	282	191	180	171	161	153	149
ST. HEDWIG	BEXAR	SAN ANTONIO	MUN	120855000	L	855	802	15	19	290	200	215	230	275	318	367
TERRELL HILLS	BEXAR	SAN ANTONIO	MUN	120888000	L	888	600	15	19	835	1090	1056	1054	1070	1063	1050
UNIVERSAL CITY	BEXAR	SAN ANTONIO	MUN	120919000	L	919	614	15	19	2612	3386	3748	4186	4864	5491	6200
WINDCREST	BEXAR	SAN ANTONIO	MUN	120978000	L	978	658	15	19	1372	1675	1663	1665	1687	1713	1731
BMWD (OTHER SUBDNS)	BEXAR	SAN ANTONIO	MUN	120996015	L	996	757	15	19	24370	27999	34024	39841	46235	52910	56821
COUNTY-OTHER	BEXAR	SAN ANTONIO	MUN	120996015	L	996	757	15	19	22810	20711	23697	28678	37439	44363	33682
COUNTY-OTHER	BEXAR	NUECES	MUN	120996015	L	996	757	15	21	473	1030	1333	1450	1763	2045	1908
MANUFACTURING	BEXAR	SAN ANTONIO	MFG	121001015	L	1001	1001	15	19	20627	16805	19682	22359	24935	28264	31697
MANUFACTURING	BEXAR	NUECES	MFG	121001015	L	1001	1001	15	21	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	BEXAR	SAN ANTONIO	PWR	121002015	L	1002	1002	15	19	25714	36000	36000	40000	45000	50000	56000
STEAM ELECTRIC POWER	BEXAR	NUECES	PWR	121002015	L	1002	1002	15	21	0	0	0	0	0	0	0
MINING	BEXAR	SAN ANTONIO	MIN	121003015	L	1003	1003	15	19	6429	4781	4758	5018	5217	5451	5763
MINING	BEXAR	NUECES	MIN	121003015	L	1003	1003	15	21	168	182	178	183	189	194	199
IRRIGATION	BEXAR	SAN ANTONIO	IRR	121004015	L	1004	1004	15	19	38729	36623	33605	32038	30997	29684	28434
IRRIGATION	BEXAR	NUECES	IRR	121004015	L	1004	1004	15	21	2743	3380	3274	3282	2830	2713	2592
LIVESTOCK	BEXAR	SAN ANTONIO	STK	121005015	L	1005	1005	15	19	1791	1461	1461	1461	1461	1461	1461
LIVESTOCK	BEXAR	NUECES	STK	121005015	L	1005	1005	15	21	31	26	26	26	26	26	26
LOCKHART	CALDWELL	GUADALUPE	MUN	120533000	L	533	364	28	18	2033	2279	2498	2703	2978	3024	3047
LULING	CALDWELL	GUADALUPE	MUN	120550000	L	550	372	28	18	1145	1532	1750	1955	2244	2516	2819
MARTINDALE	CALDWELL	GUADALUPE	MUN	120568000	L	568	910	28	18	88	109	103	97	99	106	113
COUNTY-OTHER	CALDWELL	COLORADO	MUN	120996028	L	996	757	28	14	115	121	133	145	157	157	158
COUNTY-OTHER	CALDWELL	GUADALUPE	MUN	120996028	L	996	757	28	18	1805	3000	3090	3158	3216	2936	2601
MANUFACTURING	CALDWELL	COLORADO	MFG	121001028	L	1001	1001	28	14	0	0	0	0	0	0	0
MANUFACTURING	CALDWELL	GUADALUPE	MFG	121001028	L	1001	1001	28	18	12	62	67	71	77	82	87
STEAM ELECTRIC POWER	CALDWELL	COLORADO	PWR	121002028	L	1002	1002	28	14	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	CALDWELL	GUADALUPE	PWR	121002028	L	1002	1002	28	18	0	0	0	0	0	0	0
MINING	CALDWELL	COLORADO	MIN	121003028	L	1003	1003	28	14	6	13	9	5	2	0	0
MINING	CALDWELL	GUADALUPE	MIN	121003028	L	1003	1003	28	18	6	8	7	5	2	0	0
IRRIGATION	CALDWELL	COLORADO	IRR	121004028	L	1004	1004	28	14	14	18	16	14	13	11	10
IRRIGATION	CALDWELL	GUADALUPE	IRR	121004028	L	1004	1004	28	18	1728	1204	1070	951	844	751	667
LIVESTOCK	CALDWELL	COLORADO	STK	121005028	L	1005	1005	28	14	133	139	139	139	139	139	139
LIVESTOCK	CALDWELL	GUADALUPE	STK	121005028	L	1005	1005	28	18	668	696	696	696	696	696	696
POINT COMFORT	CALHOUN	COLORADO-LAVACA	MUN	120707000	L	707	474	29	15	191	171	160	155	160	169	176
PORT LAVACA	CALHOUN	LAVACA-GUADALUPE	MUN	120711000	L	711	479	29	17	1672	1769	1709	1698	1792	1909	2033
SEADRIFT	CALHOUN	LAVACA-GUADALUPE	MUN	120811000	L	811	546	29	17	191	196	202	216	238	257	280
COUNTY-OTHER	CALHOUN	COLORADO-LAVACA	MUN	120996029	L	996	757	29	15	66	246	259	270	294	318	353

**TABLE 2:
Water Demand by City and Category**

WUGNAME	COUNTYNAME	BASINNAME	DATA CAT	WUGNUM	RWPG	SEQ#	CITY#	COUNTY#	BASIN#	h1996	d2000	d2010	d2020	d2030	d2040	d2050
COUNTY-OTHER	CALHOUN	LAVACA-GUADALUPE	MUN	120996029	L	996	757	29	17	539	2004	2101	2188	2382	2589	2869
COUNTY-OTHER	CALHOUN	GUADALUPE	MUN	120996029	L	996	757	29	18	2	9	9	10	11	11	13
COUNTY-OTHER	CALHOUN	SAN ANTONIO-NUECES	MUN	120996029	L	996	757	29	20	4	16	16	17	18	20	22
MANUFACTURING	CALHOUN	COLORADO-LAVACA	MFG	121001029	L	1001	1001	29	15	19824	16538	20391	22590	25036	27669	30494
MANUFACTURING	CALHOUN	LAVACA-GUADALUPE	MFG	121001029	L	1001	1001	29	17	20109	46069	56704	62813	69603	76905	84738
MANUFACTURING	CALHOUN	GUADALUPE	MFG	121001029	L	1001	1001	29	18	93	419	493	546	601	662	726
MANUFACTURING	CALHOUN	SAN ANTONIO-NUECES	MFG	121001029	L	1001	1001	29	20	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	CALHOUN	COLORADO-LAVACA	PWR	121002029	L	1002	1002	29	15	29	100	100	100	100	100	100
STEAM ELECTRIC POWER	CALHOUN	LAVACA-GUADALUPE	PWR	121002029	L	1002	1002	29	17	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	CALHOUN	GUADALUPE	PWR	121002029	L	1002	1002	29	18	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	CALHOUN	SAN ANTONIO-NUECES	PWR	121002029	L	1002	1002	29	20	0	0	0	0	0	0	0
MINING	CALHOUN	COLORADO-LAVACA	MIN	121003029	L	1003	1003	29	15	1	1	1	1	0	0	0
MINING	CALHOUN	LAVACA-GUADALUPE	MIN	121003029	L	1003	1003	29	17	4	6	5	4	3	2	2
MINING	CALHOUN	GUADALUPE	MIN	121003029	L	1003	1003	29	18	6	13	9	4	2	0	0
MINING	CALHOUN	SAN ANTONIO-NUECES	MIN	121003029	L	1003	1003	29	20	4	8	6	3	1	1	1
IRRIGATION	CALHOUN	COLORADO-LAVACA	IRR	121004029	L	1004	1004	29	15	0	0	0	0	0	0	0
IRRIGATION	CALHOUN	LAVACA-GUADALUPE	IRR	121004029	L	1004	1004	29	17	48082	26822	22747	19950	17673	16132	15028
IRRIGATION	CALHOUN	GUADALUPE	IRR	121004029	L	1004	1004	29	18	0	0	0	0	0	0	0
IRRIGATION	CALHOUN	SAN ANTONIO-NUECES	IRR	121004029	L	1004	1004	29	20	0	0	0	0	0	0	0
LIVESTOCK	CALHOUN	COLORADO-LAVACA	STK	121005029	L	1005	1005	29	15	16	15	15	15	15	15	15
LIVESTOCK	CALHOUN	LAVACA-GUADALUPE	STK	121005029	L	1005	1005	29	17	300	287	287	287	287	287	287
LIVESTOCK	CALHOUN	GUADALUPE	STK	121005029	L	1005	1005	29	18	2	2	2	2	2	2	2
LIVESTOCK	CALHOUN	SAN ANTONIO-NUECES	STK	121005029	L	1005	1005	29	20	0	0	0	0	0	0	0
FAIROAKS RANCH	COMAL	SAN ANTONIO	MUN	120290000	L	290	771	46	19	27	58	58	54	57	60	64
GARDEN RIDGE	COMAL	GUADALUPE	MUN	120332000	L	332	773	46	18	401	616	689	728	856	917	911
NEW BRAUNFELS	COMAL	GUADALUPE	MUN	120629000	L	629	430	46	18	7284	10335	12570	15436	19499	22447	25717
SCHERTZ	COMAL	SAN ANTONIO	MUN	120808000	L	808	543	46	19	65	150	440	913	997	1092	1192
COUNTY-OTHER	COMAL	GUADALUPE	MUN	120996046	L	996	757	46	18	4482	5531	6908	9114	11827	14776	18013
COUNTY-OTHER	COMAL	SAN ANTONIO	MUN	120996046	L	996	757	46	19	1619	1897	2115	2442	3333	4298	5330
MANUFACTURING	COMAL	GUADALUPE	MFG	121001046	L	1001	1001	46	18	11700	3450	3487	3548	3799	4071	4351
MANUFACTURING	COMAL	SAN ANTONIO	MFG	121001046	L	1001	1001	46	19	264	0	0	0	0	0	0
STEAM ELECTRIC POWER	COMAL	GUADALUPE	PWR	121002046	L	1002	1002	46	18	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	COMAL	SAN ANTONIO	PWR	121002046	L	1002	1002	46	19	0	0	0	0	0	0	0
MINING	COMAL	GUADALUPE	MIN	121003046	L	1003	1003	46	18	8909	5570	5464	5628	5796	3590	2224
MINING	COMAL	SAN ANTONIO	MIN	121003046	L	1003	1003	46	19	0	0	0	0	0	0	0
IRRIGATION	COMAL	GUADALUPE	IRR	121004046	L	1004	1004	46	18	17	393	377	361	347	332	319
IRRIGATION	COMAL	SAN ANTONIO	IRR	121004046	L	1004	1004	46	19	18	66	63	61	58	56	53
LIVESTOCK	COMAL	GUADALUPE	STK	121005046	L	1005	1005	46	18	261	306	306	306	306	306	306

**TABLE 2:
Water Demand by City and Category**

Comments		
4/6/01 - Co 7/30/01 DONE CKR		
4/6/01 - Co 7/30/01 Already done CKR		
4/6/01 - Co 7/30/01 DONE CKR		

**TABLE 2:
Water Demand by City and Category**

WUGNAME	COUNTYNAME	BASINNAME	DATA CAT	WUGNUM	RWPG	SEQ#	CITY#	COUNTY#	BASIN#	h1996	d2000	d2010	d2020	d2030	d2040	d2050
LIVESTOCK	COMAL	SAN ANTONIO	STK	121005046	L	1005	1005	46	19	44	50	50	50	50	50	50
CUERO	DEWITT	GUADALUPE	MUN	120220000	L	220	147	62	18	1462	1767	1710	1684	1749	1823	1891
YOAKUM	DEWITT	LAVACA	MUN	120992000	L	992	670	62	16	382	478	493	517	576	640	718
YORKTOWN	DEWITT	GUADALUPE	MUN	120993000	L	993	671	62	18	407	438	427	424	451	479	510
COUNTY-OTHER	DEWITT	LAVACA	MUN	120996062	L	996	757	62	16	183	136	126	121	124	128	131
COUNTY-OTHER	DEWITT	LAVACA-GUADALUPE	MUN	120996062	L	996	757	62	17	4	3	3	3	3	3	3
COUNTY-OTHER	DEWITT	GUADALUPE	MUN	120996062	L	996	757	62	18	955	683	609	553	532	512	482
COUNTY-OTHER	DEWITT	SAN ANTONIO	MUN	120996062	L	996	757	62	19	148	109	102	98	100	103	106
MANUFACTURING	DEWITT	LAVACA	MFG	121001062	L	1001	1001	62	16	5	0	0	0	0	0	0
MANUFACTURING	DEWITT	LAVACA-GUADALUPE	MFG	121001062	L	1001	1001	62	17	0	0	0	0	0	0	0
MANUFACTURING	DEWITT	GUADALUPE	MFG	121001062	L	1001	1001	62	18	42	108	126	146	170	195	223
MANUFACTURING	DEWITT	SAN ANTONIO	MFG	121001062	L	1001	1001	62	19	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	DEWITT	LAVACA	PWR	121002062	L	1002	1002	62	16	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	DEWITT	LAVACA-GUADALUPE	PWR	121002062	L	1002	1002	62	17	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	DEWITT	GUADALUPE	PWR	121002062	L	1002	1002	62	18	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	DEWITT	SAN ANTONIO	PWR	121002062	L	1002	1002	62	19	0	0	0	0	0	0	0
MINING	DEWITT	LAVACA	MIN	121003062	L	1003	1003	62	16	78	94	52	26	18	16	16
MINING	DEWITT	LAVACA-GUADALUPE	MIN	121003062	L	1003	1003	62	17	21	43	30	19	6	1	0
MINING	DEWITT	GUADALUPE	MIN	121003062	L	1003	1003	62	18	22	24	24	25	26	27	28
MINING	DEWITT	SAN ANTONIO	MIN	121003062	L	1003	1003	62	19	0	0	0	0	0	0	0
IRRIGATION	DEWITT	LAVACA	IRR	121004062	L	1004	1004	62	16	57	0	0	0	0	0	0
IRRIGATION	DEWITT	LAVACA-GUADALUPE	IRR	121004062	L	1004	1004	62	17	0	0	0	0	0	0	0
IRRIGATION	DEWITT	GUADALUPE	IRR	121004062	L	1004	1004	62	18	31	231	203	178	156	137	120
IRRIGATION	DEWITT	SAN ANTONIO	IRR	121004062	L	1004	1004	62	19	0	19	17	15	13	11	10
LIVESTOCK	DEWITT	LAVACA	STK	121005062	L	1005	1005	62	16	256	271	271	271	271	271	271
LIVESTOCK	DEWITT	LAVACA-GUADALUPE	STK	121005062	L	1005	1005	62	17	50	53	53	53	53	53	53
LIVESTOCK	DEWITT	GUADALUPE	STK	121005062	L	1005	1005	62	18	1339	1419	1419	1419	1419	1419	1419
LIVESTOCK	DEWITT	SAN ANTONIO	STK	121005062	L	1005	1005	62	19	146	153	153	153	153	153	153
ASHERTON	DIMMIT	NUECES	MUN	120039000	L	39	26	64	21	302	211	205	206	224	243	267
BIG WELLS	DIMMIT	NUECES	MUN	120086000	L	86	827	64	21	186	165	153	143	146	147	149
CARRIZO SPRINGS	DIMMIT	NUECES	MUN	120146000	L	146	97	64	21	1946	2316	2583	2827	3232	3657	4137
COUNTY-OTHER	DIMMIT	NUECES	MUN	120996064	L	996	757	64	21	373	238	221	211	231	260	280
COUNTY-OTHER	DIMMIT	RIO GRANDE	MUN	120996064	L	996	757	64	23	8	6	6	6	6	6	7
MANUFACTURING	DIMMIT	NUECES	MFG	121001064	L	1001	1001	64	21	4	11	11	12	13	14	15
MANUFACTURING	DIMMIT	RIO GRANDE	MFG	121001064	L	1001	1001	64	23	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	DIMMIT	NUECES	PWR	121002064	L	1002	1002	64	21	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	DIMMIT	RIO GRANDE	PWR	121002064	L	1002	1002	64	23	0	0	0	0	0	0	0
MINING	DIMMIT	NUECES	MIN	121003064	L	1003	1003	64	21	919	1003	817	906	916	926	950

