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CHAPTER 9.0: WATER INFRASTRUCTURE FINANCING RECOMMENDATIONS

9.1 INTRODUCTION

Infrastructure financing needs have long been a key concern of the Texas Water Development Board (TWDB) as it pursues its mission of providing adequate funding to timely meet local water needs. The 77th Legislature, in Senate Bill (SB) 2, added the formal preparation of an Infrastructure Financing Report (IFR) to the regional planning process. The purpose of the IFR is to determine the amount of funding needed from outside sources to implement Region K's management strategies as recommended in the 2011 Regional Plan. The intent of this portion of Chapter 9 is to present the following:

- The total capital cost of all the improvements recommended in the management strategies portion of the Plan.
- The results of the Infrastructure Survey letters that were sent by the Regional Water Planning Group (RWPG) to each identified municipal water user group (WUG) that had a recommended water management strategy that required a capital cost.
- An estimate of the capital cost of the Plan improvements that cannot be funded out of local revenues and funding sources.
- A review of the funding options listed in the responses to the Infrastructure Survey letters.
- A review of the Policy Statements in Chapter 8 that the RWPG adopted that dealt with funding issues.

9.2 CAPITAL COSTS FOR THE 2011 REGION K WATER PLAN

The total capital cost of the water management strategies (WMS) proposed by the 2011 Region K Water Plan is \$850 million over the 50-year planning period. This total cost includes project cost estimates for the major capital improvement strategies involving the development of new supply projects, treatment and transmission cost estimates, and capital infrastructure expenses related to irrigation conservation measures (namely, precision laser-leveling). The total cost also includes estimates associated with localized WUG costs for expansion of existing groundwater and surface water capabilities for treatment and transmission systems, additional wells, and additional storage. Costs for major capital improvement projects are estimated at \$745 million. The WUG-level costs for localized expansion of groundwater costs are estimated at \$105 million. *Table 9.1* summarizes the estimated costs for both the major capital improvement strategies and the WUG-level strategies for the region.

Table 9.1: Recommended Strategies Requiring Capital Expenditure

Water Management Strategy	Starting Decade ¹	Largest Firm Yield ² (ac-ft/yr)	Total Project Cost ³ (2008 \$)
Major Capital Improvement Strategies			
Construct Goldthwaite Channel Dam	2010	0	\$3,269,500
City of Austin Direct Reuse ⁴	2010	53,700	\$429,195,700
Reuse by Highland Lakes Communities	2010	5,000	\$5,751,000
Purchase Water From City of Austin for Hays County	2010	1,100	\$2,987,000
Aquifer Storage and Recovery	2040	10,000	\$270,627,490
Development of Saline Zone of Edwards-BFZ Aquifer	2010	7,100	\$27,862,100
HB 1437 Irrigation Conservation	2020-2060	25,000	\$3,817,900
Subtotal			\$743,510,700
Local WUG-level Strategies			
New or Expanded Use of Groundwater	2010	30,949	\$105,643,000
Total			\$849,153,700

¹ The Starting Decade is shown as 2010 for several WUGs since it is anticipated that they will start planning/engineering work on some of the projects right away in order to have the projects constructed by the time they are needed, which could result in expenditures being spread out over the entire planning period.

