

TEXAS WATER ALLOCATION ASSESSMENT

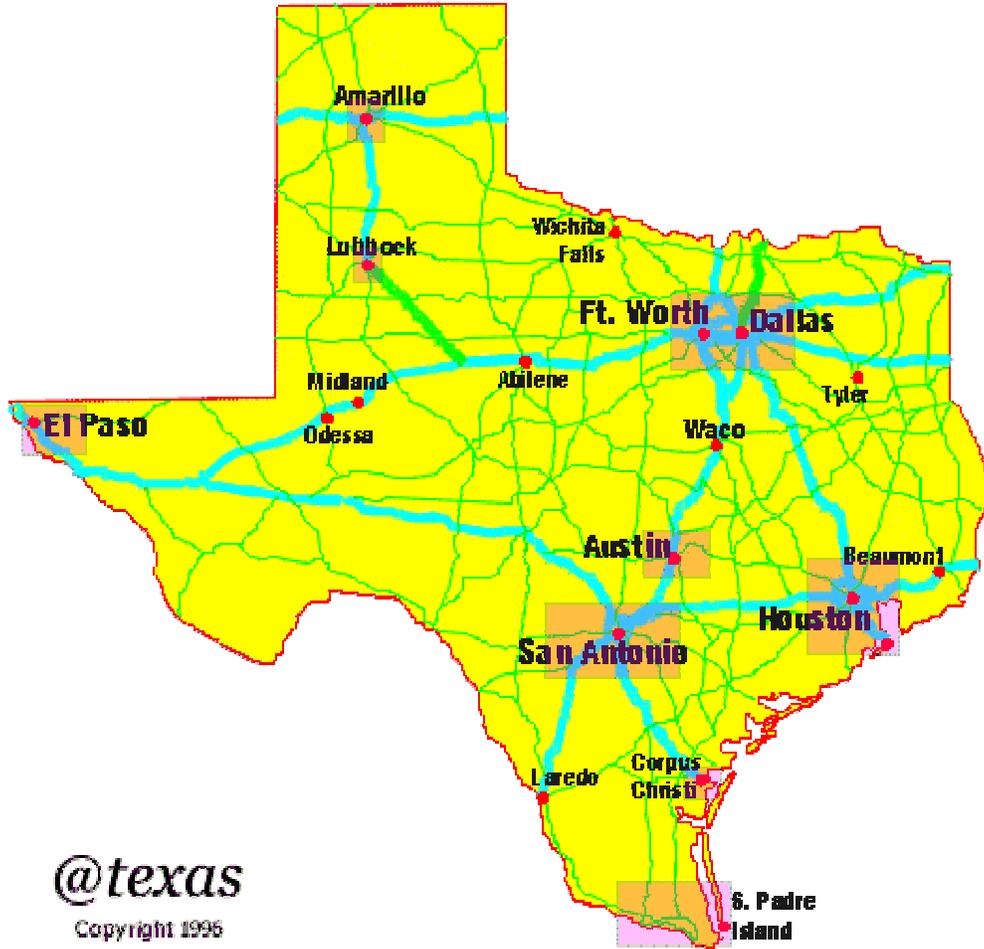
REVIEW OF CORPS WATER SUPPLY AUTHORITIES, POLICIES AND RELATED LAND RESOURCES ISSUES

Prepared for:
U.S. Army Corps of Engineers, Ft. Worth District

Prepared by:
U.S. Army Corps of Engineers
Institute for Water Resources
Alexandria, Virginia 22315
and
Planning and Management Consultants, Ltd.
P.O. Box 1316
Carbondale, Illinois 62903

Oversight provided by:
U.S. Army Corps of Engineers, Southwestern Division

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PREFACE and ACKNOWLEDGEMENTS

In response to critical droughts, in 1997, the 75th Texas Legislature passed Senate Bill 1 to address water management and planning in Texas. Senate Bill 1 put in place a regional approach to water planning. Sixteen regions were created across the state based on water sources, river basins, economic growth centers and other factors. In each region, a Regional Water Planning Group managed a study to identify available water supplies and projected demands for the next fifty years. The Regional Planning Groups then identified water management strategies for entities with projected shortages and developed cost estimates. On a statewide basis, over \$17 billion of improvements (in 1999 dollars) were recommended to meet the projected demands by 2050. For many entities these improvements cannot be completed without outside assistance, and present local and state resources may not be sufficient. In response, the Texas Congressional Delegation requested a study on the potential for Federal assistance with water supply in Texas.

This report is prepared as part of that Congressionally authorized Texas Water Allocation Assessment Study. The report was developed as a joint effort between the Planning and Policy Studies Division of the Institute for Water Resources (IWR) and *Planning and Management Consultants, Ltd.*, (PMCL) Carbondale, Illinois. Report authors were Theodore Hillyer and William Werick from IWR and Stuart Norvell and Jack Kiefer from PMCL. The study manager was Kevin Craig of the Corps of Engineers' Ft. Worth District.

The U.S. Army Corps of Engineers (Corps) plays an important role in meeting the water supply needs of Texas. Today, Corps reservoirs within Texas provide 4.6 million acre-feet of municipal and industrial water supply storage space, which provides about 36 percent of the potable water supply for Texas. This report presents an assessment of the Corps of Engineers water supply authorities, policies and related land resources issues including the permitting process and the enabling and limiting nature of those items. The report also constructs and discusses an institutional framework that describes how water supply is developed and administered in the State of Texas. The primary focus of the report is on institutional, regulatory and legal aspects of water supply rather than hydrologic and geologic considerations. The report also focuses on water quantity as opposed to water quality.

Conclusions are provided on how the Corps' Ft. Worth District can provide the most effective support to the State of Texas to meet its future water needs.

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EXECUTIVE SUMMARY

Overview

In 1997 the 75th Texas Legislature passed and Governor George W. Bush signed Senate Bill 1, a law that set a statewide strategy for meeting the water supply needs of a rapidly growing population. Sixteen regions were created across the state based on water sources, river basins, economic growth centers and other factors. In each region, a Regional Water Planning Group managed a study to identify available water supplies and projected demands for the next fifty years. The Regional Water Planning Groups have projected municipal and industrial water shortages of over 3 million acre-feet per year in Texas by 2050 with the current supplies. They recommended over \$17 billion of improvements to address that shortfall. For many entities these improvements cannot be completed without outside assistance, and present local and state resources may not be sufficient. In response, the Texas Congressional Delegation requested a study on the potential for Federal assistance with water supply in Texas. This report lays out the potential for the Corps of Engineers (Corps) to help in resolving the water supply problems in Texas by applying individual authorities and by using a new collaborative approach that span multiple Corps program areas.

Conclusions

The Corps cannot, under existing authorities, subsidize the construction of new water supply infrastructure. This conclusion is based on a review of existing Corps authorities (Chapter I). This report considers, but assigns little chance that those authorities might change. There have been a few water supply and wastewater projects built in Pennsylvania by the Corps and paid for in part by the Federal government. Those projects, however, are notable exceptions to established policies, authorized by Congress on a project-by-project basis. The report also considers whether a Federal interest in water supply, similar to that of navigation and flood control could expand in the future. The notion that the Corps should build navigation and flood control projects, however, evolved over a very long period of time. This report concludes that what we take into the twenty-first century is an outcome that relies on affirmative answers to three questions (see paragraph II-2.3): (1) is Federal involvement constitutional? (2) will benefits spill over state or local political boundaries? and (3) are benefits unlikely to be realized without Federal intervention? These answers are not likely to be answered affirmatively for water supply.

The report identifies two avenues that offer the most promise. The first being the Corps' authority to reallocate space in its existing water reservoirs, using the space for water supply rather than the existing authorized purpose such as hydropower. The Federal government has to be reimbursed for the full cost of that portion of the reservoir, but it is by definition a "good deal" since the Corps will only approve the reallocation if this is the least costly way to increase the reliable yield of a water supply system. Texas already uses as much space in Corps reservoirs

as the rest of the country combined (see paragraph I-6.1.2). This large amount of storage space in Texas reservoirs offers a favorable possibility of reallocation to meet a portion of the State's needs. The second avenue that offers promise is the new collaborative approach. This offers enormous promise, but it will only work if the Corps, water utilities, stakeholders and non-governmental organizations interested in water supply issues commit themselves to joint development of water supply solutions rather than proceeding individually in their roles as designers and critics. The Corps can play a central role in this because the new collaborative approach, called shared vision planning (see paragraph II-7), was developed by the Corps and because most of the \$17 billion in improvements will require a Corps permit. Water supply projects such as Two Forks Reservoir (Denver, Colorado), the Gaston Pipeline (Virginia Beach, Virginia) and the King William Reservoir (Newport News, Virginia) were held up or stopped in the Corps permitting process. Project proponents saw this as a waste of time and money; project opponents believed the additional studies and delays were necessary because the project proponents had not identified the least environmentally damaging practicable alternative. In these cases, though, the Corps became the focus of intense criticism. This report introduces the experience of the Rappahannock River Basin Commission. See paragraph II-7.3 for additional information on these case studies. This shared vision approach is probably even more important in Texas, because the transfer of water from one region to another is both feasible from an engineering and economic perspective and problematic from a political and environmental perspective.

Other Federal agencies also have programs that could help. The delivery and even the level of Federal help might be improved by a new Federal-state cooperative effort such as the California Bay-Delta system (Calfed) (see paragraphs V-2 and V-3), initiated in 1994 to address environmental and water management problems including water supply in California's Bay-Delta system. From the perspective of Texas water supply, Calfed could serve as a model in terms of overcoming the fragmented Federal, state and local missions, responsibilities and interests with respect to water supply. To the extent that stakeholder fragmentation could be overcome, Federal-state partnerships could streamline regulatory requirements for developing water supply through interregional transfers, additional storage and new conveyance infrastructure. In addition, creation of a "Texfed" could result in direct funding for Texas water supply through the Federal legislative mechanism.

However, there are several considerations with respect to pursuing an approach similar to Calfed. First, there is some uncertainty regarding the stability of long-term funding of the program. If a program such as Calfed fails to deliver new water during the next several years, Federal legislators and their constituencies may be reluctant to continue allocating funds through the program. Secondly, despite an apparent increase in collaboration between agencies, site-specific environmental review for individual projects has not yet taken place, and it is not clear whether increased collaboration will result in a streamlined regulatory process when it is time to move forward on water supply infrastructure construction. Lastly, it is not clear whether Calfed has resulted in an absolute increase in Federal appropriations for water supply development in California. In general, there has also been a long-term decline in the amount of Federal outlays for water supply infrastructure in the Corps and United States Bureau of Reclamation and in grant assistance to local and regional water providers.

Water shortages in Texas are in large part regional (see paragraph IV-3.2). Some areas will likely have abundance of water over the next several decades, while others are likely to experience minor to significant shortages. Thus, the issue is geospatial and shortages could be greatly reduced in many cases by transferring water from areas of high concentration (i.e. East Texas) to areas of low concentration (i.e., West Texas). The difficulty in achieving regional and interstate reallocations is reaching a consensus among stakeholders and obtaining consensus of various agencies - local, state and Federal - involved in planning and approving such transfers. Economic and environmental impacts of large-scale water transfers must also be analyzed and assessed. The Corps could play a major role in assisting the state in developing approaches and models to evaluate the feasibility of large-scale interbasin and interstate transfers.

Developing systematic approaches to reallocating surface waters on regional and intrastate basis is another possibility and could be developed and facilitated under a Federal-State partnership. Water supply management in Texas, however, is fragmented among local, state and Federal organizations (see paragraph IV-1). From a planning perspective, a plethora of state, local and Federal agencies are involved, each with varying levels of authority and missions. Federal-state partnerships in other areas of the Nation have been conceived and implemented to address water supply development and management.

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CHAPTER I: CORPS WATER SUPPLY AUTHORITIES AND POLICIES

I-1. Introduction

I-1.1. Purpose

The purpose of this Chapter is to present the legislative landmarks upon which the U.S. Army Corps of Engineers (Corps) mission in water supply is founded as well as the major policies, procedures and cost sharing rules that have evolved from this legislation. Sections are provided on surplus water; municipal and industrial water supply; irrigation and agricultural water supply; ability to pay; databases on municipal and industrial and agricultural water supply; and emergency and drought contingency water supply. Appendix A “Compendium of Legislation Pertinent to Water Supply” accompanies this chapter.

I-1.2. Policy.

Water supply is a subset of water resources issues, and is generally linked to meeting municipal and industrial (M&I) needs, although it can also mean the provision of surface and groundwater supplies for all uses. National policy concerning the Corps’ role in water supply has developed over many years and is still being clarified and extended by legislation. This policy is based on recognition that states and local sponsors have the primary responsibility in the development and management of their water supplies. The policy also recognizes a significant but declining Federal interest in the long-range management of water supplies and assigns the financial burden of supply to users. The Corps can:

- Build water supply storage (but only if someone else pays for it and it is part of water projects that are primarily for other purposes) (see paragraphs I-3.2, 3.3 and 3.4);
- Reallocate storage in existing Corps reservoirs from some other use to water supply and add storage to existing projects (again, the entity using the storage must pay all costs) (see paragraph I-3.5);
- Add storage to existing reservoir projects (I-3.6);
- Provide expert assistance in water management, including water use forecasting, conservation and drought planning (see paragraph I-7).

- Exercise regulatory review of new water supply projects (see paragraph II-5); and
- Manage the storage and release of water from its reservoirs to address multiple purposes throughout a river basin to enhance water supply efforts managed by others (see paragraph II-6).

I-1.3. Legislation.

A compendium of the legislation pertinent to the Corps water supply program is contained in Appendix A. These laws are of major significance to the Corps mission in water supply planning in that they provide authority for the Corps to use their reservoirs for municipal, industrial, surplus and agricultural water supply. These laws also give the Corps authority to provide emergency water and assist states and local interests in their water supply planning process. The Corps role in water supply can be subdivided into the four categories of: surplus water; municipal and industrial water supply storage space; irrigation and agricultural water supply; and emergency and drought contingency water supply.

I-2. Surplus Water

I-2.1. History.

Section 6, Public Law 78-534 (Flood Control Act of 1944) authorized the Secretary of the Army to “make contracts with” States, municipalities, private concerns or individuals for sale of surplus water from Corps reservoir projects. Surplus water contracts are normally for temporary use only. From a historical and legislative perspective the phrase “to make contracts” was originally “to sell to.” The Senate changed the language from “to sell to” to “to make contracts

Box I-1. Surplus Water

- Definition:
 - Water that is not required because the authorized need never developed.
 - Water not required because the need was reduced by changes that have occurred since authorization.
 - Water that would be more beneficially used as municipal and industrial than for the authorized purpose.
 - Water, that when withdrawn, would not significantly affect authorized purposes.
- Costs:
 - Based on the higher of benefits or revenues foregone, replacement cost or the updated cost of storage.
 - Paid yearly and include a pro-rata share (based on amount of storage space dedicated) of operation, maintenance, repair, replacement and rehabilitation costs.
- Use:
 - Normally for small amounts of water.
 - Temporary use only, contracts limited to 5-year terms.
 - Permitted only when non-Federal sponsors do not want to purchase storage because use of the water is desired for a short term, or use would be temporary pending development of the authorized use.
 - Can be used while a reallocation report is being developed.

with" because the western Senators were incensed at the idea that the Federal government owned the water. That discussion includes the following statement: "One of the reasons why it was desired to amend that section was that it provides for the sale by the Secretary of War of water in the West. Ownership of the water does not repose in any individual or in any agents. It reposes in the public. So it was our desire to change this language from an authorization to sell to an authorization to make contracts for the distribution..."¹ Box I-1 provides an overview of the Corps' Surplus Water Authority.

I-2.2. Definition.

Section 6 provides to the Corps what is referred to as the "surplus water" authority. This authority is normally used only as a temporary measure. Under this authority, the Secretary of the Army is authorized to enter into agreements for surplus water with states, municipalities, private concerns, or individuals at any reservoir under the control of the Department of the Army. The price and terms of the agreements may be, as the Secretary deems reasonable. These agreements may be for domestic, municipal, and industrial uses, but not for crop irrigation. Under Corps procedures, surplus water will be classified as one of the following cases:

- Water stored in a Department of the Army reservoir that is not required because the authorized need for the water never developed or the need was reduced by changes that have occurred since authorization or construction.
- Water that would be more beneficially used as municipal and industrial water than for the authorized purpose that, when withdrawn, would not significantly affect authorized purposes over some specified period.

I-2.3. Implementing Guidance.

The annual cost deemed reasonable for surplus water supply is to be determined by the same procedure used to determine the annual payment for an equivalent amount of reallocated storage (see paragraph I-3.5). To this annual cost will be added an estimated annual cost for operation, maintenance, repair, replacement, rehabilitation and reconstruction. The total annual cost is to be limited to the annual cost of the least costly alternative, but never less than the benefits foregone or, with hydropower, revenues foregone. For small withdrawals (including a group of separate users at a specific project), under Section 6 authority, a standard minimum charge or standard unit charge should be established and applied for all of the withdrawals. All proposals for establishment of such standard charges must be submitted to the Corps Headquarters for approval. The Corps contracts for surplus water are limited to 5-years. At the end of that time, consideration for an additional 5-year contract can be considered, but costs are adjusted to current price levels.

¹ Congressional Record p.8551, November 29, 1944.

I-3. Water Supply Storage

I-3.1. History.

The growing water supply problems of the early 1950s led the Chief of Engineers in the mid-1950s to advocate that all Corps reservoirs constructed for river control include water supply storage. A number of previously authorized reservoirs were also being modified by specific legislation to include storage for municipal and industrial water supply. The present era of Federal water supply begins with the Water Supply Act of 1958. This act authorized the Corps to include municipal and industrial water supply for present and future demand at Corps projects. The Senate Committee on Public Works thinking at the time of the passage of the Water Supply Act of 1958 was that the Act prescribed a sound division of water supply responsibility between the Federal Government and States and local interests by declaring it to be the policy of Congress to recognize the primary responsibilities of the States and local interest in developing water supplies for domestic, municipal, industrial and other purposes and the Federal Government should participate and cooperate with States and local interest in developing such water supplies in connection with the construction, maintenance, and operation of Federal water resources projects.² The Committee considered it to be most important because of the increasingly acute water shortages, which were developing not only in the more arid sections of the country but also in humid areas. The committee felt that the Act provided a framework within which the Corps of Engineers and the Bureau of Reclamation may develop the best overall use of water resources in river basins in the service of water supply. Although the committee knew that under existing law and certain conditions water supply storage could be provided, it was the intention of the committee that the Act make possible provision of water supply storage in reservoirs, where it is apparent that there will be a future demand for such storage but where the demand is not pressing at the time of construction.

I-3.2. 1958 Water Supply Act.

Title III of Public Law 85-500 (the 1958 River and Harbor Act) is referred to as the “1958 Water Supply Act.” This legislation provides the Corps’ primary authority in the field of water supply and is referred to as the “storage” authority. Section 301(a), of the law established a policy of cooperation in development of water supplies for domestic, municipal, industrial, and other purposes. Section 301(b) is the authority for the Corps to include storage for municipal and industrial (M&I) water supply in reservoir projects and to reallocate storage in existing projects to M&I water supply. However, as specified in Section 301(d), “modifications to a planned or existing reservoir project to add water supply, which would seriously affect the project, its other purposes, or its operation, requires congressional authorization.” The act called for water supply cost plus interest to be paid by non-Federal interests within the life of the project (50-years; 30

² Senate Report No. 1710, 85th Congress, 2d Session June 14, 1958.

percent of project costs could be set aside for future water supply with a 10-year interest free period). As summarized in the following paragraphs, Section 10 of Public Law 87-88 and Section 932 of Public Law 99-662 physically amended this act and Public Law 88-140, Section 221 of Public Law 91-611, Section 4 of Public Law 92-222 and Section 322 of Public Law 101-640 impacted on the provisions of the intent of this act. The authorities and implementing guidance relating to the Corps water supply mission are varied as they have evolved over time and have been subject to many legislative and policy decisions. The costs and repayment are particularly varied depending upon when and how the storage is included in the project. The legislation, costs and repayment requirements are provided in the following paragraphs and summarized in Box I-2. Unlike surplus water contracts, storage contracts are for permanent use.

I-3.3. 1958 Water Supply Act Amendments and Related Authorities.

I-3.3.1. Section 10, Public Law 87-88, 20 July 1961 (the Federal Water Pollution Control Act Amendments of 1961) modified the 1958 Act to permit the acceptance of assurances for future water supply to accommodate the construction cost payments for future water supply.

I-3.3.2. Public Law 88-140, 16 October 1963, extended to the non-Federal sponsor of water supply storage the right to use the storage for the physical life of the project subject to repayment of costs. This removed an uncertainty as to the continued availability of the storage space after the 50-year maximum period previously allowed in contracts.

Box I-2. Water Storage

- Definition. Space in a reservoir to be used by a non –Federal sponsor for the storage of water for M&I purposes. The Federal Government makes no representation with respect to the quality or quantity of water and assumes no responsibility for the treatment, or availability of the water. Once the cost of the storage space has been repaid by the sponsor, the sponsor owns the space provided the assigned operation, maintenance, repair, replacement and rehabilitation costs are repaid when due.
- Authorities.
 - The 1958 Water Supply Act (PL 85-500).
 - Section 10 (PL 87-88) permitted assurances for future water supply.
 - PL 88-140 provided permanent rights to storage.
 - Section 221 (PL 91-611) required a written agreement, modified by Section 4 of PL 92-222 to exempt the storage for future water supply.
 - Section 932 of PL 99-662, Water Supply Act Amendments of 1986, modified repayment terms for Corps projects.
 - Section 322 of PL 101-640, Reduced price for low income communities.
- Cost and Repayment.
 - Old project. Allocated actual project cost assigned to the storage space to be repaid over a 30-year period, the first 10-years of which are interest free if not used.
 - New project. Allocated actual project cost assigned to the storage space cost to be repaid during the period of construction.
 - Reallocation. Current value of assigned storage in the project to be repaid over a 30-year period with no interest free period. Any cost of project modification to be repaid during the modification.
 - Addition of storage. Assigned cost to be repaid within the remaining physical life of the project, but not to exceed 25 years from completion of project modification; or if water supply is already a project purpose, within 30 years from the time the project was first used for water supply.

I-3.3.3. Section 221 of Public Law 91-611. 31 December 1970 required a written agreement by the non-Federal sponsor prior to construction to furnish its required cooperation for the project.

I-3.3.4. Section 4 of Public Law 92-222, 17 November 1986, (WRDA '86) clarified that Section 221 of Public Law 91-611 does not apply to storage for future water supply.

I-3.3.5. Section 932, Public Law 99-662 (WRDA '86) modified the 1958 Act for Corps projects but not for Bureau of Reclamation projects. The amendment eliminated the 10-year interest free period for future water supply, modified the interest rate formula, limited repayment to 30 years, and required annual operation, maintenance and replacement (OM&R) costs to be reimbursed annually. This latter requirement on repayment of OM&R costs had always been a part of Corps policy and repayment procedures.

I-3.3.6. Section 322, Public Law 101-640, 28 November 1990, (Water Resources Development Act of 1990) authorized, as the discretion of the Assistant Secretary of the Army (Civil Works), a reduced price of water for low-income communities when storage is reallocated and the cost of the reallocated storage is determined by the updating procedure.

I-3.4. Implementing Guidance.

The policies and procedures used by the Corps to implement the 1958 Water Supply Act, as amended, and other related laws are provided in the Planning Guidance Notebook (ER 1105-2-100). This report can be found at:

<http://www.usace.army.mil/inet/functions/cw/cecwp/pgncover.htm>.

This guidance is summarized in the following paragraphs.

I-3.4.1. The term “storage” conveys the right to store a resource (water) in a Corps reservoir project without guaranteeing that the resource will be available. In Texas, the right to withdraw water from the storage space requires a water rights permit granted by the State. Municipal and industrial (M&I) water supply while not defined in legislative history, have been defined by the Corps to mean supply for uses customarily found in the operation of municipal water systems and for uses in industrial processes. Industrial processes can include thermal power generation and mining operations. Agricultural irrigation is not ordinarily found among customers of a municipal system and, therefore, is not eligible to be included in a project under the M&I authority unless so specifically authorized by Congress. Water supply storage will be provided under the authority of the 1958 Water Supply Act, as amended. Services to be provided will normally consist of space in a reservoir for use in regulating the flow of water so that it is useful for water supply purposes. Where necessary, facilities in the project structure to provide for the release or withdrawal of the stored water may also be provided. Repayment agreements for storage space will base the amount of storage to be provided on the yield required by the non-Federal sponsor.

I-3.4.2. Existing Projects. Storage in projects authorized prior to WRDA '86 is referred to as storage in existing projects. There is a limited amount of this storage space remaining in Corps projects and none within the State of Texas (see paragraph I-6.1). For this storage space, the cost will include interest during construction and interest after the ten-year interest free period on future water supply storage. Costs will also include the costs of the water supply conduit (if included in the project). The share of the users cost of storage represented in the repayment agreement will be the same ratio as the share of the users storage space is to the total water supply storage space. The non-Federal sponsor is also responsible for cost of past expenditures for items such as repair, replacement and rehabilitation (RR&R) as well as all future operation, maintenance and RR&R costs allocated to its storage space. Both the non-Federal sponsor and the Federal Government must approve an agreement covering all costs allocated to water supply prior to the initiation of use.

I-3.4.3. New Projects. Projects authorized subsequent to WRDA '86 are subject to a different set of rules. For these "new" projects, the cost of storage will be the actual construction cost allocated to the amount of storage assigned to the sponsor. While the law permits the repayment over a 30-year period, Administration policy requires the repayment of these costs either before or during the period of construction of the reservoir project. For these "new" projects, there is no 10-year interest free period. In addition, Section 103(j) of WRDA '86 requires that projects (except hydroelectric projects) shall be initiated only after the non-Federal interests have agreed to pay 100 percent of the operation, maintenance and RR&R (OMRR&R) costs of the project as well as the non-Federal share of the construction costs. This means, that even if a new multipurpose project with water supply could be authorized, the non-Federal sponsor would have to pay all the costs associated with OMRR&R versus a reallocation where only the costs assigned to the storage space reallocated to water supply need to be repaid. Subsequent yearly costs will include an appropriate share of project operation, maintenance and RR&R costs. Only one multiple purpose project with water supply has been constructed since enactment of these new rules, the Little Dell project in Utah. This project was authorized in 1968, modified in 1976, and included in the 1985 supplemental. The 1985 supplemental authorized Secretary of the Army to construct subject to terms and conditions that he found acceptable. The project cost sharing agreement was signed in 1986, and basically WRDA '86 rules (though not in affect at the time) applied. Following completion of construction, this project was turned over to the local sponsor to operate and maintain.

I-3.4.4. Single Purpose Projects. In addition to all the requirements for new projects, Administration policy also prohibits the construction of single purpose water supply projects. A single purpose water supply project is defined for the following two different scenarios: (1). If there is justified separable storage for a primary purpose (flood control, navigation, agricultural water supply and/or ecosystem restoration), the sum of benefits for these purposes must be at least ten percent of total National Economic Development (NED) benefits. (2). If there is not justified separable storage for one or more of the primary purposes, then the sum of the benefits for these purposes must be a least 20 percent of total NED benefits. In these cases, if the benefits for the primary purposes do not measure up, then the project is considered to be single purpose M&I water supply and not eligible for Federal participation. The Corps will also not conduct single purpose water supply studies except for analysis of existing data under Section 22 of

WRDA '74. This constraint does not apply to single purpose water supply modifications to previously constructed projects having primary purposes, as described above. Also, the Corps may conduct reimbursable single purpose water supply studies for non-Federal interests under provisions of the Intergovernmental Cooperation Act of 1968.

I-3.5. Reallocations.

I-3.5.1. Definition. Since the Corps is currently not constructing many multipurpose reservoir projects, the most viable means to obtain storage in Corps reservoirs is through reallocation. Reallocation is a reassignment of the usage of existing storage space in a reservoir project from an existing authorized purpose to a higher and better use. In this process, economic, political and public welfare issues are taken into account. Reallocation of storage in an existing reservoir project from its present use to M&I water supply is authorized by the Water Supply Act of 1958. Reallocations of storage that would seriously affect the purposes for which the project was authorized, surveyed, planned, or constructed, or which would involve major structural or operational changes, will be made only upon the approval of Congress. Providing the above criteria are not violated it is Corps policy that up to 15 percent of total storage capacity allocated to all authorized project purposes or 50,000 acre feet, whichever is less, may be allocated from storage authorized for other purposes at the discretion of the Commander, USACE. Reallocations that exceed this limit may be approved at the discretion of the Secretary of the Army if such reallocations do not require Congressional approval as described above.

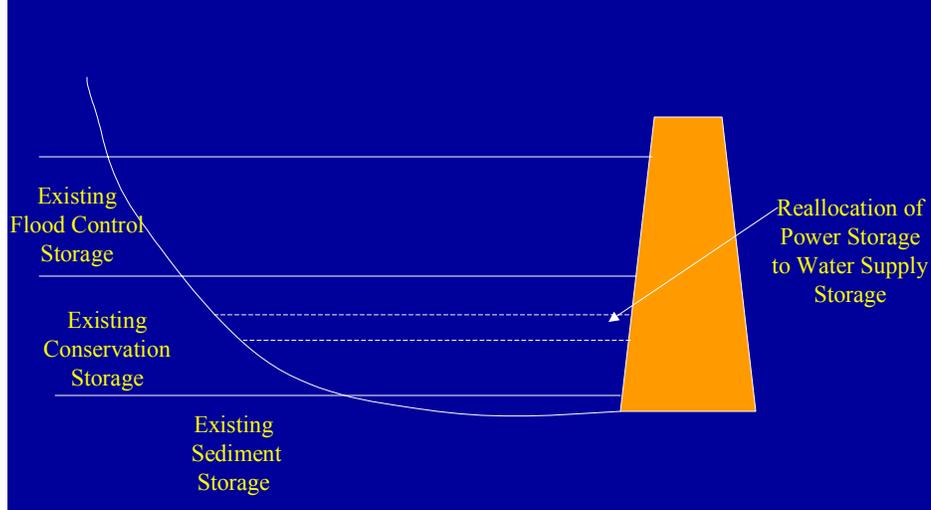
I-3.5.2. Opportunities. A typical multipurpose reservoir consists of three pools; a flood control pool, a conservation pool, and an inactive or sediment pool (see Figure I-1). The flood control pool is normally kept empty to permit storage of runoff during times of high inflow. The conservation pool can consist of dedicated storage for one or more of the following purposes: hydropower, navigation, water supply, water quality, or irrigation. Recreation can also have dedicated storage, but in most all Corps multipurpose reservoir projects, the recreation feature uses the top of the conservation pool. The inactive or sediment pool, while it can be used, is generally not available to meet downstream water needs. This storage is normally set aside for hydropower head and/or to store the sediment expected to accumulate over the life of the project. There are several opportunities available for reallocation. The first two listed are the ones normally used for permanent reallocations and have been performed a number of times.

- (1). Reallocation of conservation storage;
- (2). Reallocation of flood control space;
- (3). Use of water supply storage not under contract;
- (4). Temporary use of storage allocated for future conservation purposes and sediment;
- (5). Seasonal use of flood control space during dry seasons;
- (6). Modification of reservoir water control plan and method of regulation;
- (7). Raising existing dams; and
- (8). System regulation of Corps and Non-Corps reservoirs.

I-3.5.3. Reallocation of Conservation Storage. Originally authorized project purposes may no longer be required to meet present needs or may be available for some new equal or higher purpose. The opportunity then exists to modify or update the authorized project purposes through reallocation. For example, water quality storage originally provided to dilute pollutants

may no longer be needed if pollutants are now being removed before being discharged into a stream or river. Another possibility is the reallocation of hydropower storage. This is the most common example of reallocation and has been accomplished several times when the benefits of the reallocation are positive. In these cases, however, transferring some of the revenues collected from the water supply user to the local power-marketing agency may be necessary.

Figure I-1. Reallocation from the Conservation Pool



I-3.5.4. Reallocation of Flood Control Space. Three conditions that create an opportunity to reallocate flood control storage to water supply storage are:

- (1). Where reallocated flood control storage volumes are small and do not affect flood protection. If the effect is large, Congressional action is required;
- (2). Where the downstream floodplain has (or could be) changed or supplemental protection has been provided; and
- (3). Where reservoirs have been designed to a maximum site capacity that is larger than required by hydrologic analysis.

I-3.5.5. Reallocation of Sediment Storage. Changes in a reservoir's upstream conditions may provide an opportunity to consider whether to extend the period that sediment could be collected without encroachment on other storage or to allow part of the storage initially reserved for sediment to be reallocated to water supply.

I-3.5.6. Cost. The cost of reallocated storage is the higher of benefits or revenues foregone as a result of the reallocation, the replacement cost of an equivalent amount of storage in another or a new project, or the updated cost of storage in the Federal project. The cost that usually governs is the updated cost of storage. This procedure is an attempt to duplicate the cost of the project, as originally constructed at today's prices. This process updates original

construction cost through use of the *Engineering News Record* Construction Cost Index (for costs that precede 1968) and the Corps' "Civil Works Construction Cost Index System" for all subsequent costs. The cost to the local sponsor is then prorated based on the storage reallocated to the total usable storage in the project. This cost procedure is an attempt to price the storage space at the current value, which reduces any subsidy, reduces any incentive to waste the resource and is environmentally friendly. The local sponsor is also responsible to pay the pro-rata share, based on the storage reallocated, of the annual operation, maintenance, repair, replacement and rehabilitation costs.

I-3.5.7. Repayment. Repayment of costs assigned to the reallocated storage will be over a period of 30-years from the date of availability of the storage space. This date of availability is normally considered to be the date the repayment agreement is signed by the approving Corps official. Costs may be repaid, with interest, over a period of 30-years. The interest rate will be that rate established in Section 932 of WRDA '86 and will be adjusted at 5-year intervals over the repayment period. Since reallocations are to satisfy immediate needs, the 10-year interest free period is not available. In addition, any cost associated with the reallocation; e.g., relocation of camping and picnic facilities or roads as a result of a raise in the lake level, must be paid prior to or during the period of the relocation.