**TABLE 2:
Water Demand by City and Category**

WUGNAME	COUNTYNAME	BASINNAME	DATA CAT	WUGNUM	RWPG	SEQ#	CITY#	COUNTY#	BASIN#	h1996	d2000	d2010	d2020	d2030	d2040	d2050
MINING	DIMITT	RIO GRANDE	MIN	121003064	L	1003	1003	64	23	0	0	0	0	0	0	0
IRRIGATION	DIMITT	NUECES	IRR	121004064	L	1004	1004	64	21	10946	10551	10199	9932	9828	9432	9026
IRRIGATION	DIMITT	RIO GRANDE	IRR	121004064	L	1004	1004	64	23	0	0	0	0	0	0	0
LIVESTOCK	DIMITT	NUECES	STK	121005064	L	1005	1005	64	21	686	621	621	621	621	621	621
LIVESTOCK	DIMITT	RIO GRANDE	STK	121005064	L	1005	1005	64	23	166	150	150	150	150	150	150
DILLEY	FRIO	NUECES	MUN	120248000	L	248	166	82	21	720	824	855	873	906	939	962
PEARSALL	FRIO	NUECES	MUN	120685000	L	685	459	82	21	1446	1955	2020	2057	2146	2210	2263
COUNTY-OTHER	FRIO	NUECES	MUN	120996082	L	996	757	82	21	897	731	740	740	761	784	799
MANUFACTURING	FRIO	NUECES	MFG	121001082	L	1001	1001	82	21	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	FRIO	NUECES	PWR	121002082	L	1002	1002	82	21	227	400	400	400	400	400	400
MINING	FRIO	NUECES	MIN	121003082	L	1003	1003	82	21	139	150	63	32	16	7	3
IRRIGATION	FRIO	NUECES	IRR	121004082	L	1004	1004	82	21	93421	94688	91294	88045	84933	81955	79103
LIVESTOCK	FRIO	NUECES	STK	121005082	L	1005	1005	82	21	906	1192	1192	1192	1192	1192	1192
GOLIAD	GOLIAD	SAN ANTONIO	MUN	120347000	L	347	240	88	19	414	429	419	408	407	416	440
COUNTY-OTHER	GOLIAD	GUADALUPE	MUN	120996088	L	996	757	88	18	197	182	172	164	164	165	174
COUNTY-OTHER	GOLIAD	SAN ANTONIO	MUN	120996088	L	996	757	88	19	285	259	245	233	233	234	247
COUNTY-OTHER	GOLIAD	SAN ANTONIO-NUECES	MUN	120996088	L	996	757	88	20	61	58	55	53	52	53	56
MANUFACTURING	GOLIAD	GUADALUPE	MFG	121001088	L	1001	1001	88	18	0	0	0	0	0	0	0
MANUFACTURING	GOLIAD	SAN ANTONIO	MFG	121001088	L	1001	1001	88	19	0	0	0	0	0	0	0
MANUFACTURING	GOLIAD	SAN ANTONIO-NUECES	MFG	121001088	L	1001	1001	88	20	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	GOLIAD	GUADALUPE	PWR	121002088	L	1002	1002	88	18	11037	15000	15000	20000	20000	20000	20000
STEAM ELECTRIC POWER	GOLIAD	SAN ANTONIO	PWR	121002088	L	1002	1002	88	19	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	GOLIAD	SAN ANTONIO-NUECES	PWR	121002088	L	1002	1002	88	20	0	0	0	0	0	0	0
MINING	GOLIAD	GUADALUPE	MIN	121003088	L	1003	1003	88	18	6	12	9	5	2	0	0
MINING	GOLIAD	SAN ANTONIO	MIN	121003088	L	1003	1003	88	19	0	0	0	0	0	0	0
MINING	GOLIAD	SAN ANTONIO-NUECES	MIN	121003088	L	1003	1003	88	20	7	5	3	1	1	0	0
IRRIGATION	GOLIAD	GUADALUPE	IRR	121004088	L	1004	1004	88	18	26	0	0	0	0	0	0
IRRIGATION	GOLIAD	SAN ANTONIO	IRR	121004088	L	1004	1004	88	19	157	592	511	442	382	330	285
IRRIGATION	GOLIAD	SAN ANTONIO-NUECES	IRR	121004088	L	1004	1004	88	20	6	0	0	0	0	0	0
LIVESTOCK	GOLIAD	GUADALUPE	STK	121005088	L	1005	1005	88	18	190	267	267	267	267	267	267
LIVESTOCK	GOLIAD	SAN ANTONIO	STK	121005088	L	1005	1005	88	19	337	471	471	471	471	471	471
LIVESTOCK	GOLIAD	SAN ANTONIO-NUECES	STK	121005088	L	1005	1005	88	20	336	470	470	470	470	470	470
GONZALES	GONZALES	GUADALUPE	MUN	120348000	L	348	241	89	18	1693	1648	1607	1566	1564	1589	1623
NIXON	GONZALES	GUADALUPE	MUN	120638000	L	638	432	89	18	406	384	368	353	351	358	363
WAELDER	GONZALES	GUADALUPE	MUN	120936000	L	936	984	89	18	138	157	146	141	142	140	140
COUNTY-OTHER	GONZALES	LAVACA	MUN	120996089	L	996	757	89	16	16	14	13	13	13	13	13
COUNTY-OTHER	GONZALES	GUADALUPE	MUN	120996089	L	996	757	89	18	1898	1676	1595	1540	1519	1528	1545
MANUFACTURING	GONZALES	LAVACA	MFG	121001089	L	1001	1001	89	16	0	0	0	0	0	0	0

**TABLE 2:
Water Demand by City and Category**

WUGNAME	COUNTYNAME	BASINNAME	DATA CAT	WUGNUM	RWPG	SEQ#	CITY#	COUNTY#	BASIN#	h1996	d2000	d2010	d2020	d2030	d2040	d2050
MANUFACTURING	GONZALES	GUADALUPE	MFG	121001089	L	1001	1001	89	18	1091	929	992	1043	1083	1160	1231
STEAM ELECTRIC POWER	GONZALES	LAVACA	PWR	121002089	L	1002	1002	89	16	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	GONZALES	GUADALUPE	PWR	121002089	L	1002	1002	89	18	0	0	0	0	0	0	0
MINING	GONZALES	LAVACA	MIN	121003089	L	1003	1003	89	16	2	4	3	1	0	0	0
MINING	GONZALES	GUADALUPE	MIN	121003089	L	1003	1003	89	18	31	37	34	32	29	29	30
IRRIGATION	GONZALES	LAVACA	IRR	121004089	L	1004	1004	89	16	0	0	0	0	0	0	0
IRRIGATION	GONZALES	GUADALUPE	IRR	121004089	L	1004	1004	89	18	1379	3052	2632	2269	1957	1687	1455
LIVESTOCK	GONZALES	LAVACA	STK	121005089	L	1005	1005	89	16	31	54	57	57	57	57	57
LIVESTOCK	GONZALES	GUADALUPE	STK	121005089	L	1005	1005	89	18	3389	5945	6277	6277	6277	6277	6277
CIBOLO	GUADALUPE	SAN ANTONIO	MUN	120168000	L	168	763	94	19	316	441	437	464	519	593	632
MARION	GUADALUPE	SAN ANTONIO	MUN	120563000	L	563	908	94	19	157	131	120	113	113	113	114
MCQUEENEY (CDP)	GUADALUPE	GUADALUPE	MUN	120580000	L	580	906	94	18	318	251	242	232	254	272	277
NEW BRAUNFELS	GUADALUPE	GUADALUPE	MUN	120629000	L	629	430	94	18	81	75	84	98	139	155	171
SCHERTZ	GUADALUPE	SAN ANTONIO	MUN	120808000	L	808	543	94	19	1811	4612	4508	4261	4654	5094	5563
SEGUIN	GUADALUPE	GUADALUPE	MUN	120816000	L	816	550	94	18	4530	4566	5093	5711	6800	8073	9538
COUNTY-OTHER	GUADALUPE	GUADALUPE	MUN	120996094	L	996	757	94	18	3825	4279	5883	7864	10617	12094	14166
COUNTY-OTHER	GUADALUPE	SAN ANTONIO	MUN	120996094	L	996	757	94	19	978	1125	1565	2104	2857	3254	3835
MANUFACTURING	GUADALUPE	GUADALUPE	MFG	121001094	L	1001	1001	94	18	2893	1883	2102	2248	2385	2590	2797
MANUFACTURING	GUADALUPE	SAN ANTONIO	MFG	121001094	L	1001	1001	94	19	2	0	0	0	0	0	0
STEAM ELECTRIC POWER	GUADALUPE	GUADALUPE	PWR	121002094	L	1002	1002	94	18	0	10760	10760	10760	10760	10760	10760
STEAM ELECTRIC POWER	GUADALUPE	SAN ANTONIO	PWR	121002094	L	1002	1002	94	19	0	0	0	0	0	0	0
MINING	GUADALUPE	GUADALUPE	MIN	121003094	L	1003	1003	94	18	261	186	188	190	192	197	203
MINING	GUADALUPE	SAN ANTONIO	MIN	121003094	L	1003	1003	94	19	9	10	10	10	10	10	10
IRRIGATION	GUADALUPE	GUADALUPE	IRR	121004094	L	1004	1004	94	18	373	2194	2088	1988	1893	1803	1717
IRRIGATION	GUADALUPE	SAN ANTONIO	IRR	121004094	L	1004	1004	94	19	0	326	311	296	282	268	255
LIVESTOCK	GUADALUPE	GUADALUPE	STK	121005094	L	1005	1005	94	18	1372	848	848	848	848	848	848
LIVESTOCK	GUADALUPE	SAN ANTONIO	STK	121005094	L	1005	1005	94	19	460	284	284	284	284	284	284
KYLE	HAYS	GUADALUPE	MUN	120483000	L	483	330	105	18	307	353	337	339	376	435	504
SAN MARCOS	HAYS	GUADALUPE	MUN	120797000	L	797	537	105	18	6404	9393	11600	14381	18671	24078	31049
WIMBERLEY (CDP)	HAYS	GUADALUPE	MUN	120977000	L	977	994	105	18	576	615	732	790	898	1004	1128
WOODCREEK	HAYS	GUADALUPE	MUN	120986000	L	986	995	105	18	208	171	160	149	150	153	157
COUNTY-OTHER	HAYS	GUADALUPE	MUN	120996105	L	996	757	105	18	3634	5569	6646	7236	8315	9255	8325
MANUFACTURING	HAYS	GUADALUPE	MFG	121001105	L	1001	1001	105	18	96	93	105	118	129	142	154
STEAM ELECTRIC POWER	HAYS	GUADALUPE	PWR	121002105	L	1002	1002	105	18	0	0	6400	6400	6400	6400	6400
MINING	HAYS	GUADALUPE	MIN	121003105	L	1003	1003	105	18	153	84	82	68	55	37	28
IRRIGATION	HAYS	GUADALUPE	IRR	121004105	L	1004	1004	105	18	137	294	292	289	287	284	281
LIVESTOCK	HAYS	GUADALUPE	STK	121005105	L	1005	1005	105	18	281	271	271	271	271	271	271
KARNES CITY	KARNES	SAN ANTONIO	MUN	120457000	L	457	311	128	19	393	468	435	442	468	491	515

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Water Demand by City and Category**

WUGNAME	COUNTYNAME	BASINNAME	DATA CAT	WUGNUM	RWPG	SEQ#	CITY#	COUNTY#	BASIN#	h1996	d2000	d2010	d2020	d2030	d2040	d2050
KENEDY	KARNES	SAN ANTONIO	MUN	120464000	L	464	317	128	19	587	828	779	799	847	885	931
RUNGE	KARNES	SAN ANTONIO	MUN	120781000	L	781	524	128	19	153	199	184	187	196	203	213
COUNTY-OTHER	KARNES	GUADALUPE	MUN	120996128	L	996	757	128	18	36	27	25	25	26	28	28
COUNTY-OTHER	KARNES	SAN ANTONIO	MUN	120996128	L	996	757	128	19	1240	936	860	865	904	945	958
COUNTY-OTHER	KARNES	SAN ANTONIO-NUECES	MUN	120996128	L	996	757	128	20	72	54	50	50	52	55	55
COUNTY-OTHER	KARNES	NUECES	MUN	120996128	L	996	757	128	21	98	74	68	68	71	75	76
MANUFACTURING	KARNES	GUADALUPE	MFG	121001128	L	1001	1001	128	18	0	0	0	0	0	0	0
MANUFACTURING	KARNES	SAN ANTONIO	MFG	121001128	L	1001	1001	128	19	80	296	320	331	340	356	383
MANUFACTURING	KARNES	SAN ANTONIO-NUECES	MFG	121001128	L	1001	1001	128	20	0	0	0	0	0	0	0
MANUFACTURING	KARNES	NUECES	MFG	121001128	L	1001	1001	128	21	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	KARNES	GUADALUPE	PWR	121002128	L	1002	1002	128	18	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	KARNES	SAN ANTONIO	PWR	121002128	L	1002	1002	128	19	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	KARNES	SAN ANTONIO-NUECES	PWR	121002128	L	1002	1002	128	20	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	KARNES	NUECES	PWR	121002128	L	1002	1002	128	21	0	0	0	0	0	0	0
MINING	KARNES	GUADALUPE	MIN	121003128	L	1003	1003	128	18	6	11	8	4	1	0	0
MINING	KARNES	SAN ANTONIO	MIN	121003128	L	1003	1003	128	19	127	147	59	23	15	8	4
MINING	KARNES	SAN ANTONIO-NUECES	MIN	121003128	L	1003	1003	128	20	4	8	6	4	3	2	0
MINING	KARNES	NUECES	MIN	121003128	L	1003	1003	128	21	0	0	0	0	0	0	0
IRRIGATION	KARNES	GUADALUPE	IRR	121004128	L	1004	1004	128	18	0	0	0	0	0	0	0
IRRIGATION	KARNES	SAN ANTONIO	IRR	121004128	L	1004	1004	128	19	2157	1840	1664	1505	1362	1232	1114
IRRIGATION	KARNES	SAN ANTONIO-NUECES	IRR	121004128	L	1004	1004	128	20	0	0	0	0	0	0	0
IRRIGATION	KARNES	NUECES	IRR	121004128	L	1004	1004	128	21	0	0	0	0	0	0	0
LIVESTOCK	KARNES	GUADALUPE	STK	121005128	L	1005	1005	128	18	120	92	92	92	92	92	92
LIVESTOCK	KARNES	SAN ANTONIO	STK	121005128	L	1005	1005	128	19	1374	1060	1060	1060	1060	1060	1060
LIVESTOCK	KARNES	SAN ANTONIO-NUECES	STK	121005128	L	1005	1005	128	20	90	70	70	70	70	70	70
LIVESTOCK	KARNES	NUECES	STK	121005128	L	1005	1005	128	21	151	117	117	117	117	117	117
BOERNE	KENDALL	SAN ANTONIO	MUN	120095000	L	95	63	130	19	1083	1259	1711	1718	2199	2812	3598
COMFORT (CDP)	KENDALL	GUADALUPE	MUN	120194000	L	194	846	130	18	293	265	254	245	254	269	285
FAIROAKS RANCH	KENDALL	SAN ANTONIO	MUN	120290000	L	290	771	130	19	81	232	359	326	331	336	342
COUNTY-OTHER	KENDALL	COLORADO	MUN	120996130	L	996	757	130	14	33	22	21	22	23	25	28
COUNTY-OTHER	KENDALL	GUADALUPE	MUN	120996130	L	996	757	130	18	873	686	874	1094	1378	1513	1661
COUNTY-OTHER	KENDALL	SAN ANTONIO	MUN	120996130	L	996	757	130	19	876	1069	1539	2809	4099	5578	6847
MANUFACTURING	KENDALL	COLORADO	MFG	121001130	L	1001	1001	130	14	0	0	0	0	0	0	0
MANUFACTURING	KENDALL	GUADALUPE	MFG	121001130	L	1001	1001	130	18	1	0	0	0	0	0	0
MANUFACTURING	KENDALL	SAN ANTONIO	MFG	121001130	L	1001	1001	130	19	6	2	3	4	4	5	6
STEAM ELECTRIC POWER	KENDALL	COLORADO	PWR	121002130	L	1002	1002	130	14	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	KENDALL	GUADALUPE	PWR	121002130	L	1002	1002	130	18	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	KENDALL	SAN ANTONIO	PWR	121002130	L	1002	1002	130	19	0	0	0	0	0	0	0

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WUGNAME	COUNTYNAME	BASINNAME	DATA CAT	WUGNUM	RWPG	SEQ#	CITY#	COUNTY#	BASIN#	h1996	d2000	d2010	d2020	d2030	d2040	d2050
MINING	KENDALL	COLORADO	MIN	121003130	L	1003	1003	130	14	6	13	9	5	1	0	0
MINING	KENDALL	GUADALUPE	MIN	121003130	L	1003	1003	130	18	0	0	0	0	0	0	0
MINING	KENDALL	SAN ANTONIO	MIN	121003130	L	1003	1003	130	19	0	0	0	0	0	0	0
IRRIGATION	KENDALL	COLORADO	IRR	121004130	L	1004	1004	130	14	0	0	0	0	0	0	0
IRRIGATION	KENDALL	GUADALUPE	IRR	121004130	L	1004	1004	130	18	894	364	349	334	320	306	293
IRRIGATION	KENDALL	SAN ANTONIO	IRR	121004130	L	1004	1004	130	19	330	0	0	0	0	0	0
LIVESTOCK	KENDALL	COLORADO	STK	121005130	L	1005	1005	130	14	13	17	17	17	17	17	17
LIVESTOCK	KENDALL	GUADALUPE	STK	121005130	L	1005	1005	130	18	299	404	404	404	404	404	404
LIVESTOCK	KENDALL	SAN ANTONIO	STK	121005130	L	1005	1005	130	19	68	91	91	91	91	91	91
COTULLA	LA SALLE	NUECES	MUN	120209000	L	209	138	142	21	1057	908	934	942	970	1005	1040
ENCINAL	LA SALLE	NUECES	MUN	120283000	L	283	863	142	21	98	93	75	61	55	51	48
COUNTY-OTHER	LA SALLE	NUECES	MUN	120996142	L	996	757	142	21	231	371	382	389	397	403	398
MANUFACTURING	LA SALLE	NUECES	MFG	121001142	L	1001	1001	142	21	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	LA SALLE	NUECES	PWR	121002142	L	1002	1002	142	21	0	0	0	0	0	0	0
MINING	LA SALLE	NUECES	MIN	121003142	L	1003	1003	142	21	0	0	0	0	0	0	0
IRRIGATION	LA SALLE	NUECES	IRR	121004142	L	1004	1004	142	21	7209	7067	6849	6638	6433	6234	6042
LIVESTOCK	LA SALLE	NUECES	STK	121005142	L	1005	1005	142	21	574	1077	1077	1077	1077	1077	1077
CASTROVILLE	MEDINA	SAN ANTONIO	MUN	120150000	L	150	101	163	19	670	958	985	1013	1061	1092	1123
DEVINE	MEDINA	NUECES	MUN	120244000	L	244	162	163	21	755	953	943	940	964	987	1005
HONDO	MEDINA	NUECES	MUN	120414000	L	414	282	163	21	1777	2032	2092	2164	2263	2327	2393
LACOSTE	MEDINA	SAN ANTONIO	MUN	120494000	L	494	786	163	19	213	278	299	300	326	345	365
LYTLE	MEDINA	NUECES	MUN	120553000	L	553	374	163	21	90	92	89	87	88	90	92
NATALIA	MEDINA	NUECES	MUN	120624000	L	624	425	163	21	283	397	408	422	440	452	464
COUNTY-OTHER	MEDINA	SAN ANTONIO	MUN	120996163	L	996	757	163	19	468	441	458	466	493	509	540
COUNTY-OTHER	MEDINA	NUECES	MUN	120996163	L	996	757	163	21	2158	1961	2038	2075	2197	2272	2416
MANUFACTURING	MEDINA	SAN ANTONIO	MFG	121001163	L	1001	1001	163	19	0	0	0	0	0	0	0
MANUFACTURING	MEDINA	NUECES	MFG	121001163	L	1001	1001	163	21	47	302	319	339	361	384	411
STEAM ELECTRIC POWER	MEDINA	SAN ANTONIO	PWR	121002163	L	1002	1002	163	19	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	MEDINA	NUECES	PWR	121002163	L	1002	1002	163	21	0	0	0	0	0	0	0
MINING	MEDINA	SAN ANTONIO	MIN	121003163	L	1003	1003	163	19	56	68	68	70	72	74	76
MINING	MEDINA	NUECES	MIN	121003163	L	1003	1003	163	21	62	75	60	58	57	58	60
IRRIGATION	MEDINA	SAN ANTONIO	IRR	121004163	L	1004	1004	163	19	16783	24081	23322	22402	21521	20678	19869
IRRIGATION	MEDINA	NUECES	IRR	121004163	L	1004	1004	163	21	69573	120332	115260	110402	105749	101291	97022
LIVESTOCK	MEDINA	SAN ANTONIO	STK	121005163	L	1005	1005	163	19	277	276	276	276	276	276	276
LIVESTOCK	MEDINA	NUECES	STK	121005163	L	1005	1005	163	21	1648	1638	1638	1638	1638	1638	1638
REFUGIO	REFUGIO	SAN ANTONIO-NUECES	MUN	120742000	L	742	497	196	20	616	638	626	608	604	599	589
WOODSBORO	REFUGIO	SAN ANTONIO-NUECES	MUN	120987000	L	987	665	196	20	261	328	317	304	298	293	288
COUNTY-OTHER	REFUGIO	SAN ANTONIO	MUN	120996196	L	996	757	196	19	10	10	9	9	8	8	8