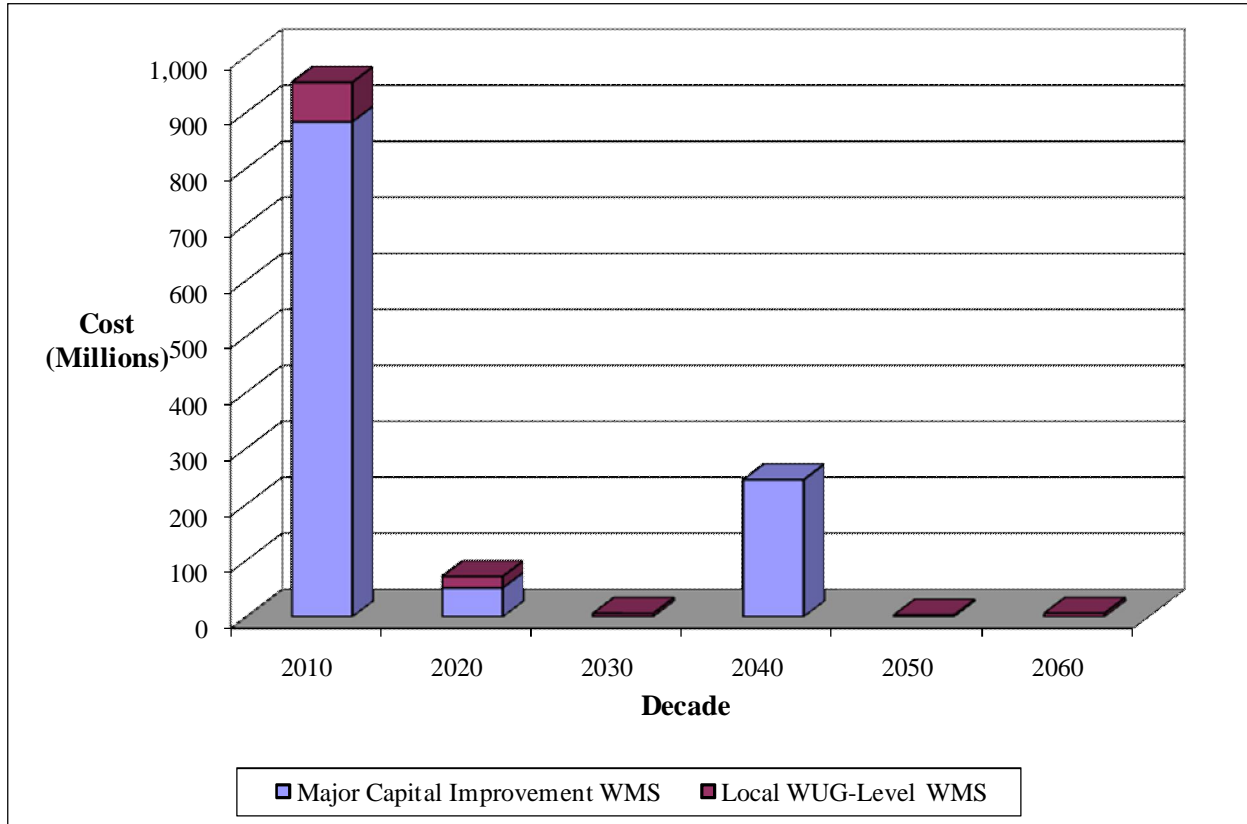
² The Largest Firm Yield indicated the largest annual firm yield of the project over the planning period. This value was used to calculate unit costs. Several projects will produce different amounts of water each year of the planning period, and this largest firm yield will not be available every year.

³ Total Project Costs include capital costs (construction costs - September 2008); engineering, contingencies, financial, and legal services costs (assumed percent of capital costs); land and easements costs; environmental and archeological studies and mitigation costs; interest during construction; and water right acquisition costs.

⁴ Note that the City of Austin continually updates its Capital Improvements Program spending plan through its budgeting and approval process; therefore, the anticipated capital expenditures related to City of Austin water management strategies are subject to change.

Figure 9.1 illustrates how the capital costs for both major capital improvements as well as WUG-level strategies shown above are distributed over the planning period. For simplicity, the WUG-level costs are shown as all beginning in 2010 in the above *Table 9.1*; however, several entities do not have a need until later in the planning period. Therefore, in *Figure 9.1*, the WUG-level costs for new or expanded use of groundwater are shown as occurring in the decade in which facilities are required.

Figure 9.1: Costs by Starting Decade and Category



Note that in some cases actual expenditures will likely be spread out over the entire planning period.