I-3.5.8. Low Income Communities. Section 322 of WRDA '90 authorized, at the discretion of the Assistance Secretary of the Army (Civil Works) (ASA (CW)), an option for a reduced cost for reallocated storage when the cost is determined by the updating procedure. This provision is discretionary in that the ASA (CW) may, but is not required to offer the lower price. The law identifies low-income communities as communities with a population of less than 20,000 that are located in counties with a per capita income of less than the per capita income of two-thirds of the counties in the United States. The data source for the per capita income will be the same as that used for the ability to pay for flood control (enacted by the Federal Register rule of Jan. 26, 1995). The factors are based on county per capita personal income for each of the last three calendar years for which information is available. The cost is limited to \$100 per acre-foot for contracts signed in 1991. The \$100 value is updated yearly by the Consumer Price Index as published in the Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*.

I-3.5.9. Advantage of Reallocations. As shown in paragraph I-3.4.3, for new projects, the non-Federal sponsor is responsible for 100 percent of project OMRR&R costs versus a reallocation where only the OMRR&R cost associated with the reallocated water supply storage space must be repaid. This provision of law (Section 103(j) of WRDA '86) also makes coordinated operation of reservoirs on the same river system more difficult than if the provisions were reversed to the situation existing prior to WRDA '86. These conditions make it a major disincentive to any non-Federal sponsor to pursue a Federal multipurpose project since outputs like flood control and ecosystem restoration only increase the sponsor's OMRR&R costs compared to a smaller, non-Federal single purpose water supply only project. However, the construction of a single purpose water supply project may be less desirable from a public welfare and environmental standpoint as well as more costly than an equal amount of water supply storage reallocated from an existing Corps reservoir project.

I-3.6. Addition of Storage.

When water supply storage is added to an existing project and storage is not reallocated or otherwise authorized by Congress, a willingness to pay concept is used to assign costs to the new water supply purpose. Under this concept the non-Federal sponsor is responsible for 100 percent of the new construction costs allocated to water supply. This is to be paid during the construction period. In addition, payments equal to 50 percent of the sponsor's savings are required. The sponsor's savings are construed as the cost of the most likely alternative which would be constructed by the non-Federal sponsor in lieu of the proposed modification, less the sponsor's share of the cost of the modification to the Corps project. This latter cost is to be repaid at the water supply rate current at the start of project modification (to be adjusted at 5-year intervals) and within the remaining physical life of the project, but not to exceed 25 years from completion of project modification; or if water supply is already a project purpose, within 30 years from the time the project was first used for water supply. Total local capital contributions (original project plus modification) should not exceed the sum of the local share of the new construction costs, plus the Federal construction costs of the original project. The non-Federal sponsor shall also be responsible for the appropriate pro-rata share of the operation, maintenance, repair replacement and rehabilitation costs.

I-3.7. Reallocations and Project Modifications for Texas.

Over the years there have been several reallocations, project modifications and studies from seven Corps reservoirs that have, or are in the process of increasing the storage for M&I water supply by over 1,000,000 acre-feet for use by the citizens of Texas. This information is summarized in Table I-1. The Lake Texoma project is administered by the Corps' Tulsa District, the other six projects are in the Corps' Ft. Worth District.

Table I-1. Reallocation and Project Modification for Texas

Project	User	Storage (AF)	Method
Denison Dam, Lake Texoma	Red River Authority of Texas	2,736	Reallocation of hydropower storage
	North Texas Municipal WD	95,023	
	Greater Texoma Utility Auth.	11,600	
	Greater Texoma Utility Auth. as Agent for City of Sherman, TX [1]	11,000	
	City of Denison	21,300	
	Texas Utilities, Power and Light	16,400	
Waco [2]	Brazos River Basin	47,526	Reallocation of flood control storage
Lavon [3]	Trinity River Basin	280,000	Project Modification
Lewisville [4]	City of Dallas	131,400	Project Modification
	City of Denton	46,300	
Whitney	Brazos River Authority	50,000	Reallocation of flood control storage
Belton [5] [6]	Brazos River Authority	247,000	Reallocation of flood control storage
Sam Rayburn [6]	City of Lufkin, TX	43,000	Reallocation of flood control storage
Total		1,003,285	

Footnotes:

1. Of the 11,000 AF; 6,000 is under contract. A contract for the remaining 5,000 AF is underway.
2. Actual reallocation currently in the process of being implemented.
3. Project modification to increase storage space.
4. Increased water storage space as a result of the construction of Ray Roberts Lake upstream.
5. Increased water storage space as a result of the construction of Proctor Lake upstream.
6. This storage is not contained in the Corps water supply data base as discussed in paragraph I-6.

I-4. Irrigation and Agricultural Water Supply

I-4.1. Western States.

I-4.1.1. Bureau of Reclamation. Storage of water for irrigation of agricultural lands, whether to meet the entire needs or to supplement natural supplies, may be considered in plan formulation. The Reclamation Act of 1902, Public Law 57-161, established irrigation in the West as a national policy. The Act authorized the Secretary of the Interior to locate, construct, operate

and maintain works for the storage, diversion, and development of waters for the reclamation of arid and semi-arid lands in the Western States. For purposes of Reclamation Law, the West is defined as those 17 contiguous states lying either partially or wholly west of the 98th meridian. This meridian runs through the states of Texas (just west of Austin), Oklahoma, Kansas, Nebraska, South Dakota and North Dakota. These five states as well as the 12 contiguous states west of these five states are subject to Reclamation Law. In these 17 western states, in conformity with Reclamation Law, the Bureau of Reclamation administers the repayment arrangements and agreements for irrigation water from Corps projects.

I-4.1.2. Corps of Engineers. Section 8 of the 1944 Flood Control Act provides that Corps reservoirs may include irrigation as a purpose upon the recommendation of the Secretary of the Interior. Section 8, which applies only to the 17 Western States, also provides the Department of Interior with the authority to provide the irrigation works needed to make use of the irrigation storage. It is Interior's responsibility to construct, operate and maintain the additional irrigation works and to contract for the storage space. If allocated irrigation costs exceed the amount that can be repaid by water users, then in accordance with Reclamation Law, the excess amount will be stated. It will also be pointed out that special Congressional authorization is required for projects where irrigation costs exceed water users' repayment ability.

I-4.2. Areas Outside the Western States.

Subsection 103(c)(3) of WRDA '86 established the cost sharing rules that apply to agricultural water supply outside the 17 Reclamation states. In non-Reclamation states, non-Federal sponsors must provide 35 percent of the joint and separable construction costs and 100 percent of the joint and separable costs of operation, maintenance, repair, reconstruction, rehabilitation, and replacement, allocated to this purpose. Non-Federal sponsors requesting irrigation capacity as a project purpose should provide a firm expression of intent to use and pay for the storage, obtain water rights or their equivalent and possess legal power to enter into a repayment agreement with the Corps of Engineers.

I-4.3. Interim Use of M&I Water Supply Storage for Irrigation.

Section 931 of WRDA '86 provides that for any Corps reservoir project the Secretary of the Army may allocate to irrigation purposes, for an interim period, storage included in the project for M&I water supply that is not under a repayment agreement. No agreements for the interim use of such storage shall be entered into which would significantly affect then-existing uses of the storage. The cost to the non-Federal sponsor under Section 931 agreements will be 35 percent of the original project investment cost (including any accrued interest after the 10-year interest free period) allocated to M&I water supply (for the block of storage to be used for irrigation as determined by the Use of Facilities cost allocation method). The non-Federal sponsor will also be responsible for 100 percent of the operation and maintenance, repair, replacement, rehabilitation, and reconstruction costs allocated to the storage space being placed under the repayment agreement. The term of the agreement for this interim use will not exceed

five (5) years. An option for incremental five-year extensions is allowed but only if recalculations for the annual costs are performed at the end of each five-year increment. Note that this authorization is only applicable to those projects which were authorized prior to 1986 and for which all the M&I storage is not yet under contract. These projects are only located in West Virginia, Oregon, Mississippi, Arkansas and Oklahoma. There are no projects in Texas in this category (see paragraph I-6.1) of non-contracted M&I water supply storage.

I-5. Ability to Pay

I-5.1. M&I Water Supply.

The ability to pay for M&I water supply has only been recognized in a limited way through Section 322 of WRDA '90. This section authorized a reduced price of water for low-income communities. The provisions, however, are applicable only to those cases when the updating methodology is used to determine the price of water (see paragraph I-3.5). This provision is discretionary in that the Assistant Secretary of the Army (Civil Works) may, but is not required to offer the lower price. Section 322 should be used only for public water supply needs consistent with the purposes of the Water Supply Act of 1958. The law identifies low-income communities as communities with a population of less than 20,000 that are located in counties with a per capita income of less than the per capita income of two-thirds of the counties in the United States. The data source for the per capita income will be the same as that used for the ability to pay for flood control (enacted by the Federal Register rule of Jan. 26, 1995). The factors are based on county per capita personal income for each of the last three calendar years for which information is available. For example, for fiscal year 2002, such information is based on the years of 1997-99. This source of data is published yearly in the Department of Commerce, Bureau of Economic Analysis, *and Survey of Current Business*.

I-5.2. Agricultural Water Supply.

An ability to pay provision for agricultural water supply was first enacted in Section 103(m) of WRDA '86. This section provided that any cost-sharing agreement under this section for flood control or agricultural water supply shall be subject to the ability of a non-Federal interest to pay. This section was implemented through the rule published in the Federal Register of Oct. 2, 1989. The rule, however, applied only to flood control and not agricultural water supply. In WRDA 1990, Congress directed a review of the ability to pay rule as the rule applied to cash contributions. Before this rule could be finalized, WRDA 1992 was enacted. In WRDA '92, Congress reverted back to the WRDA 86 wording. A rule on the wording of WRDA '92 was published in the Federal Register of Jan. 26, 1995. In WRDA 1996, Congress again directed revisions to the ability to pay for flood control procedures. Before these provisions could be implemented, WRDA 2000 was enacted. Section 204 of WRDA 2000 again directed a modification to the ability to pay rule. This legislation also expanded the provisions to include

the purposes of environmental protection, environmental restoration, navigation, hurricane storm damage reduction, and recreation in addition to the previously authorized purposes of flood control and agricultural water supply. Guidance to implement the provisions of WRDA 2000 are still under development.

I-5.3. Summary.

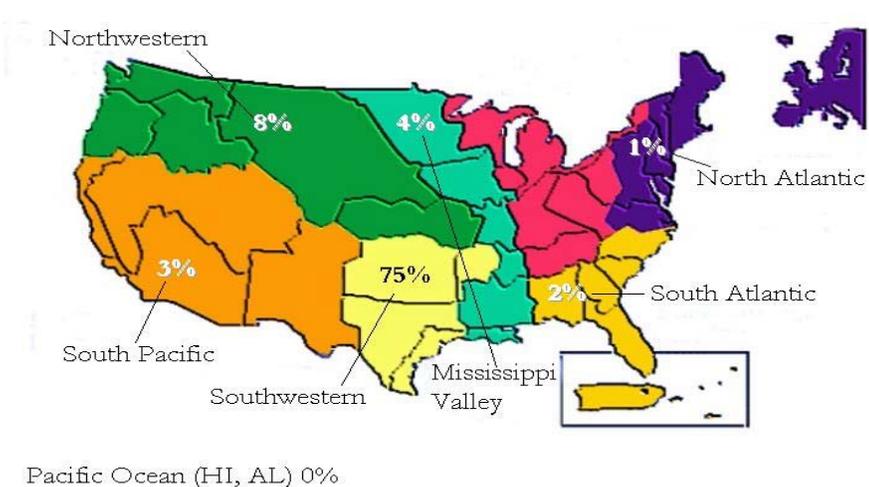
The history of providing relief to low income communities with a subsidized cost for water through a Corps of Engineers program, is not encouraging to those seeking relief through generic means. Specific authorities (see paragraph II-4) may offer the only means available. Other Federal programs e.g., the Farm Bill of 2002 that provides grants to low-income communities, may be a more viable option.

I-6. Databases

I-6.1. M&I Water Supply Storage Database.

I-6.1.1. Nationwide there are about 235 municipal and industrial water supply agreements in 117 Corps reservoir projects. These agreements cover about 9.5 million acre-feet of storage space and represent a value of about \$1.3 billion. This storage is not distributed evenly though out the nation; the vast majority is in Oklahoma and Texas. The distribution of M&I water storage space by Corps division is shown in Figure I-2. The database utilized is contained in the *Water Supply Handbook*, Institute for Water Resources Report 96-PS-4, Revised December 1998. This report can be found at: <http://www.iwr.usace.army.mil/iwr/pdf/96ps4.pdf>

Figure I-2. M&I Water Supply Storage Space Distribution by Corps Division



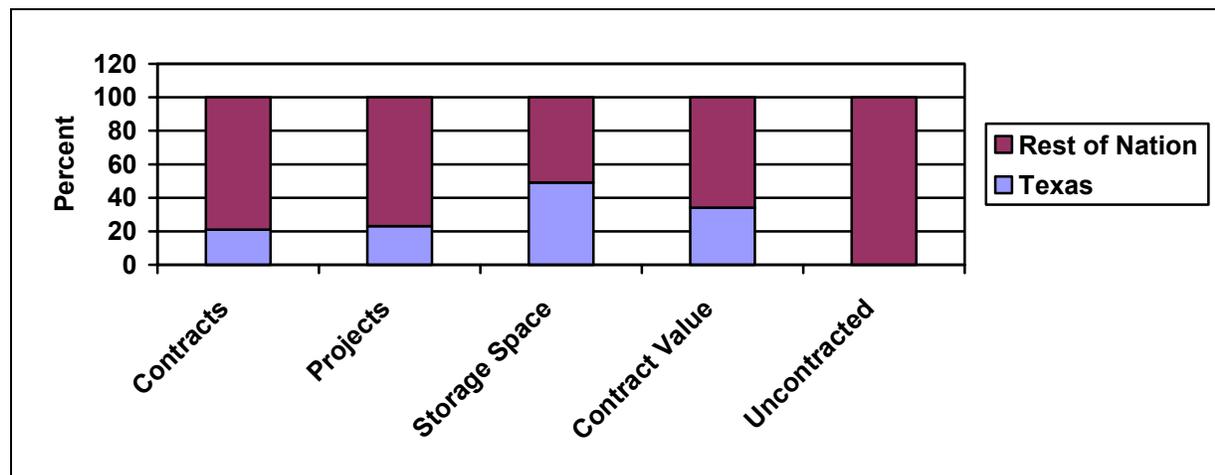
There are also approximately 775,000 acre-feet of M&I storage in 21 projects in 5 states that is not under contract. This data is summarized in Table I-2.

Table I-2. M&I Water Supply Storage Space Not Under Contract

State	Storage Space (acre-feet)	Percent of Total
West Virginia	2,200	0.3
Oregon	8,600	1.1
Missouri	101,900	13.1
Arkansas	167,800	21.7
Oklahoma	494,500	63.8

I-6.1.2. For the state of Texas, the database shows there are 49 contracts in 26 projects, representing 4.6 million acre-feet of storage space at a contract cost of \$446 million. All of the storage space set aside for M&I in these 49 contracts (4.6 million acre-feet) has been placed under contract. With respect to Corps projects, Texas has 21% of all the contracts, 22% of all the projects, 48% of all the storage space and 33% of all the costs allocated to M&I water supply. Figure I-3 puts these values into perspective.

Figure I-3. M&I Water Supply Storage Space, Texas versus the Nation



I-1.6.3. The storage volumes for the 26 Corps projects in Texas that include M&I water supply storage is shown in Table I-3.

Table I-3. Storage Volumes for the Corps Projects in Texas

Project	Storage Volume (acre-feet)			
	Flood Control	Water Supply	Other Conservation	Sediment
Aquilla	87,600	33,600		25,700
Bardwell	79,600	42,800		17,600
Belton	640,000	372,700		84,900
Benbrook	76,550	72,500		15,750
Canyon	346,400	366,400		28,100
Cooper	131,400	273,000		37,000
Denison		140,960		
Ferrell's Bridge	336,100	250,000		2150
Granger	162,200	37,900		44,100
Grapevine	243,050	161,250		28,200
Hords Creek	16,670	5,780		2860
Joe Pool	123,100	142,900		38,000
Lavon	275,600	380,000		92,600
Lewisville	325,700	555,000		73,800
Navarro Mills	143,200	53,200		15,800
N. Sam Gabriel	87,600	29,200		14,000
O.C. Fisher	277,200	80,400		38,800
Procter	310,100	31,400		32,700
Ray Roberts	260,800	749,200		54,600
Sam Rayburn	1,099,100	43,000	1,403,500	1,452,000
Somerville	337,700	143,900		25,900
Stillhouse Hollow	390,600	204,900		34,900
Town Bluff		77,600		16,600
Waco	502,800	151,626		69,000
Whitney	1,372,400	50,000		577,100
Wright Patman	2,363,700	91,263		68,000
Total (26 projects)	9,989,170+	4,540,479	1,403,500	2,890,160

I-6.2 Agricultural Water Supply Storage Database.

Available records indicate there are 40 Corps projects nationwide that contain approximately 57 million acre-feet of storage space with authorized storage for irrigation. Most of the 57 million acre-feet are included in projects for joint use with other purposes such as flood control, navigation, recreation and/or hydroelectric power. Four of the Corps projects contain both municipal and industrial water as well as agricultural water. Agricultural water supply is included in Corps reservoir projects in the Western states under repayment agreements between the Bureau of Reclamation and the local sponsors. At the time of construction, it cost almost \$1.3 billion to include this joint and specific use storage space. This information is displayed in Table I-4. The vast majority of this storage space is located in Corps projects in Upper Missouri River in Montana and North and South Dakota.

Table I-4. Agricultural Water Supply Storage Space in 40 Corps Projects

Division	Number of Projects	Non-Federal Cost	Joint-Use Storage Space (acre-feet)	Storage Space Specific for Irrigation (acre-feet)
Northwestern	21	915,249,000	50,348,000	312,000
South Pacific	17	316,351,000	5,677,000	597,000
Southwestern	2	43,400,000	0	63,800
Total	40	\$1,275,000,000	56,025,000	972,800

For the state of Texas, the database shows only Belton Lake on the Leon River in Bell County contains irrigation storage. The amount and value of this space is shown in Table I-5.

Table I-5. Agricultural Water Supply in Corps Projects in Texas

Project	Total Project Cost	Total Federal Cost	Storage Allocated to Irrigation			Percent of Project Cost Allocated to Irrigation
			Joint (Acre Feet)	Specific (Acre Feet)	(%)	
Belton	\$18,400,000	\$16,300,000	0	45,000	12	4.3

I-7. Emergency and Drought Contingency Water Supply

I-7.1. Introduction.

The Corps has a significant, but not a dominant role as part of the overall national response to drought and drought management. The Department of Agriculture has principal responsibility for farm aid and the disaster assistance program while the Federal Emergency Management Agency, coordinates other disaster relief assistance. These agencies primarily provide money, while the Corps main role is to supply water. The Corps is best at planning, coordinating and operating water management systems and emergency assistance. The Corps' main role is primarily in the development of long range water supplies, working with communities to develop drought contingency plans, and through the implementation of reservoir drought contingency plans. There are, however, several ways the Corps can help during droughts. These authorities are outlined in the following paragraphs and summarized in Box I-3.

I-7.2. Authorities.

I-7.2.1. Drought Contingency Plans. This program is not codified in law, but it is part of the operation of Corps reservoirs. Water control managers are required to continually review and adjust water control plans in response to changing public needs. These procedures are to include plans for the release of water from Corps reservoirs during drought. Corps regulations (ER 1110-2-1941 “Drought Contingency Plans,” dated Sept. 1981) require that a drought management plan be developed and implemented as part of over all water control management responsibilities. The drought contingency plan should assess the availability of storage of surplus water for emergency water withdrawals. The amount of water is limited and impacts on other project purposes must be considered. This procedure, however, is probably the best of the Corps emergency and drought programs.

I-7.2.2. Drought Contingency Water. Drought and other emergencies affecting domestic, municipal and industrial water supplies will likely generate requests for water stored in Corps reservoirs. When those drought situations occur and the governor has declared a state of emergency, Section 6 of the 1944 Flood Control Act provides adequate authority to permit temporary withdrawal of water from Corps projects to supplement normal supplies. When available, the Secretary of the Army can sell storage in Corps reservoirs to provide surplus water to a state or political subdivision which agrees to act as wholesaler for all of the water requirements of individual users. Water stored for purposes no longer considered necessary can be considered “surplus.” Water may also be considered “surplus” if it could be more beneficially used for municipal and industrial purposes, and its use would not significantly affect the authorized purpose. The local government determines who is entitled to shares of this surplus water based on assessments of local needs. The price for drought contingency water will

Box I-3. Emergency and Drought Authorities

- Drought Contingency Plans for Corps Reservoirs. Provides for release of water from Corps reservoirs during drought. Not in law, but is part of the operation of Corps reservoirs. This is the Corps best emergency plan.
- Drought Contingency Water, Section 6 of the 1944 FCA. When available, the Corps can sell surplus water to a state of political subdivision, which agrees to act as a wholesaler.
- Emergency Provisions of Clean Water. PL 84-99, as amended. Water can be provided to a community that is confronted with a source of contaminated water. This is a program of last resort.
- Emergency Well Construction. PL 84-99, as amended. Authorizes the construction of wells or the transport to water. This should also be considered as a program of last resort.
- Planning Assistance to States, PL 93-251, as amended. States may obtain Corps water resources planning expertise on 50-50 cost shared studies to develop plans related to the overall state water plan. This plan must be developed prior to any water shortage in order to be effective.
- Reallocation of Storage, PL 85-500. This permits the reallocation of storage from an existing purpose to M&I water supply. This plan must also be developed prior to any water shortage in order to be effective.
- Interim use of M&I for Irrigation, Section 931, PL 99-662. This program is limited in that it is only applicable to certain projects, none of which are in Texas.

be determined in the same manner as for surplus water (see paragraph I-2.3) but never less than \$50 per acre-foot per year.

I-7.2.3 Emergency Provision of Clean Water. Public Law 84-99 as amended by Section 82 of Public Law 93-251 and Section 917 of Public Law 99-662 grants the Chief of Engineers discretionary authority to provide emergency supplies of clean water. This supply can be provided to any locality that he finds is confronted with a source of contaminated water causing or likely to cause a substantial threat to the public health and welfare of the inhabitants of the locality. Applicants must exhaust all other reasonable means before the Corps has authority to help. Corps assistance is supplemental to state and local efforts. Work under this authority requires a request from the governor of the state where the source of water has become contaminated and is normally limited to 30 days. Loss of water source or supply is not correctable under this authority. The Chief of Engineers determines terms for repayment. This program, by definition, is a program of last resort.

I-7.2.4. Emergency Well Construction and Water Transport. Public Law 95-51 further amended Public Law 84-99 to provide the Secretary of the Army authority to construct wells and to transport water to farmers, ranchers, and political subdivisions of those areas determined to be drought distressed. Any farmer, rancher or political subdivision within a distressed area may make a written request for assistance. Corps assistance will only be considered when non-Federal sponsors have exhausted reasonable means for securing necessary water supplies (within the limits of their financial resources) including assistance from other Federal agencies. This authority should only be considered as a last resort.

I-7.2.5. Planning Assistance to States. This authority (Section 22, Public Law 93-251), as amended, grants to states the means to obtain Corps water resources planning expertise in 50-50 cost shared studies to develop plans related to the overall state water plan. Up to one-half of the sponsor's 50 percent share of costs may be provided as in kind-products or services. This program can be used to develop state drought contingency plans, or local and regional plans that support state water plans. This section has been amended several times to increase the monetary limits, to include ecosystem and watershed planning under its provisions and to extend the provisions to Guam, American Samoa, the Virgin Islands, the Northern Marianas the Trust Territory of the Pacific Islands and Indian Tribes. Section 319 of Public Law 101-640 further amended the Act to require fees for the development of state water plans. Current monetary limits for the program (set in Section 221 of Public Law 104-303) are for an annual budget of \$10 million and a per-state expenditure not to exceed \$500,000 per year. This is a planning authority and must be used in advance of drought as part of a water supply plan.

I-7.2.6. Reallocation of Storage. Public Law 85-500, the Water Supply Act of 1958 provides the authority for the reassignment of storage space in an existing Corps reservoir to M&I water supply. Generally used to provide more M&I water supply, which can reduce drought impacts. Reallocation can be a time consuming process and must be considered in advance of a drought, as part of a water supply plan. For additional information on reallocations see paragraph I-3.5.

I-7.2.7. Interim Use of M&I Water Supply Storage for Irrigation (Public Law 99-662, Section 931). For eligible projects the Secretary of the Army may, for an interim period, reallocate for irrigation use, storage intended for municipal and industrial water supply if that storage is not under a repayment agreement. This authority allows temporary use of Corps reservoir space to store water for irrigation, and so may help farmers obtain irrigation water during droughts. This program is limited in that only those Corps projects with authorized but uncontracted M&I water supply storage are eligible. There are no such projects in Texas. For additional information on this program, see paragraph I-4.3.

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CHAPTER II: OTHER RELATED ISSUES

II-1. Purpose

The purpose of this chapter is to examine issues and areas that are outside the traditional authorities and policies that are normally associated with water supply; those were covered in Chapter I. This chapter first explores the manner in which the Federal Government became involved in navigation and flood control and determines if there is a correlation to the current climate with respect to M&I water supply. Two sections are devoted to specific water supply authorizations including such non-traditional missions of wastewater treatment and environmental infrastructure studies and projects. Appendix B “Authorizations for Water Supply, Water Quality and Related Infrastructure Projects and Studies” accompanies this discussion. The very important regulatory mission is covered and the need to get this arm of the Corps involved early on in the planning stages is stressed. Sections on Watershed Planning and Shared Vision Planning are provided. These planning procedures, in addition to reallocations, may be the best hope for the Corps to become involved in the State of Texas water supply in the future. Finally, the Budget Process of the Corps is explained. In this process, the long lead times required for a study or project to get in the Federal budget, and differing budget cycles for the state and local governments, require early coordination if the Corps is to assist Texas with water supply solutions.

II-2. The Federal Interest

II-2.1. Evolution of the Federal Interest in Navigation.

II-2.1.1. The notion that the Army should make and manage investments for navigation and flood damage reduction is not intuitively obvious, nor is true for any other industrialized nation. In fact, the United States was almost a century old before the Federal interest in navigation was firmly established, and it was another half century before the Federal interest in flood control matured into something near our present day vision of it. Along the way, constitutional, political and economic issues were debated, but often not resolved until natural disasters tipped the scale in favor of Federal action. The paragraphs below offer the highpoints of the evolution of the definition of the Federal interest in navigation and flood control. Our history shows the federal interest is not static; the Federal interest in water supply could change from what it is today. We examined the history to see if there are arguments or conditions that could be used to support a greater role for the Federal government in water supply infrastructure. The discussion is based largely on information from Martin Reuss, a Corps historian, who wrote

extensively on this subject for the Linacre Lecture³. The Oxford Press will soon publish the lecture. Additional information on the passage of the 1936 Flood Control Act was gathered from other sources as noted and in discussions with Dr. Reuss.

II-2.1.2. The power of the Federal government to pay for “internal improvements”⁴ is not explicitly authorized by the U.S. constitution. In fact, it was the hope of George Washington and others that the government would provide overall plans but private corporations would provide the capital for public works. The Gallatin Plan, proposed by Secretary of the Treasurer Albert Gallatin in 1808 was an ambitious Federal road and canal plan that Gallatin believed would require a constitutional amendment to authorize. It failed for lack of funds and other reasons.

II-2.1.3. *Gibbons vs. Ogden*, an 1824 Supreme Court decision, established the Federal right to regulate matters of interstate commerce including navigation. Aaron Ogden was first a partner, then rival to Thomas Gibbons, who ran a steamboat between New Jersey and New York using a United States license. New York state had granted Robert Livingston and Robert Fulton, the inventor of the steamboat, an exclusive right to steam navigation in New York state. Anyone who wanted to run a steamboat in New York had to get a license from them. Ogden petitioned a New York State court, believing the New York laws on licensing would preclude entry into the state by a vessel using a U.S. license. But Gibbons went to the Supreme Court, which ruled that Gibbons could not be stopped because the Federal government was the only power that could regulate interstate commerce. The decision did not change New York’s internal powers - commerce completely within a state was still a state matter.⁵

II-2.1.4. James Monroe, whose last term ended in 1825 pronounced the “other” Monroe doctrine – that the Federal government could not construct public works unless they were “national, not state, general, not local” – which opened the door to Federal investments in public works. For example, the General Survey Act authorized the Corps to survey roads and canals if there was a national importance stemming from national security, commerce or transportation of mail. A later bill funded navigation improvements to the Mississippi and Ohio rivers; the surveyed projects were built or not built based on Congressional politics more than the merits of the projects. Although the Act was repealed in 1830, the two laws put the Corps into the water resources business.

II-2.1.5. The next few Presidents after Monroe refused to walk through the door he had cracked open. They vetoed water resources development legislation on the grounds that the Federal government did not have the constitutional authority to spend money for public works. By the time of the Civil War, Federal investments in water projects were about \$17 million, less than ten percent of private investments totaling about \$185 million. Many opposed this non-

³ Martin Reuss, "The Development of American Water Resources: Planners, Politicians, and Constitutional Interpretation," in *Managing Water Resources, Past and Present: The Twelfth Annual Linacre Lectures*, ed. Paul Slack and Julie Trottier. Oxford University Press, 2003 (forthcoming).

⁴ Initially this term was used to describe roads, canals, schools, lighthouses, and even fortifications, but eventually it came to mean the public infrastructure that supported private enterprise.

⁵ Uncredited, 2001 Touro College Jacob D. Fuchsberg Law Center

intervention policy. One was Congressman Abraham Lincoln, who argued against President James Polk's veto of the 1848 Rivers and Harbors Act in these words:

“The just conclusion from all this is that, if the nation refuses to make improvements of the more general kind because their benefits might be somewhat local, a state may, for the same reason, refuse to make an improvement of a local kind because its benefits may be somewhat general. A state may well say to the nation, ‘If you will do nothing for me I will do nothing for you.’”⁶

II-2.1.6. In 1874, the Select Committee on Transportation Routes to the Seaboard determined that Rivers and Harbor act investment contributed to the national welfare. The Daniel Ball Supreme Court case in 1870 determined forever that the Federal government could regulate any river that was navigable. Federal investments rose to \$111 million by 1882. Water spending was being used to help the post-Civil War economy. In the later part of the 19th century, the Corps sent a great deal of money into the economy, using mostly contract labor to develop and build the projects.

II-2.2. Evolution of the Federal Interest in Flood Damage Reduction.

II-2.2.1. The Federal interest in flood control was established well after the Federal interest in navigation, and it evolved incrementally. Floods in 1890 helped remove restrictions against using Federal money for building levees. Floods in 1912, 1913, and 1916 along the Ohio and Mississippi rivers eventually led to passage of the 1917 Flood Control Act, the nation's first act dedicated solely to flood control. It provided funds on a cost-shared basis for levee construction along the lower Mississippi and another appropriation to improve the Sacramento River in California. Theodore Roosevelt, President from 1901 to 1909, embraced multipurpose planning, an approach that inherently shifted power from the Congress to the executive branch. He appointed an Inland Waterways Commission to propose a comprehensive plan for water development, but it was not until the 1917 Rivers and Harbors Act that a waterways commission was authorized, and then President Woodrow Wilson did not appoint any members. Despite reservations within the Corps about the constitutionality of multipurpose projects, Congress asked the Corps to prepare the “308 Reports,” general multipurpose plans to improve navigation, waterpower, flood control and even irrigation.

II-2.2.2. As the relationship of flood control and navigation became apparent, Congress called on the Corps of Engineers to use its navigational expertise to devise solutions to flooding problems along the Mississippi River. The flood that finally brought a reevaluation of policy and financing happened in 1927. Between 250 and 500 people were killed, over 16 million acres flooded, and 41,000 buildings destroyed. The flood of 1927 finally convinced the Corps that levees could not sufficiently control the Mississippi's waters: a mix of levees, floodways, and spillways would be necessary. The flood control act passed on 15 May 1928 authorized this new

⁶ Kemper, J. P. (1949). *Rebellious River*. Boston: Humphries, Inc., as cited in Reuss.

Plan, which came to be called the Mississippi River and Tributaries project. The act released lower Mississippi residents from all local cooperation requirements except those to maintain certain flood control works after completion, to accept certain lands condemned for the project, and to provide rights-of-way. The reason for this generous Federal commitment is that many congressmen judged that the residents of the lower Mississippi had borne enough suffering; they had spent a substantial amount of money on non-Federal levee construction, and it "as unreasonable to expect them to bear this burden longer."⁷

II-2.2.3. The 1928 Flood Control Act paved the way for much more ambitious flood control planning. The idea of the Federal government paying for flood damage reduction engendered considerable debate in the U.S. Congress. Debates in 1935 and 1936 led to the 1936 Flood Control Act, which established the Federal interest. Dr. Reuss believes the most compelling argument for Federal involvement in flood control projects was that local governments could not afford to do it alone. Just as the Federal investments in navigation projects were used to help a post-war recovery, flood control legislation passed during the Great Depression, when public works were being built because it put people to work. The Bureau of Labor reports that nearly 10 million Americans were unemployed in 1939, an unemployment rate of over seventeen percent. The Bureau of the Census estimated that unemployment was as high as twenty-five percent in 1933. But the new authorities were still tightly constrained because of New York Senator Copeland's concern that the flood control authority would be used to pay for structures that could be used for other water management purposes such as hydropower. As a result, the law required projects to be justified on flood control benefits alone. The Corps was, however, allowed to build penstocks into dams for potential future hydropower development. The most controversial point of the 1936 Act was whether the Federal government should assume the entire cost of flood control projects, as it had for the lower Mississippi under the 1928 Flood Control Act. In the end, committee members agreed that the local interests should provide lands, rights-of-way, and easements and should hold and save the United States free from damages due to the construction work. Later, another stipulation was added: local interests should maintain and operate all the works after completion of the project in accordance with regulations prescribed by the Secretary of War. The three provisions—to provide land, rights-of-way, and easements; to stand the cost of damages; and to maintain and operate the works--became known as the "a,b,c" requirements.⁸ Corps historian Martin Reuss writes that "In the absence of floods and economic depression, it is doubtful the legislation would have reached the President's desk." In 1940, the U.S. Supreme Court endorsed this expansion in *United States v. Appalachian Electric Power Company*, ruling that flood control and watershed development were authorized under the Commerce Clause of the U.S. Constitution. Subsequent rulings (*United States v. Gerlach Live Stock Co.*) even extended the authority to irrigation.

⁷ Martin Reuss and Paul K. Walker, "Financing Water Resources Development, A Brief History," EP 870-1-13, July 1983.

⁸ Joseph L. Arnold, "The Evolution of the 1936 Flood control Act," EP 870-1-29, July 1988.