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WUGNAME	COUNTYNAME	BASINNAME	DATA CAT	WUGNUM	RWPG	SEQ#	CITY#	COUNTY#	BASIN#	h1996	d2000	d2010	d2020	d2030	d2040	d2050
COUNTY-OTHER	REFUGIO	SAN ANTONIO-NUECES	MUN	120996196	L	996	757	196	20	359	352	323	299	288	277	265
MANUFACTURING	REFUGIO	SAN ANTONIO	MFG	121001196	L	1001	1001	196	19	0	0	0	0	0	0	0
MANUFACTURING	REFUGIO	SAN ANTONIO-NUECES	MFG	121001196	L	1001	1001	196	20	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	REFUGIO	SAN ANTONIO	PWR	121002196	L	1002	1002	196	19	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	REFUGIO	SAN ANTONIO-NUECES	PWR	121002196	L	1002	1002	196	20	0	0	0	0	0	0	0
MINING	REFUGIO	SAN ANTONIO	MIN	121003196	L	1003	1003	196	19	0	0	0	0	0	0	0
MINING	REFUGIO	SAN ANTONIO-NUECES	MIN	121003196	L	1003	1003	196	20	112	44	26	19	11	4	4
IRRIGATION	REFUGIO	SAN ANTONIO	IRR	121004196	L	1004	1004	196	19	0	0	0	0	0	0	0
IRRIGATION	REFUGIO	SAN ANTONIO-NUECES	IRR	121004196	L	1004	1004	196	20	0	0	0	0	0	0	0
LIVESTOCK	REFUGIO	SAN ANTONIO	STK	121005196	L	1005	1005	196	19	19	16	16	16	16	16	16
LIVESTOCK	REFUGIO	SAN ANTONIO-NUECES	STK	121005196	L	1005	1005	196	20	476	391	391	391	391	391	391
SABINAL	UVALDE	NUECES	MUN	120783000	L	783	526	232	21	454	510	546	573	632	683	739
UVALDE	UVALDE	NUECES	MUN	120921000	L	921	616	232	21	4435	5173	5621	5921	6610	7198	7871
COUNTY-OTHER	UVALDE	NUECES	MUN	120996232	L	996	757	232	21	1248	1027	907	823	777	737	661
MANUFACTURING	UVALDE	NUECES	MFG	121001232	L	1001	1001	232	21	337	600	643	675	700	759	817
STEAM ELECTRIC POWER	UVALDE	NUECES	PWR	121002232	L	1002	1002	232	21	0	0	0	0	0	0	0
MINING	UVALDE	NUECES	MIN	121003232	L	1003	1003	232	21	521	444	428	499	576	666	777
IRRIGATION	UVALDE	NUECES	IRR	121004232	L	1004	1004	232	21	84588	135168	129883	124804	119924	115234	110728
LIVESTOCK	UVALDE	NUECES	STK	121005232	L	1005	1005	232	21	1864	1494	1494	1494	1494	1494	1494
BLOOMINGTON	VICTORIA	LAVACA-GUADALUPE	MUN	120091000	L	91	61	235	17	258	269	268	281	316	343	373
VICTORIA	VICTORIA	LAVACA-GUADALUPE	MUN	120931000	L	931	624	235	17	2310	2161	2210	2269	2410	2571	2743
VICTORIA	VICTORIA	GUADALUPE	MUN	120931000	L	931	624	235	18	8922	8345	8533	8762	9304	9927	10590
COUNTY-OTHER	VICTORIA	LAVACA	MUN	120996235	L	996	757	235	16	23	22	22	23	23	23	25
COUNTY-OTHER	VICTORIA	LAVACA-GUADALUPE	MUN	120996235	L	996	757	235	17	1031	987	939	906	941	970	1058
COUNTY-OTHER	VICTORIA	GUADALUPE	MUN	120996235	L	996	757	235	18	1201	1195	1141	1109	1151	1188	1290
COUNTY-OTHER	VICTORIA	SAN ANTONIO	MUN	120996235	L	996	757	235	19	19	34	33	32	33	34	37
MANUFACTURING	VICTORIA	LAVACA	MFG	121001235	L	1001	1001	235	16	0	0	0	0	0	0	0
MANUFACTURING	VICTORIA	LAVACA-GUADALUPE	MFG	121001235	L	1001	1001	235	17	0	0	0	0	0	0	0
MANUFACTURING	VICTORIA	GUADALUPE	MFG	121001235	L	1001	1001	235	18	19587	24115	28446	31157	33670	37900	42201
MANUFACTURING	VICTORIA	SAN ANTONIO	MFG	121001235	L	1001	1001	235	19	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	VICTORIA	LAVACA	PWR	121002235	L	1002	1002	235	16	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	VICTORIA	LAVACA-GUADALUPE	PWR	121002235	L	1002	1002	235	17	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	VICTORIA	GUADALUPE	PWR	121002235	L	1002	1002	235	18	1893	8000	10000	10000	10000	10000	10000
STEAM ELECTRIC POWER	VICTORIA	SAN ANTONIO	PWR	121002235	L	1002	1002	235	19	0	0	0	0	0	0	0
MINING	VICTORIA	LAVACA	MIN	121003235	L	1003	1003	235	16	0	0	0	0	0	0	0
MINING	VICTORIA	LAVACA-GUADALUPE	MIN	121003235	L	1003	1003	235	17	419	640	726	828	931	1045	1174
MINING	VICTORIA	GUADALUPE	MIN	121003235	L	1003	1003	235	18	2596	1938	1302	904	783	675	688
MINING	VICTORIA	SAN ANTONIO	MIN	121003235	L	1003	1003	235	19	0	0	0	0	0	0	0

**TABLE 2:
Water Demand by City and Category**

Comments		

**TABLE 2:
Water Demand by City and Category**

WUGNAME	COUNTYNAME	BASINNAME	DATA CAT	WUGNUM	RWPG	SEQ#	CITY#	COUNTY#	BASIN#	h1996	d2000	d2010	d2020	d2030	d2040	d2050
IRRIGATION	VICTORIA	LAVACA	IRR	121004235	L	1004	1004	235	16	0	0	0	0	0	0	0
IRRIGATION	VICTORIA	LAVACA-GUADALUPE	IRR	121004235	L	1004	1004	235	17	10617	10101	8718	7524	6494	5605	4838
IRRIGATION	VICTORIA	GUADALUPE	IRR	121004235	L	1004	1004	235	18	1672	1723	1487	1284	1108	956	825
IRRIGATION	VICTORIA	SAN ANTONIO	IRR	121004235	L	1004	1004	235	19	0	0	0	0	0	0	0
LIVESTOCK	VICTORIA	LAVACA	STK	121005235	L	1005	1005	235	16	8	7	7	7	7	7	7
LIVESTOCK	VICTORIA	LAVACA-GUADALUPE	STK	121005235	L	1005	1005	235	17	822	660	660	660	660	660	660
LIVESTOCK	VICTORIA	GUADALUPE	STK	121005235	L	1005	1005	235	18	813	653	653	653	653	653	653
LIVESTOCK	VICTORIA	SAN ANTONIO	STK	121005235	L	1005	1005	235	19	97	78	78	78	78	78	78
FLORESVILLE	WILSON	SAN ANTONIO	MUN	120300000	L	300	203	247	19	1146	1290	1340	1385	1453	1531	1613
LA VERNIA	WILSON	SAN ANTONIO	MUN	120491000	L	491	897	247	19	203	225	230	234	254	276	286
POTH	WILSON	SAN ANTONIO	MUN	120717000	L	717	484	247	19	325	449	474	494	522	552	600
STOCKDALE	WILSON	SAN ANTONIO	MUN	120862000	L	862	583	247	19	317	334	353	369	392	412	448
COUNTY-OTHER	WILSON	GUADALUPE	MUN	120996247	L	996	757	247	18	100	113	118	123	129	137	150
COUNTY-OTHER	WILSON	SAN ANTONIO	MUN	120996247	L	996	757	247	19	2247	3392	4523	5003	6413	7831	9205
COUNTY-OTHER	WILSON	NUECES	MUN	120996247	L	996	757	247	21	153	173	181	188	198	209	229
MANUFACTURING	WILSON	GUADALUPE	MFG	121001247	L	1001	1001	247	18	0	59	69	81	95	110	128
MANUFACTURING	WILSON	SAN ANTONIO	MFG	121001247	L	1001	1001	247	19	1	2	3	4	4	5	6
MANUFACTURING	WILSON	NUECES	MFG	121001247	L	1001	1001	247	21	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	WILSON	GUADALUPE	PWR	121002247	L	1002	1002	247	18	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	WILSON	SAN ANTONIO	PWR	121002247	L	1002	1002	247	19	0	0	0	0	0	0	0
STEAM ELECTRIC POWER	WILSON	NUECES	PWR	121002247	L	1002	1002	247	21	0	0	0	0	0	0	0
MINING	WILSON	GUADALUPE	MIN	121003247	L	1003	1003	247	18	6	11	8	4	1	0	0
MINING	WILSON	SAN ANTONIO	MIN	121003247	L	1003	1003	247	19	271	182	97	58	38	30	20
MINING	WILSON	NUECES	MIN	121003247	L	1003	1003	247	21	0	0	0	0	0	0	0
IRRIGATION	WILSON	GUADALUPE	IRR	121004247	L	1004	1004	247	18	0	101	90	80	70	62	55
IRRIGATION	WILSON	SAN ANTONIO	IRR	121004247	L	1004	1004	247	19	10853	10761	9767	8893	8122	7443	6845
IRRIGATION	WILSON	NUECES	IRR	121004247	L	1004	1004	247	21	5213	3659	3231	2853	2521	2227	1969
LIVESTOCK	WILSON	GUADALUPE	STK	121005247	L	1005	1005	247	18	69	64	64	64	64	64	64
LIVESTOCK	WILSON	SAN ANTONIO	STK	121005247	L	1005	1005	247	19	1801	1687	1687	1687	1687	1687	1687
LIVESTOCK	WILSON	NUECES	STK	121005247	L	1005	1005	247	21	164	154	154	154	154	154	154
BATESVILLE (CDP)	ZAVALA	NUECES	MUN	120060000	L	60	821	254	21	234	212	200	196	204	212	209
CRYSTAL CITY	ZAVALA	NUECES	MUN	120219000	L	219	146	254	21	1891	2034	1948	1850	1908	1902	1908
LA PRYOR (CDP)	ZAVALA	NUECES	MUN	120490000	L	490	896	254	21	336	238	203	171	157	150	145
COUNTY-OTHER	ZAVALA	NUECES	MUN	120996254	L	996	757	254	21	229	290	343	357	383	489	658
MANUFACTURING	ZAVALA	NUECES	MFG	121001254	L	1001	1001	254	21	721	1407	1507	1582	1642	1780	1914
STEAM ELECTRIC POWER	ZAVALA	NUECES	PWR	121002254	L	1002	1002	254	21	0	0	0	0	0	0	0
MINING	ZAVALA	NUECES	MIN	121003254	L	1003	1003	254	21	114	97	42	25	8	2	0
IRRIGATION	ZAVALA	NUECES	IRR	121004254	L	1004	1004	254	21	74669	103213	99135	95218	91456	87842	84371

**TABLE 2:
Water Demand by City and Category**

WUGNAME	COUNTYNAME	BASINNAME	DATA CAT	WUGNUM	RWPG	SEQ#	CITY#	COUNTY#	BASIN#	h1996	d2000	d2010	d2020	d2030	d2040	d2050
LIVESTOCK	ZAVALA	NUECES	STK	121005254	L	1005	1005	254	21	809	881	881	881	881	881	881

**TABLE 2:
Water Demand by City and Category**

Comments	

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100																																																																		
Population	120000000	125000000	130000000	135000000	140000000	145000000	150000000	155000000	160000000	165000000	170000000	175000000	180000000	185000000	190000000	195000000	200000000	205000000	210000000	215000000	220000000	225000000	230000000	235000000	240000000	245000000	250000000	255000000	260000000	265000000	270000000	275000000	280000000	285000000	290000000	295000000	300000000	305000000	310000000	315000000	320000000	325000000	330000000	335000000	340000000	345000000	350000000	355000000	360000000	365000000	370000000	375000000	380000000	385000000	390000000	395000000	400000000	405000000	410000000	415000000	420000000	425000000	430000000	435000000	440000000	445000000	450000000	455000000	460000000	465000000	470000000	475000000	480000000	485000000	490000000	495000000	500000000	505000000	510000000	515000000	520000000	525000000	530000000	535000000	540000000	545000000	550000000	555000000	560000000	565000000	570000000	575000000	580000000	585000000	590000000	595000000	600000000	605000000	610000000	615000000	620000000	625000000	630000000	635000000	640000000	645000000	650000000	655000000	660000000	665000000	670000000	675000000	680000000	685000000	690000000	695000000	700000000	705000000	710000000	715000000	720000000	725000000	730000000	735000000	740000000	745000000	750000000	755000000	760000000	765000000	770000000	775000000	780000000	785000000	790000000	795000000	800000000	805000000	810000000	815000000	820000000	825000000	830000000	835000000	840000000	845000000	850000000	855000000	860000000	865000000	870000000	875000000	880000000	885000000	890000000	895000000	900000000	905000000	910000000	915000000	920000000	925000000	930000000	935000000	940000000	945000000	950000000	955000000	960000000	965000000	970000000	975000000	980000000	985000000	990000000	995000000	1000000000

Item No.	Description	Unit	Quantity	Rate	Amount
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Account	Account Name	Account Type	Account Description	Account Balance	Account Status	Account Location	Account Category	Account Sub-Category	Account Code	Account Date	Account Period	Account Amount	Account Currency	Account Unit	Account Rate	Account Tax	Account Fee	Account Note	Account Remark	Account Detail	
1000	General Management Expenses	Expense	General Management Expenses	1000	Active	General	Management	Expenses	1000	2023-01-01	2023-12-31	1000	USD	1.00							
1001	Salaries and Wages	Expense	Salaries and Wages	1001	Active	General	Management	Expenses	1001	2023-01-01	2023-12-31	1001	USD	1.00							
1002	Travel Expenses	Expense	Travel Expenses	1002	Active	General	Management	Expenses	1002	2023-01-01	2023-12-31	1002	USD	1.00							
1003	Office Supplies	Expense	Office Supplies	1003	Active	General	Management	Expenses	1003	2023-01-01	2023-12-31	1003	USD	1.00							
1004	Utilities	Expense	Utilities	1004	Active	General	Management	Expenses	1004	2023-01-01	2023-12-31	1004	USD	1.00							
1005	Insurance	Expense	Insurance	1005	Active	General	Management	Expenses	1005	2023-01-01	2023-12-31	1005	USD	1.00							
1006	Professional Fees	Expense	Professional Fees	1006	Active	General	Management	Expenses	1006	2023-01-01	2023-12-31	1006	USD	1.00							
1007	Depreciation	Expense	Depreciation	1007	Active	General	Management	Expenses	1007	2023-01-01	2023-12-31	1007	USD	1.00							
1008	Interest	Expense	Interest	1008	Active	General	Management	Expenses	1008	2023-01-01	2023-12-31	1008	USD	1.00							
1009	Other Expenses	Expense	Other Expenses	1009	Active	General	Management	Expenses	1009	2023-01-01	2023-12-31	1009	USD	1.00							
1010	Income Tax	Expense	Income Tax	1010	Active	General	Management	Expenses	1010	2023-01-01	2023-12-31	1010	USD	1.00							
1011	Dividends	Expense	Dividends	1011	Active	General	Management	Expenses	1011	2023-01-01	2023-12-31	1011	USD	1.00							
1012	Retirement	Expense	Retirement	1012	Active	General	Management	Expenses	1012	2023-01-01	2023-12-31	1012	USD	1.00							
1013	Health Insurance	Expense	Health Insurance	1013	Active	General	Management	Expenses	1013	2023-01-01	2023-12-31	1013	USD	1.00							
1014	Life Insurance	Expense	Life Insurance	1014	Active	General	Management	Expenses	1014	2023-01-01	2023-12-31	1014	USD	1.00							
1015	Disability Insurance	Expense	Disability Insurance	1015	Active	General	Management	Expenses	1015	2023-01-01	2023-12-31	1015	USD	1.00							
1016	Other Insurance	Expense	Other Insurance	1016	Active	General	Management	Expenses	1016	2023-01-01	2023-12-31	1016	USD	1.00							
1017	Charitable Contributions	Expense	Charitable Contributions	1017	Active	General	Management	Expenses	1017	2023-01-01	2023-12-31	1017	USD	1.00							
1018	Gifts	Expense	Gifts	1018	Active	General	Management	Expenses	1018	2023-01-01	2023-12-31	1018	USD	1.00							
1019	Entertainment	Expense	Entertainment	1019	Active	General	Management	Expenses	1019	2023-01-01	2023-12-31	1019	USD	1.00							
1020	Other	Expense	Other	1020	Active	General	Management	Expenses	1020	2023-01-01	2023-12-31	1020	USD	1.00							

Attachment A
Discussion of Dependable Supply Associated with the
Colorado River Diversion Option (LCRA)

The Colorado River Diversion Option is an important part of the South Central Texas (Region L) Regional Water Plan that was adopted by the SCTRWPG on January 4, 2001. The strategy is included in the Adopted Regional Water Plan with an associated dependable water supply of 150,000 acft/yr for Region L. However, the SCTRWPG acknowledges potential revisions in the dependable supply for this strategy pursuant to the TWDB review of March 28, 2001. The following discussion includes: (1) Background information; (2) Acknowledgement of the possibility that the quantity available may be only 131,000 acft/yr; (3) Recognition of Memorandum Contract between SAWS and LCRA; (4) Recognition of HB 1629, 77th Texas Legislature; (5) Description of a potential reduction of 19,000 acft/yr in the dependable supply for the Regional Water Provider(s) for Bexar County; and (6) Discussion of cost implications of this potential reduction in dependable supply.