Table 9.1 and Figure 9.1 show only those proposed strategies with associated capital project costs. Several of the strategies proposed by the Plan do not require any capital expenditures for the individual WUG due to sufficient existing system capacity, continuation of strategy already being implemented, or cost borne by other entities, etc. Some of these strategies include municipal conservation, water purchase contract amendments, purchase of water from a wholesale water provider (WWP), pumping of additional groundwater for entities that already have the additional capacity available, continued use of return flows, and irrigation strategies involving use of the LCRA-SAWS Water Project (LSWP)¹. While no capital expenditures are shown for these strategies, annual operational costs are incurred over the planning period. Some of these annual costs include implementation cost for municipal conservation efforts, annual purchase cost for water obtained under new or amended contracts, and additional annual energy costs associated with pumping of additional groundwater using existing facilities. In the case of the LSWP, per the Definitive Agreement between LCRA and SAWS, Region K is not responsible for the associated costs of the LSWP, which will be paid primarily through water use fees and surcharges imposed on SAWS. Annual costs associated with these strategies are factored into the comparison with socioeconomic impacts of unmet water needs discussed in Sections 9.4 and 9.5 below.

¹ The project is the subject of litigation. For a description of the status of the project see p. 4-34.

9.3 ANALYSIS OF POSSIBLE FINANCING OPTIONS

9.3.1 Municipal Water User Groups

Surveys were sent out to 10 districts and municipalities and two wholesale water providers (WWPs) with projected water shortages. This mailing included municipal users and wholesale providers in the region who have an identified shortage during the planning period and have a recommended water management strategy that requires a capital cost. Of these, 4 responses were received as of July 14, 2010, two of which were from the City of Austin and LCRA, which are both characterized as WWPs. As of July 14, 2010, the total capital costs of the returned surveys equaled nearly \$498 million, which is 90% of the total capital costs of all 12 surveys mailed out (\$552.8 million). Of the possible \$498 million in future cost, the survey responses indicated a potential future request for \$151.6 million in funding. Responses received are tabulated in *Appendix 9A*, and the survey correspondence is found in *Appendix 9B*.

The surveys requested responses for five types of funding: Planning, Design, and Permitting; Acquisition and Construction; Excess Capacity; Rural; and Disadvantaged. The majority of survey responses indicated a potential future request for funding for Planning, Design, and Permitting, and Acquisition and Construction. One response showed a potential request for funding for Excess Capacity. None of the responses anticipated use of funding for Rural or Disadvantaged categories of projects.

9.3.2 Non-Municipal Water User Groups

Non-municipal WUG demands, supplies, and resulting needs are reported at the county and basin level. It is expected that within the non-municipal water user categories, funding will come from a combination of the methods outlined below, which in turn, come from a review of existing funding programs, funding methodologies outlined as part of recommended strategies (discussed also in Chapter 4), and review of information contained in previous water plans.

Manufacturing: The only manufacturing WUG with a need and a capital cost associated with the recommended strategy is the Hays County – Colorado River Basin Manufacturing WUG. The strategy proposed for this WUG falls into the new/expanded use of groundwater category. It is anticipated that the manufacturers will directly construct the required infrastructure to supply the additional groundwater.

Steam-Electric Power: Steam-electric power is projected to increase in direct proportion to population and manufacturing growth, and along with it, an associated increase in water demand. The Wharton County – Brazos-Colorado Basin Steam-Electric Power WUG is the only user other than the City of Austin with an anticipated capital cost for addressing needs over the planning period. This capital cost is associated with development of the Gulf Coast Aquifer groundwater source. It is expected that plant owners will obtain financing through traditional methods for private power industries in order to complete the project, and these costs will be passed through to the customer through the rate charged for providing electric power. The City of Austin steam-electric strategy with capital costs is the City of Austin Direct Reuse strategy that is combined with the municipal and manufacturing needs under the Major Capital Improvements category in *Table 9.1*.