II-2.3. Analogical Issues for the Federal Interest in M&I Water Supply.

II-2.3.1. As the preceding history shows, the Federal interest in water resources has been redefined since the first Presidency. The current policies on Federal involvement in water supply could also change, but it is not clear that they will. Experts agree to disagree on whether the arguments supporting a Federal role for flood control and navigation would also support the use of Federal funding to build large municipal water supply projects. Eventually, affirmative answers to three questions helped establish a Federal interest:

1. Is Federal involvement constitutional?
2. Will benefits spill over state or local political boundaries?
3. Are benefits unlikely to be realized without Federal intervention?

The last issue covers many possibilities, including the fact that during slow economic times, public works projects are often used to reduce unemployment and, unlike state or local government, the Federal government can spend more than it takes in for prolonged periods of time.

II-2.3.2. The question is, when can these questions be answered affirmatively on the issue of water supply? One relatively new and notable Federal municipal water supply program meets these three criteria well. The U.S. Department of Agriculture has a large and expanding role in providing water supply and wastewater grants to Native American and rural communities. This authority was most recently expanded in the Farm Act of 2002. In the case of Native Americans, the United States government acknowledges a special “trust” relationship with Native American communities, “involving the legal responsibilities and obligations of the United States toward Indian tribes and the application of fiduciary standards of due care with respect to Indian lands, tribal trust resources, and the exercise of tribal rights.”⁹ Tribal trust resources often include water resources. Tribal sovereignty places some issues outside state and local political boundaries. The answers to the first two questions are not as obvious for non-Native American rural water supply, but are consistent with a century or more of Federal subsidies to agriculture. Finally, water supply assistance to Native Americans and small rural communities is consistent with what is perhaps the most persuasive argument from the Congressional debate that led to the 1936 Flood Control Act, that the projects were beyond the capability of local governments to implement. Small rural community aquifers can be polluted by agricultural runoff or may otherwise require expensive treatment costs to comply with the Safe Drinking Water Act. The per capita costs can be hundreds of times higher than the costs for large municipalities, partly because so few people share the costs and partly because the solution is often to abandon the local supply and to bring water in from great distance at great expense.

II-2.3.3. The third question is unlikely to be answered affirmatively in the case of most large-scale Texas water supply developments. In fact, the benefits seem much more likely to occur without Federal investments:

⁹ SECRETARIAL ORDER # 3206, Subject: American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act, U.S. Department of the Interior.

- Municipal drinking water is a vendible commodity, it is relatively inexpensive and demand is fairly inelastic. New M&I supplies that have been developed in the Southeast and Southwest in the last decade have generally been developed without any Federal subsidy. As a rule of thumb, experts believe water use will drop about 10% when the price of water is doubled. That suggests that Texans will not hesitate to pay for needed new water supplies.
- Major new Federal water programs do not seem likely. Spending exceeded Federal revenues in FY 2002. Defense, social security and health care expenses will increase rapidly while revenues will be constrained by the economic slow down in the near term and the phasing in of the 2001 Federal tax cut legislation over the next ten years. As a result, real non-Defense discretionary spending is unlikely to grow. Within the Corps budget, expenses for maintenance on our existing projects constitute a larger and larger share of our budget each year. While the costs of a Federal water supply program are speculative, based on the degree and type of support provided – EPA reports that in the next 20 years Americans will have to spend hundreds of billions more than they spend now on water supply.
- Subsidies of any sort are likely to lead to inefficient water use. This is widely recognized and was demonstrated when the state of California was unable to sell all the water available in the State water bank created in the early 1990s despite the fact that the state was in the fifth year of a serious drought. The “need” for water that sold for as little as \$6 an acre foot evaporated when water was available at market prices. Inefficient use can cause environmental and financial impacts.

II-2.3.4. These three questions could be answered in the affirmative, however, when there are economic or environmental benefits to considering water supply issues on a geographic scale outside local or state boundaries. Although not firmly established in law and practice, there may be a Federal interest in regional water supply assessments. In fact, a case could be made to justify Federally funded projects so long as local governments or utilities ultimately repay the full costs of the projects. It is widely held, and our experience supports the conclusion that, compared to multiple local projects, a regional water supply project can reduce the financial and environmental costs for providing the same water supply yield. Regional water supply projects are unusual, though, because it is not in the obvious self-interest of any local government to initiate such studies and projects, and there are few regional governing bodies capable of aligning the political forces within the region to develop a regional plan. It might seem that the Corps’ existing authority to conduct regional assessments (see paragraph II-4) would overcome these problems, but it does not. Cost-sharing requirements create a “Catch-22” situation. Local communities in a region often compete with one another and are in conflict over spending and management issues. It is unlikely – perhaps even unethical – for one local government to pay for the local share of a Corps water supply planning study. An affirmative answer to the third question - are benefits unlikely to be realized without Federal intervention – might be possible if all non-Federal costs could be provided by in-kind efforts by local governments. This would eliminate the need for a pre-existing regional body to provide funding and could help provide the required level of collaboration from local governments.

II-2.3.5. While Congress did not enact a water resources bill in 2002, two sections of a recent draft of the proposed bill reflect, to some degree, this regional approach:

Section 509. Southeastern Water Resources Assessment.

Authorizes the Secretary to provide assistance to a coordinated effort by Federal, State, and local agencies, non-Federal and nonprofit entities, regional researchers, and other interested parties to assess the water resources and water resources needs of river basins and watersheds of the southeastern United States. This assistance may be used to support the Southeast Water Supply Institute.

Section 540. Rathbun Lake, Iowa.

Directs the Secretary to provide water supply storage at 100 percent local cost to a regional water association, and to provide credit towards these costs for certain in-kind contributions.

II-2.3.6. The arguments used for the Federal interest in navigation could be used to support a Federal interest in regional planning and even development of water supply projects whose costs are fully reimbursed by water users. The Federal interest in navigation arises because the benefits - reduced costs of goods - are widespread, essentially national, and the associated costs cannot be fairly assigned to state and local governments. The analogous Federal interests in water supply are environmental protection and reduced transaction costs. For more on regional planning, see paragraph II-6 on “Watershed Planning” and paragraph II-7 on “Shared Vision Planning.”

II-2.4. Water Supply and Environmental Considerations.

As a matter of Federal law, Corps projects have historically included low flows for environmental purposes. These flows are generally to preserve and protect aquatic communities and water quality and to restore stream flows altered by Corps projects. However, as we get into environmental restoration projects, this may change and local sponsors may desire additional “environmental water.” As indicated in paragraph I-3.4.4, ecosystem restoration is viewed as a national benefit and Corps budgetary priority. When considering a new multipurpose project to include M&I water or reallocating storage in existing projects for M&I water, the advantages of including additional environmental water should be considered.

II-3. 1965 News Authorization

Title I of the 1965 River and Harbor and Flood Control Act (Public Law 89-298) is the “Northeastern United States Water Supply” (NEWS). This authorization was the first of many to follow that encouraged a broad look at the water supply needs of a region of the country. At that time it appeared to be a giant step forward for the future role of the Federal Government in water

supply. Provisions of the Act, however, have never been carried out. In NEWS, Congress recognized that the Federal Government should provide assistance in solutions for water supply problems of metropolitan areas. Plans developed could include construction, operation and maintenance by the United States of a system of major reservoirs, major conveyance facilities by which water may be exchanged between river basins and major purification facilities. Legislative history clearly shows that Congress had in mind a system to serve the entire northeast United States. Also, if features could be best constructed or operated and maintained by local authorities they could do so. It is significant to note that Section 101, specifically states, “[T]his plan may provide for the construction, operation and maintenance by the United States....” Whereas the original Congressional legislative language said “[T]his plan shall provide....” (underlining added). It has been abundantly clear over the years that the Administration’s views were and are that local authorities should continue to meet their own needs, and while the Federal Government may end up with a construction role, the Office of Management and Budget would most certainly disapprove. This authorization, which is still on the books, could provide a vehicle for authorizations of water supply systems in the northeastern United States.

II-4. Recent Authorizations

II-4.1. New Initiatives.

II-4.1.1. Up until the mid-1980s the Corps’ traditional missions were navigation and flood control, and when constructing a multiple project the additional missions of hydropower, recreation and water supply could be considered. Beginning with the Water Resources Development Act of 1986 (WRDA ’86) (PL 99-662), Congress recognized there were an emerging new set of problems and water resources issues that could not be readily solved by the limited traditional authorities of the Corps that were designed for navigation and flood control. Beginning in WRDA ’86, Congress has been conveying its understanding of the Federal interest through an increasingly diverse portfolio of water resources related initiatives. Some of these are highlighted in the following paragraphs.

- First, in WRDA ’86 Congress added to the Corps’ portfolio of major new environmental restoration missions (Sections 1103, “Upper Mississippi River Plan,” and 1135, “Project Modifications for Improvement of the Environment.”) At the time, these were non-traditional areas, but over time, as previously stated, restoration of aquatic ecosystems has become one of the Corps’ primary missions.
- WRDA ’90 authorized a nationwide study to provide technical assistance to small communities on methods of mitigating radium contamination in ground water used as a source of public drinking water.
- WRDA ’92 included several environmental infrastructure provisions (Sections 217, 218, 219 (a nationwide study), 220, 221, 222, 307, 313 and 340).

- In WRDA '96 there were two watershed management sections (503 and 552).
- In WRDA '99 there were expansions of the watershed program (Section 211, amending Section 503 of WRDA '96), the flood control and riverine restoration program (Section 212), an expansion of the environmental infrastructure program authorized in Section 219 of WRDA '92 (Section 502) and abandoned and inactive noncoal mine restoration (Section 560).

II-4.1.2. The WRDA '99 also authorized a set of pilot regional technical assistance programs that have the potential of serving as the nucleus for the Corps' long standing desire to enter into municipal water supply planning, as part of a more comprehensive view of related environmental infrastructure needs of communities and regions. Section 592 applies to the State of Mississippi, Section 593 addresses the problems of central New Mexico, and Section 594 applies to Ohio, while Section 595 covers the states of Nevada and Montana. This pilot program is unique in that it is structured to provide technical assistance to non-Federal interests for the design and construction of water-related environmental infrastructure, resource protection and development, including projects for:

- Wastewater treatment and related facilities,
- Combined sewer overflow, water supply (storage, treatment, and related facilities),
- Mine drainage,
- Environmental restoration and
- Surface water protection (includes water quality) and development.

Each of these pilot program authorizations has provisions for a 75% Federal cost-share that can be provided in the form of grants or reimbursements of project costs. In each instance, the Corps (Secretary of the Army) is to report to Congress by not later than 31 December 2002 on the results of the program, including recommendations as to whether the program should be implemented nationally. The status of this program is shown in Table II-1.

Texas Water Assessment – Review of Corps Water Supply Authorities, Policies and Related Land Resources

Table II-1: Status of Pilot Regional Technical Assistance Programs

WRDA '99 Section	State	Report to Congress	Funded	Remarks
592	Mississippi	No [1]	Yes	One Project Cooperation Agreement has been prepared and another is under negotiation. Additional activities underway.
593	New Mexico	No [1]	Yes	Cong. add in FY 01 and 02. A number of projects have been complete and others are continuing. Corps contracting for the work.
594	Ohio	No	No	
595	Nevada	No [1]	Yes	Cong. add in FY 01 and 02. A number of projects have been complete and others are continuing. Cost recovery by the reimbursement approach.
	Montana	No	No	

Footnotes:

1. Reports prepared and awaiting ASA (CW) clearance.

II-4.2. Total Program.

While most of the water related authorizations since WRDA '86 have been non-traditional, there have also been some traditional authorizations. In the seven major Water Resources Development Acts from 1986 through 2000, there have been a total of 74 provisions that authorize various and sundry types of water supply, watershed, water quality and related infrastructure projects and studies; 11 of which have been traditional and 63 non-traditional. These authorizations provide for activity in 44 of the 50 states plus the District of Columbia. Over \$1.7 billion in Federal funds are authorized to be appropriated. This information is summarized in Table II-2 and provided in detail in Appendix B. Additional information on the nationwide studies is provided in paragraph II-4.4.

Table II-2: Authorizations for Water Supply, Watershed, Water Quality and Related Infrastructure Projects and Studies

Act	Number of Provisions	Authorized to be appropriated (\$000)	Number of Different States	Sections with Funds Appropriated
1986, PL 99-662	13 (including 4 nationwide); 8 traditional and 5 non-traditional	262,350	18	Not available
1988, PL 100-676	1; non-traditional	0	1	Not available
1990, PL 101-640	8 (including 1 nationwide); all non-traditional	1,500	5	Not available
1992, PL 102-580	14 (including 1 nationwide); all non-traditional	136,075	11	4
1996, PL 104-303	9; all non-traditional	188,500	15	2
1999, PL 106-53	27 (including 1 nationwide); 3 traditional and 24 non-traditional	1,123,535	33	10
2000, PL 106-540	2; both non-traditional	0	2	0
Totals	74 (including 7 nationwide); 11 traditional and 63 non-traditional	1,711,956	44+ the District of Columbia	Not available

A review of Appendix B will show that many of the authorizations are not major provisions for regions or large urban centers but are for small individual towns. An example is Section 116(z) of WRDA '90 that authorizes a study of the water supply needs of the city of Washingtonville, Ohio. This is small village that according to the 2000 census has a population of 789. While no funds are authorized, the legislation provides an avenue for Corps involvement in solving the community's need.

II-4.3. Distribution of Authorizations by State.

As would be expected, the 67 non-nationwide provisions are not distributed evenly among the states. There are six states with no authorizations, two states (New York and California), each with 10 authorizations and one state (Pennsylvania) with 11 (see Table II-3). Texas is one of the states with four authorizations (see paragraph II-4.5).

Table II-3: Distribution of Authorizations by State

Number of States	6	14 [1]	10	11	4 [2]	2	1	2	1
Number of Authorizations	0	1	2	3	4	5	7	10	11

Footnotes: [1] Includes the District of Columbia; [2] Texas included in this group.

II-4.4. Nationwide Authorizations.

The seven authorizations that apply nationwide are summarized in Table II-4.

Table II-4: Nationwide Authorizations

WRDA	Section	Provision	Authorized Appropriation [1]
1986	707	<u>Capital Investment Needs for Water Resources</u> . Authorized the Assistant Secretary of the Army for Civil Works to estimate long-term capital investment needs for, among other things, municipal and industrial water supply. Traditional	0
	729	<u>Study of Water Resources Needs of River Basins and Regions</u> . Requires the Assistant Secretary of the Army for Civil Works, in coordination with the Secretary of the Interior and in consultation with other governmental agencies, to study “water resources needs of river basins and regions of the United States.” This section specifically requires consultation with “State, interstate, and local governments” Traditional	\$5,000,000
	931	<u>Interim use of Water Supply for Irrigation</u> . Authorizes the temporary use of unused municipal and industrial water supply for irrigation. Traditional	0
	1135	<u>Project Modifications for Improvement of Environment</u> . Authorizes the review of water resources projects to determine the need for modifications in the structures and operations of such projects for the purpose improving the quality of the environment in the public interest. Traditional	0
1990	116 (dd)	<u>Radium Removal</u> . To study and provide technical assistance to small communities on methods of mitigating radium contamination in ground water used as a source of public drinking water. Non-traditional	0
1992	219	<u>Environmental Infrastructure</u> . Authorizes technical and planning and design assistance. Non-traditional	5,000,000 some funding
1999	560	<u>Abandoned and Inactive Noncoal Mine Restoration</u> . Authority to provide technical, planning and design assistance to Federal and non-Federal interests for carrying out projects to address water quality problems caused by drainage and related activities from abandoned and inactive noncoal mines. Non-traditional	\$5,000,000

Footnote: [1] Funding records, available for FY 92-02, indicate Section 219 of WRDA '92 has received some funding.

II-4.5. Authorizations for Texas.

In addition to the seven nationwide authorizations, four of the provisions apply to the state of Texas; these are summarized along with the status of the authorization in Table II-5. It is

noted that these Texas authorizations are all relatively old, with three being enacted 16 years ago, and the most recent one being enacted ten years ago.

Table II-5: Authorizations for Texas

WRDA	Section	Provision/Status	Authorized Appropriation
1986	818	<u>Brazos River Basin</u> . This section modifies Section 10 of the 1946 FCA to include water supply as a purpose in the Brazos River Basin. <u>Status</u> . This section has been implemented. In the Brazos Basin, there are 9 Corps projects (Belton, Aquilla, Georgetown, Granger, Proctor, Somerville, Stillhouse Hollow, Waco and Whitney) that contain storage for M&I water supply.	0
	838	<u>Denison Dam, Lake Texoma</u> . This section authorizes the Corps to reallocate up to 150,000 acre-feet of hydropower storage in Lake Texoma to municipal, industrial and agricultural water for the State of Texas. The section authorizes a like reallocation for the State of Oklahoma. <u>Status</u> . Of this storage, all but 276 acre-feet is under contract or in the process of being contracted by users in Texas.	0
	1121	<u>Ogallala Aquifer</u> . Authorizes the establishment of a comprehensive research and development program to assist those portions of the High Plains region dependent on water from the Ogallala Aquifer. Texas is one of eight states mentioned in the authorization. <u>Status</u> . The Corps never received any funding for this study, but some work was performed through a Department of Agriculture/United States Geologic Survey study.	\$1,625,000 was allocated to each of the 8 states.
1992	219	<u>Environmental Infrastructure</u> . Authorizes technical and planning design assistance to 18 areas, one of which is "Colonias along United States-Mexico Border." For this area, authorization is provided for wastewater treatment facilities, water systems (including water treatment plants), intake structures, raw water pipelines and pumps, distribution lines, and pumps and storage tanks for Colonias in the United States along this border. The non-Federal share of the cost of projects for which assistance is provided shall not be less than 25%, subject to the ability of the non-Federal sponsor to pay under section 103(m) of WRDA '86). <u>Status</u> . For the Texas portion of this study, through fiscal year 2002, \$297,000 has been funded and another \$100,000 has been requested for fiscal year 2003. The total cost for the Texas portion of this study is estimated at \$1,982,000 Federal and \$661,000 non-Federal. The funded money is to develop a scope of work, negotiate and execute a design agreement and issue a request for proposal for plans and specifications. The Galveston District (study manager) indicates they are having a hard time getting a local sponsor. The State of Texas is more interested in construction money than design money, but will sponsor at least a portion of the authorized work.	\$5,000,000 for all 18 areas.

II-5. Regulatory Process

II-5.1. Introduction.

Three laws give the Corps responsibility for granting or refusing permits to build water related projects in the United States: (1) The Clean Water Act of 1972 (and subsequent amendments) (see paragraph II-5.2), (2) The Rivers and Harbors Act of 1899 (see paragraph II-5.3) and (3) The Marine Protection, Research and Sanctuaries Act of 1972 (Section 103) (see paragraph II-5.4). The first two laws cover most of the projects of concern in this report and are described in the next two paragraphs. The third authority applies to a much smaller subset of projects in which dredged material is being transported through U.S. territorial waters for ocean dumping. All Corps projects, just as all non-Corps projects, must meet the requirements of these three laws. The Corps, however, does not issue or deny itself a permit. The Regulatory Process followed by the Corps is displayed in Figure II-1. Corps records show the following permitting activity as of 30 September 2002, or for the fiscal year ending that date, as indicated.

- Standard and letter permits issued in Fiscal Year 2002: 7,281; Permits denied: 128
- Activities authorized through regional permits: 38,125
- Activities authorized through nationwide permits: 35,768
- Percent of permit actions completed within 60 days: greater than 80%
- Acres of wetlands where activity was permitted: 24,651
- Acres of wetland restoration/creation/mitigation required by those permits: 57,821

II-5.2. Clean Water Act of 1972.

II-5.2.1. General. The Corps must comply with the Clean Water Act before it can begin construction of a project. The Corps must also obtain Section 401 Water Quality certification from the state or interstate water control agencies that a proposed water resources project is in compliance with established effluent limitations and water quality standards. Section 404(r) waives the requirement to obtain the State Water Quality certificate if the information on the effects of the discharge are included in an Environmental Impact Statement on the proposed project submitted to Congress before the discharge takes place and prior to either authorization of the project or appropriation of construction funds. It is the general policy of the Corps to seek State water quality certification rather than utilizing the Section 404(r) exemption. The Corps must also ensure that its projects comply with the requirements of Section 404 of the Clean Water Act. While the Corps does not issue permits to itself, the Corps does evaluate the project to ensure that the project complies with the requirements of Section 404, including the substantive criteria used to evaluate and select sites for the discharge of dredge or fill material.

II-5.2.2. Permits for Discharge of Material into U.S. Waters (Section 404). The Secretary of the Army, acting through the Chief of Engineers, is authorized to issue permits for discharges of dredged or fill material into the waters of the United States, provided that such discharges are

found to be in compliance with criteria in the Section 404(b)(1) Guidelines. These guidelines were developed by the Environmental Protection Agency (EPA) in consultation with the Corps and published in the Federal Register at 40 CFR 230 in 1980. Section 404(c) allows the Administrator of the EPA to prohibit issuance of a permit if it is determined that the discharge will result in unacceptable adverse impact on municipal water supplies, shellfish beds, wildlife, fisheries, or recreational areas. Within the last 3 years the majority of all permits issued were issued under Section 404 and Section 10/404. These include individual, letter, nationwide and regional permits.

II-5.2.3. Section 404(b)(1) Guidelines. The Section 404(b)(1) Guidelines are the primary environmental criteria regulators use in evaluating the impacts of the discharge of dredge or fill material in regulated waters. Corps regulations at 33 CFR 320-330 require that no project may be permitted if it does not comply with the Guidelines. These guidelines require that if a project is not water-dependent, applicants must clearly demonstrate that a discharge into special aquatic sites is necessary to accomplish the project purpose (40 CFR 230.10(a)(3)).

II-5.2.4. Section 404(b)(1) General Criteria. The following criteria must be met:

II-5.2.4.1. Project must represent least environmentally damaging, practicable alternative (LEDPA) (40 CFR 230.10(a)).

II-5.2.4.2. Project must comply with the applicable requirements, both Federal (for example, Endangered Species Act) and state (such as state water quality standards); (40 CFR 230.10(b)).

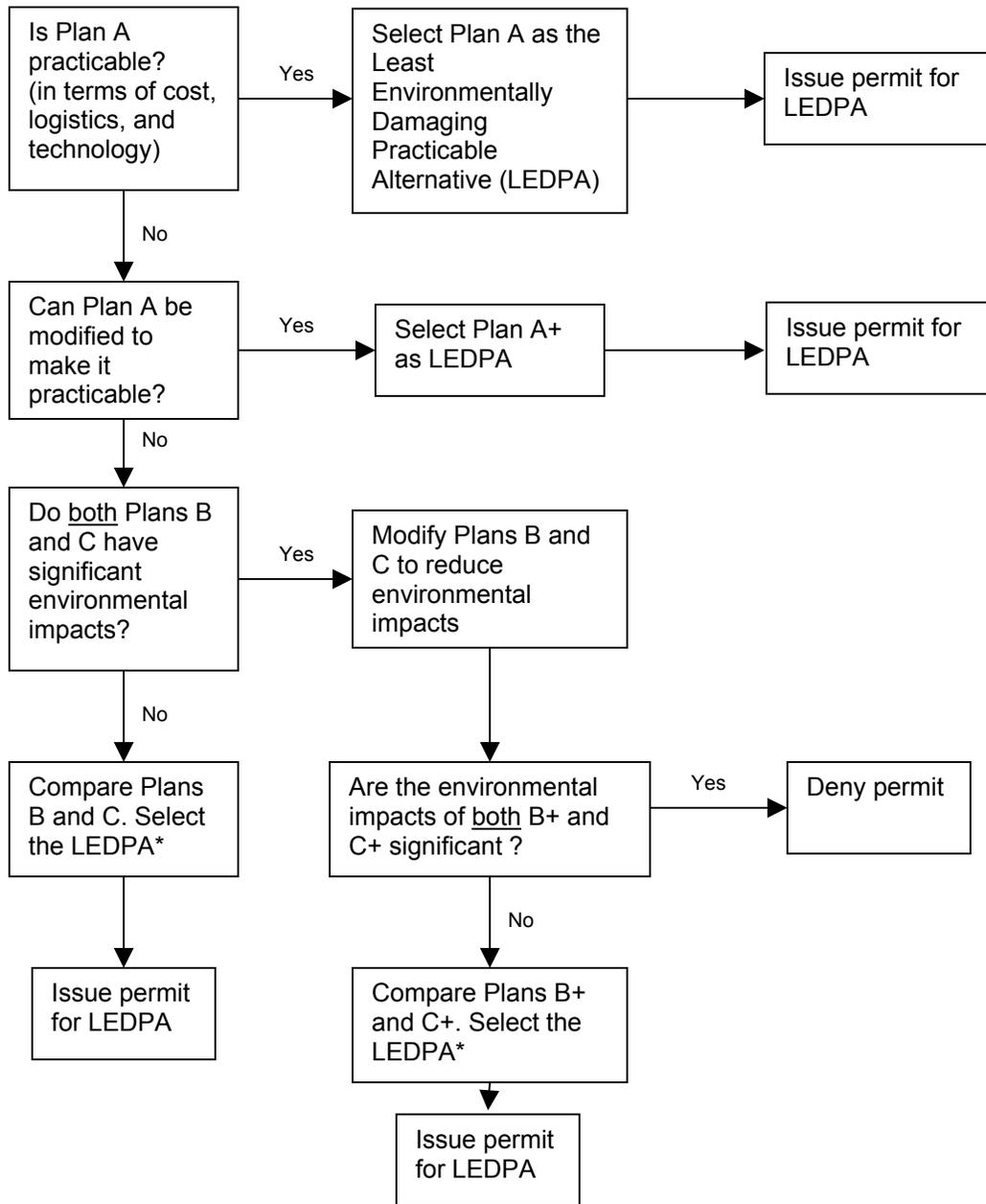
II-5.2.4.3. Project must not result in significant degradation of the aquatic environment; (40 CFR 230.10(c)).

II-5.2.4.4. All reasonable steps (for example, dredging windows or best management practices to reduce potential for erosion) must be taken to minimize project impacts. (40 CFR 230.10(d)).

II-5.2.5. 1990 MOA. The 1990 Department of Army - Environmental Protection Agency Mitigation Memorandum of Agreement clarifies the 404(b)(1) guidelines and requires that first impacts must be avoided and minimized (including compensatory mitigation) to the extent practicable to satisfy the requirements of the Guidelines. The MOA clarifies that Corps regulators may not consider mitigation when comparing alternatives and identifying the least environmentally damaging practicable alternative.

Figure II-1. Regulatory Process.

Plan A is the least environmentally damaging alternative.
 Plan B is the least costly alternative.
 Plan C is the locally preferred plan.



NOTE:
 * If there are no identifiable or discernable differences in environmental impacts between the applicant's proposed alternative and all other practicable alternatives, then the applicant's preferred alternative (Plan C or C+) should be selected.

II-5.3. River and Harbor Act of 1899, Permits for Dams and Dikes Across Navigable Waters .

The applicable provisions of the 1899 River and Harbor Act are contained in the following paragraphs.

II-5.3.1. Section 9. The Chief of Engineers and Secretary of the Army must approve plans for the construction of any dam or dike across any navigable water of the United States. Legislative approval is also needed: if the navigable portion of the waterbody lies wholly within the limits of one state, the structure may be built under the authority of the legislature of that state; otherwise the approval of the U.S. Congress is required.

II-5.3.2. Section 10. The Chief of Engineers must approve plans to build or modify any structure in or over any navigable water of the United States, or the accomplishment of any other work affecting the course, location, condition, or physical capacity of navigable waters.

II-5.3.3. Jurisdictional Limits.

II-5.3.3.1. Rivers and lakes. Federal regulatory jurisdiction extends laterally to the entire water surface and bed of a navigable waterbody, which includes all the land, wetlands, and waters below the ordinary high water mark. (33 CFR 329.11(a)) At some point along its length, a navigable waterbody will change its character and lose its real or potential physical ability to support commerce. That upper limit point where the waterbody ceases to be a navigable water of the United States is usually termed the "head of navigation". (33 CFR 329.11(b))

II-5.3.3.2. Ocean and tidal waters. The Corps regulatory jurisdiction includes all ocean and coastal waters generally within a zone three nautical miles seaward from the coastline. For bays and estuaries, jurisdiction extends to the entire surface and bed of all waterbodies subject to tidal action. This includes marshlands and similar areas insofar as those areas are subject to inundation by the mean high tidal waters. The base line (ordinary low tide line) from which the territorial sea is measured is specified in the Convention on the Territorial Sea and the Contiguous Zone. (15 UST 1 606; TIAS 5639; 33 CFR 329.12)

II-5.4. The Marine Protection, Research and Sanctuaries Act of 1972, Permits for the Transport of Dredged Material for Ocean Dumping (Section 103).

II-5.4.1. General. The Secretary of the Army is authorized to issue permits for the transportation of dredged materials for ocean disposal when dumping will not unreasonably degrade or endanger human health, welfare or amenities, or the marine environment, ecological system, or economic potentialities. A Corps Section 103 Marine Protection Research and Sanctuaries Act permit is required for the transportation of dredged material for the purpose of ocean dumping. The EPA is generally responsible for the suitability of the ocean dredged material disposal site under Section 102 of the Act and both the Corps and EPA must agree on the suitability of dredged material for disposal in the ocean.

II-5.4.2. Jurisdictional Limits.

II-5.4.2.1. For the Clean Water Act , jurisdiction is more extensive than under the River and Harbor Act of 1899. (33 CFR 328)

II-5.4.2.2. For the Marine Protection, Research and Sanctuaries Act of 1972. This Act defines a regulatory jurisdiction with respect to "Ocean Waters." (33 CFR 324.2)

II-5.5. General Policies for Evaluating Permit Applications.

II-5.5.1. Policies. The policy on Public Interest Review is applicable to the review of all applications for Department of the Army permits. The decision whether to authorize a proposed activity, and if authorized, the conditions under which it will be allowed to occur, are determined by the outcome of the general public interest balancing process. That decision should reflect the national concern for both protection and utilization of important resources. All factors, which may be relevant to the proposal, must be considered, as must their cumulative effects. Considered are: conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs and, in general, the needs and welfare of the people. No permit will be granted if issuance is found to be contrary to the public interest.

II-5.5.2. General Criteria. The following general criteria will be considered in the evaluation of every application:

II-5.5.2.1. The relative public and private need for the proposed structure or work;

II-5.5.2.2. Where there are unresolved conflicts respecting resource use, the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed structure or work;

II-5.5.2.3. The extent and permanence of the beneficial and/or detrimental effects which the proposed structure or work may have on public and private uses to which the area is suited.

II-6. Watershed Planning

II-6.1. Background.

II-6.1.1. The phrase “watershed management” is defined differently by different agencies. In general, it means water management based on systemic review of issues within one drainage basin. But there are apparently subtle differences in meaning that have large practical

consequences. For example, the EPA uses “watershed management” to mean management of small drainage basins to secure water quality improvements. The Corps often uses the phrase as a synonym for multipurpose, multiobjective river basin management. The Natural Resources Conservation Service usage connotes multipurpose and multiobjective but on smaller drainage areas. The underlying concept of integrating management along geographic, rather than just political boundaries is not new. Franklin Roosevelt’s administration espoused essentially all the ideals of integrated water management, adaptive management and even a rudimentary form of sustainability¹⁰.

II-6.1.2. There is a growing recognition that locally perceived water resources problems have regional dimensions and are of concern to numerous, diverse interest groups. Many activities occurring in a watershed are inter-related and, therefore, managing water resources has evolved to more of a holistic, collaborative effort. The Corps has developed its own watershed perspective to guide water resources development, protection, and management within the Civil Works program. This watershed perspective accommodates the multi-objective, multi-purpose planning and investigations necessary for exploring these concerns. It is a tool that helps improve performance, customer satisfaction, overall program efficiency and effectiveness and to assure use of the water resources in a sustainable manner, taking into account environmental protection, economic development, and social well-being. The concept of “watershed” is not new to the Corps of Engineers. Throughout the history of the Corps, a watershed approach has been, at varying levels, integrated into the process by which water resource systems have been investigated. The geographic “basin” organization of the Corps Civil Works programs support the Corps historic understanding of the necessity of managing water resource activities within a watershed context.

II-6.2. Applicability.

The watershed perspective applies to all Civil Works programs through planning, design, construction, operation, maintenance, restoration, rehabilitation, and regulatory activities. The application of this perspective into the Civil Works program encourages opportunities for enhancing the operations and maintenance of existing projects, especially the management of the natural resources. In addition, this perspective facilitates the integration of the nine Civil Works business programs (navigation, flood damage reduction, ecosystem restoration and protection, recreation, hydropower, water supply, regulatory, emergency operations and Interagency and International Services to others) into the identification and development of new Corps initiatives. The perspective recognizes the responsibility of the Corps as a major stakeholder in many of the Nation’s watersheds.

¹⁰ "Development of Resources", 1941. Natural Resources Planning Board, Office of the President of the United States.

II-6.3. Definitions.

Federal, tribal, state, and local agencies and organizations have varying interpretations of the definition of a watershed, the identification of the range of water resources issues, and the methods of evaluation. They also have differing views on the anticipated purposes and goals of watershed initiatives. These interpretations are based on defining manageable units and specific issues that a particular agency or organization have determined to be appropriate for their individual mission areas and identifying ways to meet their program goals. For the purpose of Corps Civil Works initiatives, the following definitions apply:

II-6.3.1. A *watershed* is an area of land within which all surface waters flow to a single point. It encompasses the area necessary to adequately scope, analyze, and manage related water and land resources.

II-6.3.2. *Watershed perspective* is the viewpoint that requires that all activities be accomplished within the context of an understanding and appreciation of the impacts of those activities on other resources in the watershed. The watershed perspective encourages the active participation of all interested groups and requires the use of the full spectrum of technical disciplines in activities and decision-making. This viewpoint takes into account: (1) the interconnectedness of water and land resources, (2) the dynamic nature of the economy and environment, and (3) the variability of social interests over time. It recognizes that watershed activities are not static, and that the strategy for managing the resources of the watershed needs to be adaptive.

II-6.3.3. *Watershed management* is the administration of and potential adjustments to the level and type of interaction among various human activities and natural processes occurring in the watershed through the application of the watershed perspective. Watershed management includes the planning, development, use, monitoring, regulation and preservation of the water and land resources. It should achieve a desirable balance among multiple, and often competing, watershed goals and objectives.