(1) Background information summarizing estimates of dependable supply based on LCRA Management Plan and Consensus Environmental Criteria. The South Central Texas (Region L) and Lower Colorado (Region K) Regional Water Planning Groups (RWPGs) included the Colorado River Diversion Option in their respective Initially Prepared Regional Water Plans pursuant to descriptive information prepared by the Lower Colorado River Authority (LCRA) and presented to the South Central Texas RWPG on July 6, 2000. LCRA descriptive information indicated that planned implementation of the Colorado River Diversion Option subject to instream flow requirements consistent with the LCRA Management Plan would result in a dependable supply of up to 150,000 acft/yr for water user groups in Region L. Region K included the water management strategy at 150,000 acft/yr and Region L included the strategy in two parts, as follows: (a) Up to 18,000 acft/yr to be diverted near Bastrop for delivery to Hays County; and (b) Up to 132,000 acft/yr to be diverted near Bay City for delivery to Bexar County. Subsequent technical analyses of this water management strategy subject to statistically-based instream flow requirements outlined in the Consensus Environmental Criteria were completed by the LCRA resulting in an estimated dependable supply of 131,000 acft/yr for water user groups in Region L.

(2) Acknowledgement of possibility that the quantity of water available to water user groups in Region L from the Colorado River Diversion Option (LCRA) water management strategy may range between 131,000 acft/yr and 150,000 acft/yr. The potential difference in quantities of water available from the LCRA to meet Region L needs depends upon applicable environmental requirements, which cannot be determined without additional research. Such research is being undertaken as noted in Points Number (3) and (4) below. Pursuant to TWDB review, Region L acknowledges that this water management strategy may involve delivery of 113,000 acft/yr (rather than 132,000 acft/yr) from the Colorado River near Bay City to Bexar County. The portion of this water management strategy involving diversions from the Colorado River near Bastrop to Hays County (18,000 acft/yr) is assumed to remain unchanged.

(3) Region L Recognition of the Memorandum Contract between SAWS and LCRA effective February 7, 2001. The Memorandum Contract states in its recitals, among other things, that: *“LCRA desires to sell and SAWS desires to purchase surface water to be made available from demand reduction and new firm yield to be developed from the Colorado River consistent with the regional water plans for Region K and Region L (“Project”) if feasible and if legislation (the “Legislation”) is enacted by the 77th Texas Legislature during its Regular Session to allow the purchase and sale of water on terms consistent with this Memorandum Contract.”* The Memorandum Contract includes the following specific provisions:

- a) Maximum of 150,000 acft/yr sale of surface water; and
- b) Seven year study period to determine if water can be made available cost-effectively while addressing potential environmental impacts.

The SCTRWPB believes that the Colorado River Diversion Option (LCRA) as presently included in the Region L and Region K Plans is consistent with this Memorandum Contract.

(4) Region L Recognition of HB 1629 of the 77th Texas Legislature effective May 3, 2001. HB 1629, enacted by the 77th Texas Legislature, Regular Session, and mentioned in the Memorandum Contract described in Point Number 3 as the “Legislation” is entitled, “AN ACT relating to the provision of water by the Lower Colorado River Authority to a municipality outside the Colorado River Basin.” HB 1629 includes the following specific provisions:

- a) Contractual sale of no more than 150,000 acft/yr of water;
- b) Provisions for instream flows no less protective than those in the LCRA Water Management Plan approved by TNRCC; and
- c) Consistency with Regional Water Plans filed with TWDB on or before January 5, 2001.

In addition, HB1629:

- a) Sets a base period for contracts of 50 years, with an option to renew for no more than an additional 30 years, with requirements that, if contracts are renewed, the municipality progressively reduces the quantity of water used during the last 10 years of the renewal term;
- b) Provides for a surcharge to enable the LCRA to develop and manage water resources for the mutual benefit of the LCRA’s service area and the municipality;
- c) Ensures that the municipality will prepare a drought contingency plan, and has developed and implemented a water conservation plan that will result in the highest practicable levels of water conservation and efficiency achievable within its jurisdiction;
- d) Provides for a broad public and scientific review process to ensure that all information that can be practicably developed is considered in establishing beneficial inflow and instream flow provisions; and
- e) Provides that the contract must benefit stored water levels in the LCRA’s existing reservoirs.

The SCTRWPB believes that the Colorado River Diversion Option (LCRA), as presently included in the Region L and Region K Plans, is consistent with HB 1629.

(5) Description of a potential reduction of 19,000 acft/yr in the dependable supply for this water management strategy assigned to the Regional Water Provider(s) for Bexar County and reflection of it in the Exhibit B tables. In the Region L Adopted Regional Water Plan, the Colorado River Diversion Option (LCRA) includes up to 132,000 acft/yr of water to be diverted at Bay City and delivered to Bexar County. The supply would be phased into use to meet the projected needs of customers of the Regional Water Provider(s) for Bexar County, with 66,000 acft/yr being needed in 2020, and the additional 66,000 acft/yr being needed in 2030, 2040, and 2050. If the LCRA source of supply is revised to a total of 131,000 acft/yr (rather than 150,000 acft/yr), the supply to Bexar County could be revised to 113,000 acft/yr, resulting in 66,000 acft/yr being available to the Regional Water Provider(s) in 2020, and only an additional 47,000 acft/yr (19,000 acft/yr less) being available in 2030, 2040, and 2050. The effects of such potential revisions upon the Total New Supplies and System Management Supply (Municipal, Industrial, Steam-Electric, & Mining) for Bexar County (Vol. I, page 5-25) are summarized below.

Description	2030	2040	2050
Colorado River Diversion Option (LCRA)			
Adopted Plan (acft/yr)	132,000	132,000	132,000
Potential Revision (acft/yr)	<u>113,000</u>	<u>113,000</u>	<u>113,000</u>
Difference (acft/yr)	19,000	19,000	19,000
Total New Supplies			
Adopted Plan (acft/yr)	467,058	529,104	567,862
Potential Revision (acft/yr)	<u>448,058</u>	<u>510,104</u>	<u>548,862</u>
Difference (acft/yr)	19,000	19,000	19,000
System Management Supply			
Adopted Plan (acft/yr)	185,852	190,458	187,477
Potential Revision (acft/yr)	<u>166,852</u>	<u>171,478</u>	<u>168,477</u>
Difference (acft/yr)	19,000	19,000	19,000

The potential revised dependable supply associated with the Colorado River Diversion Option (LCRA) is assigned to the City of San Antonio and/or the San Antonio Water System (SAWS) in Exhibit B Tables 11, 12, and 13 and footnoted accordingly. Exhibit B Tables have been submitted to the TWDB in electronic format.

(6) Discussion of the cost implications of this potential reduction in dependable supply. With modification of transmission facilities to deliver a reduced dependable supply of 113,000 acft/yr, the annual cost of this water management strategy could decrease by about \$11 million per year (8.4 percent) and the unit cost of this water management strategy could increase from about \$1,016 per acft to about \$1,087 per acft (7.0 percent). This potential revision could increase the overall unit cost of water obtained through the development of multiple water management strategies by the Regional Water Provider(s) for Bexar County could increase by up to \$22 per acft (2.8 percent). Due to the small potential effects, costs presented in the Regional Water Plan and the Exhibit B tables are not changed.

Attachment B

1.12 San Antonio Water System (SAWS) Recycled Water Program; Phased Expansion (L-21)

1.12.1 Description of Option

The San Antonio electric utility, City Public Service (CPS), has been using reclaimed wastewater for electric power generation for decades, and during the 1990s, the San Antonio Water System (SAWS) developed a Reuse Water Program^{1,2}. Construction of the San Antonio municipal water recycling system began in 1997. Phase I includes two main conveyance lines, with one line beginning at the Salado Creek Water Recycling Center (WRC) and extending north through the eastern part of the city, and the other beginning at the Leon Creek WRC and extending north through the western part of the city (Figure 1.12-1). Phase II of the Plan provides for interconnection of these two conveyance lines to allow east-west as well as north-south flow of recycled water. Subsequent expansion of the system may provide additional water supply to other parts of the city and Bexar County³.

The present SAWS Recycled Water Program is capable of delivering about 35,000 acft/yr, with estimated consumptive reuse of 24,941 acft/yr, which is included as existing water supply of the South Central Texas Region. Recycled water is used for non-potable purposes, including industrial purposes, office and business cooling towers, landscape irrigation, and streamflow augmentation. Such uses to date are direct substitutes for water previously obtained from the Edwards Aquifer, and thereby reduce the use of Edwards Aquifer water by the quantity of recycled water used. This water supply option involves the expansion of the recycled water program to provide dependable water supplies for non-potable uses, bringing the total supply of recycled water to a level sufficient to meet 20 percent of SAWS projected municipal and industrial water demands. Facilities for future expansion are expected to include southern interconnections between the Leon Creek, Dos Rios, and Salado Creek WRCs as well as a

¹ San Antonio Water System, "San Antonio Water System, Water Conservation and Reuse Plan," November 1998.

² Pape-Dawson Engineers, Inc., "Environmental Assessment System Interconnect Addendum," San Antonio Water System, September 2000.

³ US Bureau of Reclamation, "Reuse Water Storage Alternatives Assessment Report," San Antonio Water System, September 2000.

northern interconnection linking the transmission lines originating at the Leon Creek and Salado Creek WRCs.

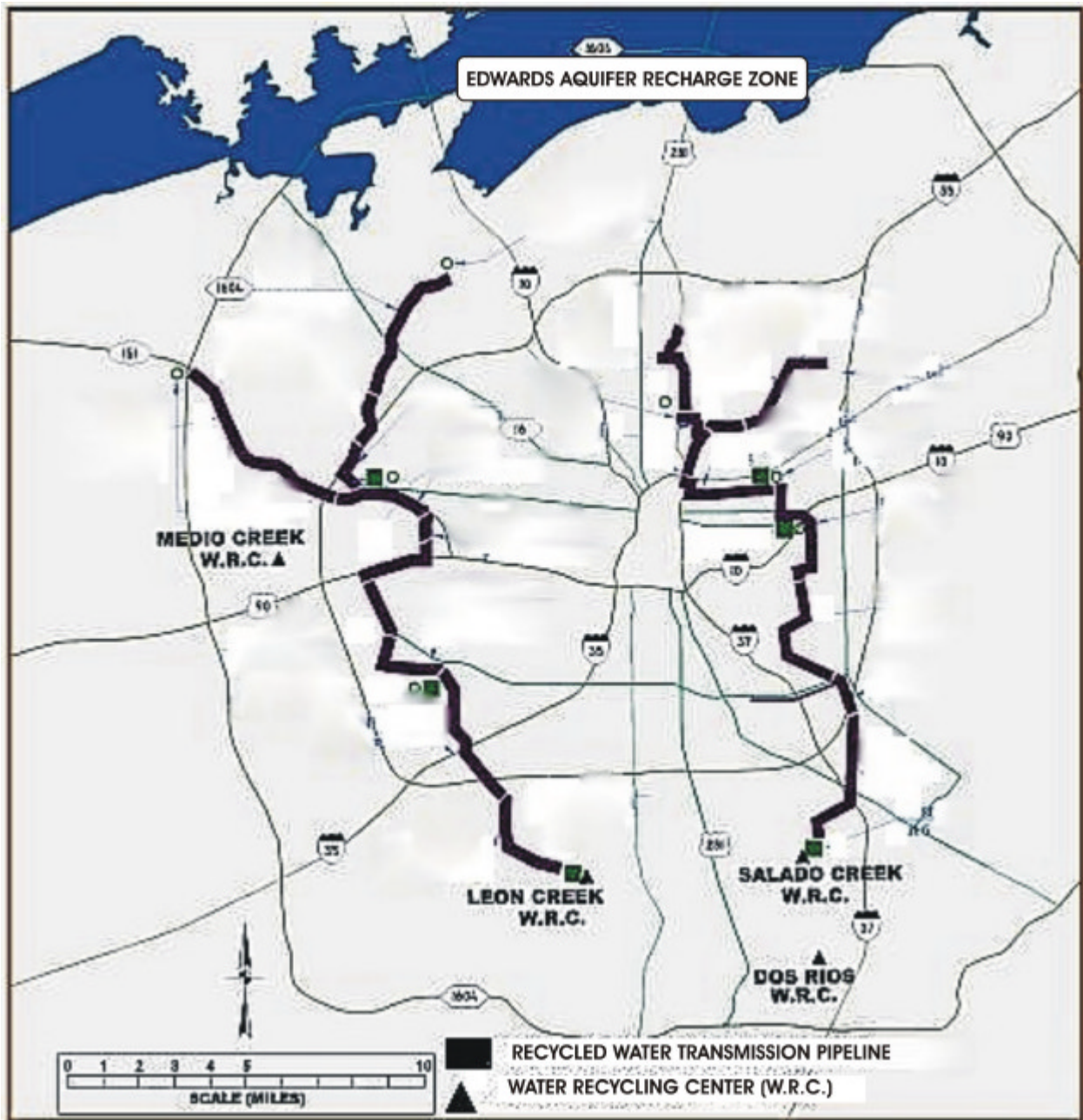


Figure 1.12-1. SAWS Water Recycling System

1.12.2 Water Availability

Increased treated wastewater volumes associated with increased municipal water use are potential sources of water to meet a part of the projected non-potable needs (shortages) of water user groups in the region. This reuse may be accomplished directly (prior to stream discharge or “flange-to-flange”) or indirectly through bed and banks delivery to downstream diversion and/or storage site(s) subject to applicable law. Direct and indirect reuse methods are both currently used by SAWS, however, it is most probable that direct reuse methods will be used in the expansion of the recycled water program. Indirect reuse of treated wastewater volumes derived from privately owned groundwater and/or interbasin transfer of surface water may be subject to fewer water rights or environmental flow constraints because these sources would not naturally have been present in the streams below wastewater treatment facilities.

For the purposes of consideration for inclusion in the South Central Texas Regional Water Plan, future expansion of the SAWS Recycled Water Program is based on the goal of meeting 20 percent of projected municipal and industrial water demands with recycled water. Table 1.12-1 summarizes the calculation of future quantities of recycled water potentially available after adjusting projected demands to account for recommended municipal water conservation projections for San Antonio (Section 1.1, Table 1.1-5, Vol. III). In addition, Table 1.12-1 includes estimates of projected effluent volumes likely to be discharged to the San Antonio River and/or tributary streams. These projected effluent volumes will be available for downstream water rights, reclamation through bed and banks transfer, and instream uses. Estimated recycled water quantities available through expansion of the SAWS system increase from 19,826 acft/yr in 2010 to 52,215 acft/yr in 2050.

1.12.3 Environmental Issues

As the ultimate configuration for a phased expansion of the SAWS Recycled Water Program has yet to be determined, this discussion of environmental issues focuses upon information developed for the planned system interconnections between the Leon Creek and Salado Creek WRCs and the Dos Rios WRC⁴. It is likely that further expansion of the water recycling system will encounter similar environmental issues and concerns to those encountered

⁴ Op. Cit., Pape-Dawson Engineers, Inc., September 2000.

in the implementation of the existing system. Following a description of the project area, key issues including downstream flows, water quality, endangered species, and cultural resources are briefly discussed.

**Table 1.12-1. Estimated Potential Quantities of Recycled Water¹
San Antonio Water System**

	2000	2010	2020	2030	2040	2050
Projected Demand						
Municipal	220,405	242,339	272,507	312,695	349,957	391,640
Industrial	16,805	19,682	22,359	24,935	28,264	31,697
Conservation (-)	(29,610)	(38,185)	(36,477)	(33,805)	(35,710)	(37,555)
Net Projected Demand ²	207,600	223,836	258,389	303,825	342,511	385,782
Estimated Total Effluent ³	103,800	111,918	129,195	151,913	171,256	192,891
Current Recycle Quantities ⁴	24,941	24,941	24,941	24,941	24,941	24,941
Future Recycle Quantities		19,826	26,737	35,824	43,561	52,215
Total Recycle Goal ⁵	41,520	44,767	51,678	60,765	68,502	77,156
Remaining Effluent	62,280	67,151	77,517	91,148	102,753	115,735
1. All quantities in acft/yr. 2. SAWS municipal demand plus Bexar County industrial demand less municipal water conservation projections for SAWS. 3. Calculated as 50 percent of Net Projected Demand. 4. Quantity shown is estimated consumptive use of recycled water. System capacity is about 35,000 acft/yr. 5. Calculated as 20 percent of Net Projected Demand.						

Expansion of the SAWS Recycled Water Program will occur within Bexar County which, in turn, lies within the Edwards Plateau (thin, rocky soils), Blackland Prairie (thick, clayey soils), and Rio Grande Plains (sandy soils) physiographic provinces. Geologic substrate includes sedimentary rock units such as limestones, sands, clays, and alluvium and terrace deposits. Bexar County is drained by tributaries of the Medina and San Antonio Rivers and underlain by the Edwards Aquifer from which San Antonio and San Pedro Springs periodically emanate. Flora and fauna of Bexar County are representative of the Edwards Plateau, Blackland Prairie, and South Texas Plains vegetation areas and the Balconian, Texan, and Tamaulipan biotic provinces. Urban and agricultural development within the county have had an influence on native terrestrial, riparian, and aquatic biota and have created cultural resources of historical, archaeological, and socio-economic importance.