Mining: Shortages in the Mining WUG category are anticipated across the region, with the majority of the needs to be met through the new or expanded use of groundwater. Capital costs associated with new or additional facilities would be borne by the private mining company. In fact, much of the mining occurs in

areas where the surface mine penetrates shallow groundwater, so the need is more for pumping and recirculation equipment than for actual groundwater wells.

Livestock: The primary strategy for addressing the needs of Livestock WUGs in the region is new or expanded use of groundwater supplies. The estimated capital costs required to implement this strategy were developed under the assumption that each individual livestock owner would develop or expand their groundwater use individually on their property, rather than from development of a larger collection and distribution system for a group of users. Therefore, it is anticipated that capital costs would be borne individually by the respective landowner.

Irrigation: Irrigation capital infrastructure costs are related to the precision laser-leveling component of the irrigation conservation strategy. HB 1437, enacted in 1999 during the 76th session of the Texas Legislature, authorized LCRA to transfer up to an additional 25,000 ac-ft/yr from the Colorado River Basin to new customers within the Brazos River Basin. The legislation allows the transfer only if there is no net loss to the Colorado River Basin and requires that any adverse effects of the transfer be mitigated. Funding for this mitigation is addressed through the establishment of an Agricultural Water Conservation Fund (Ag Fund). One of the mitigation projects proposed is the precision laser-leveling of rice fields. Irrigation users will be responsible for paying 20 percent of the capital cost of the precision leveling. Individual irrigators would predominantly fund this share of the capital cost. Assistance may also be available to the irrigators through the Ag Fund. Note that the capital costs shown above in *Table 9.1* and *Figure 9.1* represent the irrigators 20 percent capital cost portion.

Additional irrigation conservation measures and improvements are part of the LCRA-SAWS Water Project² and, as mentioned above, the costs for the water project are to be borne by SAWS.

9.3.3 Wholesale Water Providers

There are two WWP, as defined by the State planning process in Region K: LCRA and the City of Austin (COA).

Lower Colorado River Authority (LCRA): LCRA has developed their FY2011 Capital Improvments Plan, which includes a section on Water Services that provides information on specific projects planned for the next five years. Specifically, the plan discusses four major categories of capital expenditures: Water and Wastewater Utilities, Stored Water, Hydroelectric, and Irrigation. With respect to funding, LCRA's plan indicates that its policy allows funding of its capital program to come from a combination of net revenues and debt. The plan states that water and wastewater utility, hydroelectric, flood, irrigation, and other river management projects are to be funded using new tax-exempt commercial paper debt, while net revenues will fund all other capital expenditures to the extent available.

City of Austin (COA): Austin Water Utility (AWU) updates its ten-year Capital Improvements Program (CIP) plan annually. The update process includes reviewing all existing CIP projects, identifying new projects, and evaluating financing options. AWU generally finances its capital improvement projects through a combination of cash or current revenues, bonds, and grant funding, to the extent available. The percent share of each funding source is typically 20 percent for cash or current revenues, 65 percent for bonds, and up to 15 percent for Federal Government Grant Programs (through the Bureau of

² The project is the subject of litigation. For a description of the status of the project *see* p. 4-34.

Reclamation's Grant Program, for example.) To the extent that grant programs do not supplement the funding needs, the remainder would be funded by cash and bonds.

9.4 INTRODUCTION TO SOCIOECONOMIC IMPACTS OF UNMET WATER NEEDS

The following excerpts are taken directly from the Introduction to the TWDB report entitled *Socioeconomic Impacts of Projected Water Shortages in the Lower Colorado Planning Area (Region K)*, dated May 2010. The full report, which includes the information below as well as additional sociological impacts, such as reduction in population and school enrollment, is provided in full as *Appendix 9C* to this chapter:

Administrative rules require that regional water planning groups evaluate the impacts of not meeting water needs as part of the regional water planning process, and rules direct TWDB staff to provide technical assistance: "*The executive administrator shall provide available technical assistance to the regional water planning groups, upon request, on water supply and demand analysis, including methods to evaluate the social and economic impacts of not meeting needs*" [(§357.7 (4)(A))]. Staff of the TWDB's Water Resources Planning Division designed and conducted this study in support of the Lower Colorado Regional Water Planning Group (Region K).