II-6.3.4. *Watershed studies* are planning initiatives that have a multi-purpose and multi-objective scope and that accommodate flexibility in the formulation and evaluation process. The outcome of a watershed study will generally be a watershed management plan. This plan will identify the combination of recommended actions to be undertaken by various partners and stakeholders in order to achieve the needs and opportunities identified in the study and may or may not identify further Corps studies or implementation projects. However, budgetary priority will be given to those studies likely to result in further Corps activities or which will provide benefits to an existing Corps project whose uses are being impaired by activities or conditions within the watershed. Further consideration for funding will be given to Corps involvement in watershed studies of national importance that do not necessarily lead to a Corps project.

II-6.4. Policy.

The Corps will integrate the watershed perspective into opportunities within, and among, Civil Works elements. Opportunities should be explored and identified where joint watershed resource management efforts can be pursued to improve the efficiency and effectiveness of the Civil Works Programs. The Corps will solicit participation from Federal, tribal, state, and local agencies, organizations, and the local community to ensure that their interests are considered in the formulation and implementation of the effort. Due to the complexity and interrelation of systems within a watershed, an array of technical experts, stakeholders, and decision-makers should be involved in the process. This involvement will provide a better understanding of the consequences of actions and activities and provide a mechanism for sound decision-making when addressing the watershed resource needs, opportunities, conflicts, and trade-offs. The watershed perspective encourages collaborative efforts, which advocate the integration of interests in the watershed by identifying, scoping, and developing comprehensive water resources management goals. This approach improves opportunities for public and private groups to identify and achieve common goals by unifying on-going efforts and leveraging resources. The specific roles and amount of involvement by the Corps and other parties will vary depending on the initiative. The level of involvement may also vary throughout the process. The analytical framework will be founded on factual scientific, social, and economic information, allowing for the assessment, evaluation, and comparison of alternative plans, including positive and negative effects on economic development, the environment, and social well-being.

II-6.5. Watershed Perspective.

The Corps Civil Works watershed perspective includes the following nine ideals:

- The use of the water resources in a manner that is sustainable, taking into account environmental protection, economic development, and social well-being;
- Coordinated planning and management of water and related land resources by the responsible Federal, tribal, state or local government;
- Interagency cooperation, including cost-shared collaboration on initiatives that incorporate local, tribal, regional, and national water resources management goals;
- Consideration of adaptive management of resources in the watershed;
- Leveraging resources and integrating programs and activities within and among Civil Works programs, and with other Federal, tribal state and non-governmental organizations, to improve consistency and cost effectiveness;
- Identification of future water resource use demands, including local, tribal, regional, and national goals;

- Use of interdisciplinary teams to include a wide range of engineering and scientific expertise, as well as skills in public involvement, geographic information systems, alternative dispute resolution and other skills;
- Public input to watershed resources development and management; and
- Evaluation of the monetary and non-monetary trade-offs to be considered.

II-6.6. Practical Implications.

The principles outlined in the policy are important – some would say inarguable. Water experts have agreed on these principles for decades. This begs the question, why is water management done any other way? IWR's experience suggests a myriad of answers, including the inexperience and self-interest of potential collaborators. Shared vision planning and management – discussed in the section below - provides practical, tested methods for applying the principles of watershed management.

II-7. Shared Vision Planning

II-7.1. Introduction.

II-7.1.1. Shared vision planning¹¹ is a practical and rigorous form of watershed planning developed during the National Drought Study (NDS) (1989-1993). Shared vision planning is based on the notion that all stakeholders, decision makers and experts should work together to develop a single (shared) view of the system to be managed, with this view articulated in a dynamic computer simulation.

II-7.1.2. Shared vision planning can be distinguished from other watershed approaches by this combination of practices:

- Systems perspective, with clearly articulated goals, objectives and measures of performance.
- Public involvement, using a specific, tested approach called Circles of Influence to increase effectiveness and reduce costs.
- The collaborative development by stakeholders, decision makers and experts of a computer simulation of the system being managed.

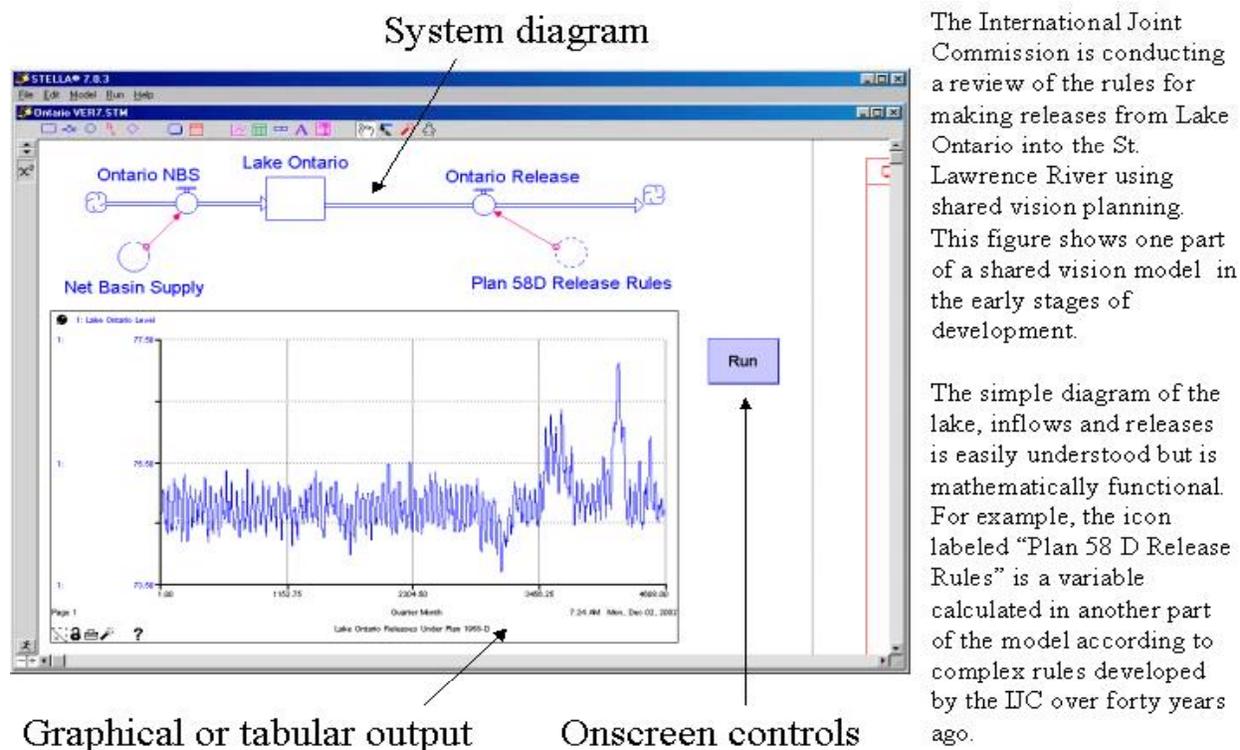
¹¹ For more information, see <http://www.iwr.usace.army.mil/iwr/svtemplate/SVP.htm>.

II-7.1.3. In 1989, on the heels of severe droughts in much of the west, southeast and the Missouri-Mississippi Valley, the Corps of Engineers began The NDS effort to find a better way to manage water for drought. After a year of study and collaboration with other Federal agencies, states, municipalities, universities and many other groups focused on drought that year, the Corps proposed a drought preparedness method and applied it in test cases around the country. The method was a form of the systems analysis approach designed during the Harvard Water Program of the late 1950's and early 1960's that later became the basis for Federal water resources planning, "Principles and Standards" (1973) and "Principles and Guidelines" (P&G, 1983). Discussion of the P&G can be found in Chapter 2 of the Planning Guidance Notebook (see paragraph I-3.4). Those planning processes were designed to determine whether the Federal government should develop a water resources project; the drought preparedness method was designed for multiple governing bodies to collaboratively design, implement test and update solutions to reduce drought impacts. Since the NDS, the method was expanded to include non-drought water problems and has been renamed "shared vision planning".

II-7.2. Simulation Model.

The idea of using a simulation model in negotiations over water supply had first been used in 1981 by a young post-doctoral student at Johns Hopkins, Richard Palmer. His "PRISM" model was simplistic, but it allowed the water utilities around Washington, D.C. to understand how interconnections and joint operations of reservoirs could provide a high degree of water supply reliability and avoid the construction of multiple new reservoirs. In 1991, Palmer, now a Civil Engineering professor at the University of Washington, attended a NDS workshop of the Cedar and Green River Case Study in Seattle. There he proposed that the Corps develop system simulation models in each test case, and showed how the models could be built with stakeholders and decision makers. Each of the five case study managers agreed to do so, although they were not allowed any increase in budget or time for what might appear to be an "extra" task. At the time, Palmer was using an object-oriented software called STELLA®, which made it easier to create models that could be understood by non-modelers because the functional relationships were diagrammed as they were mathematically defined. Stakeholders could literally see the factors that affected any variable. For example, reservoir systems appeared as a series of boxes connected by flows (see figure II-2).

Figure II-2 Example of Shared Vision Model



The International Joint Commission is conducting a review of the rules for making releases from Lake Ontario into the St. Lawrence River using shared vision planning. This figure shows one part of a shared vision model in the early stages of development.

The simple diagram of the lake, inflows and releases is easily understood but is mathematically functional. For example, the icon labeled “Plan 58 D Release Rules” is a variable calculated in another part of the model according to complex rules developed by the IJC over forty years ago.

II-7.3. Case Study Results.

II-7.3.1. Two of the five test cases (the Kanawha River in West Virginia and the Cedar-Green River in Washington) in the NDS convinced people to manage water differently. In West Virginia, whitewater rafters had lost considerable income because whitewater releases had been reduced to conserve water needed to provide minimum flows for wastewater dilution. Near the study end, Dr. Richard Punnett (now retired from the Jacksonville district, but then in Huntington) led a workshop using the basin STELLA® model in which he demonstrated reservoir operating rules that would improve both water quality and whitewater dependability. All the necessary decision makers and stakeholders had participated in the planning and model building process, so new operating rules were put in place quickly. Participants estimated that the new plan would save \$10 million in regional tourism revenue during the next severe drought while improving water quality. In Tacoma, WA Palmer and the Corps conducted a “Virtual Drought” that simulated several months of drought in a seven-hour workshop. The “drought” proceeded in two-week intervals. At the end of each interval, a “forecast” would be made and the “press” would characterize conditions and criticize decisions. Decision makers all used the model they had helped build to assess water supplies and demand, and to analyze and negotiate decisions as the drought progressed. Discussions were sometimes heated, but by day’s end participants reported increased faith in their model and its potential to help them manage

collaboratively. The model and the relationships developed in this exercise helped reduce the time, effort and stress in subsequent reservoir management decisions in the basin. The virtual drought concept was later applied by Tarrant County, Texas, using a model developed with the Fort Worth District under a Section 22 study.

II-7.3.2. In two other case studies (Boston, Massachusetts and Marais des Cygnes-Osage (Kansas and Missouri), the participants built good models that improved understanding of how the water system worked and demonstrated the soundness of ideas that probably would have been implemented without the models. In the fifth case James River, Virginia, the modelers failed to build a good model, and the study had no effect on decision makers.

II-7.3.3. After the National Drought Study, the approach was adapted for use in different types of water conflicts that had eluded settlement using traditional methods. Florida, Georgia, Alabama and the Corps' Mobile District elected to use shared vision planning for the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint (ACT-ACF) Comprehensive Study when it appeared their negotiations would break down, forcing them to return to court to resolve the lawsuits brought by Alabama and Florida. The shared vision models they built integrated the results from studies of agricultural production and water demand; groundwater availability and interaction with surface water; recreation activity and economics, riverine and lacustrine environments, municipal and industrial water use; navigation availability and cost savings; and hydropower. Each state had two members on a basinwide management working group responsible for the development of the models. Starting in 1994, the University of Washington hosted a website where data, models and study meeting notes were accessible to all. The models were built to allow people to formulate their own alternatives by using dials and toggle switches on the model interface to create combinations of individual and multiple reservoir operating plans, new reservoirs, structural alternatives to the current navigation project, municipal and agricultural water conservation; and revised routing of Atlanta's water supply diversions and wastewater returns. When the models were essentially complete, the states entered into the first interstate water compacts in the Southeast. The compacts established temporary commissions to negotiate a water allocation agreement among the states for each basin (ACT and ACF). The states were free to extend the compacts with unanimous agreement if they had not reached agreement on allocation, but thought they could with more time. The states had not reached an agreement by the end of 2002, but continue to extend the deadline.

II-7.3.4. In 1998, a form of the shared vision approach was used in Devils Lake, North Dakota. Devils Lake is a city of about 7,700 people alongside a closed basin lake of the same name. Lake levels had been high in the early 1800's, but by 1940, the lake almost disappeared, with levels more than forty feet lower than the 1800's peak. Since 1940, the lake had slowly and unsteadily risen again, with spectacular increases in the 1990's. Homes built eight miles from the lake were being flooded. The Corps of Engineers had been evaluating a plan to pump water from the lake to the nearby Sheyenne River. Using a United States Geologic Survey (USGS) lake level forecasting model that assumed that future years' inflows would almost as likely be lower than higher than average, however, the Corps concluded the project costs would far exceed the benefits. Pump supporters argued that lake levels were cyclic and that lake was much more likely to continue to rise than to fall. Year after year, the critics appeared to be right as the lake rose to levels the USGS had, in the previous year, suggested were possible but had only from 0.5% to

2% chance of happening. Andrew Wood, who had been a graduate student of Palmer's, asked various stakeholders to specify the type of future conditions they were most concerned about. Wood then built a STELLA® model of the Devils Lake system, using six selected inflow-evaporation traces from the 10,000 generated by the USGS to assess the probabilities of future lake levels. The traces ranged from the wettest future scenarios to the driest. The control panel of Wood's model featured a toggle switch to activate the pump, a dial to adjust its size and more dials to adjust the quality and quantity restrictions on the pumped effluent. Users could also select any of the six inflow traces from a spreadsheet dynamically linked to his STELLA® model. The model was used at a "Virtual Flood" workshop in Grand Forks, North Dakota attended by pro and anti pump forces. Repeated runs of the model showed that the pump could not be designed to reduce peak lake levels if the wet future did occur, partly because of the costs of larger pumps and partly because the pumped water would cause flooding in the Sheyenne River for years. However, the pump was able to bring lake levels down after 30 years. The Virtual Flood decoupled belief in high lake levels and support for the pump, but did not change many people's minds about whether the pump should be built. They argued that the pump was effective because it would uncover their town sooner and allow their children to rebuild. Design of the Devils Lake project has been funded, but the project remains controversial, with construction uncertain.

II-7.3.5. As the case histories above suggest, shared vision planning has been applied in the most difficult situations, where other methods have been tried and failed. Because of the qualified successes in even these most difficult cases, shared vision planning is beginning to gain wider acceptance and is being used in circumstances that are a little less dire. It is currently being applied on a grand scale in an International Joint Commission Study (IJC) of the regulation of Lake Ontario and in a small scale on a study of water supply related management in the Rappahannock River Basin in Virginia. In each case, the regions have witnessed failures in traditional approaches. The last multiyear study of Lake Ontario by the IJC failed to lead to changes in operating rules; two other water supply efforts in Virginia (Virginia Beach's Gaston Pipeline and Newport News' King William Reservoir) were delayed for about a decade by opponents. The American Society of Civil Engineers has a shared vision planning committee¹². The World Bank applied some of the principles in its Shared Vision of the Nile project¹³. But it may be the Rappahannock study¹⁴ that is most relevant to the future of Texas water supply.

II-7.3.6. Rappahannock River Basin Commission (RRBC). This area of Virginia, which is from about an hour to two hours distant from Washington, D.C., is experiencing rapid growth that is expected to continue for decades. While surface water supplies are generally adequate now, they will not be sufficient for the expected future populations and groundwater supplies have already started to fail. Communities in this basin witnessed Virginia communities on the eastern coast such as Virginia Beach and Newport News struggle for over a decade to develop

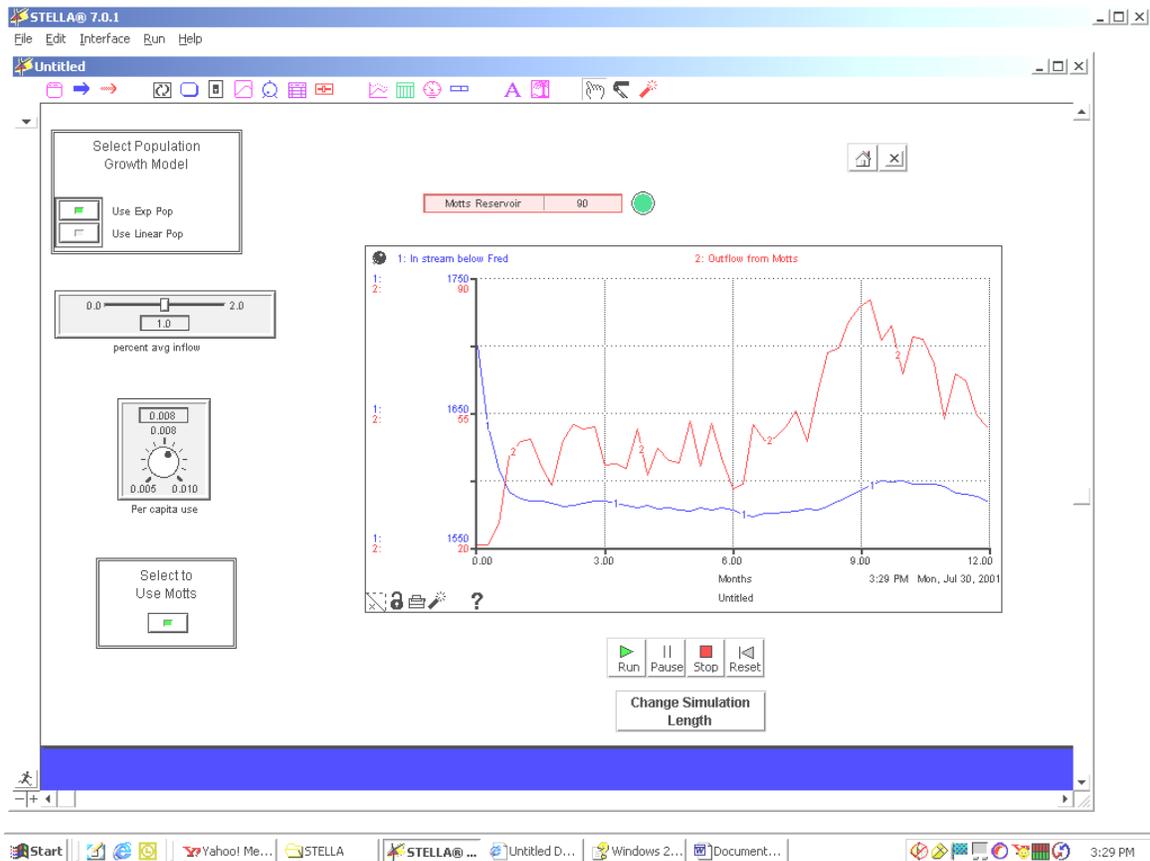
¹² <http://www.pubs.asce.org/WWWdisplay.cgi?0100522>

¹³ World Bank site is <http://www.worldbank.org/afr/nilebasin/>. Uganda's collection of Shared Vision Program Project Documents is available at <http://www.nilebasin.org/pubdocs.htm>.

¹⁴ For information on the Rappahannock studies, see <http://www.raprivervbasin.state.va.us/default.asp?S=16>

and obtain permits for local water supply solutions. The RRBC worked with the Department of Civil and Environmental Engineering at Virginia Tech to develop an alternative approach. Communities, including Fredericksburg and Spotsylvania, Virginia, are working hand in hand with EPA, the state of Virginia, and regulators in the Corps of Engineers' Norfolk district to collaborate on water supply planning. They have elected to use the shared vision planning method (see figure II-3).

Figure II-3. Shared Vision Model for Rappahannock



II-7.3.7. Water supply efforts by local governments require a Corps of Engineers permit if they involve a reservoir or even a structure placed in a river. The regulatory process (see paragraph II-5) is designed to protect the environment and it includes a public interest review that provides an opportunity for stakeholders and non-governmental organizations to challenge the local water supply solution. The Two Forks Dam near Denver, Colorado, is perhaps the most famous example. The permit to build the dam was granted by the Corps' Omaha District after a long, multi-million dollar EIS, but the permit was vetoed by the Environmental Protection Agency because EPA believed the least environmentally damaging practicable alternative was water conservation, not a dam. Even when there is some pre-application collaboration and

information sharing between the Corps and water supply agencies, the collaboration is limited and does not include EPA or the U.S. Fish and Wildlife Service, despite the fact that these agencies may be involved later in the decision process. RRBC asked the Corps, EPA, the U.S. Fish and Wildlife Service, and Virginia regulators to work with community water supply agencies and the Commission to develop a shared vision of the basins needs and solutions.

II-7.3.8. The preliminary stage of study on the Rappahannock was completed in the Summer of 2002. The RRBC is now trying to maintain the momentum generated by the initial collaboration. Ultimately, the RRBC hopes to use the shared vision approach to develop better water supply plans, which address environmental concerns by regulating agencies faster, early in the design process, and at lower cost.

II-8. Budget Process

II-8.1. General.

The Corps of Engineers' annual recommendation for the Civil Works Program is submitted by the Assistant Secretary of the Army for Civil Works (ASA (CW)) to the Office of Management and Budget (OMB) for review in behalf of the President. The recommendation is prepared in Headquarters, United States Army Corps of Engineers (HQUSACE) in consultation with the ASA (CW) after review and analysis of recommendations of the division commanders. Submissions are based on principles and requirements outlined in the annual program guidance and OMB circulars. OMB places specific ceilings on overall funding, associated employment strength, and spending for the Civil Works program. The budget cycle is shown on Figure II-4.

II-8.2. Agency Submission.

Agencies of the Executive Branch of Government develop recommendations for the President's Program and Budget in compliance with the guidelines set forth in OMB Circular A-11, and within overall funding and spending ceilings set by OMB. The Corps publishes its own annual program guidance incorporating requirements of OMB Circular A-11 and policy and related guidance of HQUSACE and ASA (CW). Existing activities (projects, studies, programs) are reexamined to determine their validity and necessity. Each activity is rejustified as to funding, manpower requirements, and spending each time a program is prepared. The process involves assigning a priority to individual studies and projects.

Figure II-4. The Budget Cycle.



II-8.3. OMB Passback.

The ASA (CW) and HQUSACE defend the Corps of Engineers recommended Civil Works Program at hearings before OMB. Following the hearings, OMB reviews and revises the recommended program in accordance with then prevailing objectives and criteria of the Administration. The program is evaluated against recommended programs of other agencies to determine its relative performance in meeting the Administration's requirements. OMB “passes back”, through ASA (CW), tentative overall funding, employment, and spending allowances for programs, studies, and projects; and other guidance, as conditions warrant. ASA (CW), together with HQUSACE, reviews the OMB passback and submits one or more appeals, as warranted. Subsequently, the President’s Program and Budget are prepared and submitted to the Congress, usually in February.

II-8.4. Program Defense and Congressional Hearings.

Following establishment of the President's Program and Budget, the Corps prepares supporting data and defends the President's Program and Budget at hearings before the House and Senate Appropriations Committees. The Corps fully supports the President's Program and

Budget. Testifying Officers do not encourage appropriations in amounts different than budgeted. Congress reviews and revises the President's Program and Budget based on then prevailing objectives of the Congress.

II-8.5. Appropriations.

The Corps policy is to allocate and use appropriated funds as closely as practicable in accordance with the program presented to the Congress, including any modifications by the Congress in its action on the Appropriations bill. Allowances for surveys and projects agreed to by the conferees at the time of passage of the annual Energy and Water Development Appropriations Bills are referred to as appropriations, even though these amounts are subject to reductions when making final allocations to district commanders. The reduction is necessary to distribute an overall Appropriation Title reduction for "savings and slippage" and other undistributed reductions applied by Congress to the total of the individual allowances.

II-8.6. Budget Year New Starts.

The Corps budget recommendation to OMB each year includes a separate section of the budget memorandum, which identifies each new start in many subprograms. These include reconnaissance studies, preconstruction engineering and design, construction of specifically authorized projects, major rehabilitation of Federally maintained projects, reconstruction of non-Federally maintained projects, and large Revolving Fund items, such as dredges. Also considered under the Other New Starts category are separable elements of continuing construction projects, deficiency corrections, resumptions of construction, and initiation of construction of previously funded new starts. Current budget procedures involve a joint effort of the staffs of the Chief of Engineers and ASA (CW) in developing criteria for selection of each category of new starts to be recommended to OMB for inclusion in the President's Budget. These criteria are published each year in the budget guidance for the year. The selection is made so as to fit, together with the continuing program, within the budget ceiling, which OMB had established for the budget year.

CHAPTER III: HOW AUTHORITIES AND POLICIES LIMIT CORPS INVOLVEMENT

III-1. Introduction

The purpose of this chapter is to describe the limiting nature of the Corps involvement in water supply. In this regard, Federal policies on water supplies address two overriding questions: “Who pays?” and “Who designs?”

Who Pays. There is a broad consensus among water experts that municipal and industrial water should be sold at its full price. “Full cost pricing” ensures water’s most efficient use and tends to minimize the environmental, economic and financial costs of providing it. The Corps follows this principle through the updated cost of storage procedure in reallocations. There is, however, a policy precedent for subsidy, largely in the form of low interest loans from EPA’s Revolving Loan fund, to reduce the financial impacts of providing safe drinking water to those too poor to finance needed water quality enhancements or to remote communities where the provision of safe drinking water may mean the replacement of existing supplies with new, regional supplies that need extensive and costly new distribution systems. In addition, there have been cases where individual projects received subsidies for water and wastewater treatment facilities through Congressional acts: however, this is the exception, not the rule.

Who Designs. The question of design is more complex. New and existing water supplies must be designed to meet multiple criteria regarding the quality and quantity of the water itself and the financial, economic, environmental and social costs of supplying it. The responsibility for setting these criteria and assuring they are met is spread among every level of government. Engineer consulting firms generally design and construct water supply facilities under the guidance of the public or private utilities that will operate and maintain them. In some cases, the management of physical plant (pumps, plants, reservoirs, and pipes) is separated from the management of water (drought planning, supply planning, quality planning and management). What is clear is that there will be multiple decision makers in any water supply expansion. For instance, more often than not, new water supply projects will need a Corps permit. The sequential application of various design criteria and assessments by different decision makers has been blamed for increasing the cost and time required for water supply projects, and it tends to lead to conflict over the original design rather than a collaborative search for the best design.

III-2. Municipal and Industrial.

III-2.1. Surplus.

Under Section 6 of the 1944 FCA, surplus water is only available if one of the following cases occur: it is not required because the authorized need never developed or the need was reduced by changes that have occurred since authorization, or its use for municipal and industrial water is more beneficial than the authorized use and if used, would not significantly affect the authorized purpose. Costs are the same as for reallocations and contract terms are limited to 5-year periods, after which costs must be recalculated.

III-2.2. Storage.

Under Public Law 85-500, states and local interests have the primary role in providing municipal and industrial water supply. This authority does not apply to irrigation water, only to uses normally found in the operation of municipal water systems and for uses in industrial processes. The law also does not provide the Corps with authority to provide intake and distribution facilities, only outlet works in the dam and applies only to storage space and not water. Local sponsors are required, as necessary, to acquire the necessary water rights. Not many new multi-purpose projects are being constructed. When they are, however, Public Law 85-500 as amended by Public Law 99-662 permits the costs for Corps projects to be repaid over a 30-year period (for Bureau of Reclamation projects the repayment period remains at 50 years). Current Corps policy, however, requires the cost of water supply storage in new projects to be repaid during the period of construction. For new projects (constructed subsequent to WRDA '86) the non-Federal sponsor must also pay (except for hydroelectric projects) the yearly operation, maintenance, repair, replacement and rehabilitation expense for the entire project. Current Administration policy also prohibits the Corps from constructing single purpose water supply projects and, except in limited cases, even studying single purpose water supply projects.

III-2.3. Reallocations.

Reallocations must be evaluated, justified and approved and can be a time consuming process. The sponsor must pay for the reallocated space over a period of not to exceed 30-years, with interest. The sponsor must also pay the appropriate yearly portion of the operation and maintenance expense of the project. Approval of reallocations may be made by Congress, the Commander, USACE, or by divisions or district commanders, depending on the size of the reallocation and the impact on other purposes. The cost of reallocated storage is the higher of benefits or revenues foregone, replacement cost, or the updated cost of storage, which can become quite expensive in an older project. In reallocations, Section 322 of the Water Resources

Development Act of 1990 gives the Assistant Secretary of the Army limited discretion to authorize a lower price for low-income communities.

III-3. Irrigation and Agricultural.

The possibility of the Corps constructing a new large multipurpose project, which could include irrigation storage, is small. A contract for irrigation storage in a Corps project has not been entered into in over 30 years. Based on Section 103(c) of WRDA '86 agricultural water supply in Corps projects in the east is cost shared 65/35 Federal/non-Federal. For Corps projects in the west, agricultural water supply is administered by the Bureau of Reclamation.

III-4. Emergencies and Drought.

III-4.1. Emergency Provisions.

The programs administered under Public Law 84-99 are, by definition, means of last resort. In the droughts of the 1980's, many applicants came to the Corps before exploring other alternatives, and were chagrined to learn the law requires that all other reasonable means must be exhausted before the Corps has authority to help. Corps assistance is supplemental to state and local efforts. Long-term solutions to water supply problems are the responsibility of state and local interests. The authorities are not to be used to provide drought emergency water assistance in cases where an owner of livestock has other options, including raising funds from private sources through a loan, selling all or part of the herd, or relocation of the animals to an area where water is available. Federally owned equipment must be used to the maximum extent possible. Assistance can be made available to transport water for consumption and the Corps provides the cost of transporting water. The cost of purchasing and storing water, however, is the non-Federal sponsor's responsibility. Assistance can also be provided to construct wells, providing the Federal costs associated with well construction are repaid.

III-4.2. Drought Contingency Water.

Drought contingency water under Section 6 of the 1944 FCA may be used for water supply vulnerability revealed by droughts; the amount of water available, however, is more than likely limited and impacts on other project purposes must be considered. Water can be provided only if surplus water is available in the Corps reservoir. For those locations where the Governor of the state has declared a state of emergency due to drought, Corps project managers may approve withdrawals from 50 acre-feet of storage or less. This water can be made available for domestic and industrial uses but not crop irrigation. If the Corps reservoir has an approved Drought Contingency Plan, the District Commander can approve emergency demands that require less than 100 acre-feet of storage, and the Division Commander can approve demands

that require from 100 to 499 acre-feet. The term of the agreement will not exceed one year. Requests for large amounts and agreements not following the standard format should be submitted to HQUSACE. If reservoir operation manuals are revised, Section 310(b) of Public Law 101-640 requires opportunities for public participation.

III-4.3. Planning Assistance to States.

Under the program administered under Section 22 of Public Law 92-251, as amended, half the study costs are paid by the Corps, half are paid by the state. Half of the non-Federal sponsor's share of costs may be provided by in-kind products or services. Nationwide annual funds cannot exceed \$10 million; actual funding has been somewhat less. Not more than \$500,000 per state can be spent in any year. This is a popular program used to provide Corps planning expertise to support state water plans for all things, not just drought. Advance planning is required to get into the budget cycle. If consideration is not given until a drought has already started to occur, the possibility of early relief is diminished.

III-5. Regulatory and Permitting Requirements.

III-5.1. Introduction.

Corps regulators approve or deny permits for many water related activities, including new water supply projects. But unlike planners, regulators usually get involved long after a solution to the water resources problem has been designed. This practice is typical, but not necessary. Earlier involvement of regulators may be difficult to arrange, but there are good reasons to believe that it leads to better, cheaper water supply solutions, implemented more quickly and with less conflict. The relationship between the Corps regulator and an applicant is typically quite different from the relationship the Corps planner has with a non-Federal sponsor. Whereas the Corps brings the majority of the funding to the table when it plans a project, the regulatory process adds no money but (from the applicant's perspective) adds costs and time delays. Opportunities for adaptive management are even less in regulatory than in planning. Once an applicant's project is approved, the Corps typically has no further involvement, even though the terms of the permit may require mitigation with uncertain prospects for success.

III-5.2. Limitations Imposed by Section 402(b)(1).

- The project must represent least environmentally damaging, practicable alternative;
- The project must comply with the applicable requirements, both Federal (for example, Endangered Species Act) and state (such as state water quality standards);

- The project must not result in significant degradation of the aquatic environment; and
- All reasonable steps (for example, dredging windows or best management practices to reduce potential for erosion) must be taken to minimize project impacts.

III-5.3. Limitations Imposed by Section 404(b)(1).

The 1990 Department of Army - Environmental Protection Agency Mitigation Memorandum of Agreement clarifies the 404(b)(1) guidelines and requires that first impacts must be avoided and minimized (including compensatory mitigation) to the extent practicable to satisfy the requirements of the Guidelines. Furthermore, the MOA clarifies that Corps regulators may not consider mitigation when comparing alternatives and selecting the least environmentally damaging practicable alternative. The guidelines also require that if a project is not water-dependent, applicants must clearly demonstrate that a discharge into special aquatic sites is necessary to accomplish the project purpose.

III-5.4. Implications for Texas Water Supply Projects.

A Corps permit will be required for almost any surface water supply project. The Corps public interest review process allows members of the public to challenge the need for the water supply project and to propose that a less environmentally damaging, practicable alternative (including non-structural measures such as increased water conservation or improved drought planning) exists. A conscientious response by the Corps to a serious challenge can lead to extensive reconsideration of the basic planning assumptions made by the applicant. This will be met defensively by the applicant if a great deal of time and money has been spent on the alternative named in the permit application, especially if city councils have already bought land or approved municipal actions based on the specific alternative. This can result in an adverse relation between the city and the groups challenging the permit, with the Corps subject to criticism from both groups simultaneously. Cities will often enlist state and Federal legislative pressure to encourage the Corps to grant the permit as it stands, while non-governmental organizations may use the press to develop public pressure for the Corps to deny the permit. Funding of additional studies may be problematic. Under these conditions, it is unlikely that the best alternative solution will be discovered or approved.

III-6. Watershed and Shared Vision Planning.