As indicated in Table 1.12-1, treated effluent quantities in excess of those planned to be recycled are expected to increase throughout the 50-year planning horizon as a result of increasing water use and development of new water supplies from downstream, out-of-basin, and/or groundwater sources. Hence, downstream flows in the San Antonio River are expected to increase over time, potentially resulting in improved reliability of existing water rights, enhanced instream uses, and additional freshwater inflows to the Guadalupe Estuary. Maintenance of streamflows in excess of 55,000 acft/yr passing the gaging station on the San Antonio River near Falls City is not expected to be impaired by expansion of SAWS Recycled Water Program.

Applicable regulations define three classifications of recycled water based on the level of water quality as reflected in measurable parameters including BOD₅, turbidity, and fecal coliform. SAWS expects to utilize only Type I recycled water which is of high quality and can be used in areas where the likelihood of public contact may be high. Non-food crops and landscaped areas may be irrigated using Type I recycled water without restriction, however, food crops so irrigated must be processed prior to human consumption. Water produced by the Salado, Leon, and Dos Rios Water Recycling Centers presently complies with the specified quality parameters for Type I recycled water.

Endangered species listed for Bexar County include the Black-capped Vireo, Golden-cheeked Warbler, two migratory birds, six arachnids, and three beetles (see Vol. III, Appendix D for additional information). Some care may be necessary should recycled water pipelines traverse preferred habitat for the endemic species. Black-capped Vireos are insectivorous songbirds that nest in low shrubland thickets where vegetation extends to ground level. Golden-cheeked Warblers prefer habitat consisting of mature oak-juniper woodlands located along steep escarpments and canyons. The listed invertebrate species (arachnids and beetles) are all endemic to karst features or caves located in north and northwest Bexar County. The listed migratory bird species tend to avoid areas of concentrated human development.

Implementation of an expanded distribution system for recycled water will occur in predominantly urban areas and likely be concentrated in existing utility easements and previously disturbed floodplains. Hence, impacts to natural and cultural resources are expected to be minimal.

1.12.4 Engineering and Costing

Expansion of the SAWS Recycled Water Program could more than double the distribution capacity of the existing system during the next fifty years. Other than the planned southern interconnections of the water recycling centers (wastewater treatment facilities) and the northern interconnection of the existing distribution systems, specific elements of an expanded system are unknown at this time. Hence, estimates of cost for expansion of system capacity by 52,215 acft/yr by 2050 are based upon actual and projected costs for development of the existing 35,000 acft/yr system (\$125,300,000⁵) plus estimated costs for the planned interconnections (Southern = \$13,000,000 and Northern = \$9,200,000⁶). Assuming debt service at an annual percentage rate of six percent for 30 years, the annual unit cost for development of the existing system is about \$260 per acft. Applying this unit cost to the planned 52,215 acft/yr expansion of system capacity and adding estimated costs for the planned interconnections results in a Total Project Cost for expansion of the SAWS Recycled Water Program of about \$209,231,000. Amortizing this Total Project Cost and accounting for estimated operations and maintenance and pumping energy costs results in an estimated Total Annual Cost of \$20,617,000 and an Annual Unit Cost of Water of \$395 per acft or \$1.21 per 1000 gallons).

1.12.5 Implementation Issues

Implementation of an expanded SAWS Recycled Water Program (L-21) could directly affect the feasibility of other water supply options under consideration, including L-11, L-14, L-20, S-15D, S-15E, S-16C, and/or SCTN-14b. However, since SAWS has successfully implemented the initial phases of its Recycled Water Program, there do not appear to be major implementation issues to overcome.

⁵ San Antonio Express-News, December 8, 1999.

⁶ San Antonio Water System, Personal Communication, April 27, 2000.

Attachment C

Discussion of Apparent Bastrop County Groundwater Over-Allocation

Upon review of the adopted Regional Water Plans submitted by the Lower Colorado (Region K) and the South Central Texas (Region L) Regional Water Planning Groups (RWPGs), the Texas Water Development Board (TWDB) has expressed concern with potential projected “over-allocation” of groundwater from the Carrizo-Wilcox (Simsboro) Aquifer in Bastrop County in the years beyond 2030. This potential projected over-allocation is summarized in Table 1 which compares decadal estimates of supply from and drought demand upon the Carrizo-Wilcox (Simsboro) Aquifer in Bastrop County. The South Central Texas RWPG expects that groundwater supplies from Bastrop County will be used in Bexar County throughout the planning period and in Comal and Guadalupe Counties after 2030. The TWDB’s concern arises over the potential conflict between recommendations for meeting demands from Bastrop County groundwater in the Region K and Region L Regional Water Plans. If such a conflict were to occur, the TWDB would have to resolve it.

As a matter of policy, the Lower Colorado RWPG (Region K) has limited groundwater availability to estimated long-term average recharge and has based such recharge on recent studies completed by the Bureau of Economic Geology¹. Hence, the Lower Colorado RWPG has adopted a Bastrop County groundwater supply from the Carrizo-Wilcox (Simsboro) Aquifer averaging 21,950 acft/yr. Subsequent TWDB consultation with the Bureau of Economic Geology has indicated that an additional 2,455 acft/yr could be added to this supply to account for recharge to the Wilcox formation. The Bastrop County groundwater supply from the Carrizo-Wilcox (Simsboro) Aquifer is therefore estimated to average 24,405 acft/yr pursuant to adoption of this revision by the Lower Colorado RWPG. The Region K groundwater policy explicitly allows for withdrawals in excess of this average rate during drought since withdrawals will be reduced during wet periods resulting in long-term average withdrawals equal to or perhaps less than recharge.

The South Central Texas RWPG, on the other hand, has relied upon estimates of groundwater supply provided to all planning areas by the TWDB in July 1998 and upon additional guidance provided by the Evergreen and Gonzales County Underground Water Conservation Districts during the regional planning process. It is noted that the estimates of groundwater supply from the Carrizo-Wilcox Aquifer in Bastrop County provided by the TWDB in 1998 range from an average recharge rate of 33,391 acft/yr to a “mining” rate in excess of 72,000 acft/yr which could be recovered from storage over a 50-year planning period.

It is clear that discussions regarding groundwater availability in Bastrop County and the authority of an RWPG to set groundwater policy will continue among the Lower Colorado and South Central Texas RWPGs, the TWDB, and other interested parties. In recognition of this fact, the RWPGs agree that discussions will be more productive with additional scientific information to be available upon completion of the Groundwater Availability Models (GAMs). The development of a GAM for this portion of the Carrizo-Wilcox (Simsboro) Aquifer is in progress with scheduled completion by 2003. In order to comply with TWDB interpretation of

¹ Dutton, A.R., “Groundwater Availability in the Carrizo-Wilcox Aquifer in Central Texas – Numerical Simulations of 2000 through 2050 Withdrawal Projections,” Report of Investigations No. 256, Bureau of Economic Geology, University of Texas at Austin, Texas Water Development Board Contract No. 99-483-279, Austin, Texas, 1999.

statutory provisions, however, the Lower Colorado and South Central Texas RWPGs and the TWDB now conditionally agree to the assessment of Bastrop County groundwater supply and demand summarized in Table 2. All interests remain committed to the pursuit of additional scientific information and recognize that the assessment in Table 2 may be revised at any time by action of the RWPGs, the TWDB, and/or over-riding legal authority.

In the regional water planning process, calculation of water needs has been based on comparison of dependable supplies and projected demands during drought (below normal rainfall) conditions. Simulations of the potential cumulative effects of long-term aquifer pumpage have also been based upon full utilization of projected drought demands in each and every year, often resulting in over-estimation of withdrawals from aquifers because municipal water demands subject to average climatological conditions (normal rainfall) are substantially less than drought demands. Review of TWDB municipal water demand projections for Comal, Guadalupe, and Bastrop Counties indicates that water demand for normal (average) rainfall is at least 14 percent, and up to 20 percent, less than that for below normal (drought) rainfall. It is expected that municipal water suppliers in Comal and Guadalupe Counties will rely primarily upon nearby sources of supply such as the Guadalupe River, Canyon Reservoir, the Edwards Aquifer, the Schertz-Seguin Water Supply Project, and other groundwater available in Gonzales County. These municipal water suppliers are expected to use more distant sources such as Bastrop County groundwater only when absolutely necessary during drought. Hence, as summarized in Table 2, Bastrop County groundwater supplies from the Carrizo-Wilcox (Simsboro) Aquifer are calculated to be sufficient to meet projected demands throughout the planning horizon.

Comparison of the decadal Surplus/(Deficit) values in Table 2 with those in Table 1 gives an indication of the frequency with which drought withdrawals may occur while maintaining a long-term average withdrawal rate consistent with Region K policy. As the Surplus at 2040 under “normal rainfall” conditions (Table 2) exceeds the Deficit under “below normal rainfall” conditions (Table 1) (3,210 acft/yr is greater than 2,556 acft/yr), drought withdrawals could occur every other year without exceeding the average Supply identified by the Lower Colorado RWPG. The Surplus at 2050 under “normal rainfall” conditions (Table 2) is about one fifth of the Deficit under “below normal rainfall” conditions (Table 1) (2,550 acft/yr is about one fifth of 11,818 acft/yr). Hence, 2050 drought withdrawals could occur about one year in six without exceeding the average Supply identified by the Lower Colorado RWPG.

Attachment D

Discussion of Lower Guadalupe River Diversions (SCTN-16)

1) Background Information

The water management strategy identified as Lower Guadalupe River Diversions (SCTN-16) in the South Central Texas Regional Water Plan adopted January 4, 2001, involves the diversion of water from the pool formed above the Guadalupe River Saltwater Barrier to two 25,000 acft off-channel reservoirs, transmission to a regional water treatment facility in Bexar County, and connection to retail distribution systems in Bexar County. Sources of water include historically underutilized surface water rights held by the Guadalupe-Blanco River Authority (GBRA) and Union Carbide Corporation (UCC), unappropriated streamflow, and groundwater from the Gulf Coast Aquifer. Approximately 67,200 acft/yr of the total GBRA/UCC water rights of 106,000 acft/yr authorized under Certificate of Adjudication (CA) #18-5178 represent the primary source for this management strategy. In the Adopted Regional Water Plan, water availability under these rights is based on their priority date of January 7, 1952. Unappropriated streamflow available subject to Consensus Environmental Criteria and maximum diversion capacity is the secondary source of supply. Finally, groundwater available from well fields capable of producing approximately 20,700 acft/yr is the back-up source of supply used as necessary to maintain off-channel storage and ensure uniform delivery of the system firm yield. Planned implementation of this strategy would provide a dependable supply of about 94,500 acft/yr assigned to the Regional Water Provider(s) for Bexar County by about year 2010.

2) Updated Technical Information

In the process of providing technical support to the South Central Texas Regional Water Planning Group (SCTRWPG) in the consideration of TWDB comments on the Adopted Regional Water Plan and development of responses in the form of an Errata Sheet, HDR Engineering, Inc. (HDR) discovered problems with the technical evaluation of the water management strategy identified as Lower Guadalupe River Diversions (SCTN-16). More specifically, these problems are associated with HDR's application of an updated version of the TNRCC Guadalupe – San Antonio River Basin Water Availability Model (GSAWAM) and the resulting conclusion that the dependable supply (firm yield) based on the facilities and assumptions described in Item 1 is approximately 20,000 acft/yr less than the 94,500 acft/yr previously reported.

In order to preserve the original dependable supply of 94,500 acft/yr, it will be necessary to double the planned well field capacity associated with this management strategy to about 41,400 acft/yr and retain other facilities as originally planned. This would result in long-term average annual utilization of about 14,200 acft from the Gulf Coast Aquifer, as compared to an average of 11,200 acft/yr reported in the Adopted Regional Water Plan. Recent modeling of the Gulf Coast Aquifer by Texas A&M University at Corpus Christi for the Coastal Bend (Region N) Regional Water Planning Group (CBRWPG)¹ indicates that this quantity could be available

¹ Coastal Bend Regional Water Planning Group, "Coastal Bend Regional Water Planning Area Regional Water Plan, Volume I, Executive Summary and Regional Water Plan, Appendix C," Nueces River Authority, Texas Water Development Board, Texas A&M University, et al., January 2001.

from Refugio County in compliance with groundwater availability constraints determined by the Groundwater Advisory Panel of the CBRWPG. Subject to average production of 14,200 acft/yr, consideration of test simulations for the CBRWPG indicates that water level declines in the confined portion of the aquifer would be less than about 125 feet from predevelopment levels and would not exceed about 30 percent of the elevation difference between predevelopment levels and the top of the aquifer.

Doubling the well field capacity and adjusting the cost estimates for diversion facilities to sizes needed increases the overall annual cost of water obtained through the development of multiple water management strategies (including the Lower Guadalupe River Diversions (SCTN-16) by the Regional Water Provider(s) for Bexar County by up to about \$8,500,000. Unit costs increase by about \$ 46 per acft (7 percent) in year 2010 and less than \$33 per acft (4 percent) thereafter. As the water user groups purchasing water from or participating in specific projects with the Regional Water Provider(s) for Bexar County are numerous, the revisions in decadal unit costs shown in Item 5 below would affect many tables in Volume I, Section 5.3.2 of the Adopted Regional Water Plan. Affected water user groups include the San Antonio Water System (SAWS) and the Bexar Metropolitan Water District (BMWD) as Major Providers serving Bexar County. Others potentially affected include Alamo Heights, Balcones Heights, Castle Hills, China Grove, Converse, Elmendorf, Fair Oaks Ranch, Fort Sam Houston, Helotes, Kirby, Lackland AFB, Leon Valley, Live Oak, Olmos Park, Randolph AFB, Shavano Park, Terrell Hills, Universal City, County Rural, and the Industrial and Mining water user groups.

3) Interbasin Transfer Issues

The Guadalupe River Saltwater Barrier is located immediately downstream of the confluence of the Guadalupe and San Antonio Rivers and about 10 miles upstream of the first of a system of bays comprising the Guadalupe Estuary. The Saltwater Barrier is authorized in #18-5484 and creates a small impoundment extending several miles up both the Guadalupe and San Antonio Rivers. As diversions under CA#18-5178 are dependent, in part, upon flows in the San Antonio River, the use of a portion of these water rights to meet needs in the San Antonio area was not considered an interbasin transfer in the Adopted Regional Water Plan. In fact, treated effluent (return flows) resulting from the implementation of the Lower Guadalupe River Diversions (SCTN-16) water management strategy would flow by gravity to the original point of diversion. Hence, on the basis of topographic boundaries, the watersheds of the Guadalupe and San Antonio Rivers (as well as the Medina, San Marcos, and Blanco Rivers) form one hydrologic system outfalling to the Guadalupe Estuary.

In addition to the topographic boundaries that define hydrologic systems, regulatory boundaries have been established that define river basins and set the conditions under which water may be transferred from one river basin to another. For example, pursuant to Texas Water Code (TWC) Section 16.051, river basins are defined and designated by the Texas Water Development Board (TWDB) by rule. In early 1998, the TWDB adopted river basin boundaries terminating the San Antonio River Basin at the confluence of the San Antonio and Guadalupe Rivers. On the basis of these river basin boundaries and interpretation of existing law, TWDB Staff provided comments indicating that the Lower Guadalupe River Diversions should be considered an interbasin transfer. As such, diversions to be delivered to Bexar County from the portion of CA#18-5178 could be subject to adjusted priority relative to other rights [TWC

11.085(s)] and subject to application of Consensus Environmental Criteria [TWC 11.085(k)(1)(F)].