Water shortages during drought would likely curtail or eliminate economic activity in business and industries reliant on water. For example, without water, farmers cannot irrigate, refineries cannot produce gasoline, and paper mills cannot make paper. Unreliable water supplies would not only have an immediate and real impact on existing businesses and industry, but they could also adversely affect economic development in Texas. From a social perspective, water supply reliability is critical as well. Shortages would disrupt activity in homes, schools and government and could adversely affect public health and safety. For all of the above reasons, it is important to analyze and understand how restricted water supplies during drought could affect communities throughout the state.

Table 9.2 and *Figure 9.2* summarize estimated economic impacts. Variables shown include:³

- **Regional income** – total payroll costs (wages and salaries plus benefits) paid by industries, corporate income, rental income, and interest payments for the region
- **Jobs** – number of full and part-time jobs required by a given industry including self-employment
- **Business taxes** – sales, excise, fees, licenses, and other taxes paid during normal operation of an industry (does not include any type of income tax)

If drought of record conditions return and water supplies are not developed, study results indicate that the Region K Water Planning Area would suffer significant losses. If such conditions occurred in 2010, lost income to residents in the region could total \$138 million with associated job losses as high as 1,989. State and local governments could lose nearly \$14.6 million in tax receipts. If such conditions occurred in 2060, income losses could run \$2,933 million, and job losses could total 21,576. Approximately \$393 million worth of State and local taxes would be lost. Reported figures are probably conservative because they are based on estimated costs for a single year; however, in much of Texas, the drought of

³ Regional income plus business taxes are a suitable measure of economic prosperity because they are a better measure of net economic returns.

record lasted several years. For example, in 2030, models indicate that shortages would cost residents and businesses in the region \$1,396 million in lost income. Thus, if shortages lasted for three years, total losses related to unmet needs could easily approach \$4,188 million.

Table 9.2: Annual Economic Impacts of Unmet Water Needs

Year	Income (\$ millions) ¹	Jobs	State and Local Taxes (\$ millions) ¹
2010	\$137.79	1,989	\$14.60
2020	\$1,326.15	8,447	\$178.65
2030	\$1,395.74	9,860	\$185.78
2040	\$2,245.55	14,651	\$304.67
2050	\$2,407.36	16,273	\$325.82
2060	\$2,932.61	21,576	\$393.08

Source: TWDB, Office of Water Resources Planning

¹ In year 2008 dollars

9.5 SOCIOECONOMIC IMPACTS AND ANNUAL COSTS OF IMPLEMENTING THE REGIONAL WATER PLAN

As discussed in the previous section and in more detail in the full report in *Appendix 9C*, there are significant negative economic impacts which would occur during the return of drought of record conditions at anytime during the planning period, if sufficient water supplies are not developed. These impacts have both sociological, and in turn, economic consequences on the region. The economic consequences to the region were summarized in *Table 9.2* in the previous section. *Table 9.3* below compares the total estimated annual cost of implementing the Regional Plan's recommended strategies with the total economic impact of unmet water needs, shown for each decade across the entire planning period.

Table 9.3: Comparison of Annual Costs of Implementing Strategies and Annual Economic Impacts of Unmet Water Needs

Year	Total Estimated Annual Cost of Strategies (\$ millions) ¹	Total Socioeconomic Impact to Region (\$ millions) ¹
2010	34.10	152.39
2020	36.45	1,504.80
2030	38.68	1,581.52
2040	66.50	2,550.22
2050	67.48	2,733.18
2060	72.53	3,325.69

¹ The total socioeconomic impacts provided in year 2006 dollars. Total estimated annual costs of strategies provided in September 2008 dollars. The values are provided for comparison purposes only.