With the exception of restricted authorizations such as Section 729 of WRDA '86, the biggest limitation on the use of watershed or shared vision planning is that the Corps has no general standing authority to apply these planning procedures. For water supply projects then, the Corps must find other implementation procedures. The most common approaches are:

- Through specific authorizations in a Water Resources Development Act or other Federal legislation;
- Through Section 22 (Planning Assistance to States);
- With regulatory funding that would otherwise be used for permit review, although this is a very limited resource;
- By the applicant, with the Corps and other interested parties as collaborators.

III-7. Special Legislative Initiatives.

Policy statements to the contrary, the Corps has planned and built water supply and wastewater treatment projects. These projects were added by Congress on a project-by-project basis. These projects are among the many water supply authorizations listed in Appendix B.

CHAPTER IV: SPECIFIC ISSUES RELATED TO TEXAS

Chapter IV constructs and discusses the institutional framework that describes how municipal and industrial water supply is administered and developed. The chapter focuses on regulatory and legal aspects of water supply rather than hydrologic and geologic considerations. In addition, discussion centers on the discovery, collection and transmission of water (i.e., water quantity) as opposed to water quality. The institutional framework includes the laws, legislation, policies and people that play a prominent role in Texas water supply. Laws and legislation govern water rights that in turn dictate how people may extract and use water. Policies are generally distinct from legislation in that they are rules that stem from general legislative authority. Lastly, people include the myriad of public and private organizations charged with water administration, management and/or planning.

IV-1 Texas Water Law

IV-1.1 Surface Water Rights in Texas

IV-1.1.1. Groundwater and surface water supplies are typically treated under distinct sets of rules and legal doctrines, and state law is the primary vehicle by which water rights are defined through the nation. Each of the fifty states has a different set of statutes for surface water rights, although there are strong regional underpinnings that are closely linked to climate. In the dry and arid west, appropriation rights predominate, while in the humid eastern half of the nation, the riparian doctrine usually prevails.

IV-1.1.2. The riparian doctrine is based on a body of civil law or “common law” created through court decisions rather than statutory laws enacted by legislatures. Several principles are fundamental to riparian rights:¹⁵

1. *Ownership*: Riparian rights are based on ownership of land adjacent to surface waters. A person has water rights under a riparian system if he or she owns riparian lands, and as a general rule, water use is restricted to nearby land.¹⁶
2. *Equality*: In principle, there is equality among riparian owners, and during shortages, no one right has precedence over another. Most states, however, have established a general

¹⁵ See, Gould, G. A. “*Water Rights Systems.*” Water Rights of the Fifty States and Territories. American Water Works Association, 1990. See also, MacDonald, J.B. “*The Riparian Doctrine.*” Water Rights of the Fifty States and Territories. American Water Works Association, 1990.

¹⁶ Geographic restrictions on water use depend upon the state in question. Restrictions can be limited based on watershed boundaries, one fourth of quarter sections (40 acres), a “reasonable” distance from the shore, the smallest lot in single ownership or a combinative of any of the above.

preference for domestic uses (drinking, cooking, washing etc.) over non-domestic uses (irrigation, manufacturing etc.).

3. *Irrelevance of use*: Use of water is not needed to initiate water rights and nonuse does not revoke rights. However, rights are lost when riparian land is sold, or if it is legal under state law, when one party transfers water rights to another.
4. *Limited government involvement*: Riparian water rights do not require government agency oversight and administration to allocate and distribute water. The only option for riparian owners who believe that their water rights have been infringed upon is to sue all other riparian owners in a court.¹⁷
5. *Reasonable use*: Riparian systems allow each rightful owner to withdraw as much water they deem necessary for “reasonable uses,” as long as the amount withdrawn does not interfere with reasonable uses of other riparian owners.

IV-1.1.3. In stark contrast to riparian systems, prior appropriation water rights are *not* inherent in land ownership.¹⁸ Priorities are established by the dates when users first secure water, and the system protects the rights of senior users from later appropriators. Prior claims to water take precedence over newer claims. The appropriation doctrine originated in the west when gold miners sought to protect claims. “First in time, first in right” is commonly used to describe appropriative rights.

IV-1.1.4. Several principles are fundamental to the prior appropriation doctrine that distinguish it from the riparian doctrine:

1. *Water use versus ownership*: While riparian systems are based on land ownership, water rights under prior appropriation are acquired by diverting (or impounding) and using water for a “beneficial” purpose. An appropriated water right is a vested real property right that grants a person the right to use water, however the state retains ownership of the watercourse through which appropriated water flows. Vested rights to use water are lost only if the owner voluntarily transfers it to others or involuntarily via abandonment or forfeiture. Abandonment is the failure to use the water granted by the water right over an extended period of time coupled with the owners to abandon that right. Forfeiture can apply in some states and does not require demonstration of intent to abandon.
2. *First in time, first in right versus equality among water rights-holders*: During shortages, the oldest rights prevail. Equality of rights does not prevail in prior appropriation systems.
3. *Beneficial use*: When a person or organization does not apply water to a beneficial use, they

¹⁷ There is a growing trend toward adoption of permit-based systems in the Eastern United States. Water shortages and drought are prompting some eastern states to correct perceived flaws in the riparian doctrine via establishment of permit systems administered by regulatory agencies.

¹⁸ See, Fischer, W. R. and Fischer W. “*The Appropriation Doctrine.*” Water Rights of the Fifty States and Territories. American Water Works Association, 1990.

violate the right to use the water. Water used for domestic purposes, industry, agriculture, navigation, mining, hydropower, recreation and wildlife are usually considered beneficial.

4. *State regulation*: States that operate under the appropriation doctrine administer and regulate water rights and withdrawals.

IV-1.1.5. The riparian doctrine forms the basis for water law in twenty-nine eastern states in the U.S., and nine western states have prior appropriation systems. The remaining ten western states, including Texas, originally recognized riparian rights but later converted to appropriation systems while preserving existing riparian rights.¹⁹

IV-1.1.6. Before 1967, surface water law in Texas was based on a combination of appropriated and riparian rights. Appropriated rights had evolved under Spanish and Mexican law, and riparian rights were recognized after Texas joined the Union.²⁰ The inherent flaw in such a system became apparent during the 1950s when Texas endured a seven year uninterrupted drought that is considered by many to be the worst recorded drought in the state's history. The 1950s drought caused severe water shortages in the Lower Rio Grande River. As water dried up, conflicts erupted over which rights had precedence over others. Under pure appropriation law, the oldest claims prevailed over newer ones. Under riparian law, no one water right took precedence over another and all suffered equally. Thus, under the hybrid system that existed in Texas, the answer as to which rights had precedence over others was unclear and court battles raged for years.²¹

IV-1.1.7. To remedy the situation, the Texas Legislature passed the Water Rights Adjudication Act (WRAA) in 1967. The WRAA established an administrative and judicial adjudication procedure that consolidated all surface water rights under a unified system by transforming previously held Spanish and Mexican grants and riparian claims into "certificates of adjudication." The WRAA required all riparian and unrecorded users of water to file claims with the Texas Water Rights Commission—the predecessor of the Texas Commission on Environmental Quality (TCEQ)—to settle claims through a judicial (i.e., adjudicative) procedure.²² The Water Rights Commission required claimants to prove that they had used a specific amount of water at a specified rate for a specified length of time. State district courts then reviewed each claim and the Commission's recommendation for each claim's disposition.

¹⁹Summary of Water Rights – State Law and Administrative Procedures. U.S. Army Corps of Engineers Institute for Water Resources. June 1992.

²⁰See, Texas Environmental Almanac. Texas Center for Policy Studies. 1995, and Texas Comptroller of Public Accounts, "*Forces of Change: Shaping the Future of Texas Volume II, Part I*."

²¹ For many years, Texas courts, water agencies and water users believed that Hispanic and pre-1840 republic land grants carried riparian rights to water. The Texas Supreme Court agreed with this assumption in the historic case of *Mott v. Boyd* (1926). However, in the 1950s construction of the Falcon Reservoir on the Rio Grande prompted the court to reexamine the issue. The Texas Supreme Court determined in *State v. Valmont Plantations* (1961) that rights to water for irrigation and other uses did not accrue from pre-1840 land grants unless expressly mentioned in the grant deed. See, Ronald Kaiser, A Handbook of Texas Water Law: Problems and Needs. College Station: Texas Water Resources Institute, Texas A & M University, 1986.

²² The TCEQ was formerly the Texas Natural Resource Conservation Commission. The agency changed its name in October of 2002.

Approved certificates were assigned priority dates that indicate when water use first began. Since 1967, Texas has adjudicated about 10,000 claims. The process is complete except in the Upper Rio Grande Basin, near El Paso, where a handful of claims are now being adjudicated.

IV-1.1.8. Although they both grant perpetual water rights, certificates of adjudication are distinct from water permits issued by the state.²³ Today, anyone wishing to obtain a new water right must obtain a permit from the state under Section 11.134(b) of the Texas Water Code. Permits grant rights to water that the State has not already appropriated via certificates of adjudication. Paragraph IV-3 discusses the permit process and other issues associated with developing water supplies in Texas.

IV.1.1.9. The WRAA and the adjudication process transformed surface water rights in Texas into a permit-based system that operates under the prior appropriation doctrine. Texas has issued about 6,800 water rights permits under the system. Appropriated rights to use surface water in Texas are analogous to holding a place in line. If there is enough water in a stream, every owner of a water right can use his or her specified amount of water. In the event that there is not enough water, persons in front of the line have priority. Riparian owners that use water for Domestic and Livestock (D&L) purposes are at the front.²⁴ Appropriations with the oldest priority dates are next in line, while uses with the newest priority dates are at the end of the line.

IV-1.1.10. Most water permits grant “run-of-the-river” rights that allow permit owners to divert surface water for beneficial off-stream uses. Other permits authorize users to impound water in a lake or reservoir for later use. If downstream run-of-the-river rights have older priority dates than upstream users with impoundment rights, they can require that stream flows into a reservoir be passed through the dam to satisfy their needs if all of the following are true:

- The downstream senior-right holder is not receiving his or her appropriated flow,
- Current inflows into the reservoir are greater than outflows,
- The water could reach the senior user under current stream conditions.²⁵

IV-1.1.11. Once water is stored, however, downstream water right holders cannot demand that impounded water be released for their use. Run-of-the-river rights, no matter how great their seniority, have no claim to water that has been legally stored in a reservoir, and during a drought, a downstream user with senior water rights cannot legally divert water released from a

²³Surface water rights can be abandoned or forfeited under Texas law. Forfeiture applies if water is willfully abandoned for three successive years. Intent to forfeit must be demonstrated, but generally speaking, nonuse for a period of time may raise a strong presumption that the right has been forfeited. Abandonment applies if all or some appropriated water is not beneficially used for ten consecutive years. In such a case, the Texas Commission on Environmental Quality can cancel water rights. Texas Water Code § 11.030.

²⁴ Domestic use refers to water utilized for lawn and gardens and for domestic activities such as drinking, washing and cooking, and use is restricted to riparian property. Domestic use does not include water for crop or pasture irrigation, and it is not analogous municipal use. Livestock use is water for open range livestock. Texas Water Code § 11.024

²⁵ “*Rights to Surface Waters in Texas.*” Texas Commission on Environmental Quality. May 2002.

reservoir that has been sold under contract to a buyer further downstream. For example, assume there is a drought and flows on the Brazos River are minimal and run-of-the-river water right “A” cannot divert his or her appropriated amount of water. The Brazos River Authority (BRA) owns rights for water impounded in several Corps reservoirs along the river. If one of these reservoirs was upstream of water right “A” and the BRA released stored water for a buyer downstream of water right “A,” then water right “A” could not prevent this water from reaching its intended recipient.

IV-1.2. Groundwater Rights in Texas

IV-1.2.1. In most states, laws governing groundwater differ from those that regulate surface water. There are four major doctrines for groundwater rights:²⁶

1. *Absolute ownership*: Under the absolute ownership doctrine, underground water is the property of whoever owns land above the groundwater source. Overlying landowners can pump unlimited quantities of water and use it however they desire. Most states have found it impractical to recognize the absolute ownership doctrine. Unlimited pumping can deplete groundwater aquifers and leave groundwater users at the mercy of high-capacity wells.
2. *Reasonable use*: As is the case with absolute ownership, the reasonable use doctrine holds that groundwater rights are directly tied to ownership of overlying land. However, if water withdrawal interferes with groundwater uses by neighboring owners, one must reduce his or her pumping if such use is “unreasonable.” Thus, in contrast to absolute ownership, the reasonable use doctrine places implicit limits on how water is used.
3. *Correlative rights*: The rule of correlative rights states that groundwater rights are not absolute, but are dependent upon the rights of overlying users, which in turn are based on the amount of acreage owned.
4. *Appropriation*: Appropriation systems for groundwater are similar to those of surface water in that priority dates are central, and water is regulated by way of permit systems administered at a state and/or regional level.

IV-1.2.2. The absolute ownership rule prevails in Texas. In *Houston & T. C. Ryan v. East* (1904), the Texas Supreme Court firmly established right of capture in the state. Since the *East* case, the general rule has been elaborated somewhat by Texas courts but has not been modified significantly.²⁷ Basically, if one owns land above an aquifer, he or she can pump as much as they would like despite impacts on the sustainable yield of an aquifer. Texas groundwater law has often been called the “law of the biggest pump.” The deepest, largest and most powerful wells get the most water.

²⁶ *Supra* note 1.

²⁷ See, Kaiser, R., *A Handbook of Texas Water Law: Problems and Needs*. College Station: Texas Water Resources Institute, Texas A & M University. 1986 and Caroom, D. G. “*Texas Groundwater Law*.” Presented at the 12th Annual Local Government Seminar. Austin, Texas. August 1999.

IV-1.2.3. There are several exceptions to the general rule. First, Texas courts have ruled that withdrawing groundwater cannot be done in a malicious manner with the express intent of injuring a neighbor, nor can it amount to “wanton and willful waste.”²⁸ Secondly, absolute ownership applies only to percolating groundwater and not to underground streams in defined channels. Texas courts and the legislature have made distinctions between percolating groundwater and underground streams. Surface underflows—also called subflows or supporting flows—have been declared as state property if they have the same characteristics of a surface watercourse such as beds and banks that form a channel and current.²⁹ Texas courts assume that all groundwater is percolating unless proven otherwise. However, neither the courts nor the state have provided defining parameters for underground streams. Apparently, this is due to a lack of sophisticated hydrological evidence needed to prove that groundwater is not “percolating.”³⁰

IV-1.2.4. Regulatory programs of regional Underground water Conservation Districts (UCDs) and the creation of the Edwards Aquifer Authority (EAA) represent an important development for groundwater use in the state. In 1949, the Texas legislature authorized the creation of UCDs in response to concerns over excessive withdrawals from the Ogallala Aquifer.³¹ In 1995, after decades of controversy and lawsuits, the legislature passed Senate Bill 1477 that created the EAA. The EAA and some UCDs have broad regulatory power. Creation of such districts represents a move toward local regulation of groundwater quantity in Texas.³²

IV-1.3. In-Stream Water and Environmental Water Rights

IV-1.3.1. In-stream water rights include uses such as navigation, wildlife habitat and recreation and do not involve the diversion or impoundment of water. Most western states recognize in-stream flows as beneficial uses and require that future appropriations of water do not diminish or deplete in-stream flows.

²⁸ See, *City of Corpus Christi v. City of Pleasanton*, 276 S.W.2d 798, 801 (1955).

²⁹ Texas Water Code § 11.021.

³⁰ In 1992, the Texas Water Commission (today the Texas Commission on Environmental Quality) declared that the southern Edwards Aquifer, which is San Antonio’s primary source of water, was an “underground stream” and imposed restrictions on withdrawals from the aquifer. Obviously, many people were not pleased with the imposed limitations on pumping, and the issue ultimately found its way into court. In *Danny McFadin and Texas Farm Bureau, et al. v. Texas Water Commission*, a State District Court ruled that the Water Commission did not have regulatory authority over groundwater withdrawals. Additionally, as part of the Edwards Aquifer Authority enabling legislation, Senate Bill 1477 declared that the Edwards Aquifer is *not* an underground river. No other underground water source has ever been designated an underground river in the State of Texas. See, Booth, M.J. “*Texas Water Rights*.” Presented at the Fundamentals of Water Law in Texas, June 1998, and Hutchinson, W. *The Texas Law of Water Rights*. January 1961.

³¹ Texas Water Code Chap. 36.

³² Section IV-2 of this chapter discusses UCDs and the EAA in more detail.

IV-1.3.2. In Texas, legislation has been in place since 1913 that gives the state power to require releases from Texas reservoirs for in-stream uses including fish, wildlife, water quality, recreation and bay and estuary protection.³³ The need to protect bays and estuaries prompted the legislature to expand state authority in 1975 and explicitly required TCEQ to consider impacts on bays and estuaries during the water right permit review process.³⁴ Estuaries and adjacent wetlands depend greatly upon the inflow from rivers and streams, which provides lifeblood of freshwater, sediments and nutrients. In 1985, the Texas legislature further expanded the state's role to evaluate the impacts of water projects on water quality and fish and wildlife. If state funding is involved for a reservoir project within 200 miles of the Texas coastline, 5 percent of the reservoir's firm yield must be appropriated for bay and estuary and in-stream uses.³⁵ The 1985 legislation also created a research and planning fund to study how proposed water supply projects affect bays and estuaries along the Gulf Coast. The Corps can provide 65 percent of the cost of projects or portions of projects to ensure water for the environment. For these projects, the non-Federal sponsor is required to provide all lands, easements, rights-of-way and disposal areas (LERRD). The value of LERRD is credited towards the sponsor's 35 percent share of total first costs and the Corps will reimburse the sponsor for the amount that LERRD exceeds 35 percent.

IV-1.3.3. Passage of the 1985 legislation reflected a rapid increase in the attention given to environmental protection in Texas. However, it remains to be seen just how Texas will balance environmental needs with municipal, industrial and agricultural demands now and in the future. Since 1986, all new permits or modifications to existing permits must consider impacts on environmental uses, but only about one-quarter or 2,154 of the 9,135 active permits have been granted since 1986. The remaining three-quarters of water permits have been issued without explicit consideration for environmental concerns. Some have argued that the state should bar new permits because of the environmental damage caused by current permit holders or that any new permits mandate that new water right-holders mitigate past environmental damages that may have resulted from past water supply projects.³⁶

IV-1.4. Interstate Water Compacts

Rivers and streams in Texas flow in other states including Arkansas, Louisiana, Oklahoma and New Mexico. Issues surrounding management of transboundary waters have led to the creation of interstate compacts. These agreements allow states to allocate water equitably and address other issues such as water storage and pollution control. The unique feature of compacts is that they provide a mechanism to avoid litigation in Federal courts. Compacts require congressional approval, and the Federal government usually participates in their

³³ Texas Water Code §11.134(b)(3)(c).

³⁴ Texas Water Code § 11.147.

³⁵ Texas Water Code § 15.347. Firm yield is the maximum amount of water a reservoir can supply annually during a repeat of the worst drought that particular area has experienced.

³⁶ Booth, M. J. "Texas Water Rights." Presented at the Fundamentals of Water Law in Texas. Austin, Texas. June 1998.

formation to protect Federal interests such as commerce and navigation. Texas has six river compacts that are summarized below:³⁷

1. *Rio Grande Compact*: Texas signed the Rio Grande Compact in 1938 with New Mexico and Colorado. Under the agreement, Colorado must deliver water to New Mexico and New Mexico must deliver water to Texas via the Elephant Butte Reservoir, which is located 100 miles inside of New Mexico. Despite the compact, litigation between New Mexico, Texas and Colorado has occurred, particularly during low flow conditions.
2. *Canadian River Compact*: The Canadian River Compact is an agreement between Texas, Oklahoma and New Mexico. In 1938, the U.S. Congress authorized the Corps to construct the Conchas Reservoir in New Mexico. The Conchas is on the main stem of the Canadian River and provides flood control for all three states and water supply for a 34,000-acre irrigation project in New Mexico. Under the compact, New Mexico may recapture all water in the river above the Conchas Dam, as long as it maintains 200,000 acre-feet of water in conservation storage below the dam.³⁸ Texas may store 500,000 acre-feet in conservation storage in the Canadian River, but storage in the Northern Canadian is restricted to household and domestic uses, livestock watering and irrigation for family farms. Oklahoma has unrestricted use of water. However, if Oklahoma constructs new storage facilities, the storage capacity allocated to Texas must increase under the compact. In the 1980s, Texas and Oklahoma sued New Mexico over alleged violations, and today Oklahoma is threatening to sue Texas over alleged violations. Oklahoma claims that Texas should not have built a reservoir on Palo Duro Creek in the Canadian River basin. Oklahoma officials say that the reservoir violates compact provisions that allow a project only if it serves domestic water needs. Texas officials claim the lake was built to provide water to cities, however Oklahoma officials believe that the reservoir does not serve domestic needs. Without the dam, the water would flow into the Overholser and Hefner lakes and Oklahoma City residents would use the water.³⁹
3. *Pecos River Compact*: In 1948, Texas and New Mexico established the Pecos River Compact. The agreement required New Mexico to maintain water deliveries depending on the amount of water reaching the river in New Mexico by natural causes. For years, Texas claimed negligence on the part of New Mexico, and in 1974 Texas sued. Ultimately, the U.S. Supreme Court ruled that New Mexico owed Texas 340,000 acre-feet of water for the period between 1950 and 1983, and ordered that New Mexico repay Texas with deliveries of 34,000 acre-feet of water a year for ten years.
4. *Sabine River Compact*: Louisiana and Texas signed the Sabine River Compact in 1953. The compact divides water in the Sabine River equally between the two states regardless of the

³⁷ Texas Water Code § 41.001 - § 47.011.

³⁸ Conservation storage refers to storage capacity in a reservoir that is allocated for beneficial purposes other than flood control such as municipal, industrial, agricultural and hydropower uses.

³⁹ See, “*Oklahoma Says Texas is Illegally Storing Water.*” U.S. Water News. September 2002.

source. Few conflicts have arisen with respect to the compact, probably due to an abundance of water in the region.

5. *Red River Compact*: Texas, Louisiana and Oklahoma signed the Red River Compact in 1978. The agreement divides the river into five sections that are in turn divided into five sub-basins. Each state is entitled to all water within their borders. States upstream of each section guarantee at least a 40 percent flow downstream.
6. *Caddo Lake Compact*: The Caddo Lake Compact was ratified between Texas and Louisiana in 1979, and augments and amplifies the Red River Compact by creating additional storage in Lake Caddo and restricting diversions from the lake.

IV-1.5. Wastewater Reuse

IV-1.5.1. In most M&I applications wastewater reuse is the process of using reclaimed water for a beneficial purpose. For example, rather than discharging treated effluent into a stream or river, a city wastewater treatment plant could capture or “reclaim” wastewater and use it for industrial cooling water or for landscape irrigation. Under current law, as long as a city or other entity keeps water “in the pipe” and does not release it into a water body, they can use the water unless their water right permit clearly states otherwise.⁴⁰

IV-1.5.2. Senate Bill 1 adopted several provisions related to reuse.⁴¹ For one, language of the bill distinguishes between return flows originating from groundwater and those derived from surface waters with respect to bed and banks permits used to transfer water for downstream uses.⁴² Under Senate Bill 1, criteria for a bed and bank permits used to transfer groundwater-based effluent are less stringent than effluent that stems from surface waters. A bed and banks permit for reused surface waters must undergo a new water rights determination by the TCEQ. Reused groundwater, which is not regulated by the state, does not. The reason for this is that the rights of many senior water rights holders were issued based on water availability studies that did not - at the time - separate wastewater returns from stream flow measurements. Another related provision of Senate Bill 1 affecting wastewater reuse is a provision stating that surplus water

⁴⁰ Texas Water Code § 11.046(c).

⁴¹ In 1997, the Texas legislature passed Senate Bill 1 - more popularly known as the “Water Bill “ – that among other features, substantially changed the way Texas conducts water planning, water-availability modeling, financing and drought management. Senate Bill 1 shifted the emphasis from water development to better management of existing water resources through conservation, drought management, reallocation and reuse of treated wastewater. This is being accomplished at the regional level through regional citizen planning groups.

⁴² A bed and banks authorization is a permit from the TCEQ that allows an upstream water rights holder to release water into a river or stream and “transfer” the water for downstream uses. For example, assume that an upstream water rights holder that has impounded water in a reservoir and wishes to sell the water to a downstream industrial user. There is no pipeline connecting the two users, and therefore the upstream user must utilize the river to transport water to the buyer. This would require a bed and banks authorization from the TCEQ.

(i.e., water without a beneficial use) that is returned to a stream is subject to state appropriation by others unless the permit states otherwise.⁴³

IV-1.5.3. In general, state laws in Texas regarding wastewater reclamation are not fully developed, and according to some, they will not be settled any time in the near future.⁴⁴

IV-1.6. Federal Contractual Water Rights

IV-1.6.1. Federal contractual water rights in Texas are important with respect to water supply because the Federal government built and operates many of the state's large reservoirs. As discussed previously, there are two primary authorities through which the Corps can support M&I water supply: 1. The Flood Control Act of 1944 (Public Law 78-534), and 2. The "Water Supply Act" of 1958 (namely Title III of the Rivers and Harbor Act, Public Law 85-500). The Water Supply Act (WSA) authorizes the Corps to provide storage space for M&I use under certain repayment conditions, while the Flood Control Act (FCA) authorizes actual sale of water from Corps projects. Given that this involves physical water as opposed to storage space, some discussion of state versus Federal water rights is warranted.⁴⁵

Under Section 6 of the FCA, the Secretary of the Army has the exclusive authority to:

*"to make contracts with states, municipalities, private concerns or individuals, at such prices and on such terms as he may deem reasonable for domestic and industrial uses for surplus water that may be available at any reservoir under his control, provided such contracts shall not adversely affect the existing lawful uses of such water."*⁴⁶

The FCA does not explicitly require the Secretary of the Army to conform to state law, however the declaration of policy section of the FCA states that.

*"it is hereby declared the policy of the Congress to recognize the interests and rights of the states in determining the development of the watershed within their borders and likewise their interests and rights in water utilization and control."*⁴⁷

IV-1.6.2. U.S. court rulings clearly support the above policy declaration. In *Ickes v. Fox*, the U.S. Supreme Court rejected an argument by the U.S. Bureau of Reclamation (USBR) that

⁴³ *Supra* note 26.

⁴⁴ See, Booth, M.J. "Texas Water Rights." Presented at the Fundamentals of Water Law in Texas, June 1998.

⁴⁵ See, Boronkay, C. and J. Muys, "Federal Contractual Water Rights." Water Rights of the Fifty States and Territories. American Water Works Association, 1990.

⁴⁶ Flood Control Act of 1944 (33 U.S.C. § 708).

⁴⁷ 33 U.S.C. § 701-1.

the Secretary of the Interior has the authority to reduce the amount of water that users were entitled to under their contracts. The water user in this case was the Sunnyside Irrigation District in the State of Washington. The USBR argued that it owned the water rights in its reservoir, and thus could reduce the amounts of water under contract. In its explanation the court stated that:

“Although the government diverted, stored and distributed the water, the contention of petitioner that thereby ownership of the water or water rights became vested in the United States is not well-founded. Appropriation was made not for the use of the government but, under the Reclamation Act, for use of the landowner; and by the terms of the law and of the contract already referred to, the water-rights became the property of the landowners, wholly distinct from the property right of the government in the irrigation works.”

IV-1.6.3. More recently, the Supreme Court reviewed *Ickes v. Fox* in *Nevada v. United States*.⁴⁸ The court found that while the Federal government may appropriate water for individual project users, the ownership of water rights is not derived from water-delivery contracts, but by beneficial use according to state law. Thus, it is clear that water rights are separate and distinct from property rights to the reservoir itself.

IV-1.6.4. Another factor to consider with respect to contracts for stored water is the nature of “surplus water” identified in Sec. 6 of the FCA. The Corps defines surplus water as either: 1. Water stored in a Corps reservoir that is not required because the authorized need is reduced by changes that have occurred since the authorization took place, or 2. Water that could be put to a more beneficial use than was previously authorized, and that when withdrawn would not adversely affect existing lawful uses of such water over some specified period.⁴⁹ The difficulty with surplus water is that courts have ruled that the Federal government does not own rights to water stored in reservoirs. Without property rights to water, contractual sales to others are groundless. To avoid problems, the Corps contracts for water storage space only as authorized by the Water Supply Act of 1958, and they require that customers and/or local sponsors obtain necessary water rights from the states.

IV-2 Roles and Authorities of Key Organizations in Texas Water Supply Development and Management

Water law and water rights form one tier of the institutional framework for water supply in Texas. Another critical foundation is the many individuals and groups of individuals who play key roles in water supply development and management. Although different groups often have various interests and agendas, the overarching goal is to ensure a safe and sustainable water supply for individuals and the state as a whole. The following section outlines the roles and responsibilities of key organizations and agencies involved in Texas water supply.

⁴⁸ *Nevada v. United States*. 463 U.S.C. 110 (1983).

⁴⁹ *Supra* note 2.

IV-2.1. Private Suppliers and Non-Governmental Organizations (NGOs)

IV-2.1.1. Private water supply companies are numerous in Texas. About 4,500 private water suppliers provide potable water to approximately 10 percent of the state’s population. Private water suppliers are classified as non-community systems and typically service individual businesses—primarily farms and ranches.

IV-2.1.2. Non-governmental organizations or “NGOs” consist of private special interests groups including lobbyists, and in particular, environmentalists including the Texas Chapter of the National Wildlife Federation, the Environmental Defense Fund and the Lone Star Chapter of the Sierra Club. Although, these groups do not have formal authority, they are important players in the institutional framework. For example, in 1998 a river authority in Texas and a major environmental group filed suit in Texas courts claiming that depletion of the Edwards Aquifer was destroying the habitats of several species listed on the Federal government’s endangered species lists. The suit was partially successful for both plaintiffs, and the court mandated that U.S. Fish and Wildlife update a habitat recovery plan. However, the ultimate goal of restricting pumping from the aquifer was not achieved.

IV-2.1.3. Another excellent example occurred two years ago when a local river foundation applied to the TCEQ for a water rights permit.⁵⁰ The foundation filed an application authorizing them to appropriate 1.15 million acre-feet of river water as a beneficial use in bays and estuaries along the Gulf of Mexico.⁵¹ The move by the environmental group was a preemptive strike against a large river authority that had planned to use the water for a large water supply project. The group’s permit is currently under review by the TCEQ. According to the group’s attorneys, an environmental water right is legal under Texas law and there is enough water for appropriation. The issue will probably end up in court regardless of the outcome of the permit application.

IV-2.1.4. Other special interest groups include organizations that represent public and private water suppliers and water right holders. The Texas Water Conservation Association (TWCA) is a powerful lobbying organization representing local and regional water suppliers including local utilities, water districts, river authorities and others. The TWCA’s stated purpose is to “promote and support the development, conservation, protection and utilization of the state’s water resources.” The Texas Rural Water Association (TRWA) is a nonprofit statewide trade association with an active membership consisting of more than 700 municipal utility districts, special utility districts, nonprofit water supply corporations, small-town water departments, investor-owned utilities and individual members. In addition, more than 200 water

⁵⁰ See, Bernstein, J., “*The Rights of a River.*” The Texas Observer.” June 2002.

⁵¹ The amount requested for appropriation is not arbitrary. As mentioned previously, since 1985 the legislature has required the TCEQ and Texas Parks and Wildlife (TPWD) to consider in-stream flows and the needs of estuaries when reviewing permit applications. In 1998, a TPWD report estimated that the bays and estuaries supported by the San Marcos require 1.5 million acre-feet per year to remain healthy.

industry suppliers participate in TRWA activities as associate members. The TRWA members provide water and wastewater service to 2.5 million customers throughout Texas.

IV-2.2. Local and Regional Roles in Texas Water Supply Development and Management

Today, a plethora of local agencies and corporations are involved in supplying water for municipal, industrial and agricultural use. Several units of local government in Texas are authorized to engage in water programs including counties and municipalities. The extent to which counties and municipalities exercise their authority varies considerably. Early in the state's development, Texas relied on county government to undertake many water functions including navigation, water supply and irrigation. However, county programs were limited given that the Texas Constitution permits only special assessment taxes to finance water improvements. In 1904, Texas amended its constitution to promote public development of water resources, and authorized the first water districts (special tax districts) that in turn have become one of the most important units of local government involved in Texas water supply.⁵²

IV-2.2.1 Water Districts and Water Authorities

IV-2.2.1.1. Water districts in Texas direct a variety of major water programs including: water supply, flood control, drainage, navigation, irrigation, sewage disposal, power supply, groundwater control, mosquito control, soil conservation and recreation. Tasks of supplying or controlling water often involve the construction of levees, dams, lakes and power facilities, or the channeling, clearing and maintenance of streams and rivers. The TCEQ or county commissioners can create general law water districts. "Special law" districts are established or altered by the state legislature. Table IV-1 summarizes state laws that apply to the establishment and operation of water districts. Chapters 49 through 66 of the Texas Water Code specify the powers and duties of different types of districts. Other code that may apply to districts includes laws that govern topics such as taxes and local governments. Special law districts must comply with the language in the legislative act that created the district.⁵³ State law allows most districts to incur debt, charge for services, enter into contracts (including water storage and delivery), obtain easements and condemn property. With the exception of river authorities, most districts can levy taxes.

IV-2.2.1.2. Texas has many types of water districts, but from the perspective of municipal and industrial water supply the following are probably the most common:

1. *Municipal Utility Districts, Water Supply Corporations and Water Control and Improvement Districts*: In Texas, there are more than 1,000 Municipal Utility Districts (MUDs) and Water Supply Corporations (WSCs) that can develop water supply by building reservoirs, drilling

⁵²Thompson, J.T., "Water Agencies and Programs." Texas Historical Society. July 2002.

⁵³See, "Texas Water Districts: A General Guide." Texas Commission on Environmental Quality. April 2000.

wells or by contracting with river authorities and Federally owned reservoirs for water storage and/or delivery. Both MUDs and WSCs can operate water supplies, however there are some major differences between the two. The most significant distinction is that MUDs are recognized political subdivisions of the state, while WSCs are not. This means that MUDs have to comply with open meeting laws and regulations of the Texas Election Commission. The WSCs does not. The MUDs are tax-exempt, can obtain Federal and state grants and/or loans for capital improvement projects, they have a tax base and general funds and they are able to support bond referendum proposals. The MUDs typically receive a large portion of their revenue from property taxes. The WSCs are not qualified to receive state loans or grants and do not have taxing authority. Their sole sources of income are loans from the Farmers Home Administration, private-lending institutions, privately financed bonds and income from water sales. Capital improvement projects or other cost intensive outlays undertaken by WSCs can usually be financed only by raising the rates charged to members of the system. In general, MUDs are larger and more engaged in large-scale water supply projects. Water Control and Improvement Districts (WCIDs) are very similar to MUDs, but they only deal with water.