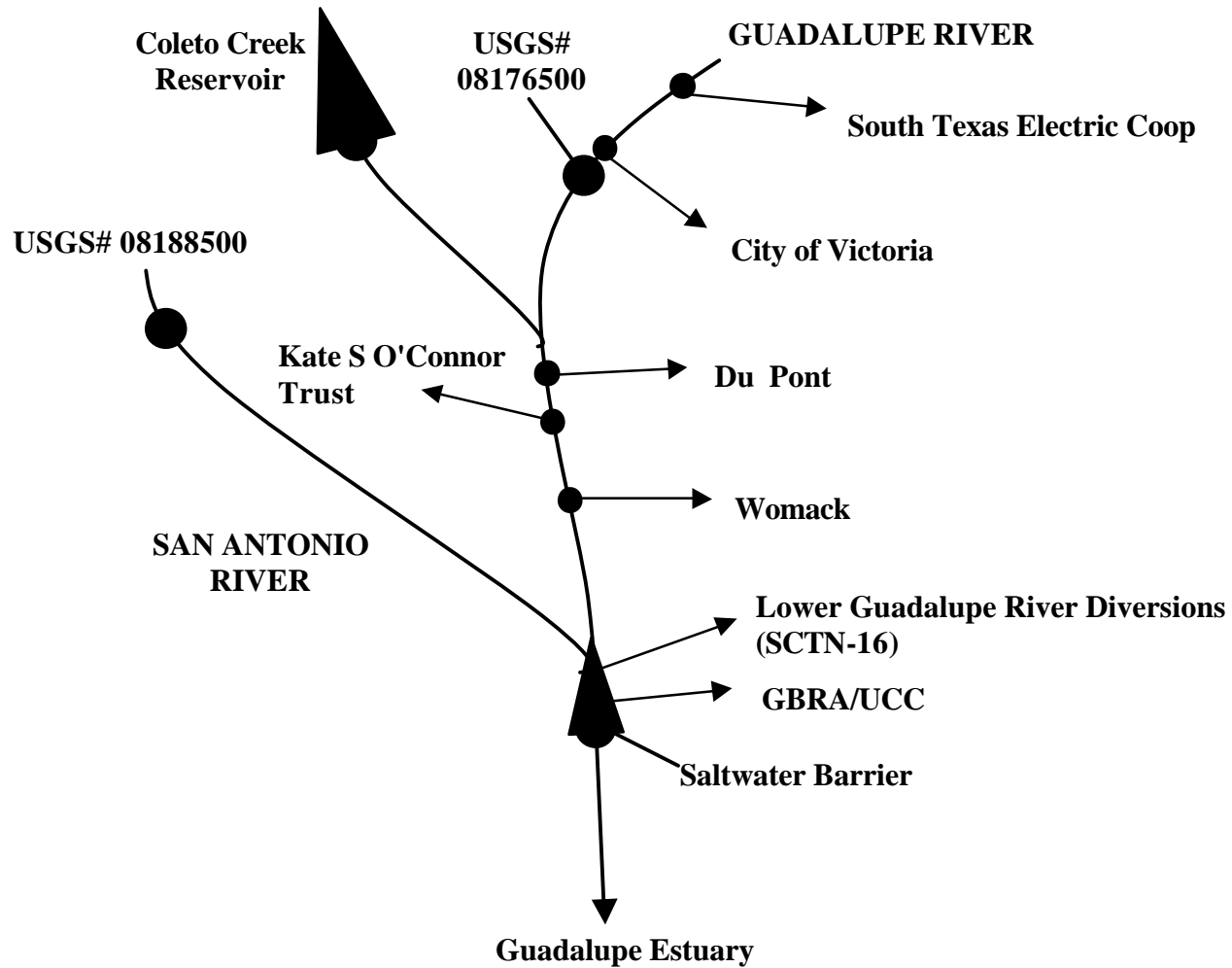
Due to the potentially significant dependable supply associated with this water management strategy, its planned implementation to meet projected Bexar County needs early in the planning horizon, and substantial reductions in water availability under the GBRA/UCC rights if their use constitutes an interbasin transfer, there has been an active dialog between the TWDB Staff and various interests represented on the SCTRWPG. Since issuance of their March 28, 2001 review (Attachment 1), the TWDB Staff has assisted with efforts to facilitate discussions through participation in meetings on April 20, May 8, May 29, June 5, and June 18. It is the opinion of the SCTRWPG that this dialog has been very productive as it has resulted in the recognition that there is some degree of inconsistency between the topographic and regulatory boundaries, respectively uniting and separating the Guadalupe and San Antonio Rivers at the Guadalupe Estuary. Hence, the TWDB Staff and the SCTRWPG have agreed to:

- a) Provide comparisons (in an Errata Sheet) of the dependable water supply and costs associated with this water management strategy with and without application of interbasin transfer provisions;
- b) Seek TWDB approval of the Adopted Regional Water Plan revised pursuant to SCTRWPG approval of the Errata Sheet; and
- c) Allow the complex issues briefly summarized herein to be more fully considered in the permitting, rather than planning, process upon Texas Natural Resource Conservation Commission (TNRCC) consideration of applications for water rights and amendments necessary to implement the planned Lower Guadalupe River Diversions.

4) Significance of Interbasin Transfer Classification

In response to comments received from the TWDB, the SCTRWPG has authorized the development of supplementary technical information regarding the dependable supply and costs associated with the Lower Guadalupe River Diversions (SCTN-16) should the use of water available under existing water rights used in this management strategy be classified an interbasin transfer. Such classification would significantly reduce the dependable supply from the 94,500 acft/yr shown in the Adopted Regional Water Plan due to adjustment of priority and application of Consensus Environmental Criteria for diversions under the portion of the GBRA/UCC water rights (CA#18-5178) to be used in Bexar County. Water available to other rights dependent upon streamflows in the Guadalupe River and its tributaries (including the San Antonio River) could also be affected by the classification of this water management strategy. Potential effects of interbasin transfer classification upon GBRA/UCC and other selected water rights and upon the Lower Guadalupe River Diversions water management strategy are summarized in the following paragraphs, tables, and figures.

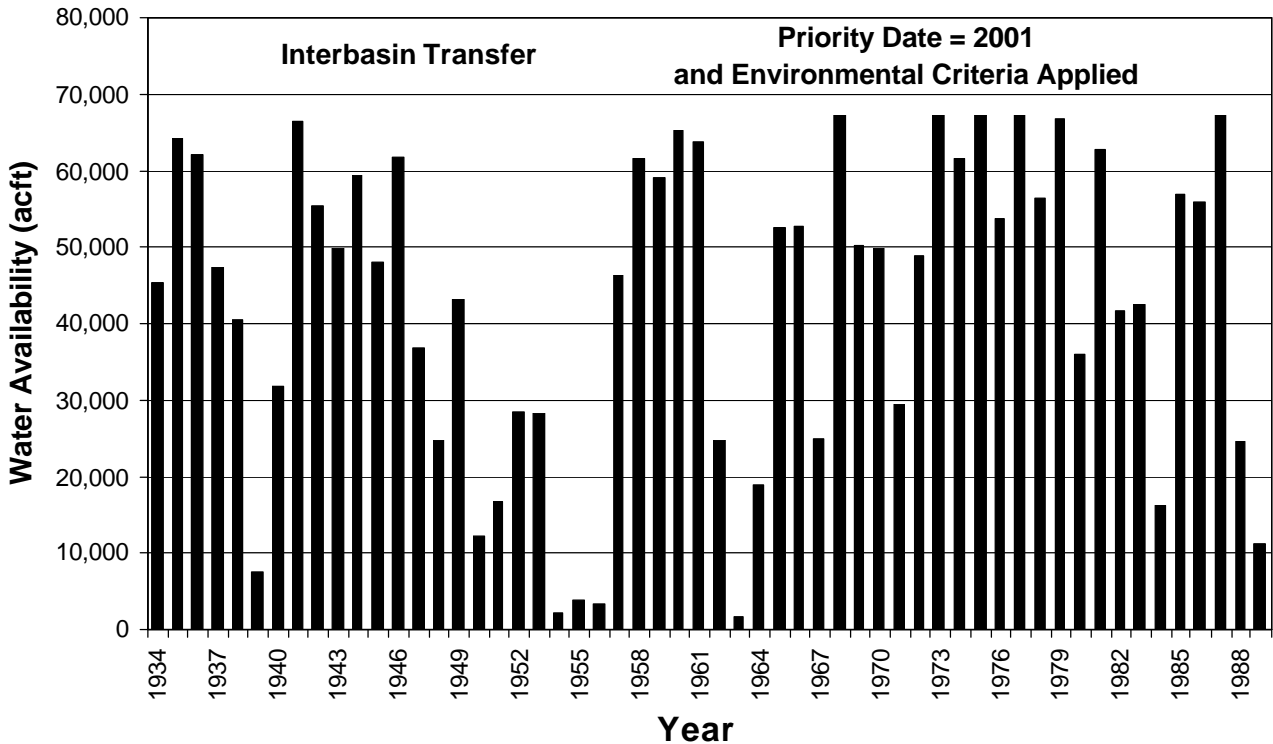
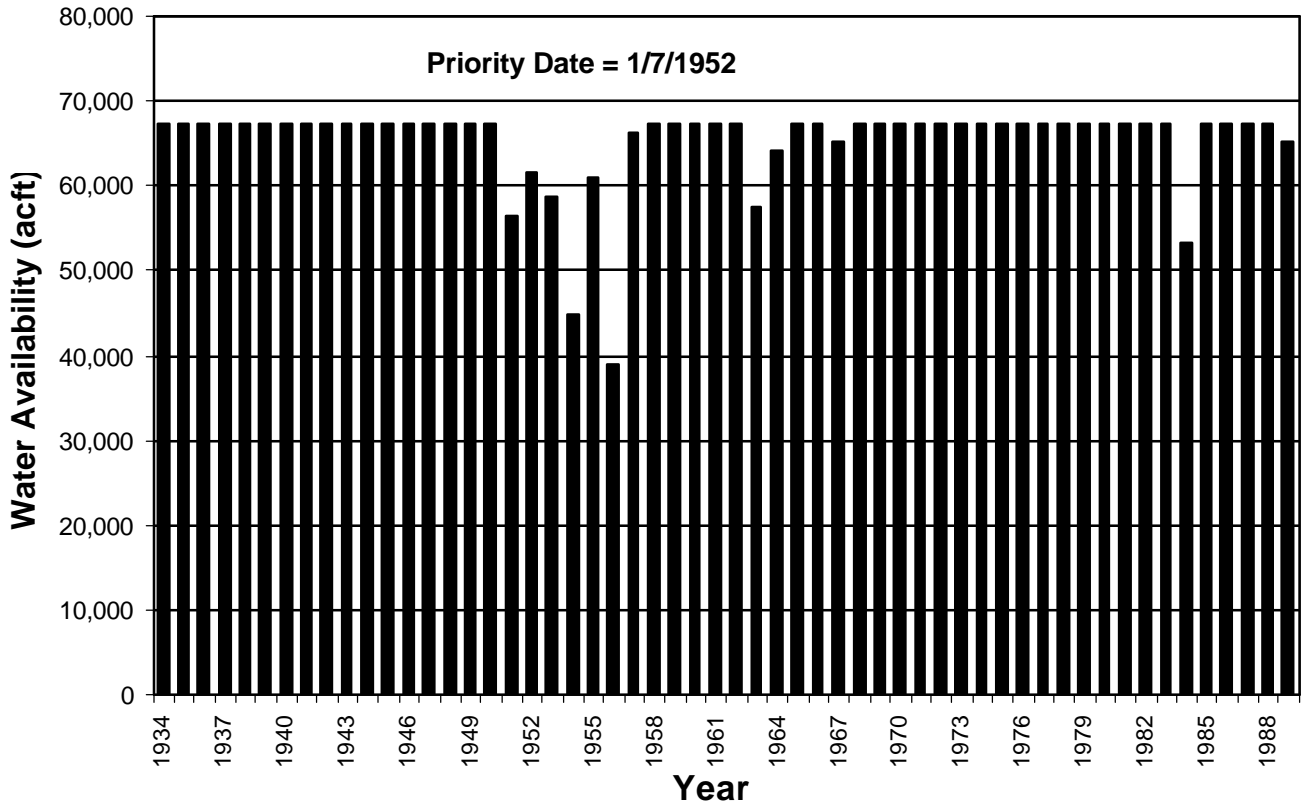
The Guadalupe – San Antonio River Basin Water Availability Model (WAM) has been used to evaluate the potential effects on all water rights of adjustment of priority and application of Consensus Environmental Criteria to 67,200 acft/yr of the GBRA/UCC water rights (CA#18-5178). These technical analyses have been performed subject to general assumptions consistent with the evaluation of Current Supplies in the Adopted Regional Water Plan. Figure 1 is a schematic diagram illustrating the relative locations of selected water rights and facilities near the confluence of the Guadalupe and San Antonio Rivers. Table 1 and Figure 2 show that interbasin transfer classification could reduce long-term average (1934-1989) water availability



Effects of Adjusted Priority for Portion of CA# 18-5178

	Authorized Diversion Amount	Priority Date	Modeling Condition	Amount Available			
				Long-term Average (Jan, 1934 - Dec, 1989)	Extended Drought Average (Jan, 1947 - Dec, 1956)	Severe Drought Average (Jan, 1954 - Dec, 1956)	YEAR 1956
	(acft/yr)	MM/DD/YYYY		(acft/yr)	(acft/yr)	(acft/yr)	(acft/yr)
GBRA/UCC (CA# 18-5178)	67,200*	1/7/1952	CA# 18-5178 Current Priority	65,175	59,036	48,240	38,937
			CA# 18-5178 Adjusted Priority	63,369	53,923	34,916	19,759
			CA# 18-5178 Adjusted Priority & Environmental Criteria Applied	35,733	17,870	3,230	3,436
City of Victoria	20,000	5/28/1993	CA# 18-5178 Current Priority	16,732	9,649	4,344	1,320
			CA# 18-5178 Adjusted Priority	16,732	9,649	4,344	1,320
South Texas Electric Cooperative	1,900 Consumptive (110,000 Total)	2/18/1964	CA# 18-5178 Current Priority	1,654	1,091	484	152
			CA# 18-5178 Adjusted Priority	1,683	1,146	585	285
Kate S O'Connor Trust	4,676 Consumptive (9,676 Total)	7/10/1978	CA# 18-5178 Current Priority	4,368	3,538	1,918	1,181
			CA# 18-5178 Adjusted Priority	4,448	3,935	2,857	1,969
City of San Antonio (Braunig Lake)	12,000	4/16/1961	CA# 18-5178 Current Priority	11,742	11,088	9,552	7,836
			CA# 18-5178 Adjusted Priority	11,766	11,388	10,572	10,644
All Water Rights Junior to 1/7/1952	251,313	Various Dates between 1/7/1952 and 12/31/2000	CA# 18-5178 Current Priority	194,288	151,502	114,583	99,932
			CA# 18-5178 Adjusted Priority	194,803	153,289	118,830	105,319
Du Pont Industrial	33,000 Consumptive (60,000 Total)	8/16/1948	CA# 18-5178 Current Priority	32,733	31,507	28,876	25,999
			CA# 18-5178 Adjusted Priority	32,733	31,507	28,876	25,999

Water Available Under Portion of CA# 18-5178



from 67,200 acft/yr of the GBRA/UCC rights (CA#18-5178) by more than 29,000 acft/yr. Simulated reductions in water available to these rights during severe drought (1954-1956) could approach 45,000 acft/yr leaving an average of only 3,230 acft/yr available for diversion. The majority of these reductions in average availability for CA#18-5178 are attributable to application of the Consensus Environmental Criteria².

Table 1 also summarizes the effects on water available to all water rights having priority dates after January 7, 1952 (including selected rights such as the Kate O'Connor Trust, South Texas Electric Cooperative, and City of Victoria) if the priority for the referenced portion of CA#18-5178 is adjusted. As indicated in Table 1, water rights junior to January 7, 1952 (as a group) would experience modest increases in water availability as compared to much greater reductions in water availability from CA#18-5178. For example, CA#18-5178 availability during severe drought (1954-1956) is reduced by 13,324 acft/yr with adjusted priority while availability to the group of all water rights junior to January 7, 1952 increases by 4,247 acft/yr. The reductions in availability under CA#18-5178 with adjusted priority are primarily a result of priority refilling of storage in reservoirs junior to January 7, 1952 (Braunig, Calaveras, and Canyon). Interestingly, the water right showing the greatest increase in severe drought water availability with adjusted priority for a portion of CA#18-5178 is that associated with operations of Braunig Reservoir for steam-electric power generation purposes in Bexar County. While changes in availability are apparent for some water rights, no such changes are apparent for the City of Victoria due to its 1993 priority date and special conditions included in its permit. Water available to DuPont is shown simply to illustrate that water rights senior to January 7, 1952 are unaffected.

The firm yield of the Lower Guadalupe River Diversions (SCTN-16) subject to interbasin transfer provisions, but retaining the same facilities as described in Items 1 and 2 above, is 48,600 acft/yr. This represents a reduction of 45,900 acft/yr (48.6 percent) in firm yield as compared to the firm yield of 94,500 acft/yr without application of interbasin transfer provisions. With adjusted priority for diversions from CA#18-5178 and without application of Consensus Environmental Criteria, the comparable firm yield of this water management strategy is 78,600 acft/yr. Figure 3 illustrates utilization of the three water sources for this management strategy with and without interbasin transfer provisions for the 56-year simulation period extending from 1934 through 1989. Figure 4 shows simulated storage fluctuations in the off-channel reservoirs for the 56-year simulation period and clearly illustrates that the most severe historical drought occurred in the years 1954 through 1956.