The annual socioeconomic cost to the region is larger than the annual cost of implementing water strategies by a factor of 4.5 in decade 2010, and increases to a factor of 46 by 2060. Therefore, if drought of record conditions were to occur during the planning period, the anticipated annual socioeconomic

impacts of unmet water needs on the region greatly outweigh estimated annual costs of implementing the strategies recommended to meet those water needs.

It should also be noted here that the above analysis does not include costs for impact on the environment. There is no readily available study which defines the economic cost of reduced instream flows to the above cost impacts. There is data available about the economic impact of reduced inflows on the fishery industry in Matagorda Bay. The economic impact of the shrimp industry alone is estimated at \$330 million annually and supports 30,000 jobs (Texas Center for Policy Study 2002). However it is difficult to determine whether or not the impacts predicted assume that the water provided in the LCRA Management Plan is considered available. LCRA is and remains committed to providing the instream flows and bay and estuary freshwater inflows currently included in their management plan, which would take place regardless of whether or not the management strategies noted in this plan are implemented. This issue deserves more in-depth study in the next round of planning.

9.6 REGION K POLICY STATEMENTS FROM CHAPTER 8 THAT DISCUSS FUNDING

In this round of regional water planning, the RWPG has included several policy statements in Chapter 8 that discuss funding issues. These policy statements include the following:

- Support State funding for linking groundwater and surface water models by the TWDB during the development of the next generation of Groundwater Availability Models/Water Availability Models (GAMs/WAMs) with a priority for specific areas where groundwater and surface water closely relate and interact, such as concentrations of base-flow springs or stream-based recharge.
- *Texas Legislature* – Monitor the Environmental Flows Allocation Process set up by the 80th Texas Legislature through Senate Bill 3. Monitor and provide adequate funding for environmental flows.
- Region K policy is to encourage new funding sources for GCDs specific to data collection and storage methods that emphasize ease of public accessibility. Region K policy is to support the funding needs of the TWDB for the maintenance and expansion of state-wide groundwater databases.
- The LCRWPG encourages the funding of research efforts to determine water savings and incorporate the information into an update of the 2004 Best Management Practices guide. This information should be aimed at providing water suppliers with useful information for developing and implementing conservation goals and successful management strategies.
- The LCRWPG encourages TWDB to aid the NRCS State Conservationist in targeting water conservation program funding to projects that offer the most water conservation benefit for the state. The TWDB should also offer expert testimony to the Agriculture Committees of both the Senate and the House regarding the need and effectiveness of water conservation accomplished through EQIP in order to highlight the ongoing need for adequate EQIP funding.
- The LCRWPG supports the continuation and expansion of TWDB funding for retail utility water loss projects.

- LCRWPG supports water providers having the ability to have a dedicated yearly funding source for water conservation programs and projects.
- The LCRWPG supports adequate and timely state funding for the regional water planning process. This funding is critical for the development of long-term, sustainable, environmentally protective and conservation-effective water management strategies as well as the collection of water data and groundwater availability information, including the refinement of modeling data, public information materials, and administrative assistance.
- The LCRWPG recommends the State should provide adequate funding for water treatment and radioactive waste disposal for those rural communities that may lose their water supply if such financial support is lacking.

LCRWPG WATER PLAN

APPENDIX 9A
TABULATED SURVEY RESULTS

LCRWPG WATER PLAN

APPENDIX 9B

SURVEY CORRESPONDENCE

APPENDIX 9C

*SOCIOECONOMIC IMPACTS OF PROJECTED WATER SHORTAGES
IN THE LOWER COLORADO WATER PLANNING AREA (REGION K),
TWDB, MAY 2010*