2. *River Authorities:* River authorities in Texas are special law districts that operate and own major reservoirs and market wholesale raw water for municipalities, industries and agriculture. According to the language of their enabling acts, river authorities may also have responsibilities for flood control, soil conservation and water quality. Some authorities also generate hydropower, provide retail water and wastewater and develop recreational facilities. Unless stipulated in their enabling legislation, river authorities cannot levy taxes, but all can issue bonds based on projected revenues from sales of water and electricity.

Table IV-1. Summary of Laws Affecting General and Special Water Districts in Texas

Item	Code
General Law Districts (administrative provisions)	TWC Chap. 49
Municipal Utility Districts	TWC Chap. 49-54
Water Control and Improvement Districts	TWC Chap. 49-51
Special Utility Districts	TWC Chap. 49-65
Open Meeting Acts	TGC Chap. 551
Public Information Acts (open records)	TGC Chap. 552
Public Funds Investment Act	TGC Chap. 2256
Public Funds Collateral Act	TGC Chap. 2257
Contract award (competitive award)	TWC Chap. 49
Financial Activity Levels	TWC Chap. 49
Taxes	Texas Tax Code
Uniform Election Dates	TEC Chap. 41
Conflicts of Interest	TLGC Chap. 171
Impact of Fees	TLGC Chap. 395
Eminent Domain	TPC Chap. 21 and TWC Chap. 49
TWC-Texas Water Code, TPC-Texas Property Code, TLGC-Texas Local Government Code, TGC-Texas Government Code, TEC-Texas Election Code, TAC-Texas Administrative Code.	

IV-2.2.2. Groundwater Conservation Districts

IV-2.2.2.1. The Texas legislature first provided for the voluntary creation of groundwater conservation districts (GCDs) in 1949. The GCDs can be established over any groundwater reservoir designated by the state. They can be created by several procedures including legislative action, petition by landowners to the TCEQ and by adding territory to an existing district.⁵⁴ The legislature has created most GCDs rather than the TCEQ. Apparently, the administrative route provided by general law is more cumbersome, and allows more opportunity for effective opposition to creating a district. In most instances, legislative creation shortcuts the administrative process and establishes a district following a confirmation election.⁵⁵

IV-2.2.2.2. As of January 1999, there were 45 groundwater conservation districts existed in Texas (see Figure IV-1). The rationale for supporting the creation and control of GCDs relates to the diversity of climatic conditions, water use patterns, growth projections and aquifer characteristics across the state. Such diversity would make it difficult to formulate and administer uniform state laws and regulations to govern the development and use of groundwater statewide. Locally controlled GCDs with rules, programs and activities that specifically address local problems and opportunities appears to be the preferred method in Texas for groundwater management.

IV-2.2.2.3. The GCDs have required duties that they must perform as well as a number of authorized powers that they may invoke. Some required duties of GCD include:

- Developing and adopting comprehensive management plans for efficient use of groundwater, for controlling and preventing waste of groundwater, and for controlling and preventing land subsidence.
- Requiring permits for drilling, equipping or completing wells that produce more than 25,000 gallons per day or for alteration to well size or well pumps (all wells producing at least 25,000 gallons per day in existence prior to the district's creation must automatically be granted a permit).

Authorized powers and optional duties allow groundwater conservation districts to:⁵⁶

- Adopt rules to conserve, preserve, protect, recharge and prevent waste of groundwater and control land subsidence.
- Provide for the spacing of water wells and regulate the production of wells.
- Acquire land to erect dams or to drain lakes, draws and depressions; construct dams and to establish sites for groundwater recharge.

⁵⁴ Texas Water Code Chap. 35 and 36.

⁵⁵ See, Caroom, D.G., "Texas Groundwater Law." Presented at the 12th Annual Local Government Seminar, Austin, Texas. August 1999.

⁵⁶ Texas Water Code Chap. 36 subchapter. D.

- Purchase, sell, transport and distribute surface water or groundwater for any purpose.
- Carry out research projects and collect information regarding the use of groundwater, water conservation and the feasibility of recharging groundwater reservoirs.
- Promulgate rules to require permits for transferring groundwater out of a district.

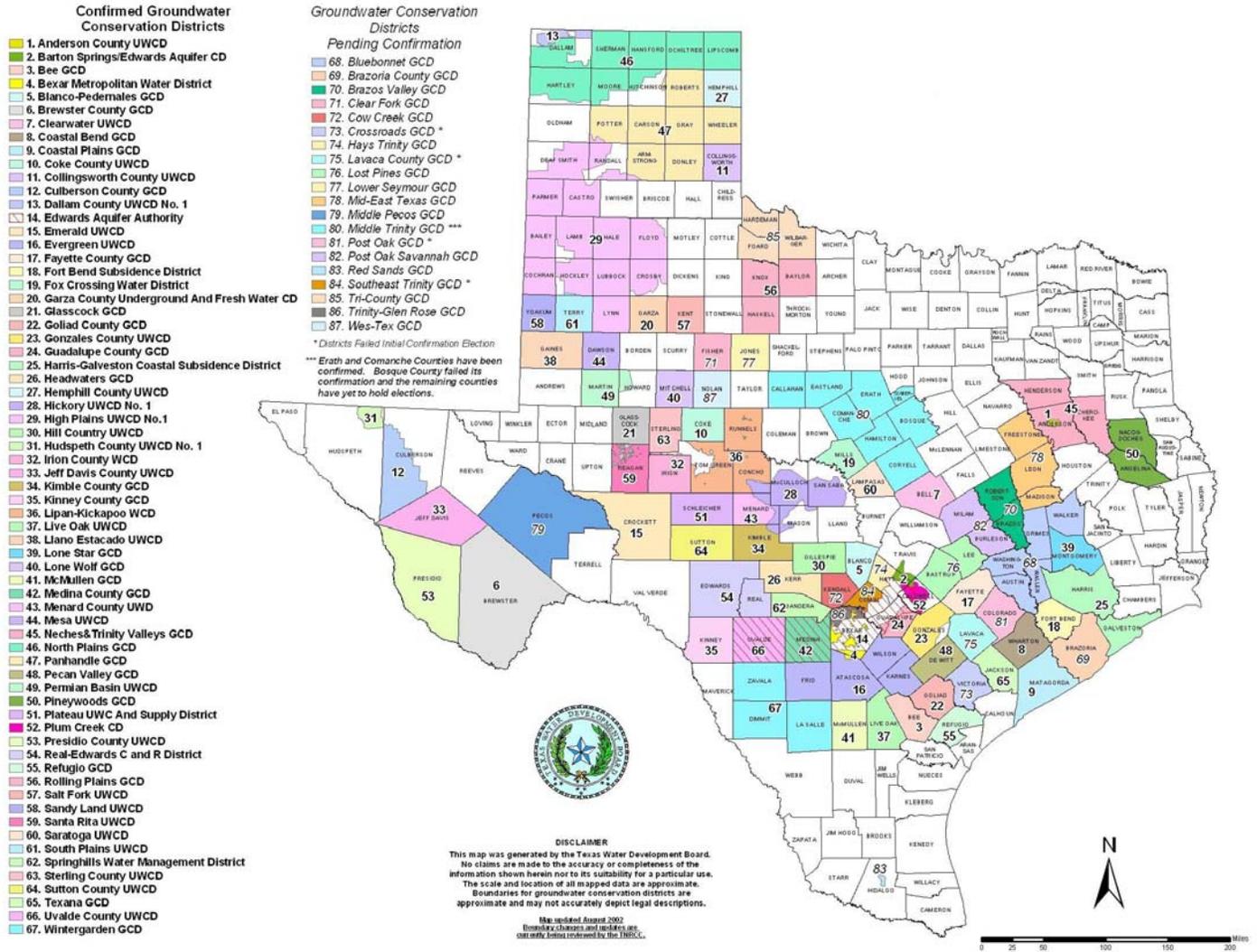
IV-2.2.2.4. Some GCDs have the authority to levy *ad valorem* taxes, which are subject to a confirmation election by voters within the proposed district. Voters also elect directors and approve tax rates for district financing.

IV-2.2.2.5. Senate Bill 1 reconfirmed and strengthened provisions for creating GCDs by state initiative in priority groundwater management areas (PGMAs). The PGMAs may be designated by the TCEQ in regions that are experiencing or that are expected to experience (within the next 25 years) critical groundwater problems such as water shortages, contamination and land subsidence. A detailed study is conducted before an area is declared a PGMA. To the extent possible, PGMAs are to coincide with the boundaries of groundwater formations. To date, sixteen PGMA studies have been completed, and four study areas have been designated PGMAs.

IV-2.2.3. Regional Water Planning Groups

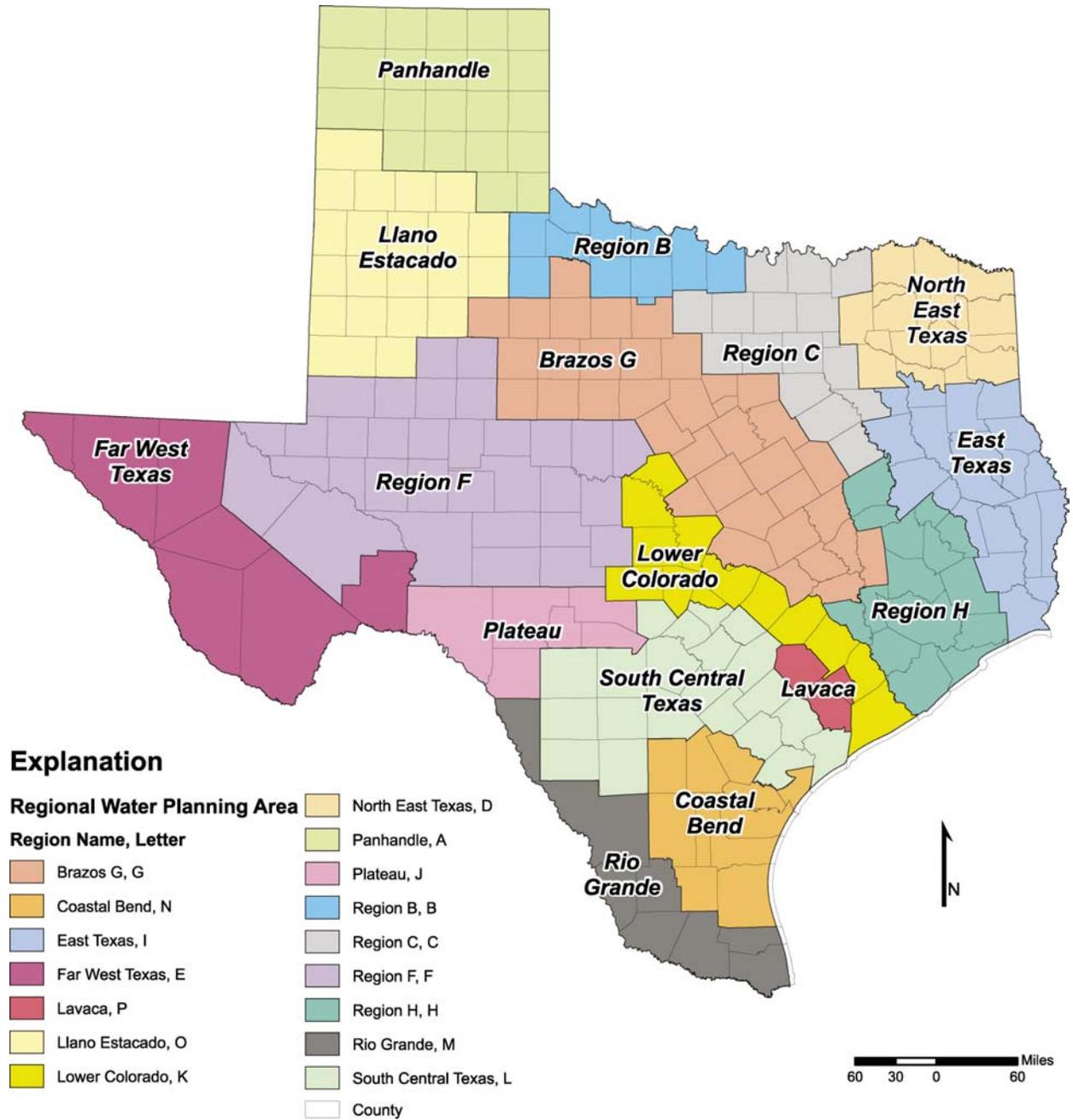
In addition to strengthening GCDs, Senate Bill 1 requires the Texas Water Development Board (TWDB) to develop a state water plan to guide current and future water policy decisions for Texas. The Bill specified that the TWDB incorporate the views and approaches of sixteen Regional Water Planning Groups (RWPGs). Each RWPG is responsible for developing a regional water plan, establishing water policies and developing water supply strategies and options over a 50-year period. Typically, RWPGs are composed of state and local officials, major water users, major water suppliers, municipalities and environmental groups. Figure IV-2 displays the geographic areas covered by each RWPG.

Figure IV-1: Groundwater Districts in Texas: Confirmed and Pending



Source: Texas Water Development Board

Figure IV-2: Regional Water Planning Groups in Texas



Source: Texas Water Development Board

IV-2.3. State Roles and Responsibilities in Texas Water Supply Development and Management

In Texas, the state's primary role in water supply development includes regulating and administrating water rights; and planning, funding and developing water supplies. Key organizations at the state level are the Texas Commission on Environmental Quality (TCEQ), the Texas Water Development Board (TWDB), and to a lesser extent, the Texas Parks and Wildlife Department (TPWD).

IV-2.3.1. Texas Commission on Environmental Quality (TCEQ)

IV-2.3.1.1. The TCEQ administers water rights in Texas via appropriation and permitting.⁵⁷ In many river basins, TCEQ relies on an honor system among water rights holders and there is no cost of enforcement. Under the honor system, water users are expected to adhere to the conditions of their water permit. The honor system works fine in basins where water is abundant such as those in east Texas. However, in west Texas water is not as plentiful and water users lack a reliable way to determine how much water is being diverted from rivers and streams, or how much they must allow to pass to senior users. Conversely, junior right holders upstream may be diverting or impounding water that should be released downstream to senior rights holders. Complaints such as these are particularly pronounced in the Brazos, Lower Colorado and Concho River basins.⁵⁸ Without an agency role or representative, it is difficult to determine who is following the law.

IV-2.3.1.2. The TCEQ's watermaster program was established to ensure compliance with water rights laws. Watermasters are officers appointed by the TCEQ who monitor stream flows, reservoir levels and water use. They also coordinate diversions and use in basins they manage, and regulate reservoirs as needed to prevent water waste. Prior to diversion, water rights holders must notify watermasters how much they intend to divert and when. Watermaster programs include staff "deputies" who conduct field inspections of authorized diversions to insure compliance with water rights. If water right holders do not comply with the terms of their water right or TCEQ rules, the TCEQ can direct watermasters to adjust control works to prevent owners from using water until he or she complies.

IV-2.3.1.3. Under Texas law, an application for a water permit can be approved only if unappropriated water is available, and issuance of a permit does not adversely affect existing water rights holders. Consequently, the TCEQ has to know how much water is available

⁵⁷ The focus of this chapter is on water quantity, however the TCEQ is the state's primary agency for regulation and enforcement of air and water quality laws. In addition, it should be noted that administration of water rights is unique along the U.S.-Mexico Border. Under provisions of U.S. treaties with Mexico, the U.S. International Boundary and Water Commission (IBWC) determines when water can be released from the Amistad or Falcon Reservoirs for use on the U.S. side of the Rio Grande River. Although a detailed discussion is beyond the scope of this chapter, some aspects of water rights administration in the Rio Grande Basin are unique as well.

⁵⁸ *Supra* note 10.

throughout the state. To do this, the TCEQ has developed Water Availability Models (WAM) for eight of the major river basins. Models consist of data files and computer programs used to analyze surface water allocation under the state's water rights system and estimate unappropriated stream flows. Senate Bill 1 authorized major development of WAM tools including the incorporation the Water Rights Analysis Package (WRAP). WRAP is a generalized river/reservoir systems simulation package based on the Texas water rights system. Researchers have applied the model in the Brazos, San Jacinto and Lavaca River Basins.⁵⁹ TCEQ is assessing several alternative reservoir/river WAM applications. The agency needs flexibility in simulating several components of an overall model including water rights, reservoir system operations and various water use requirements. Areas of potential model development include:

- Improved representation of channel losses and subsurface/surface interactions,
- Multiple reservoir operating policies,
- Return flows,
- In-stream flow requirements,
- Water quality constraints, and
- Reliability indices.⁶⁰

IV-2.3.1.4. Another important role of the TCEQ is administration of Section 401 of the Clean Water Act.⁶¹ Under Section 401, states have the authority to review and certify projects (including water supply) that are in line to receive Section 404 permits. The goal is to ensure that projects comply with state water quality standards.⁶² A 401 certificate is part of a Federal permit, and state involvement takes place in response to and in conjunction with the Federal permit process. TCEQ may take one of four actions when deciding whether to certify an application:

1. *Grant certification:* By certifying a permit, TCEQ declares that a proposed project will not violate state water quality standards as specified in the Texas Water Quality Control Act.⁶³
2. *Conditional certification:* The agency may place limits or conditions on certifications necessary to assure compliance with water quality standards. Set conditions must be included in the Federal Section 404 permit or certification is denied.
3. *Deny certification:* If the project will violate water quality standards or other applicable requirements, the TCEQ will deny certification. The Corps cannot issue a 404 permit that has been denied certification.

⁵⁹ See, Wurbs and Dunn, D.D., “*Water Rights Analysis Package (WRAP), Model Description and Users Manual, TR-146.*” Texas Water Resources Institute. October 1996.

⁶⁰ See, Wurbs, R.A., “*Water Rights Considerations in Reservoir System Management.*” Texas A&M University 1996.

⁶¹ If the project relates to gas and oil exploration, the authority rests with the Railroad Commission of Texas.

⁶² Wetlands are classified as “waters of the state” under Chapter 26 of the Texas Water Code and are subject to surface water quality standards. Procedures and criteria for the application, processing and review of water quality certifications are found in TCEQ rules contained in 30 TAC §§279.1 - 279.13.

⁶³ Texas Water Code § 26.001.

4. *Waive certification*: The TCEQ may expressly waive its authority to certify activities because they will not result in a discharge, or they do not fall within the purview of the Commission's authority.⁶⁴

IV-2.3.1.5. In addition to its regulatory mandates, the TCEQ performs several functions that affect water supply development and management including:

- General supervision and oversight of water districts and utilities,
- Processing of petitions to create districts and applications to approve utility service areas,
- Maintaining approval authority over many utility matters including review of most district bond issues to assure the engineering and economic feasibility of projects and the rates charged by privately-owned and member-owned utilities,
- Monitoring drought conditions,
- Permitting for weather modification projects,
- Assisting public drinking water systems in preparing drought contingency plans, and
- Providing technical assistance to public water utilities.

IV-2.3.2. Texas Water Development Board (TWDB)

IV-2.3.2.1. The TWDB serves as the state's primary conduit for water supply funding and as the state's lead water resource planning agency. The TWDB provides loans to local governments for:

- Water supply projects,
- Water quality projects including wastewater treatment,
- Municipal solid waste management,
- Non-point source pollution control,
- Flood control projects,
- Agricultural water conservation projects, and
- Expenses associated with creation of groundwater district

IV-2.3.2.2. Financial assistance programs of the TWDB are funded through state-backed bonds, Federal grant funds and/or limited appropriated funds. Since 1957, the legislature and voters have approved constitutional amendments authorizing the TWDB to issue up to \$2.68 billion in bonds. According to the TWDB, they have sold nearly \$1.55 billion in bonds to finance

⁶⁴ In the 76th State Legislature (1999), a bill was introduced that "encouraged" the TCEQ to eliminate duplication between its Section 401 certification program and the Corps review under Section 404. Specifically, language in the Bill dictated that the TCEQ amend its rules to waive certification review of Corps permitted projects, and established that it was the intent of the legislature that the TCEQ be no more stringent than the Federal government in its review process, and that any savings realized by eliminating duplication should be used by the TCEQ to meet demands of its water quality protection program. The resolution was not passed into law.

the construction of water and wastewater-related projects. In 1984, Texas House Bill 2 mandated that all water and wastewater loan recipients develop and implement water conservation programs and drought contingency plans. The TWDB can loan money for municipal water conservation projects at existing facilities.

IV-2.3.2.3. In 1987, the TWDB added the Clean Water State Revolving Fund (CWSRF) to its portfolio of financial assistance programs. Low-interest loans from the CWSRF finance costs associated with the planning, design, construction, expansion or improvement of water treatment facilities, wastewater recycling and reuse facilities, collection systems, stormwater pollution control projects and non-point source pollution control projects. Funded in part by Federal grant money, the CWSRF provides loans at subsidized interest rates. The TWDB also administers the Drinking Water State Revolving Fund (DWSRF) that provides for subsidized loans for water supply projects that facilitate compliance with the Federal Safe Drinking Water Act (SDWA).

IV-2.3.2.4. The 71st Texas Legislature (1989) authorized the TWDB to administer the Economically Distressed Areas Program (EDAP). The program provides financial assistance in the form of grants, loans or a combination grant/loan to bring water supply and wastewater services to economically distressed areas where current water and wastewater facilities do not meet the “minimal” needs of residents. Under state law, projects must be located in economically distressed areas within affected counties. Affected counties are those with per capita incomes 25 percent below the state average and unemployment rates 25 percent above the state average for the last three years. All counties along the U.S.-Mexico border are also eligible. The EDAP is primarily geared toward *colonies* along the Texas-Mexico border.

IV-2.3.2.5. In 2001, the 77th Texas Legislature passed the Rural Water Assistance Fund (RWAFF), which is also administered by the TWDB. The purpose of the RWAFF is to help meet rural demands for dependable and clean water by providing low-interest loans to “Rural Political Subdivisions” including water supply corporations and water districts or municipal utilities that serve populations of up to 10,000 or counties in which no urban area has a population greater than 50,000. The RWAFF primarily targets non-profit water supply corporations.

IV-2.3.2.6. The TWDB’s planning and research role includes:

- Developing a statewide water plan to guide water policy,⁶⁵
- Supporting state regions in developing regional water plans that are incorporated into the statewide plan,
- Collecting data and conducting studies on fresh-water needs of the state’s bays and estuaries in conjunction with the Texas Parks and Wildlife Department,

⁶⁵ The first plan – “*Water for Texas 2002*” - was finished in 2001 and will be update every five years.

- Administering the Texas Water Bank that facilitates transfers, sales or leases of water and water rights throughout the state,
- Administering the Texas Water Trust, where water rights are held for environmental in-stream flow maintenance purposes,
- Maintaining a centralized database of the state’s natural resource information (Texas Natural Resources Information System) including GIS databases,
- Providing agricultural water conservation funding and water-related research and planning grants,
- Providing funds for research to develop alternative technologies including desalination projects,⁶⁶ and
- Serving as state’s lead drought response planning agency.

IV-2.3.3. Texas Parks and Wildlife Department

Senate Bill 1 mandated that the TCEQ, TWDB and the Texas Parks and Wildlife (TPWD) devise an environmental planning methodology to consider in-stream water requirements when evaluating needs for new reservoirs and/or new or amended water rights permits. The TCEQ will use these “beneficial in-flows” to determine how much flow must be allowed to pass through any new reservoirs or direct diversions located within 200 miles of a bay or estuary, as well as the amount of flow that must be appropriated to in-stream flow maintenance when new water permits are issued or amended.

IV-2.4. Federal Role in Texas Water Supply Development and Management

Federal involvement in regional and local water supply in Texas has fallen largely on the Corps, the U.S. Bureau of Reclamation (USBR) and the U.S. Department of Agriculture (USDA), and to a lesser extent the U.S. Fish and Wildlife Service (USFWS).

IV-2.4.1. U.S. Bureau of Reclamation

IV-2.4.1.1. Since passage of the Reclamation Act of 1902 that provided for Federal construction of irrigation water projects, the USBR’s top statutory criteria for eligible uses for water deliveries has been agriculture. Agriculture uses most of the water developed by the USBR - 85 percent in 1992, which is the last year for which data are published. While the USBR is focused primarily on agriculture, several Federal laws authorize the USBR to provide M&I water supply.⁶⁷

⁶⁶ On April 29, 2002, Governor Rick Perry directed the TWDB to develop a recommendation for a demonstration seawater desalination project as one step toward developing desalination as viable water supply alternative for Texas.

⁶⁷ “1992 Summary Statistics: Water, Land, and Related Data.” U.S. Bureau of Reclamation. 1992.

- Town Sites Act of 1906 – authorizes lease and delivery of USBR project water to nearby towns,
- Sale of Water for Miscellaneous Projects of 1920 – authorizes delivery of USBR project water for purposes other than irrigation,
- Reclamation Project Act of 1939 - Section 9(c) – authorizes contracts for municipal water supply or for miscellaneous purposes, and the
- Water Supply Act of 1958 – Authorizes storage in either Reclamation or Corps projects for present or future municipal and/or industrial needs.

IV-2.4.1.2. Historically, the USBR has functioned primarily as a construction agency. Through the 1980s, funding for project construction accounted for 95 of the USBR’s budget, but since then there has been a marked decline in USBR water supply projects.⁶⁸ The last traditional irrigation project built by the USBR was authorized in 1979. By the end of the 1990s, project construction accounted for only about 45 percent of the agency’s funds. The purpose of USBR projects is also changing. Of projects authorized since 1979, more than a third were for wastewater reuse, while only a quarter involved traditional multipurpose projects.⁶⁹

IV-2.4.1.3. Between 1988 and 1994, the USBR underwent major reorganization as construction on projects authorized in the 1960s and earlier were complete. Emphasis in USBR programs shifted from construction to operation and maintenance of existing facilities. USBR’s redefined official mission is to “manage, develop and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.” In redirecting its programs and responsibilities, the USBR has substantially reduced staff levels and budgets. Nevertheless, the USBR still plays a very important role in providing water to western states.

IV-2.4.1.4. The change in the USBR’s mission has resulted from a number of policies. The most important of which was probably the implementation of cost benefit criteria for new projects. As is the case with the Corps, the financial terms between water users and the USBR have changed in recent years. The *Water Resources Development Act of 1986* (WRDA’86) requires a 100 percent local cost-share for USBR and Corps water supply projects.⁷⁰ WRDA’86 also requires a 50 percent cost-share for feasibility studies. In 1992, Congress established rules related to cost-sharing appraisal studies and construction of water reuse and recycling projects. In 1996, the USBR implemented a policy that shifts costs of capital improvements to project

68 See, “Water in the West: Challenges for the Next Century.” Western Water Policy Review Advisory Commission. 1997.

69 Cody, B.A., “Reclamation Project Authorization and Financing since 1979.” Statement before the Subcommittee on Water and Power, Oversight hearing on Bureau of Reclamation funding options for water project construction, enhancement, rehabilitation and mitigation, May 6, 1997. U.S. Congress, House of Representatives, Committee on Resources, Printed Hearing 105-31.

70 Section 932 of WRDA’86 also amended the Water Supply Act of 1958 by (1) eliminating the 10-year interest free period for future water supply, (2) modifying interest rate formulas, (3) limiting payment to 30 years and (4) requiring annual operation and maintenance and replacement costs to be reimbursed annually. However, Section 932 does not apply to USBR projects.

beneficiaries, while the USBR funds costs for non-reimbursable expenses such as fish and wildlife. Policies also began to shift towards environmental issues such as water quality and in-stream flows that added a much greater burden on large-scale projects that would reduce river flows and divert water for other uses.

IV-2.4.2. U.S. Army Corp of Engineers

IV-2.4.2.1. Today, the Corps primary role in Texas water supply is through operations and maintenance of its multi-purpose reservoirs, and its regulatory authority under Section 404 of the Clean Water Act. Like the USBR, the Corps is primarily a construction agency, but today both agencies spend more on operations and maintenance than construction. While Corps appropriations have generally grown over the years, the portion allocated to construction has fallen from more than 80 percent in the 1960s to less than 40 percent today. The overall decline has affected new reservoir construction in Texas and elsewhere.

IV-2.4.2.2. In Texas, the shift away from new reservoir construction is apparent in both historical reservoir construction and state water plans.⁷¹ As shown in Figure IV-3, Texas had only one reservoir before the year 1900, but by 1950, Texas had constructed 62 major reservoirs (i.e., reservoirs with more than 5,000 acre-feet of storage). Between 1950 and 1980, an additional 122 reservoirs were constructed at an average rate of four per year. The pace slowed after about 1970. From 1980 through 2000, Texas constructed 27 additional reservoirs. The state's 2002 water plan has recommended that only eight new reservoirs be constructed through 2050.

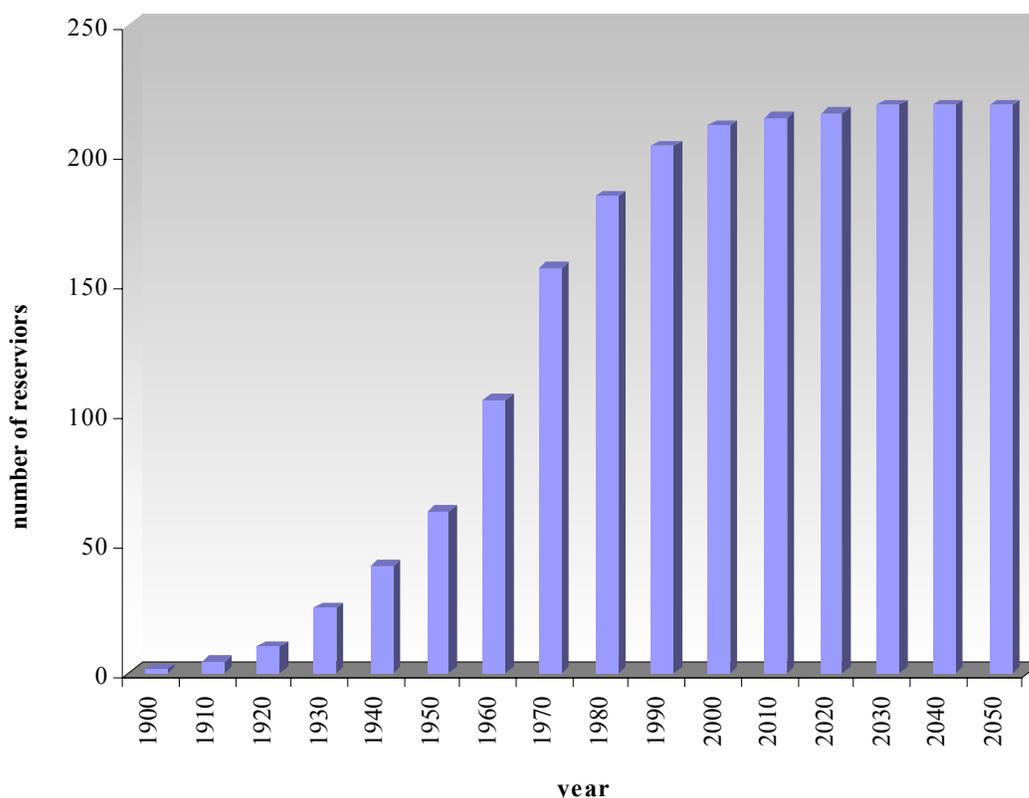
IV-2.4.2.3. While it appears unlikely that new large-scale single purpose or multi-purpose Federal reservoirs will be authorized and constructed in the near future, existing Corps and other Federal reservoirs in Texas represent a large economic investment and are an extremely important component of Texas water supply. Today in Texas, there are 211 major reservoirs (5,000 acre-feet or greater). The Corps owns and operates 31 of the 211 reservoirs. According to the Corps Southwestern Division, Corps reservoirs supply 36 percent of potable water for the State of Texas.

IV-2.4.2.4. As discussed in paragraph I, the Corps can contract for water supply storage space in its reservoirs. Nationwide, there are 235 municipal and industrial water supply contracts in 117 Corps reservoir projects for a total 9.4 million acre-feet of storage space. The majority storage space is in Oklahoma and Texas. In Texas, there are 42 M&I contracts representing 4.5 million-acre feet of storage space.⁷²

⁷¹ "Water for Texas 2002." Texas Water Development Board. January 2002.

⁷² "Water Supply Handbook." U.S. Army Corps of Engineers Institute for Water Resources. December 1998.

Figure IV-3. Historical and Projected Reservoir Construction in Texas 1900-2050



Source: Texas Water Development Board

IV-2.4.2.5. The Corps has a regulatory function in Texas that affects water supply development. As discussed in paragraph II-5, the Corps is the lead agency in protecting wetlands under Section 404 of the Clean Water Act (33 U.S.C. 1251), and Section 10 of the Rivers and Harbors Act of 1899. Section 10 applies to anyone proposing to work in, over or under navigable waters of the U.S., and Section 404 applies to anyone wishing to dump or discharge dredged or fill materials into U.S. waters. Provisions in Senate Bill 1 may affect the Corps regulatory role in Texas. Senate Bill 1 allows Regional Water Planning Groups to recommend to the Texas legislature that certain streams and rivers be designated “ecologically unique river and stream segments.”⁷³ Section 404 rules were modified recently (proposed General Condition 25), and waters that the states designate to have particular ecological significance may be considered

⁷³ There are some questions regarding the exact meaning of a unique stream designation. Regional planning groups have asked the Texas Legislature to clarify the meaning and significance of a “unique” designation. Texas Senate Bill 2 clarified the issue and states that, “a state agency or political subdivision of the State may not finance the actual construction of a reservoir...on a unique stream segment.”

“Designated Critical Resource Waters” under Federal law.⁷⁴ If so, “ecologically unique” stream segments in Texas may be ineligible for permits previously authorized under the Section 404 Nationwide Permit Program and other Federal regulations may apply.⁷⁵

IV-2.4.3. United States Department of Agriculture

IV-2.4.3.1. The United States Department of Agriculture’s (USDA) Rural Utilities Service (RUS) was originally conceived to provide Federal assistance—grants and subsidized loans—to rural cooperatives in their efforts to distribute electricity to individual farmers. Over time the REA gained approval to expand services to include electrical generation units, telephone distribution and most recently, water supply and wastewater treatment through the Rural Community Development Program (RCDP). The RCDP is dedicated to infrastructure development, most of which (80 percent) is related to water supply and quality. The total annual budget is about \$900 million, with over \$700 million in direct lending to rural communities, local governments, water districts and water supply corporations. The RUS provides about \$400 million in grants per year.⁷⁶

IV-2.4.3.2. The USDA’s Natural Resource Conservation Service (NRCS) operates another relatively small water supply program. The primary focus of the program has been watershed development projects ranging from water supply to agricultural water management. In 1997, the program underwent significant reforms to ensure that projects provided economics as well environmental benefits. According to the EOP Foundation, few if any of the projects can survive the cost benefit criteria set in water supply and development policy. Hence, few new projects are expected. In addition, as is the case with the USBR and Corps, project emphasis has shifted from water development to wetland protection.