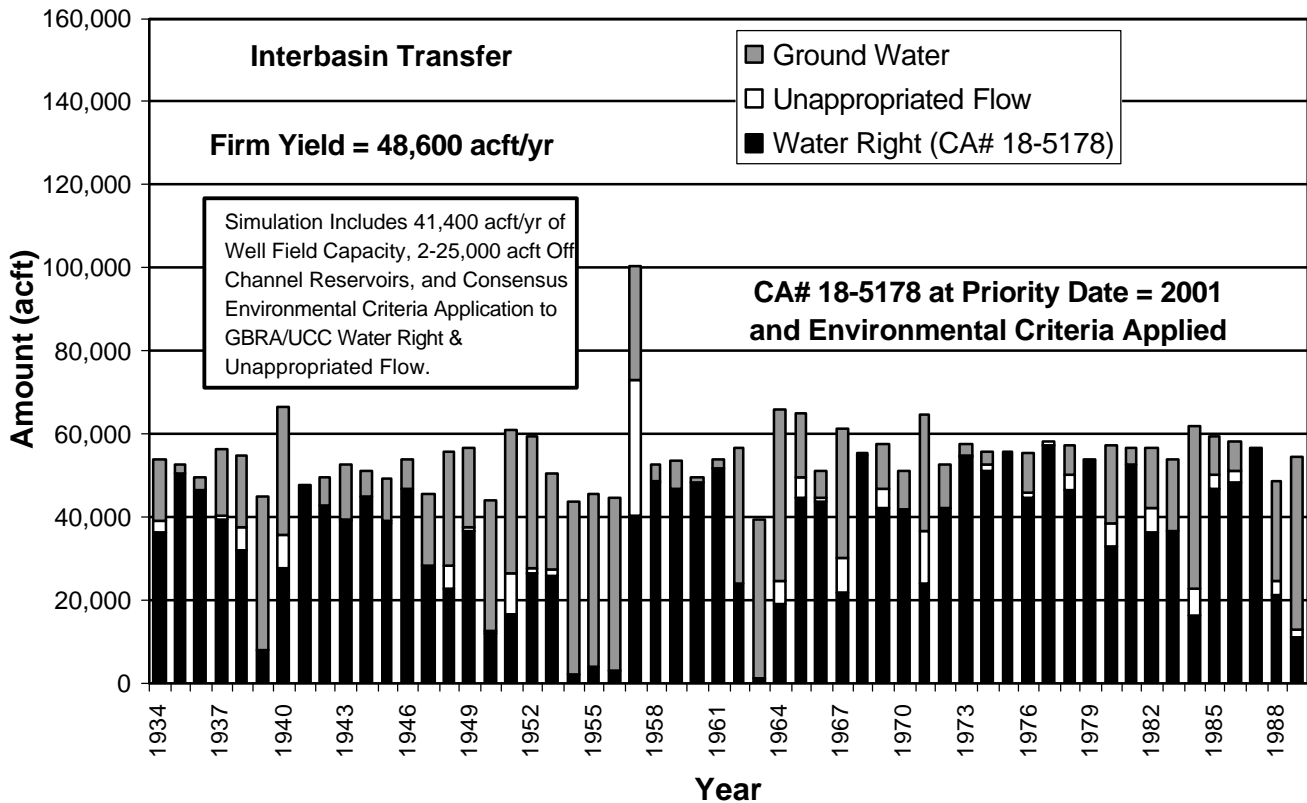
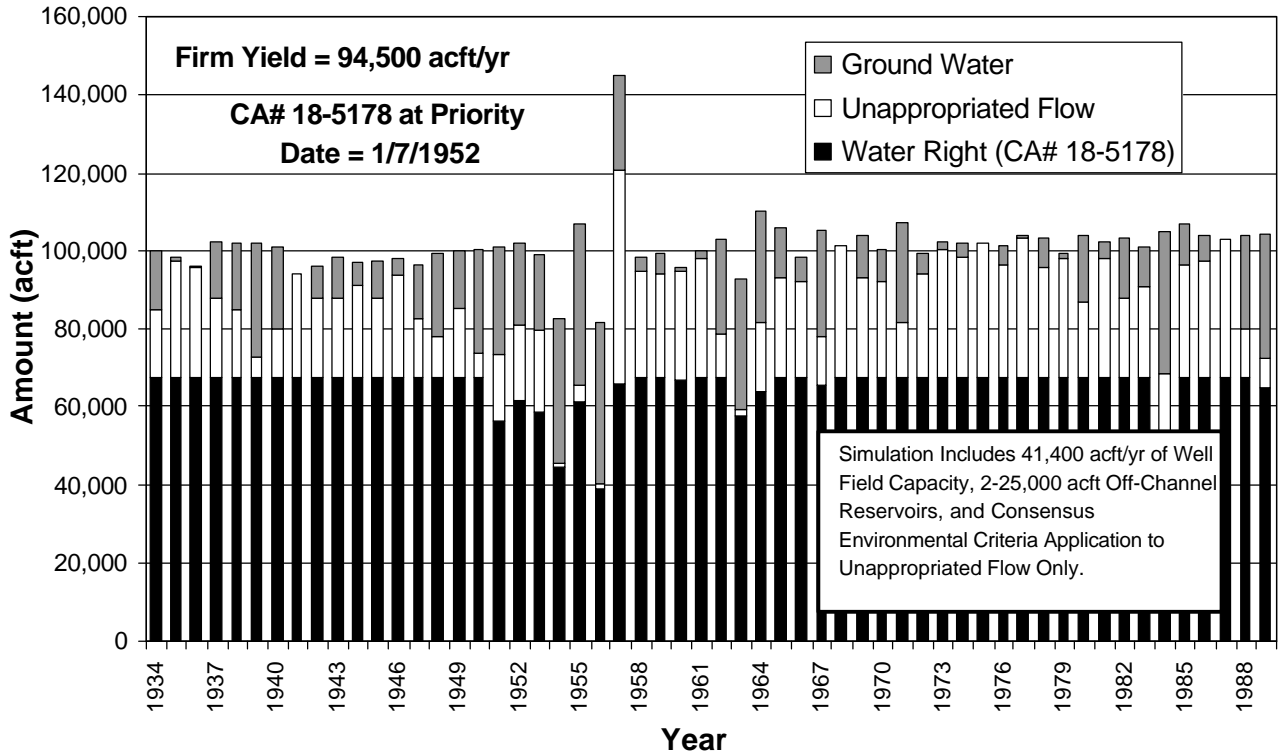
Without interbasin transfer provisions, water available under CA#18-5178 is generally reliable with long-term average use of about 65,200 acft/yr. In order to obtain the firm yield of 94,500 acft/yr, CA#18-5178 is augmented with unappropriated streamflow (averaging about 21,800 acft/yr), groundwater (averaging about 14,200 acft/yr), and off-channel storage. As shown in Figure 3 and Figure 4, unappropriated streamflow is extremely limited during severe drought and the firm yield is derived essentially from CA#18-5178, production of groundwater at a rate approaching well field capacity, and use of water previously stored.

With interbasin transfer provisions, water available under CA#18-5178 is highly variable and essentially indistinguishable from unappropriated streamflow due to adjusted priority and

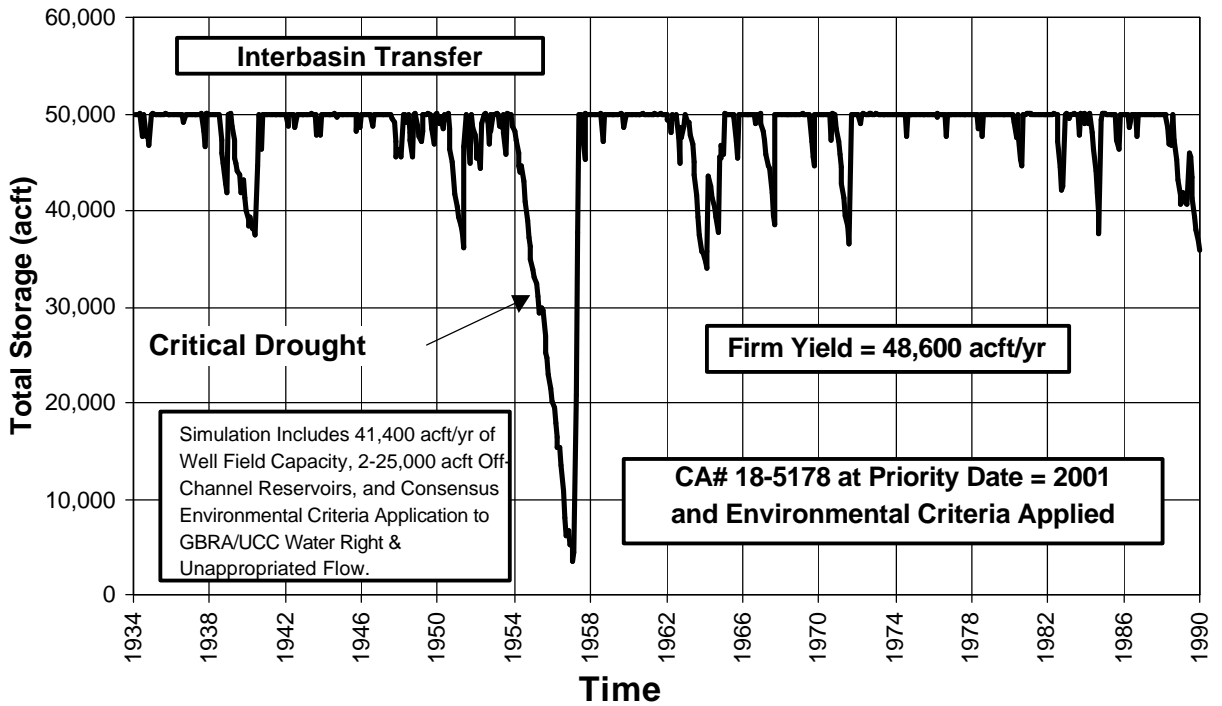
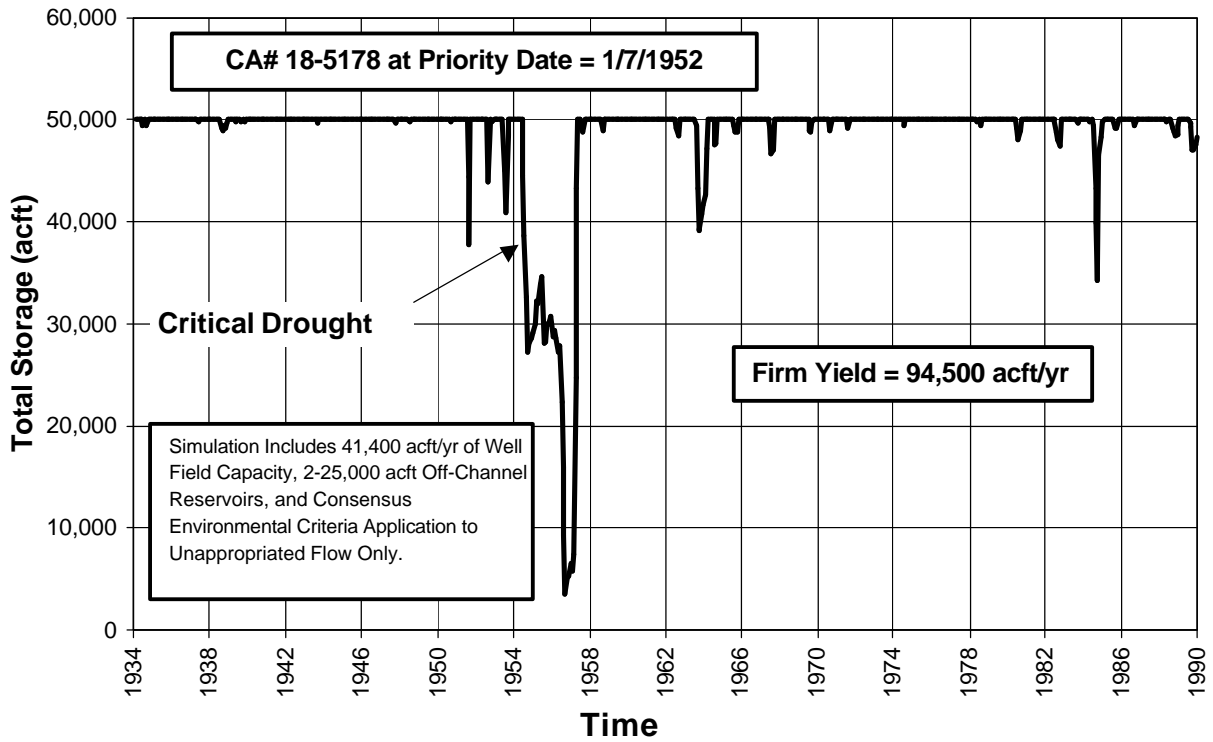
² The reductions could be limited to some degree if Consensus Environmental Criteria were applied only to the historically unused portion of the total annual diversions authorized under CA#18-5178 (106,000 acft).

application of Consensus Environmental Criteria. For accounting and graphical purposes, the first 5,600 acft/month ($67,200/12 = 5,600$) of unappropriated streamflow available is assigned to

Water Sources Used in Lower Guadalupe River Diversions (SCTN-16)



Storage Fluctuations Lower Guadalupe River Diversions (SCTN-16)



CA#18-5178. Water used under CA#18-5178 averages about 35,700 acft/yr. In order to obtain the firm yield of 48,600 acft/yr, CA#18-5178 is augmented with unappropriated streamflow (averaging about 2,600 acft/yr) and made reliable with groundwater (averaging about 16,700 acft/yr) and off-channel storage. As shown in Figure 3 and Figure 4, the firm yield is derived essentially from production of groundwater at a rate approaching well field capacity and use of water previously stored.

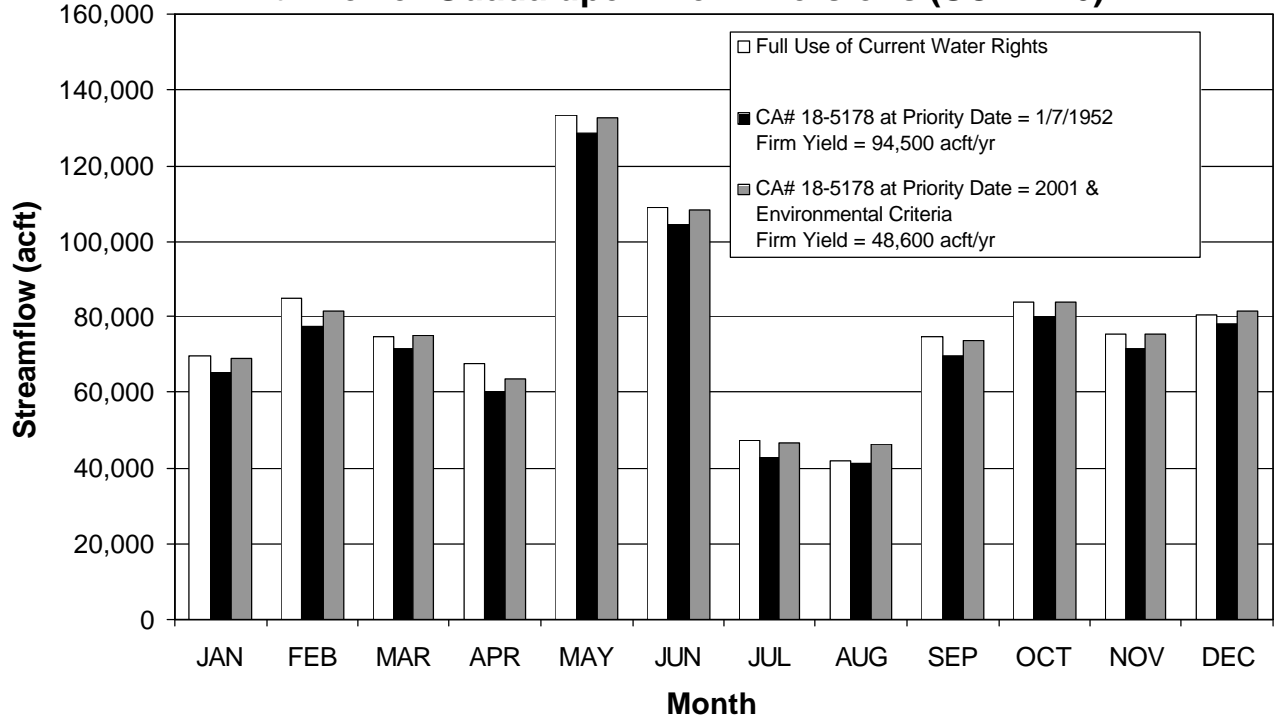
The relative potential effects of implementation of the Lower Guadalupe River Diversions (SCTN-16) upon freshwater inflows to the Guadalupe Estuary are illustrated in Figure 5. Median monthly freshwater inflows and overall freshwater inflow frequency are compared with and without application of interbasin transfer provisions, using full utilization of current water rights as a baseline. Without interbasin transfer provisions, monthly median freshwater inflows with the management strategy (firm yield = 94,500 acft/yr) are typically less than the baseline due to the diversion and use of unappropriated streamflow subject to Consensus Environmental Criteria. With interbasin transfer provisions, monthly median freshwater inflows with the management strategy (firm yield = 48,600 acft/yr) approximate, and even exceed, the baseline as a result of limitations upon water available from the portion of CA#18-5178 to be used in Bexar County. The frequency comparison in Figure 4 indicates that freshwater inflows to the Guadalupe Estuary with the management strategy subject to interbasin transfer provisions could actually increase approximately one-third of the time relative to the baseline. Implementation of the management strategy without interbasin transfer provisions would cause little, if any, change (relative to the baseline) in freshwater inflows during periods in which freshwater inflows are less than about 40,000 acft/month (approximately 660 cfs).

Should the Lower Guadalupe River Diversions (SCTN-16) be classified an interbasin transfer, annual and unit costs for water obtained through the development of multiple water management strategies by the Regional Water Provider(s) for Bexar County would increase from those shown in the Adopted Regional Water Plan and from those based on updated technical information presented in Item 2 herein. Furthermore, additional management strategies could need to be identified to replace up to 45,900 acft/yr and preserve the dependable annual supply planned for the Regional Water Provider(s) for Bexar County. With modification of transmission facilities to deliver a reduced dependable supply of 48,600 acft/yr, the unit cost of this management strategy as an element of the water supply plan for Bexar County could increase from \$914 per acft to \$1031 per acft. Assuming that an additional 45,900 acft/yr could be developed at unit costs comparable to that for this management strategy without interbasin transfer provisions, the annual cost of new supplies associated with the Regional Water Provider(s) for Bexar County could increase by about \$12,300,000 from those shown in the Adopted Regional Water Plan. Unit costs could increase by about \$67 per acft (10 percent) in year 2010 and less than \$48 per acft (6 percent) thereafter.

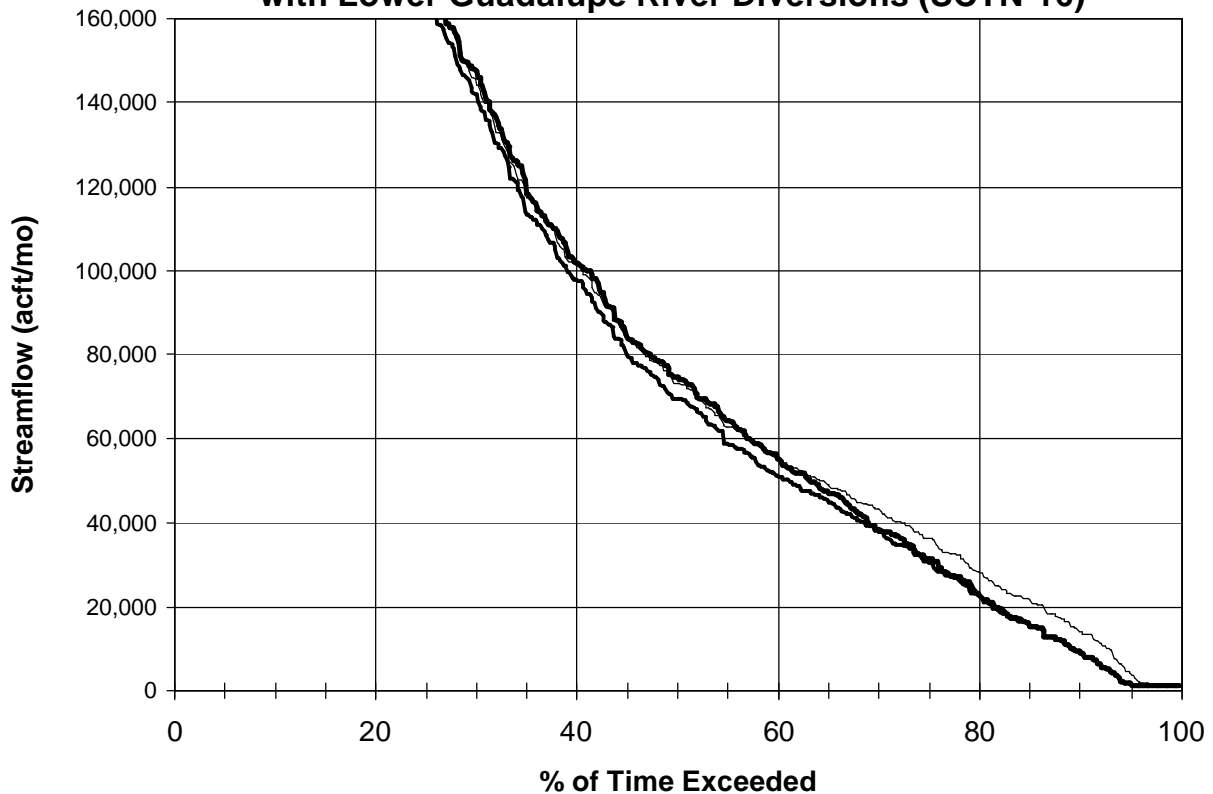
There are a number of factors or strategies that could serve to enhance the dependable supply and reduce the unit costs associated with the Lower Guadalupe River Diversions with or without the application of interbasin transfer provisions. These factors or strategies may include:

- a) Increases in the discharge of treated effluent upstream of the Saltwater Barrier as population and water use continue to grow.
- b) Enhanced springflow resulting from the planned development of Edwards Recharge – Type 2 Projects (L-18a).
- c) Additional groundwater supplies from the Gulf Coast Aquifer.
- d) Additional off-channel storage near the Saltwater Barrier.