IV-3. Developing or Expanding Water Supplies in Texas

IV-3.1. Introduction.

Developing and expanding water is becoming increasingly more important and more difficult as population grows and competition between different uses intensifies. Obtaining the funds necessary to build and operate water supply infrastructure, and of course, constructing facilities are major endeavors. However, new facilities are useless without raw water, and legally securing a reliable water source can be as challenging as building a large reservoir, particularly in areas where water is scarce. Paragraphs IV-1 and IV-2 of this chapter defined the legal and regulatory framework under which Texas develops and manages water supply, and provided a

⁷⁴ 33 U.S.C. 330(c)(25).

⁷⁵ The Corps issues two types of permits under Section 404 and Section 10 – General Permits and Standard Permits. General permits can be “nationwide” or “regional.” The Corps issues general permits to streamline the Section 404 process for activities that have minimal environmental impact.

⁷⁶ EOP Foundation, “*Budgeting for Federal Water Projects.*” October 1997.

basis for discussing how one goes about acquiring and using ground or surface water in Texas. In essence, paragraphs IV-1 and IV-2 serve as a map, while the following paragraph provides different routes available for navigating the regulatory framework for water supply. Information in paragraph IV-3 is intended only as a general guide and not for site-specific development. In addition, the primary focus is on regulatory aspects (i.e., water rights and permits) as opposed to specific hydrologic and geologic problems associated with water supply development.⁷⁷

IV-3.2. Acquiring Water in Texas

IV-3.2.1. Perpetual Water Rights

IV-3.2.1.1. Any water that is state property is generally subject to appropriation and requires permission (i.e., a permit) from the TCEQ to use such water. A perpetual water rights permit grants a person a continuous right to use waters of the state.

State waters: Water considered the property of the State of Texas held in trust for the citizens of Texas includes water of the ordinary flow, underflow and tides of every river, stream, and lake and of every bay or arm of the Gulf of Mexico.⁷⁸ Basically, if water rests or flows on a watercourse, it is state property. A “watercourse” is any impoundment or conduit that has a definite bed and bank. State water also includes water imported from outside of the state that is transported through the bed and banks of any navigable stream in Texas or by using any facilities owned or operated by the state. Additionally, state water injected into the ground for aquifer storage and recovery projects remain state water. Surface underflows—also called subflows or supporting flows—have been declared as state property if they have the same characteristics of a surface watercourse such as beds and banks that form a channel and current.⁷⁹ As noted earlier, Texas courts presume that all groundwater is percolating unless proved otherwise. But, neither the Texas courts or legislature have provided any definitional parameters for underground streams primarily due to a lack of sophisticated hydrological evidence needed to prove that water under the ground is “percolating.”

Non-State Waters: Water that is not state property includes percolating groundwater, groundwater seepage or springwater until it reaches a watercourse. Water that flows across the surface of the land in a “diffuse and unpatterned” way is not state property. Basically, diffuse water consists of run-off from precipitation and floodwaters left on land surfaces. Diffuse water is the property of landowners until it enters a watercourse of the state.

IV-3.2.1.2. Anyone wishing to divert and use state water must apply and secure a water

⁷⁷ In addition to sources mentioned throughout this section, the TCEQ publication entitled “*Divert, Store or Use State Water, Guidance for Applications to the Texas Commission on Environmental Quality.*” RG-141, June 1995 provided substantial information for this section.

⁷⁸ Texas Water Code § 11.023(b).

⁷⁹ Texas Water Code § 11.021.

rights permit with the exception of the following:

1. *Domestic and Livestock Uses* (D&L uses or “stock tank” uses): If one owns property adjacent to a watercourse, then he or she may use state water without a permit.⁸⁰ Uses are limited to *on-property* applications including household needs, yard or home garden irrigation and water for range livestock. The D&L exemption does not include M&I use, nor does it include water for crop irrigation or non-range livestock. One may also impound water in stock tanks provided that the average volume is 200 acre-feet or less for D&L purposes. The D&L water rights are not transferable and remain tied to the land.
2. *Emergency Uses*: The executive director of the TCEQ or a watermaster can authorize local agencies and other public services to withdraw water from local reservoirs without obtaining a permit when water is needed to deal with conditions that pose an imminent threat to public health and safety. Emergency uses require notification to the TCEQ and the governor, and are limited in duration to 180 days.⁸¹
3. *Other Exempt Uses*: In 2001, the legislature added wildlife management as an exempt use. For wildlife uses, landowners may divert water to an impoundment that normally holds no more than 200 acre-feet of water, and the impoundment must be on qualified “open-space land” under Texas law.⁸² Other activities not requiring a permit include salt water used for mariculture production, oil and gas exploration in the Gulf of Mexico (one acre-foot per 24-hour period), sediment control for surface coal mines and retaining water in spreader dams or terraced contours.

IV-3.2.1.3. It is safe to assume that developing new M&I water supplies from surface sources would require a permit from the TCEQ. In the case of groundwater, a permit may be required if the proposed well would operate within the boundaries of a groundwater district or authority.

IV-3.2.1.4. In general, there are six criteria that one must meet when applying for a new water rights permit from the TCEQ.

1. *Beneficial Uses*: Any newly appropriated water must be applied to a beneficial use. When an appropriator diverts water and uses it for a beneficial purpose, the water right is perfected and becomes a vested property right. Beneficial uses specifically identified in the Texas Water Code include:
 - Municipal
 - Industrial

⁸⁰ Texas Water Code § 11.142.

⁸¹ Texas Water Code § 11.139. This is a new amendment to the code and compensated for the fact that Senate Bill 1 repealed the Wagstaff Act, which had made all non-domestic and non-municipal appropriations made after May 13th, 1917 subject to the rights of municipalities to appropriate water without condemnation proceedings and without compensating non-municipal users.

⁸² See Texas Tax Code § 23.51.

- Irrigation
- Mining
- Hydroelectric
- Navigation
- Recreation and pleasure
- Stock raising
- Public Parks
- Game Preserves
- In-stream uses for fish and wildlife

In addition to the above uses, Texas law provides a catch-all definition that allows the TCEQ to grant an application if it believes that a use is “economically necessary [and] when reasonable intelligence and diligence are used in applying the water to that purpose.”⁸³ Beneficial uses can also include expected future applications of water. For example, a city can secure a right for future uses to ensure a sustainable supply as population and economic activity increase.

2. *Reliability of Supply*: For municipal permits, applicants must demonstrate to the TCEQ that a proposed water supply can sustain a drought of record.⁸⁴ As part of its water availability review, the TCEQ considers the frequency of flows from the proposed watercourse. In general, TCEQ follows the following rules of thumb to determine whether there is sufficient water to meet the demands of a permit:

- For most users, if records show that at least 75 percent of water can be expected to be available at least 75 percent of the time, the TCEQ will usually issue the permit;
- For municipalities, the TCEQ will issue a permit only if the record shows that 100 percent of the water can be expected to be available 100 percent of the time.

Applicants for municipal permits have the opportunity to show that additional storage through groundwater or other methods make a supply reliable if TCEQ does not believe that there is not enough water for reliable supply. The TCEQ is also authorized by rule to require storage sufficient to yield the amount of water requested in an application, regardless of the intended use.⁸⁵ This provision may be waived if an applicant has a backup source of water such as a reservoir to use when run of the river water is not available. The TCEQ requires drought contingency plans for new municipal permits.

3. *Public Welfare*: The Texas Water Code has a critical catch all provision stating that the storage and/or use of state water must not be detrimental to public welfare. Although, the Code does not provide much guidance regarding how to assess public welfare impacts, Senate Bill 1 mandated that the TCEQ must consider whether an application fits into state

⁸³ Texas Water Code § 11.002.

⁸⁴ A drought of record is simply the longest drought on record.

⁸⁵ Texas Administrative Code § 297.43.

and regional water management strategies contained in the state's water plan. In addition, Senate Bill 1 has a provision that bars permits for municipal purposes in regions without an approved water plan.

4. *Environmental Considerations:* As discussed earlier, environmental issues are becoming increasingly important and environmental impacts are concerns in the permit process. Under various provisions of the Code, applicants must demonstrate the impact of a proposed project/diversion on:
- In-stream flows,
 - Bays and estuaries,
 - Fish and wildlife habitats,
 - Threatened and endangered species,
 - Water quality in the state, and
 - Archeological resources.⁸⁶

In applications for more than 5,000 acre-feet per year, the TCEQ may require mitigation of adverse impacts on fish and wildlife habitat.⁸⁷ Along the Gulf of Mexico, applications may have to conform to the Texas Coastal Management Program (TCMP). Coastal management rules apply to all permit applications outside of the TCMP boundary that are within 200 stream miles of the coast and ones that seek appropriations of 10,000 acre-feet per year or more. If they are within TCMP boundaries, conformance applies to applicants seeking 5,000 acre-feet per year or more. The TCEQ must find the application consistent with the goals and policies of the Coastal Management Program and the Texas Coastal Coordination Council can review TCEQ action.⁸⁸

5. *Conservation:* In 1984, Texas House Bill 2 required both conservation plans and drought contingency plans for all TWDB water facility loan recipients, and required that all water rights permit applicants develop water conservation plans. Conservation plans must include data and information that support conservation objectives, and evaluate conservation as an alternative to a water appropriation. Conservation plans must also evaluate feasible alternatives to new water appropriations such as transfers of existing rights. Senate Bill 1 required existing municipal and industrial water rights holders using more 1,000 acre-feet per year and all irrigation permits using more than 10,000 acre-feet to develop conservation plans. In addition, the law mandated that existing public water suppliers implement drought contingency plans.
6. *Unappropriated Water and Non-Impairment of Existing Rights:* A permit applicant must demonstrate that adequate amounts of water are available for appropriation, and that the proposed diversion would not impair existing water rights holders. Available unappropriated water is the amount left in a watercourse after accounting for all uncanceled senior water rights holders of record. This includes certificate of adjudication, permits and vested riparian

⁸⁶ Texas Water Code § 11.147.

⁸⁷ Texas Water Code § 11.152.

⁸⁸ 30 Texas Administrative Code § 281.48.

rights. According to the TCEQ, there is not a great deal of unappropriated water left Texas. Twelve of the fifteen major river basins have been fully appropriated, and where appropriations are available, they may not be very reliable during drought because any new appropriation would be junior to pre-existing rights.⁸⁹

IV-3.2.1.5. As a general rule, the water rights permitting process takes four to six months. Applications that are more complex or those that are contested may take substantially longer, particularly for large reservoir projects. The TCEQ gives public notice for most applications, and a hearing is held regarding an application if it is:

- Requested by an applicant or the executive director of the TCEQ,
- Requested by a person having a “*personal, justifiable interest related to a legal right, duty, privilege, power or economic interest affected by the application,*” or
- The TCEQ concludes that a hearing is in the public interest.

If a hearing is granted, the State Office of Administrative Hearings is in charge.

IV-3.2.1.6. Amendments to existing water rights are treated as new water rights if an applicant wants to change the type of use, place of use, add diversion points or alter the quantity originally authorized. For example, in 1997 the Guadalupe-Blanco River Authority (GBRA) filed a permit amendment to the TCEQ to increase GBRA’s diversions from the Canyon Reservoir from 50,000 to 90,000 acre-feet per year. The TCEQ approved the amendment earlier this year. The TCEQ may also involuntarily amend rights to protect senior water rights and provide a reasonable means of enforcing water laws. Lastly, the TCEQ has the right to cancel a permit if the water rights holder has not applied appropriated water to a beneficial use for a 10-year period or more.

IV-3.2.2. Short-term Permits

The TCEQ issues short-term permits in basins where waters are fully appropriated but not yet fully used. For example, a municipality may have purchased rights to more water than it currently uses in order to satisfy future demand when populations are and economic activities are greater. Since future water is not currently used “beneficially,” it is considered “surplus” water, and the TCEQ can temporarily appropriate the water to someone who will use put it to a beneficial use. There are two types of short-term permits:

1. *Term permits* are usually issued for ten years, and can be renewed if water rights holders have not begun to use the surplus water.
2. *Temporary permits* are issued for up to three years. The TCEQ issues about 200 such permits annually, mainly for road construction projects, where the water is used to suppress dust, to

⁸⁹ Rivers are fully appropriated in stretches of the Canadian, Red, Cypress, Sabine, Neches, Trinity, Brazos, Colorado, Guadalupe, San Antonio, Nueces and Rio Grande.

compact soils and to start new vegetation growth. Temporary water permits are also issued for mining and irrigation uses.

IV-3.2.3. Other Permits and Applicable Authorities

Once a water right is secured, other permits may be required and other Federal or state regulations may apply. As discussed previously, the Corps administers the Section 404 program of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. Depending upon the impact and scope of a water supply project, a Corps permit may be required. Water supply projects that would cause minimal individual and cumulative environmental impacts may qualify for general nationwide or regional permits. Reservoir construction would require an individual 404 permit. As discussed previously, Section 404 permits require Section 401(b) certification by the TCEQ (see paragraph IV-3.2.1) under Texas Commission on Environmental Quality). Table IV-2 summarizes major statutes that could apply to water supply development and management.

Table IV-2. Major Federal Statutes Applicable To Water Supply Projects

Statute	Possible requirements regarding project proposals	Regulation (33 Code of Federal Regulations)
Section 404 Clean Water Act of 1972	All reasonable alternatives have been considered; state agency has determined project will not violate state water quality regulations; project will not cause significant degradation of waters; potential adverse effects have been minimized.	320.2 (f) 320.2 (a) 320.4 (a) 320.4 (d)
Section 401 Clean Water Act of 1972	TCEQ must determine that project does not reduce water quality below state standards.	320.3 (a)
Section 9 River and Harbors Act of 1899	Congressional or legislative consent/approval for projects on or across navigable waters.	320.2 (a) 321.3 (b)
Section 10 Rivers and Harbors Act of 1899	Proposed supply does not obstruct navigable waters.	320.2 (b)
Federal Endangered Species Act of 1973	Project cannot jeopardize the continued existence of an endangered species or result in the destruction of its habitat. Generally requires coordination with U.S. Fish and Wildlife and Texas Parks and Wildlife.	320.3 (i)
Fish and Wildlife Coordination Act of 1958	The US Fish and Wildlife Service and TCEQ must be consulted and given opportunity to provide comment on the proposed project.	320.3 (e)
Section 7 Wild and Scenic Rivers Act of 1968	Project would not have a direct or adverse effect on the values for which a river was designated Wild and Scenic.	320.3 (l)
National Historic Preservation Act of 1966	Project would not have an effect on properties listed in the National Register of Historic Places, nor will it alter any terrain such that significant historical or archeological data are threatened.	320.3 (g)
Section 102 National Environmental Policy Act of 1969	“Environmental amenities “ have been given “appropriate consideration in decision-making.” For dams and reservoirs, Section 404 permits would capture NEPA requirements.	320.3 (d)

IV-3.2.4. Water Rights Transfers

IV-3.2.4.1. Texas Law allows transfers of water rights, and buying groundwater and surface water rights on the open market is one alternative to obtaining a water right in an area where unappropriated water is scarce. Note that water rights transfers are distinct from water supply contracts. Selling raw water is straightforward process that has occurred in Texas for many years. Marketing water rights, on the other hand, entails the sale or transfer of the legal

right to use certain specified of water.

IV-3.2.4.2. Any changes to the original parameters of a water rights permit would require an amendment by the TCEQ.⁹⁰ For example, if a municipality purchases industrial rights, they would need to amend the right for municipal use. Other specifications including points of diversion and diversion rates would also require an amendment. State approval is not required for sale of groundwater rights, which are tied to the land above a well and are not regulated. However, there may be exceptions if one owns land within the boundaries of a groundwater conservation district or authority. If water is pumped from land in a groundwater district or authority, the buyer and seller must adhere to applicable district rules, particularly if sales involve transferring groundwater outside of district boundaries.⁹¹

IV-3.2.4.3. In Texas, water markets are somewhat active, particularly in the Rio Grande Basin where rights are fully allocated. Most activity has involved transfers from agriculture to municipalities.⁹² For example, since 1982 the City of Brownsville's Public Utilities Board (PUB) has been acquiring water rights from individual farmers and purchasing raw water supplies from the Brownsville Irrigation and Drainage District to meet short-term needs. The city passed a \$1,000,000 bond proposal in 1994 and purchased 4,532 acre-feet of irrigation water rights that were converted to municipal rights.

IV-3.2.4.4. In 1993, the Texas Legislature passed legislation establishing the Texas Water Bank. The legislation (Senate Bill 1030) was intended to create a market atmosphere in which the bank would bring together sellers and buyers, and facilitate regional transfers of water and water rights with the ultimate goal of reducing regional water shortages. Although there has not been much trading activity as of yet, the bank may prove instrumental in coming years. In general, the characteristics of the bank reflect a well-defined commodity market that allows water to be easily bought and sold and moved to areas with higher-valued uses. Unlike the California Water Bank, the Texas bank allows buyers and sellers to determine prices. In addition, the Texas Bank is a fairly open market. For example, non-profit organizations may participate. The California Water Bank is limited to government agencies and municipalities.

IV-3.2.5. Water Supply Contracts

IV-3.2.5.1. Many local and regional units of government, including river authorities or districts, hold significant water rights and operate projects from which they sell wholesale and retail water. If these sales are in accordance with their appropriated water rights granted by the TCEQ, little regulatory authority is involved unless water is transferred outside of a river basin or across state lines. Many reservoirs are owned and operated by municipalities. Cities hold water permits and sell water to its customers. Another common case is a reservoir or system of reservoirs owned and operated by a river authority that sells water to a number of cities, large industries and irrigators. Entities purchase water directly from the authority and are not required

⁹⁰ Texas Water Code § 11.122.

⁹¹ Texas Water Code § 36.122.

⁹² See, Jensen, R. "The Texas Water Markets." Texas Institute for Water Resources. Vol. 13. No. 2. 1997.

to have a permit even though they may use substantial amounts of water. For example, the Brazos River Authority (BRA) operates a system consisting of four of its own reservoirs and has storage contracts for conservation pools in nine Corps reservoirs.⁹³ These nine Federal reservoirs, in addition to the four reservoirs owned and operated entirely by the BRA, are integrated into the authority's basin-wide system of reservoirs that supply much of Central Texas's municipal and industrial water demands. BRA owns impoundment rights in all of these reservoirs.

IV-3.2.5.2. Any municipality or industry may contract with river authorities for water deliveries assuming there is water available and infrastructure is in place to delivery the water. Many reservoir operators release water from reservoirs into a watercourse for delivery to downstream customers. In such cases, the water seller is required to obtain a "bed and banks" authorization from the TCEQ. Recall that a bed and banks authorization is a permit that a water rights holder must obtain in order to transport water via streams or rivers without losing rights to the water.

IV-3.2.5.3. Provisions in Senate Bill 1 may facilitate the use of water supply contracts. Before Senate Bill 1, some suppliers were hesitant to sell water on a short-term basis to municipal customers because suppliers worried that they would be compelled to provide water permanently, even if the suppliers needed the water themselves in the future. Fears on the part of suppliers stemmed from a number of court rulings that contained language that hinted toward the fundamental rights of citizens to receive water services.⁹⁴ In addition, state ownership of surface water and the ability of the TCEQ to compel service in some circumstances created a fear on the part of suppliers that they might be forced to provide water in greater amounts or for longer periods than specified by contracts. Senate Bill 1 clarified the law and explicitly specifies that if a water supply contract has clear expiration provisions, no service obligation beyond the length of the contract is implied. In some cases, buyers must develop alternative or replacement supplies before contract expiration. The new provisions also apply to interbasin water transfers.

IV-3.2.6. Interbasin Transfers

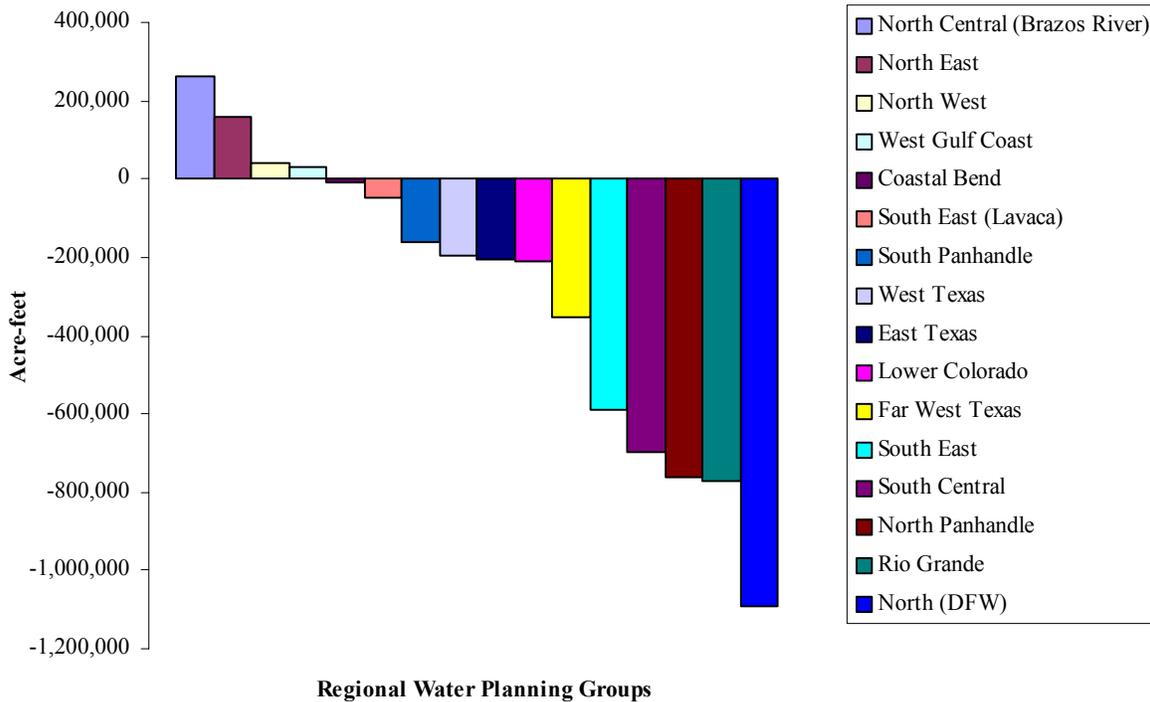
IV-3.2.6.1. Since the 1900s, Texas has approved more than 80 interbasin transfers involving communities in the Dallas Fort Worth Metroplex (DFW), Houston, Beaumont, Tyler and the Lower Rio Grande Valley. As demand for water increases, interbasin transfers will become increasingly important options available to expand municipal water supplies. Figure IV-4 displays projected water deficits and surpluses by Regional Water Planning Groups (RWPGs) in the year 2050. Texas as a whole is expected to experience a net water deficit, however some RWPGs in the state are expected to have substantial surplus water in 2050. Three RWPGs in North Texas show surpluses in 2050, while one (North Texas including DFW) is projected to

⁹³The nine relevant Corps reservoir projects in the Brazos River Basin are Lakes Aquilla (construction completed in 1983), Belton (1954), Georgetown (1980), Granger (1980), Proctor (1963), Somerville (1967), Stillhouse Hollow (1968), Waco (1965) and Whitney (1951).

⁹⁴ See, Booth, M.J. "Texas Water Rights." Present at the Fundamentals of Water Law in Texas, June 1998. Texas Water Code § 11.041 states that a person may petition the TCEQ to compel service from a supplier who has water available when such a supplier refuses to sell or demands unjust and unreasonable rates.

have the largest deficit. All four groups overlay four different river basins. Thus, expected shortages in the DFW region could be offset significantly through interbasin transfers.

Figure IV-4. Projected Water Deficits and Surpluses in Texas by Regional Water Planning Group: Year 2050



Source: Based on data of the Texas Water Development Board

IV-3.6.2.2. A water rights holder can sell water under contract outside the boundaries of their river basin with authorization from the TCEQ. For example, in 1981 the TCEQ issued a certificate of adjudication to the Lavaca-Navidad River Authority authorizing use of 75,000 acre-feet per year of water for M&I use but only within the Lavaca River Basin. On Sept. 18, 1996, the TCEQ granted an amendment to the certificate to allow an interbasin transfer from Lake Texana to Corpus Christi. Under the amendment, the City of Corpus Christi will receive 41,840 acre-feet per year via a 101-mile pipeline that connects the city and Lake Texana.⁹⁵ The TCEQ granted permits under two conditions: 1) the proposed transfer could not impair water rights in the basin of origin, and 2) assuming the first condition was met, the future economic and environmental benefits in the receiving basin has to outweigh the future costs incurred by the basin of origin.

IV-3.2.6.3. The motivation behind these rules stems from the perceived need to preserve future water supplies and to ensure that water is not over-exported from a given river basin.

⁹⁵ See, "Corpus Christi Lays Down the Line for Water." *Natural Outlook*. Texas Commission on Environmental Quality. Fall 1998.

Regions with current water surpluses fear that exporting water out of their “back yard” could result in future water shortages and thus limitations on economic development and causing environmental degradation. In the case of Corpus Christi and Lake Texana, the TCEQ found that it was justifiable as long as there were provisions that allow for a reduction in the amount of water by 10,400 acre-feet per year if there is future need for it the Lavaca Basin. The TCEQ also investigated potential environmental impacts of the transfer on inflows into the Lavaca-Matagorda estuary system. Provisions in the certificate currently provide for freshwater inflows. Lastly, TCEQ held numerous public hearings regarding the transfer.

IV-3.2.6.4. In addition to a complex administrative proceeding, several other factors hinder interbasin transfers. Senate Bill 1 contains language that requires the TCEQ to give interbasin transfers priority dates that are junior to all rights granted before the application.⁹⁶ Recall that under Texas law, those with the longest-held, or senior, water rights are able to collect water from those with the shortest-held, or junior, water rights in times of drought or shortage. Prior to Senate Bill 1, if someone bought senior water rights, they were entitled to the senior right privileges of the original owner. Under the provisions of Senate Bill 1, interbasin water rights can still be sold; however purchasers do not retain senior status.⁹⁷ Given the large costs associated with obtaining regulatory approval and building necessary infrastructure, supporters of interbasin transfers believe that the measures on junior water rights severely limit incentives for a transfer.⁹⁸

IV-3.2.6.5. Senate Bill 1 also instituted public notification and involvement requirements. The TCEQ must hold public meetings in both the basin of origin and the receiving basin to hear comments on the proposed transfer. Evidentiary hearings may be conducted if someone contests the application, which is more than likely to occur.⁹⁹ In addition, the applicant must file notices to:

- Water rights holders in the basin of origin,
- County judges and mayors of cities with populations of 1,000 in the basin of origin,
- Groundwater conservation districts in the basin origin, and
- State legislators in both basins.

IV-3.2.6.6. Another factor to consider with respect to interbasin transfers is an amendment to the state constitution that prohibits state funds from being used to finance a project that: “*contemplates or results in the removal from the basin of origin of any new surface water necessary to supply the reasonable foreseeable future water requirements for the next ensuing fifty years.*” In other words, persons in a water basin who wish to export part of their supply with the assistance of state funds must first show that they have enough water to meet

⁹⁶ Texas Water Code § 11.085.

⁹⁷ In 1999, Sen. J.E. “Buster” Brown sponsored Senate Bill 143 that would have repealed the law, however the amendment was not passed.

⁹⁸ Brown, C. “House, Senate members agree on water bill.” Texas News. Friday, May 30 1997.

⁹⁹ Texas Water Code § 11.085(d)-(e).

their own needs for the next 50 years.¹⁰⁰

IV-3.2.6.7. Certain interbasin transfers are exempt from TCEQ authorizations including:¹⁰¹

- Transfers of less than 3,000 acre-feet per year from a single water right,
- Emergency transfers of water,
- Transfers from a basin to its adjoining coastal basin (i.e., from the Trinity to the Neches-Trinity Coastal Basin or the Trinity-San Jacinto Coastal Basin)
- Transfers for use in a county partially within in the basin of origin, and
- Transfers for use in a municipality or municipal service area partially in the basin of origin.

IV-3.2.7. Interstate Transfers

IV-3.2.7.1. Interstate water transfers involve sales of water from one state to another. A water seeker in the state of destination must obtain rights to waters in the state of origin, or they would enter into a contract with water rights holders in the state of origin to purchase water. Parties in both states would agree to the terms and conditions of the contract. Any agreement would have to conform to applicable state laws. In addition, if transfers involved construction of infrastructure of reservoirs or pipelines applicable Federal and state laws would apply (e.g., Section 404) and representative agencies would have to be involved. U.S. constitutional provisions might apply as well.¹⁰²

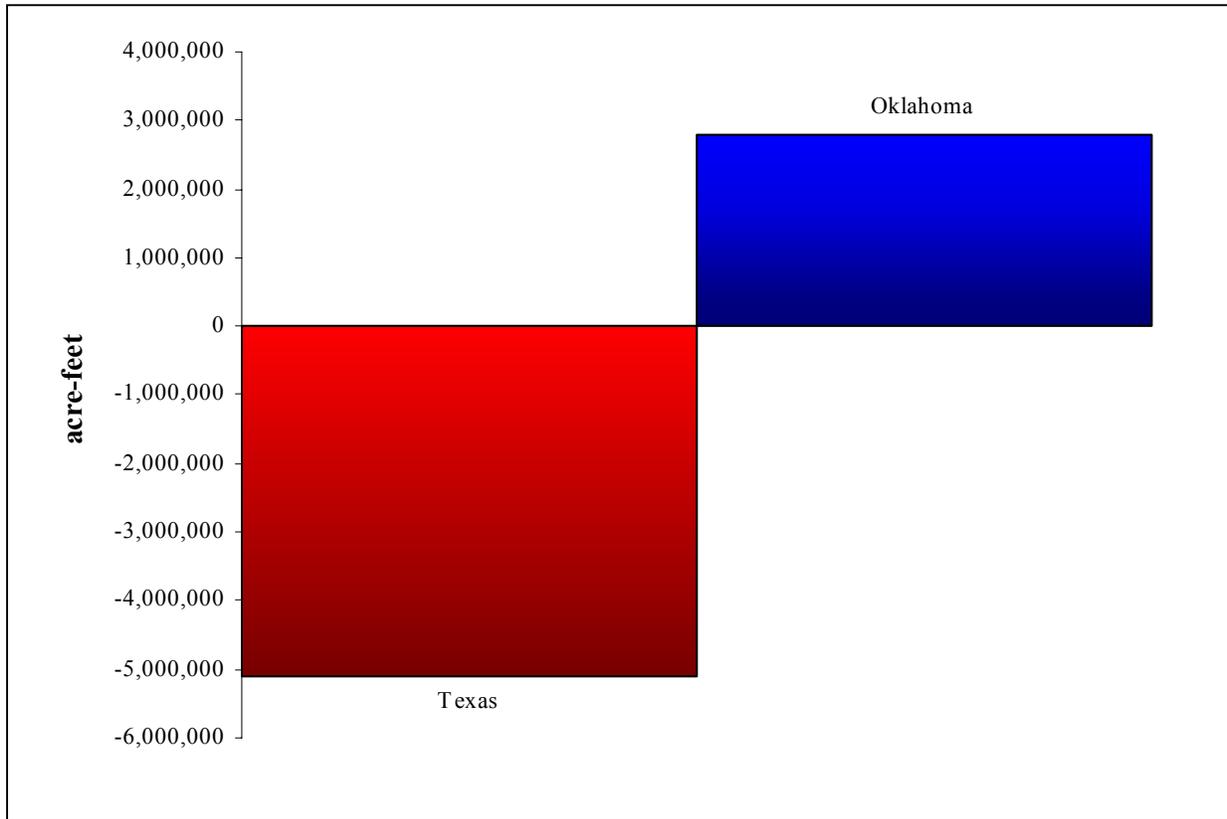
IV-3.2.7.2. In the State Water Plan for 2002, Region C included a recommendation to purchase water from the State of Oklahoma to supply the Dallas/ Fort Worth Metroplex. Comparisons of water supply and use projections for Texas and Oklahoma indicate that such a transfer could be a viable option. Figures IV-5 and IV-6 show projected water deficits or surpluses for Texas and Oklahoma in 2050.

¹⁰⁰ Texas Water Code § 11.004.

¹⁰¹ Texas Water Code § 11.085.

¹⁰² There is a considerable amount of debate as to the role of the commerce clause of the U.S. Constitution with respect to interstate water transfers. Under the “dormant” commerce clause, a variety of state statutes which sought to protect local natural resources for the use of citizens in a state have been struck down basically because they involved some form of “simple economic protectionism.” For example, in *Sporhase v. Nebraska ex rel. Douglas*, 458 U.S. 941 (1982) the courts struck down a law that prevented the export of groundwater out of Nebraska. Sporhase was a farmer whose property straddled the Colorado/Nebraska border. The farm was irrigated from a fairly large well located in Nebraska. Sporhase had historically taken some of that water through a pipeline into Colorado to irrigate the portion of the farm there. Nebraska officials told him he couldn’t export the water to the other side of the farm because it crossed the state border. The case eventually found its way into the U.S. Supreme court, which held that water was an article in interstate commerce.