Monthly Median of Inflows to the Guadalupe Estuary with Lower Guadalupe River Diversions (SCTN-16)



Monthly Frequency of Inflows to the Guadalupe Estuary with Lower Guadalupe River Diversions (SCTN-16)



- e) Additional diversion capacity at the Saltwater Barrier.
 - f) Refinement of the Consensus Environmental Criteria on the basis of site-specific studies potentially resulting in reduced instream flow requirements and increased diversions during severe drought.
 - g) Acquisition of additional water supplies and/or water rights near the Saltwater Barrier.
- 5) Specific Potential Revisions to Adopted Regional Water Plan

Specific revisions and potential revisions to the Adopted Regional Water Plan respectively associated with updated technical information for the Lower Guadalupe River Diversions (SCTN-16) and potential classification of this water management strategy as an interbasin transfer are summarized below. Revisions associated with updated technical information affect only the descriptive information (p. 5-67) and cost, as the dependable supply for this water management strategy remains unchanged. Revisions associated with interbasin transfer classification, however, affect both cost and quantity of supply for this management strategy and could necessitate identification of additional supplies for the Regional Water Provider(s) for Bexar County.

Water user groups and tables in Volume I of the Adopted Regional Water Plan affected by changes in estimated costs for the Lower Guadalupe River Diversions (SCTN-16) include:

- Regional Water Provider(s) for Bexar County – Tables 5.3.2-4 & 5.4-3
- San Antonio Water System – Tables 5.3.2-28 & 5.4-5
- Bexar Metropolitan Water District – Tables 5.3.2-42, 5.3.2-46, 5.3.2-48, & 5.4-7
- Alamo Heights – Table 5.3.2-6
- Balcones Highlands – Table 5.3.2-8
- China Grove – Table 5.3.2-10
- Converse – Table 5.3.2-12
- Elmendorf – Table 5.3.2-14
- Fair Oaks Ranch – Table 5.3.2-16
- Fort Sam Houston – Table 5.3.2-50
- Helotes – Table 5.3.2-18
- Kirby – Table 5.3.2-20
- Lackland Air Force Base (AFB) – Table 5.3.2-52
- Leon Valley – Table 5.3.2-22
- Live Oak – Table 5.3.2-24
- Olmos Park – Table 5.3.2-26
- Randolph AFB – Table 5.3.2-54
- Shavano Park – Table 5.3.2-32
- Terrell Hills – Table 5.3.2-36
- Universal City – Table 5.3.2-38
- Bexar County Rural – Table 5.3.2-56
- Bexar County Industrial – Table 5.3.2-58
- Bexar County Mining – Table 5.3.2-60

Estimated annual and unit costs for the Lower Guadalupe River Diversions applicable to summaries for the Regional Water Provider(s) for Bexar County (Tables 5.3.2-4 & 5.4-3) are shown below. Also summarized below are estimated unit costs applicable to the above water user groups for the purchase or development of water supply through the Regional Water Provider(s) for Bexar County.

Annual Cost Comparison for Lower Guadalupe River Diversions (SCTN-16)

<u>Year</u>	<u>Original Annual Cost¹</u>	<u>Revised Annual Cost²</u>	<u>Potentially Revised Annual Cost³</u>
2000	\$ 0	\$ 0	\$ 0
2010	\$ 75,925,080	\$ 84,872,340	\$ 49,336,290
2020	\$ 77,059,080	\$ 86,006,340	\$ 49,919,490
2030	\$ 77,437,080	\$ 86,384,340	\$ 50,113,890
2040	\$ 50,902,425	\$ 55,359,990	\$ 30,917,376
2050	\$ 47,504,205	\$ 51,859,710	\$ 27,417,204

Unit Cost Comparison for Lower Guadalupe River Diversions (SCTN-16)

	<u>2000</u>	<u>2010</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>	<u>2050</u>
Original Unit Cost (\$/acft) ¹	\$0	\$803	\$815	\$819	\$539	\$503
Revised Unit Cost (\$/acft) ²	\$0	\$898	\$910	\$914	\$586	\$549
Potentially Revised Unit Cost (\$/acft) ³	\$0	\$1015	\$1027	\$1031	\$636	\$564

Unit Cost Comparison for Regional Water Provider(s) for Bexar County

	<u>2000</u>	<u>2010</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>	<u>2050</u>
Original Unit Cost (\$/acft) ¹	\$323	\$648	\$817	\$761	\$836	\$684
Revised Unit Cost (\$/acft) ²	\$323	\$694	\$850	\$787	\$848	\$695
Potentially Revised Unit Cost (\$/acft) ³	\$323	\$715	\$864	\$799	\$851	\$694

¹ As shown in the Regional Water Plan adopted January 4, 2001.

² Revised to include increased well field capacity and updated diversion facility costs as a part of the Lower Guadalupe River Diversions (SCTN-16) water management strategy and retain an estimated dependable supply of 94,500 acft/yr.

³ Potential revisions if the Lower Guadalupe River Diversions (SCTN-16) are subject to interbasin transfer provisions and the dependable supply is reduced to 48,600 acft/yr. Costs also reflect modification of transmission facilities and, for the Regional Water Provider(s) for Bexar County only, development of 45,900 acft/yr of additional supply through implementation of other water management strategies.

Any revisions in quantity of supply for the Lower Guadalupe River Diversions (SCTN-16) could necessitate revision of the following additional text, tables, and/or figures in Volume I of the Adopted Regional Water Plan.

- a) Text (pages): ES-24, ES-25, 5-7, 5-8, 5-67, 5-68, 5-123
- b) Tables: 5.2-1, 5.2-3, 5.2-25, 5.3.2-3, 5.3.2-4, 5.4-2
- c) Figures: ES-14, ES-15, 5.2-2, 5.2-6, 5.2-42

Appropriate revisions to Exhibit B tables have been completed and submitted to the TWDB in electronic format.

Attachment E

Discussion of Municipal Demand Reduction (Conservation) (L-10)

During the development of the South Central Texas Regional Water Plan, public input through both surveys and focus groups consistently identified water conservation as the most preferred water management strategy. Implementation of aggressive water conservation in the high growth areas of the region was repeatedly stressed as being very important to the communities that would be providing water supplies to meet regional needs.

In South Central Texas Regional Water Plan, Volume III, Section 1.1(9), page 1.1-8, Demand Reduction (Water Conservation) (L-10) is presented as “potential additional municipal water conservation,” with estimates for all water user groups except San Antonio being based upon the following conditions: (1) New housing and business structures erected after 1993 would be equipped with low flow plumbing fixtures; (2) Toilet retrofit of 80 percent of 1990 housing would be accomplished by 2010 and the demand reduction would be applicable at 2010 and 2020; and (3) Water savings (Demand Reduction) from cutting lawn irrigation in half is calculated at 9.7 gpcd for Region L, with expected adoption by 60 percent of the population of each municipal Water User Group (WUG) (WUGs include cities, and other public water supply entities)¹. Based upon these assumptions, calculations were made of estimates of potential additional reductions in water use, as expressed in gallons per person per day (gpcd), and in the costs of accelerated toilet retrofit programs. In the Adopted Regional Water Plan, these estimates were included as a way to encourage the reduction in water use, as opposed to being a water management strategy that is necessary to meet water needs (shortages). The estimating procedure used for San Antonio was based upon information from San Antonio’s existing water conservation program, and is explained in more detail below.

The TWDB calculates water conservation using estimates of rates of adoption of plumbing retrofit for each decade, quantities of water saved per person for each type of plumbing fixture that is retrofitted, and each type of lawn irrigation and other conservation measure that is estimated to be implemented. The TWDB has water conservation rates for each respective WUG, based upon the conservation programs and conservation accomplishments of each WUG. The TWDB review of the Adopted Regional Water Plan questions the quantities of “Additional Conservation” included on the grounds that a part of the additional conservation included in the plan may already be included in the Advanced Conservation Case demand projections prepared by the TWDB, and requires revisions to these quantities.

Most WUGs of the region, and SAWS in particular, are actively engaged in aggressive plumbing retrofit, lawn irrigation efficiency improvement, and water conservation education programs. For example, SAWS has been spending more than one million dollars per year for toilet retrofit rebate, public information and education, and water conservation promotion. Such programs are needed throughout the region, in order to accomplish the demand reductions that are included in the region’s adopted water demand projections, which include advanced conservation. However, SAWS has a water conservation program that goes beyond the adopted advanced conservation demand projections used in the Regional Water Plan. In fact, SAWS achieved the advanced conservation projected per capita water use rate (gpcd) for 2050 in year

¹ Data for lawn irrigation demand reduction are from a 1997 and 1998 experiment in San Antonio by The Texas Agricultural Experiment Station of Texas A & M University, College Station, Texas.

2000, and is on the way to reaching its conservation goal of 132 gpcd by 2030. Therefore, the “Demand Reduction (Conservation) (L-10 Mun.)” strategy for San Antonio is not revised.

Costs presented in the individual WUG recommended water plans of the South Central Texas Adopted Regional Water Plan are based upon estimates of the capital costs to accomplish toilet retrofit of about 80 percent of the structures in existence in 1990, at the time of the passage of the “Low Flow Plumbing Fixtures Act,” by 2010, plus an annual public education cost of about \$0.85 per person per year, based upon the SAWS water conservation program costs for public information and education. The data used in calculating the revisions to the quantities of additional conservation are based upon similar conditions; e.g.; accomplishing 80 percent retrofit by 2010, and a strong education and promotion program.

The annual and unit costs for the “Demand Reduction (Conservation) (L-10 Mun.)” strategy included in the Adopted Regional Water Plan were calculated in accordance with TWDB costing procedures, which are to estimate capital costs in 1999-second quarter prices, with amortization of the capital cost outlay over 30 years at 6 percent interest. The public education costs of \$0.85 were treated as annual expenses in the cost estimates for this strategy. Therefore, the unit costs calculated for the strategy are appropriate for use in calculating the revised annual costs shown in Attachment E, Table A.

The revisions to the Demand Reduction (Water Conservation) (L –10) water management strategy were made using TWDB methods and water conservation data for each respective WUG of the region that had a per capita water use rate greater than 180 gpcd in year 2000, and are shown in the tables of Attachment E, Table A. It was decided that additional conservation potential might not be practical for WUGs with water use rates less than 180 gpcd in 2000. There are 27 WUGs in this category, and the revised tables for these WUGs show zeros for this strategy. These WUGs and counties in which they are located are as follows:

<u>Water User Group</u>	<u>gpcd in 2000</u>	<u>County</u>
Elmendorf	83	Bexar
Live Oak	91	Bexar
Martindale	98	Caldwell
Bloomington	97	Victoria
McQueeney	116	Guadalupe
St. Hedwig	116	Bexar
Seadrift	116	Calhoun
Cibolo	122	Guadalupe
Marion	122	Guadalupe
Karnes WUG	134	Karnes
Kyle	143	Hays
Runge	143	Karnes
Port Lavaca	144	Calhoun
Comfort	147	Kendall
Somerset	150	Bexar
Point comfort	154	Calhoun
Converse	155	Bexar
Kirby	156	Bexar
Encinal	160	LaSalle
Victoria	165	Victoria
Woodcreek	165	Hays
Woodsboro	173	Refugio
Nixon	175	Gonzales
Lockhart	176	Caldwell
Yoakum	176	DeWitt
Yorktown	176	DeWitt
Wimberley	178	Hays

The entries shown in the tables that follow are those that would have been made to the individual WUG water plans of Region L had the TWDB method and data been used to make the calculations when the plan was being developed; e.g.; in the case of Charlotte, South Central Texas Regional Water Plan, Volume I, (Table 5.3.1-2, Page 5-134) is as follows:

**Table 5.3.1-2
Recommended Water Supply Plan for Charlotte**

	2000	2010	2020	2030	2040	2050
	acft/yr	acft/yr	acft/yr	acft/yr	acft/yr	acft/yr
Projected Need	0	0	0	0	0	0
Recommended Plan						
Demand Reduction (Conservation) (L-10)	30	32	34	22	23	24
Total New Supply	30	32	34	22	23	24

Whereas, Table 5.3.1-2, with the revised estimates is as presented below:

**Table 5.3.1-2 Revised
Recommended Water Supply Plan for Charlotte**

	2000	2010	2020	2030	2040	2050
	acft/yr	acft/yr	acft/yr	acft/yr	acft/yr	acft/yr
Projected Need	0	0	0	0	0	0
Recommended Plan						
Demand Reduction (Conservation) (L-10)	2	7	8	6	6	6
Total New Supply	2	7	8	6	6	6

All other Water User Group tables of the Adopted Regional Water Plan are to be viewed in a similar way; e.g.; the entries in Attachment E, Table A that follow would replace the corresponding entries of the tables of the Adopted Regional Water Plan.

Revisions in the quantities of water supply and costs shown for Demand Reduction (Conservation) (L-10 Mun) affect the following tables in the Adopted Regional Water Plan:

- Tables 5.3.1-2 through 5.3.1-11 (Atascosa County),
- Tables 5.3.2-3 through 5.3.2-26 (Bexar County),
- Tables 5.3.2-29 through 5.3.2-54 (Bexar County)
- Tables 5.3.3-2 through 5.3.3-7 (Caldwell County),
- Tables 5.3.4-2 through 5.3.4-7 (Calhoun County),
- Tables 5.3.5-2 through 5.3.5-6 (Comal County),
- Tables 5.3.6-2 through 5.3.6-7 (DeWitt County),
- Tables 5.3.7-2 through 5.3.7-5 (Dimmit County),
- Tables 5.3.8-2 through 5.3.8-5 (Frio County),
- Tables 5.3.9-2 through 5.3.9-3 (Goliad County),
- Tables 5.3.10-2 through 5.3.10-7 (Gonzales County),
- Tables 5.3.11-2 through 5.3.11-11 (Guadalupe County),
- Tables 5.3.12-2 through 5.3.12-9 (Hays County),
- Tables 5.3.13-2 through 5.3.13-7 (Karnes County),
- Tables 5.3.14-2 through 5.3.14-5 (Kendall County),
- Tables 5.3.15-2 through 5.3.15-5 (LaSalle County),
- Tables 5.3.16-2 through 5.3.16-11 (Medina County),
- Tables 5.3.17-2 through 5.3.17-5 (Refugio County),
- Tables 5.3.18-2 through 5.3.18-5 (Uvalde County),
- Tables 5.3.19-2 through 5.3.19-5 (Victoria County),
- Tables 5.3.20-2 through 5.3.20-9 (Wilson County), and

Tables 5.3.21-2 through 5.3.21-7 (Zavala County).

The revised quantities of water supply and costs are shown in Attachment E, Table A. The quantities of water shown in the Adopted Regional Water Plan are not required to meet needs of the water user groups, except for the City of New Braunfels at year 2010, and for the City of San Marcos at 2020, 2030, 2040, and 2050. The necessary adjustments for New Braunfels and San Marcos are explained below.

In the case of New Braunfels, the needed quantity (1,000 acft/yr) is transferred from management supplies of Comal County Rural Areas (Canyon Reservoir - River Diversion, G-15C). The revisions affect Tables 5.3.5-4 and 5.3.5-6 as indicated in Attachment E, Table A.

In the case of San Marcos, Purchase Water from Major Provider (PMP) will need to be implemented at 5,700 acft/yr instead of 5,000 acft/yr from 2020 through 2050. The necessary quantity of water is available from Canyon Reservoir, and revised numbers affect Table 5.3.12-4 as shown in Attachment E, Table A.

In the case of San Antonio, no revisions have been made to the Demand Reduction (Conservation) (L-10 Mun) water management strategy because the estimates in the plan are based upon results of the San Antonio Water System (SAWS) existing water conservation plan, and the conservation goals of the SAWS Conservation Plan. SAWS records show that the quantity of water pumped per capita has declined from 157 gpcd in 1996 to 146 gpcd in 2000. The quantity pumped is the appropriate quantity for use in water planning because this is the quantity that must be obtained at the source in order to be able to meet water use demands, including unaccounted for quantities. The record of pumpage and the projected goals for the period through 2050 are as follows:

<u>Year</u>	<u>Record (gpcd)</u>	<u>Goal (gpcd)</u>	<u>TWDB Projection (gpcd) (Advanced Conservation)</u>	<u>Difference (gpcd)</u>
1996	157	--	--	--
1997	150	--	--	--
1998	154	--	--	--
1999	152	--	--	--
2000	146	157	173	16
2010	---	140	159	19
2020	---	135	150	15
2030	---	132	148	16
2040	---	132	147	15
2050	---	132	146	14

The demand reduction for SAWS was computed using the difference between the TWDB projected water use and the SAWS goals, as shown in the right hand column above. This is the SAWS plan for demand reduction, and therefore is the quantity included in the Adopted Regional Water Plan for San Antonio. The costs to accomplish this level of demand reduction are included in the plan. It is important to note, however, that there are management supplies in the San Antonio plan in excess of 131,000 acft/yr in 2010, and in excess of 166,000 acft/yr in 2050. The water supply associated with this management strategy is 38,185 acft/yr in 2010 and 37,555 acft/yr in 2050. Thus, even if this water management strategy is not fully implemented, the San Antonio needs can be met as other strategies are implemented.