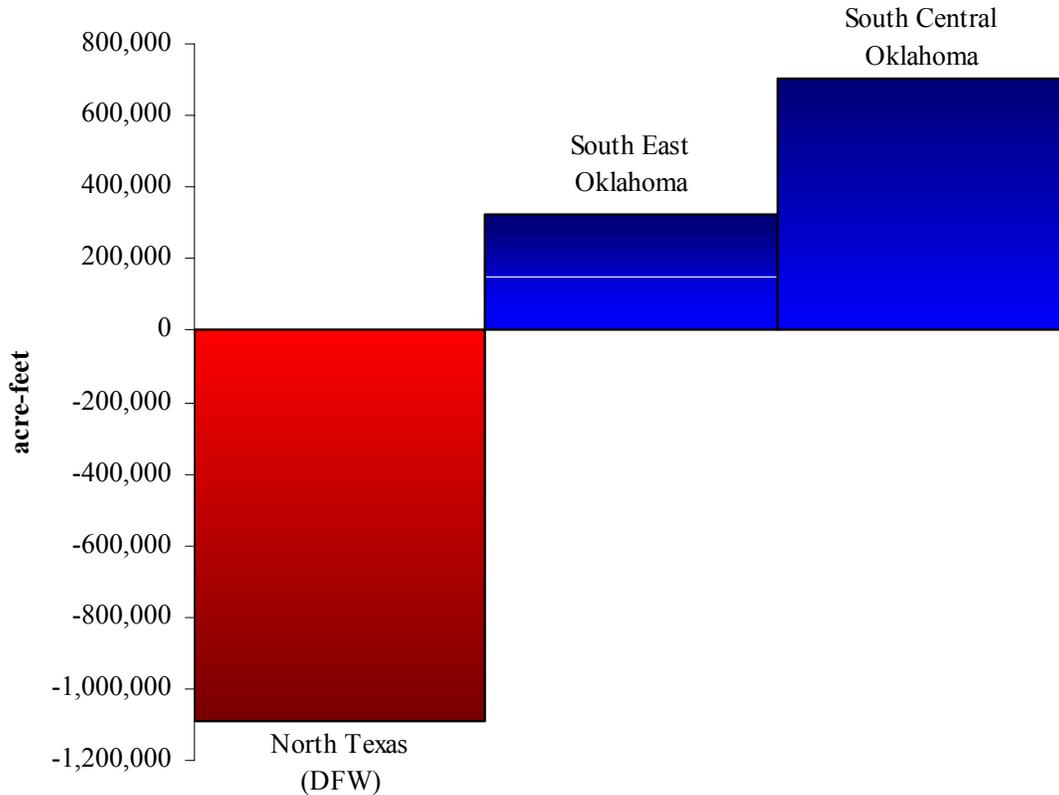
Figure IV-5: Projected Water Deficit And Surplus In Texas, And Oklahoma: Year 2050



Source: Based on Water Use Projections of Texas Water Development Board and Oklahoma Water Resources Board

IV-3.2.7.3. Projections indicate that, as a whole, Texas will experience water shortfalls of roughly 5,000,000 acre-feet. At the same, Oklahoma is expected to have about 2,800,000 acre-feet per year of available water. Projections for Regional Planning Group P in Texas (North Texas DFW) show a 2050 deficit of about 1,090,000 million acre-feet. According to the OWRB, there are 703,000 acre-feet of projected surplus water available per year in Southeast Oklahoma. About 503,000 of this consist of unallocated water from Federal projects including Corps reservoirs. According to the Corps Water Supply Handbook, there are approximately 480,000 acre-feet of reservoir storage that is not under contract in the State of Oklahoma.

Figure IV-6: Projected Water Deficit And Surplus, Texas, Southeast Oklahoma And South Central Oklahoma: Year 2050



Source: Based on Water Use Projections of Texas Water Development Board and Oklahoma Water Resources Board

IV-3.2.8. Storage Reallocation in Corps Reservoirs

Reallocation of water storage space in Corps reservoirs (see paragraph I-3.5) is a potential way to expand M&I water supply for a municipality or industrial user. Reallocation refers to the reassignment of reservoir storage to more beneficial uses.¹⁰³ Since 1965, Corps districts have conducted at least 50 reallocations involving reassignment of storage dedicated to flood control, hydroelectric power, water quality and sediment reserve to M&I water supply. The Corps, local sponsors (e.g., municipalities and industries seeking water) and the state of Texas play a role in reallocation of reservoir storage space. To reallocate storage, the Corps and local sponsor must conduct a Reconnaissance level study that the Federal government funds completely. If a study demonstrates that the reallocation is in the best interest of public welfare, the Corps and local sponsor complete a cost-shared (50/50) Feasibility Study. If reallocation is approved pending a Feasibility Study, local sponsors pay for the costs of reallocated storage. In addition, local sponsors would have to obtain water rights from the TCEQ for water stored in reallocated space.

¹⁰³ Authority for reallocation is contained in P.L. 85-500, Tit. III of the Water Supply Act of 1958.

IV-3.2.9. Wastewater Reuse

Wastewater reuse is a viable option to augment existing water supplies. However, there may be barriers to large-scale implementation in some regions of the state. In areas where waters are fully appropriated, conflicts could arise if downstream water rights holders are senior to those wishing to reclaim water that would otherwise be returned to rivers for downstream uses. If downstream users could not access their appropriated water because of upstream reuse, groups seeking to reuse water could be denied a permit.

IV-3.2.10. Emergency Drought Provisions for Water Supply

IV-3.2.10.1. Texas is prone to serious droughts that cause billions of dollars in damage to agricultural producers and threaten M&I water supplies. Small water systems with relatively limited supplies are particularly vulnerable. For example, in the summer of 2002 the towns of Electra and Throckmorton took emergency measures to maintain basic water service.¹⁰⁴ In Electra, the town's reservoir dropped to 287 acre-feet after an extended drought. By the end of July 2002, the lake held only 45 days worth of water. Electra, which is only a few miles from the Oklahoma border, had a dozen wells to supplement surface water supplies, but the added capacity could not meet the city's water demands. Normal summer usage peaks at about one million gallons per day, but at the time, the city could only provide about 350,000 gallons a day. To supplement demand and respond to the drought, the city refurbished 10 wells - at a cost of \$1.7 million - that had been closed years earlier because of excessive nitrate levels. In another instance, the lake that supplies the City of Throckmorton dropped to 285 acre-feet and left only a 60-day supply of water. City officials obtained \$800,000 in funds through the Texas Small Towns Environment Program (STEP) to buy materials for a 15-mile pipeline. With the help of several hundred volunteers from around the region, Throckmorton connected the pipeline to the nearby Fort Belknap Water Supply Corporation and solved their problem.¹⁰⁵

IV-3.2.10.2. Texas has several programs for responding to emergency situations including imminent losses of a water supply because of extended droughts.¹⁰⁶ The Texas Department of Public Safety's Division of Emergency Management has a mission to respond to "immediate needs" during a drought. An "immediate need" is defined as the failure of a water system or the projected failure of a water system within 72 hours. Failure can result from loss of water supply sources or physical plant failures. In such situations, water utilities can contact the Emergency Management Coordinator (EMC) or chief elected official (i.e., mayor or county judge) of the local jurisdiction affected by the emergency. Local governments have initial emergency response responsibility, but may request supplemental state assistance by contacting their appropriate Disaster District. In the case of a drought, it is unlikely that assistance would be

¹⁰⁴ See, "A Tale of Two Towns." *Natural Outlook*. Texas Commission on Environmental Quality. September 2000.

¹⁰⁵ STEP is coordinated by the TWDB and TCEQ. The program addresses urgent drinking and wastewater problems using "less money." Money savings are accomplished by providing assistance and support to community leaders and residents who are willing to solve their problems through self-help.

¹⁰⁶ See, "Drought Assistance Directory for Public Officials and Drinking Water Utilities." Division of Emergency Management. Texas Department of Public Safety.

categorized as an immediate need. Water utilities with problems that are not an “immediate need” would contact the TCEQ Public Drinking Water Section “Drought Team.” Direct contact between utilities, the TCEQ and TWDB is the preferred method of mitigating drought problems. This allows the TCEQ and TWDB to facilitate access to technical and financial resources in a timely manner.

IV-3.2.10.3. As noted previously, TWDB’s mission includes providing technical assistance for local drought and water conservation planning and providing low cost financial support for developing alternative water supplies. TWDB’s financial assistance programs (see Section 4.2) may be appropriate to developing alternative supplies such as wells or pipelines to other surface sources. Other relevant state programs for developing alternative water supplies during drought include the Texas Small Towns Environment Program (STEP) and the Texas Department of Housing and Community Affairs.

IV-3.2.10.4. The TCEQ provides technical assistance in identifying alternative sources, evaluating regulatory aspects of developing alternative supplies and authorizing emergency transfers of water. Recall that the executive director of the TCEQ can issue emergency water permits or temporarily suspend or amend permit conditions without notice or hearing to address emergency drought conditions for not more than 180 days. In addition, the TCEQ or a watermaster has the legal authority to transfer surface waters from non-municipal uses to a city or utility for domestic or municipal uses for not more than 180 days and only during emergency drought conditions. This does not require notice or hearing, however the owner of the transferred water must be compensated for any water transfer by whoever receives the water.¹⁰⁷

IV-3.2.10.5. The following authorities are activated during gubernatorial or presidential declaration of disasters, and can be specifically targeted to address emergency water during drought.

1. *Reclamation State Emergency Drought Relief Act of 1991* (RSEDRA): Temporary drought activities covered under the RSEDRA (P.L. 102-250) could include construction, management and conservation activities undertaken by Bureau of Reclamation (USBR) on a non-reimbursable basis. With the exception of well-drilling, only “temporary” construction projects can be funded under RSEDRA. The USBR cannot fund projects such as small dams or new canals under RSEDRA. They can purchase water from a willing seller to augment in-stream flows or construct temporary diversion canals that must be removed after the drought is over, or purchase material to line irrigation canals to prevent water loss. The USBR can drill new wells but cannot fund water distribution systems. The Act also authorizes the USBR to provide short-term loans of up to 15 years to water users for permanent construction, management, conservation activities and acquisition and transportation of water. Activities and loans are available to municipalities, Indian Reservations, state and Federal agencies and non-profit entities such as irrigation districts, municipal water utilities and private or public fish and wildlife facilities. Provisions of the Act are available after a state governor, or the governing body of a tribe makes a request to the USBR for temporary drought assistance.

¹⁰⁷ Texas Water Code § 11.139(h).

2. *The Stafford Act (PL 93-288)*: The Stafford Act authorized the Presidential Disaster Declaration Disaster Relief and Emergency Assistance Program (DREAP). Programs under DREAP are only available with a Presidential Declaration. DREAP provides cost-shared grants to state and local agencies to meet mitigate drought impacts. DREAP requires state gubernatorial declaration that an emergency or a major disaster exists that is beyond the capability of the State and local agencies, and that requires Federal assistance beyond the normal assistance available under other Federal agency authorities. Drought is specifically included in the Act as a major disaster. However the Act is very broad, and droughts may not produce emergency conditions and physical damage that warrant provisions of the Act.
3. *Emergency Community Water Assistance Grants (ECWAG)*: USDA’s Rural Development office in each state manages ECWAG. The program provides grants to municipalities in rural areas with populations of 15,000 or less, non-profit corporations, political subdivisions of states and Indian tribes. Provisions apply to areas that have been declared as disaster areas under a presidential declaration. The program is competitive, and projects compete for available funds on a national basis.
4. *Governor’s Declaration/Request for Emergency Water Supply/Drought Assistance*: In drought stressed areas, the Corps has authority to construct wells and transport water on an emergency basis for domestic uses. The authority applies to political subdivisions, public districts and agricultural producers. To activate the authority, the Secretary of the Army must determine that an area has inadequate water supplies and the inadequacy poses a substantial threat to public health and welfare. The authority is limited and there are a number of caveats.
 - The applicability of other Federal assistance programs must be evaluated including those of the Small Business Administration, Farmers Home Administration and Economic Development Administration before the Corps provides assistance.
 - The Corps can only provide assistance when all local and state resources are exhausted.
 - Local and state government must develop a credible plan for providing a long-term solution, and the plan must be executed “expeditiously.”
 - Users of emergency assistance must obtain all necessary Federal, state and local permits.
 - Applicants must pay for the water, however transportation of the water is a Federal expense.

IV-3.2.10.6. Under the program, the Corps can finance well construction costs, but applicants must agree to repay “reasonable” construction costs. Applicants can apply to Corps Districts but assistance is subject to approval at the Division level. There does not need to be a presidential disaster declaration for the Corps to provide assistance. However, state governors must declare an emergency and specifically identify areas that require assistance.

IV-4 Summary of Texas Water Supply Management and Development

IV-4.1. Overview.

IV-4.1.1. The institutional framework for Texas water supply involves two main tiers, 1) water law that defines legal rights to use and store water, and 2) the government agencies and organizations that administer water rights, provide funding and give technical assistance. The institutional framework provides the structure in which a municipality, industry or other user can develop and use water in Texas.

IV-4.1.2. Administration of legal rights to water is purely a function of the Texas Commission on Environmental Quality (TCEQ). Funding, planning and technical assistance at the state level for water supply is primarily a function of the Texas Water Development Board (TWDB). Water sales (retail and wholesale), delivery, transmission and treatment are mostly a local and regional responsibility. Municipalities, general law districts (e.g., municipal utility districts) and special law districts (e.g., river authorities) are the most important entities in this respect. Local and regional entities are also heavily involved in planning and funding water supply development through bond issues and revenues raised from water sales. The Federal government's primary role in water supply in terms of water quantity is providing storage space in Federal reservoirs. Reservoirs built and operated by the Corps, the Bureau of Reclamation and local sponsors dot the Texas landscape. The Corps, however, is not directly involved in contractual sales and transmission of water outside of its reservoirs. There are also a number of Federal programs that provide financial assistance to rural and small communities to develop water supplies, and the Corps and Bureau of Reclamation are authorized to provide planning assistance at a state level for any aspect of water resource development and management.

IV-4.1.3. The TCEQ, the Corps and several other agencies play an important regulatory role related to the construction of water supply projects. The Corps is the lead Federal agency that administers Section 404 of the Clean Water Act (CWA). Under Section 404, the Corps conducts a permit program requiring applicants to evaluate and analyze alternatives to filling U.S. waters including wetlands during project construction. Section 404 also requires applicants to provide a sequence of actions that minimize or mitigate adverse environmental impacts of a proposed project. Most large-scale water supply projects involving reservoir and conveyance construction require 404 permits. Under Section 401 of the CWA, the State of Texas through the TCEQ has the authority to review Federal permits and licenses that may affect water quality and wetlands in the state. TCEQ may grant, deny or waive certification of 404 permits based on their review of project impacts. The Corps cannot issue a Section 404 permit until it is certified by the TCEQ. Under the Fish and Wildlife Coordination Act, the Corps must also consider comments by the U.S. Fish and Wildlife Service regarding influences on the environment. The USFWS does not have authority to deny a 404 permit; however, they are responsible for ensuring that projects comply with provisions of the Federal Endangered Species Act (FESA). If a project does not comply with FESA, it is not legal under Federal law.

IV-4.1.4. Developing or expanding M&I water supply in Texas can be complex and is not necessarily a sequential and linear process. In general, however, the following actions provide a basic roadmap.

IV-4.2. Step 1. Acquire Legal Rights to Use Water.

IV-4.2.1. The source of water is critical in determining necessary steps to obtaining a legal right to use water. In Texas, one must have or acquire legal rights to water prior to diversion, storage and/or use. As a general rule, state law treats ground and surface water separately. In Texas, if one owns property that overlies groundwater, he or she has an absolute right to its use. To acquire groundwater, one must own or buy overlying land, or purchase groundwater rights or contract for groundwater from someone who does own overlying property. The state does not regulate withdrawals of percolating groundwater, and does not require permits for groundwater withdrawals. However, groundwater districts and authorities may have regulatory authority and may require permits. If land is located in a groundwater district or authority, or if groundwater originates in a district or authority, there may be restrictions on use. Generally, surface waters are considered state property and are subject to TCEQ regulatory requirements (i.e., water rights permits). Surface water consists of waters in a stream, river, pond, lake or wetland.

IV-4.2.2. There are several ways to obtain state water legally in Texas:

1. *New allocation of unappropriated water.* Anyone may petition the TCEQ for water rights. Acquiring a water permit from the TCEQ provides the user with a perpetual right to use the amounts of water authorized by the permit so long as such use does not impair water appropriated to senior water right holders. Senior water right holders are those with permits issued earlier in time. Generally speaking, applications to the TCEQ must demonstrate that a proposed water use is:
 - Applied in beneficial manner (e.g., domestic, municipal, industrial, irrigation),
 - Reliable enough to meet current and future needs even during drought conditions (applicant must prepare water conservation plans),
 - Not detrimental to public welfare
 - Considers environmental impacts including in-stream flows, bays and estuaries, fish and wildlife, threatened and endangered species, water quality and archeological resources, and

The TCEQ must also determine if adequate supplies of unappropriated water are available. Any amendment to an existing right that would change the quantity authorized or the use would require review and approval by the TCEQ.

2. *Water rights transfers:* In Texas, water rights holders can legally transfer water rights to another. Given the dearth of unappropriated water in the state, water rights transfers/sales are becoming increasingly important. If transfers involve changes to originally authorized amounts of water or changes to diversion points, permits require an amendment. Otherwise, the TCEQ's role in transfers is ministerial unless rights are transferred out of a river basin. Interbasin transfers require TCEQ authorization and generally involve complex administrative procedures. In addition, water rights transferees in the basin of destination would be considered junior to water rights in the basin of origin. Thus, in times of shortages the basin of origin may not have legal access to transferred water. Transferees within a basin retain the priority date of the original permit.
3. *Short-term permits:* The TCEQ can issue short-term permits in basins where waters are fully appropriated but not fully used. Short-term permits are generally not suitable for municipal supply, but may be appropriate for commercial and industrial uses.
4. *Water supply contracts:* Water supply contracts are very common in Texas. Local and regional units of government including river authorities and water districts contract to municipalities and industry for long-term water sales. Water contracts are not regulated by the state unless contracts involve interbasin transfers. In this case, the TCEQ would have to authorize a transfer. In addition, a water seller who wishes to convey water to a buyer via a stream or river must obtain a "bed and banks" authorization. Pipelines connected directly to a reservoir do not require bed and banks authorizations.

IV-4.3. Step 2. Acquire Infrastructure to Store and Distribute Water.

IV-4.3.1. Developing or expanding water supply may require new infrastructure such as wells, transmission lines, pump stations, intakes, treatment facilities, reservoirs and dams. As a matter of national policy, the Federal role in municipal and industrial water supply is limited. State and local interests have the greatest responsibility. However, there may be significant opportunities to contract for storage space in Corps and Bureau of Reclamation reservoirs. Purposes for which a reservoir was originally constructed may no longer be needed, or a proposed use may be of equal or higher value. In Texas, contracting for reservoir storage would likely involve reallocating existing storage already devoted to uses such as flood control given that there is no uncommitted storage space available. Most water supply infrastructure today is financed at a local and regional level and in some cases with state assistance. State funding comes from the TWDB, and Federal assistance is available in the form of block grants to the state (e.g., Housing and Urban Development Community Development Block Grants) and direct funding to small communities through the USDA's Rural Utilities Service and Rural Community Development Program.

IV-4.3.2. If infrastructure acquisition involves new construction, projects that involve Federal assistance, permits, or funding must comply with Federal environmental regulations. Large-scale projects such as reservoirs must comply with NEPA and would require individual permits under Section 404 of the CWA. Large-scale projects would also require Section 401

review and approval by the TCEQ, and would require consultation with U.S. Fish and Wildlife Agency to assess impacts on endangered and threatened species. If impacts are identified, mitigation may be required. Several additional Federal laws could apply including the National Historic Preservation Act, Wild and Scenic Rivers Act, and possibly the Coastal Zone Management Act. Some components of M&I water supply such as intakes and pump stations may be eligible for exclusion from major Federal regulatory requirements such as NEPA Environmental Impact Statements and individual Section 404 permits.

CHAPTER V: ASSESSMENT OF THE CORPS ROLE IN TEXAS WATER SUPPLY

This chapter looks to the Federal role in general and more specifically, the future role that the Corps may play in helping to develop the future water plan for Texas. A working model that is actually being employed in California is examined and how that model may be applied to Texas is presented.

V-1 Overview

V-1.1. According to the 2002 Texas water plan published by the TWDB, M&I water use is expected to increase from 4.23 million acre-feet per year in 2000 to 7.06 million in 2050 – an increase of 67 percent. At the same time, the population served by M&I water supply will increase 90 percent. As proportion of total water use, M&I is expected to grow from 35 percent in 2000 to nearly 50 percent in 2050. Although, 14.9 million acre-feet of surface water is currently available in Texas from a hydrological standpoint, users can access only 8.6 million because of restrictions in water delivery infrastructure. For example, Lake Palestine has 236,000 acre-feet per year of water availability (firm yield). Most of this has been allocated to suburbs in and around Dallas/Fort Worth; however, there is not infrastructure to deliver much of the water and only 14,000 acre-feet per year is available for use.

V-1.2. Some water management strategies under proposal in Texas involve using improving infrastructure and connectivity to surface water supplies. Nevertheless, efforts and plans to build new reservoirs in the 21st century are very modest relative to the 20th century. As noted previously, reservoir development is becoming harder due to high costs, substantial opposition from various interest groups and landowners and the need to obtain state and Federal permits for construction and impoundment.

V-1.3. As part of their strategic water plan, Texas has proposed to build only eight new reservoirs through 2050. With respect to construction, the Corps primary missions are flood damage reduction, navigation and ecosystem restoration. The Corps is limited with respect to water supply. The eight new reservoirs under proposal are primarily single purpose projects for water supply, and Corps policy is clear in that single purpose water supply projects will not be supported or recommended for Federal construction (see paragraph I-3.4). If the plans were modified to provide multi-purpose projects (e.g., flood control, navigation and/or ecosystem restoration along with water supply) Corps involvement may be possible. In addition, there are opportunities for reallocation of storage space in existing reservoirs (see paragraph I-3.5). Specific projects with potential for reallocation and other Corps involvement in water

management strategies developed by Texas have been identified in a previous study funded by the Corps of Engineers Ft. Worth District.¹⁰⁸

V-1.4. Other more broad opportunities exist as well. For over 200 years the Corps has ensured that commerce flows efficiently throughout the Nation’s rivers and lakes and has helped control surface water flows to prevent billions of dollars in flood damage. More recently, the Corps has been charged with restoring and protecting the Nation’s aquatic ecosystems. In a sense, the Corps has had the longest and broadest mission with respect to surface water quantity issues and may be the best reservoir of knowledge and expertise to assist states in managing surface used for M&I supply. The Corps has explicit authority and appropriations to provide planning assistance to the states.

V-1.5. As discussed earlier, water shortages in Texas are in large part regional. Some areas will likely have abundance of water over the next several decades, while others are likely to experience significant shortages. Thus, the issue is geospatial and shortages could be greatly reduced in many cases by transferring water from areas of high concentration (i.e. East Texas) to areas of low concentration (i.e., West Texas). The difficulty in achieving regional and interstate reallocations is reaching a consensus among stakeholders and obtaining consensus of various agencies – local, state and Federal - involved in planning and approving such transfers. Economic and environmental impacts of large-scale water transfers must also be analyzed and assessed. The Corps could play a major role in assisting the state in developing approaches and models to evaluate the feasibility of large-scale interbasin and interstate transfers.

V-1.6. Developing systematic approaches to reallocating surface waters on regional and intrastate basis could be developed and facilitated under a Federal-State partnership. Paragraph IV-2 illustrated the degree to which water supply management is fragmented among local, state and Federal organizations. From a planning perspective, a plethora of state, local and federal agencies are involved each with varying levels of authority and missions. Federal-state partnerships in other areas of the Nation have been conceived and implemented to address water supply development and management.

V-2 Calfed Bay-Delta Program

V-2.1. The Calfed Bay-Delta Program known as “Calfed” is one of the better known Federal-state cooperative efforts that involves water supply. California Governor Pete Ryan and Bruce Babbitt - former Secretary of the Interior under the Clinton Administration - initiated Calfed in 1994 to address environmental and water management problems including water supply in California’s Bay-Delta system. The Bay Delta or “Delta” is a system of waterways at the junction of the San Francisco Bay and the Sacramento and San Joaquin rivers; and the watershed that feeds them. The Delta is instrumental in providing water to California’s major

¹⁰⁸ See, Freese and Nichols, “*Texas Water Allocation Assessment Report.*” Prepared for the Fort Worth District Corps of Engineers. March 2002.

industrial and agricultural sectors and accounts for more than one-half of potable water supplied to the state's residents. It is also the largest and most productive estuary on the Pacific Coast. The overall goal of Calfed is to end chronic water shortages by rehabilitating water infrastructure, and at the same time, restore and protect ecosystems. Calfed calls for one of the Nation's largest ecosystem restoration efforts, and provides specific deadlines for developing over six million acre-feet of new water storage projects – the biggest investment in the State of California's water infrastructure in over 40 years.

V-2.2. Calfed is expected to consist of three phases. Phase I began in 1995 with a preliminary scope of work and concluded with recommended solutions in 1998. Phase II concluded in August of 2002 with the publication of the Final Programmatic Environmental Impact Statement/Environmental Impact Report (EIS/EIR) and Record of Decision (ROD). The ROD outlines Phase III that entails project implementation. The ROD outlines goals for the following Calfed programs including:

1. **Science:** Integrate science and peer review into all aspects of Calfed to guide decisions and evaluate actions that are critical to its success.
2. **Storage:** Increase water storage capacity in surface reservoirs and underground aquifers.
3. **Conveyance:** Expand and improve conveyance systems for water supply, water quality, flood protection and ecosystem benefits, and improve pumping operations of the State Water Project to increase reliability and enhance fish protection.
4. **Water efficiency:** Reduce water demand through conservation, improve water quality by altering volume, concentration, timing and location of return flows and improve ecosystem health by increasing in-stream flows where necessary to achieve targeted benefits.
5. **Water transfers:** Develop effective water transfer markets to expand water supplies by promoting transfers from willing sellers to buyers while protecting other water users, local economies and the environment.
6. **Ecosystem restoration:** Assist in the restoration and improvement of Delta ecosystems for native species while reducing water management constraints.
7. **Environmental Water Account:** Basically, the Environmental Water Account (EWA) was established to address two problems, 1) declining fish populations and 2) unreliable water supplies. Its purpose is to protect fish by making it possible to modify water project operations in the Bay-Delta and still meet the needs of water users. To accomplish this, the EWA buys water from willing sellers or diverts surplus water when safe for fish, then banks, stores, transfers and releases it as needed to protect fish and compensate water users.
8. **Watershed Program:** Provide financial and technical assistance for watershed activities that help achieve Calfed objectives and promote collaboration and integration among community based watershed efforts.

9. **Drinking Water Quality Program:** Combine cost-effective improvements in source water quality, advance treatment technology and develop innovations in water management.

10. **Levy system integrity:** Improve levees to a higher standard for greater flood protection, improve emergency response capabilities, ensure levee maintenance and habitat needs are met, improve coordination of permit processes and develop adequate and reliable funding for levee maintenance.

V-2.3. While all programs are related and important, from the perspective of M&I water supply the Storage, Conveyance and Transfers programs are the most critical. Since Calfed began in 1994, the above programs have centered on planning activities including feasibility studies, but little water supply construction has taken place.

V-2.4. Phase III of the plan is the implementation phase, and is expected to take place over a 30-year horizon. Stage 1 of Phase III will take place over the next seven years. Calfed estimates that Stage 1 will cost \$5.2 billion in state, federal and local funds.¹⁰⁹ Total program costs over the anticipated 30-year period are estimated at \$9 to 10.5 billion. Tables V-1 and V-2 summarize current funding for Calfed programs from state, Federal and local sources. Table V-1 shows funding by program for state fiscal year 2001.¹¹⁰ Funding for Calfed in Year 1 was \$766 million, primarily from state bond funds (\$323 million) and local cost sharing for recycling projects (\$149 million). Funding for year 2 is \$852 million with about one-half coming from state bonds (\$385 million) and local cost sharing for recycling projects (\$178 million). State general funding in 2002 was \$20 million less than in 2001 due to revenue shortfalls.

¹⁰⁹ Calfed 2001 Annual Report.

¹¹⁰ State fiscal year is July 1, 2000 through June 30, 2001.

Chapter V: Assessment of the Corps Role in Texas Water Supply

Table V-1: Calfed Bay-Delta Program Funding by Source for Stage 1 program implementation (California fiscal year 2001)

Program	Total	State					Federal				Local
	Year 1 Funding	General Funds	Prop 204	Prop 13	Other	Subtotal	USBR	Corps	Other	Subtotal	Subtotal
Ecosystem Restoration	\$236.0	\$3.5	\$134.9	\$46.2	\$6.1	\$190.7	\$4.3	\$0.4	\$6.3	\$11.0	\$34.3
Environmental Water Account	\$59.1	\$59.1	-	-	-	\$59.1	-	-	-	-	-
Water Use Efficiency	\$204.1	\$17.0	-	\$12.3	-	\$29.3	\$26.0	-	-	\$26.0	\$148.8
Water Conservation	(\$31.2)	(\$17.0)	-	(\$3.2)	-	(\$20.2)	(\$1.9)	-	-	(\$1.9)	(\$9.1)
Water Recycling	(\$172.9)	-	-	(\$9.1)	-	(\$9.1)	(\$24.1)	-	-	(\$24.1)	(\$139.7)
Water Transfers	\$1.1	\$1.1	-	-	-	\$1.1	-	-	-	-	-
Watershed	\$33.0	\$18.9	\$1.3	-	\$1.0	\$21.2	-	-	\$2.3	\$2.3	\$9.5
Drinking Water Quality	\$37.5	\$13.5	-	\$24.0	-	\$37.5	-	-	-	-	-
Levees	\$35.4	\$0.1	\$1.7	\$28.5	-	\$30.3	-	-	-	-	\$5.1
Storage	\$95.5	\$24.7	-	\$69.0	-	\$93.7	\$1.8	-	-	\$1.8	-
Oversight and Coordination	(\$2.9)	(\$2.9)	-	-	-	(\$2.9)	-	-	-	-	-
Surface	(\$13.8)	(\$13.8)	-	-	-	(\$12.0)	(\$1.8)	-	-	(\$1.8)	-
Groundwater	(\$78.8)	(\$78.8)	-	(\$69.0)	-	(\$78.8)	-	-	-	-	-
Conveyance	\$22.3	\$4.2	-	\$4.8	-	\$9.0	\$2.6	-	-	\$2.6	\$10.7
Science	\$28.2	\$13.2	-	-	\$2.3	\$15.5	\$4.0	\$0.2	\$1.9	\$6.1	\$6.6
Calfed Science	(\$13.8)	(\$13.8)	-	-	-	(\$13.0)	-	-	(\$0.8)	(\$0.8)	-
Interagency Ecological Program	(\$14.4)	(\$14.4)	-	-	-	(\$2.5)	(\$4.0)	(\$0.2)	(\$1.1)	(\$5.3)	(\$6.6)
Oversight and Coordination	\$13.8	\$13.5	-	-	-	\$13.5	-	\$0.3	-	\$0.3	-
Total	\$766.0	\$168.8	-	\$184.8	\$9.4	\$500.9	\$38.7	\$0.9	\$10.5	\$50.1	\$215.0

Local funds include State Water Project Funds and Central Valley Project Improvement Act (CVPIA) that are collected from state water contractors and Central Valley Project water users. Source: Calfed Bay Delta Program Annual 2001 Report.

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Table V-2: Calfed Bay-Delta Program Funding by Source for Stage 1 program implementation (California fiscal year 2002)

Program	Total	State					Federal				Local
	Year 2 Funding	General Funds	Prop 204	Prop 13	Other	Subtotal	USBR	Corps	Other	Subtotal	Subtotal
Ecosystem Restoration	\$188.2	\$2.8	\$126.3	\$10.0	-	\$139.1	\$2.2	\$1.2	\$3.1	\$6.5	\$42.6
Environmental Water Account	\$48.0	\$1.0	\$28.2	\$6.3	-	\$35.5	\$12.5	-	-	\$12.5	
Water Use Efficiency	\$333.7	\$11.8	-	\$43.3	\$57.9	\$113.0	\$19.8	-	\$18.2	\$38.0	\$182.7
Water Conservation	(\$37.1)	(\$11.8)	-	(\$18.3)	-	(\$30.1)	(\$2.3)	-	-	(\$2.3)	(\$4.7)
Water Recycling	(\$296.6)	-	-	(\$25.3)	(\$57.9)	(\$82.9)	(\$17.5)	-	(\$18.2)	(\$35.7)	(\$178.0)
Water Transfers	\$1.1	\$0.9	-	-	-	\$0.9	\$0.2	-	-	\$0.2	-
Watershed	\$17.3	\$7.3	-	\$10.0	-	\$17.3	-	-	-	-	-
Drinking Water Quality	\$16.2	\$4.1	-	\$12.1	-	\$16.2	-	-	-	-	-
Levees	\$17.2	\$4.9	\$8.4	-	-	\$13.3	-	\$0.3	-	\$0.3	\$3.6
Storage	\$123.2	\$14.1	-	\$103.0	-	\$117.1	\$6.2	-	-	\$6.2	-
Oversight and Coordination	(\$1.5)	(\$1.5)	-	-	-	(\$1.5)	-	-	-	-	-
Surface	(\$15.0)	(\$8.8)	-	-	-	(\$8.8)	(\$6.2)	-	-	(\$6.2)	-
Groundwater	(\$106.8)	(\$3.8)	-	(\$103.0)	-	(\$106.8)	-	-	-	-	-
Conveyance	\$72.2	\$3.3	-	\$37.6	-	\$40.9	\$4.0	-	-	\$4.0	\$27.3
Science	\$20.1	\$5.1	-	-	\$2.3	\$7.4	\$3.9	\$0.2	\$2.0	\$6.1	\$6.6
Calfed Science	(\$6.6)	(\$4.9)	-	-	-	(\$4.9)	-	-	(\$1.7)	(\$1.7)	-
Interagency Ecological Program	(\$13.5)	(\$0.2)	-	-	(\$2.3)	(\$2.5)	(\$3.9)	(\$0.2)	(\$0.3)	(\$4.4)	(\$6.6)
Oversight and Coordination	\$14.9	\$7.3	-	-	-	\$7.3	\$7.5	\$0.1	-	\$7.6	-
Total	\$852.2	\$62.6	\$162.9	\$222.3	\$60.2	\$508.0	\$56.3	\$1.8	\$23.3	\$81.4	\$262.8

Local funds include State Water Project Funds and Central Valley Project Improvement Act (CVPIA) that are collected from state water contractors and Central Valley Project water users. Source: Calfed Bay Delta Program Annual 2001 Report.

V-2.5. Several observations can be made with respect to current funding from Calfed: 1) there appears to be a very limited state-Federal partnership as it relates to money to fund Calfed,¹¹¹ and 2) the Corps role with respect to appropriated funds for Calfed is relatively small, and 3) the primary Federal agency roles in this capacity is the Bureau of Reclamation (USBR). Federal funds accounted for 6.5 percent of Calfed funding in FY 2001 and 9.5 percent in FY 2002.¹¹² It is also important to point out that of the Federal funds currently allocated, less than

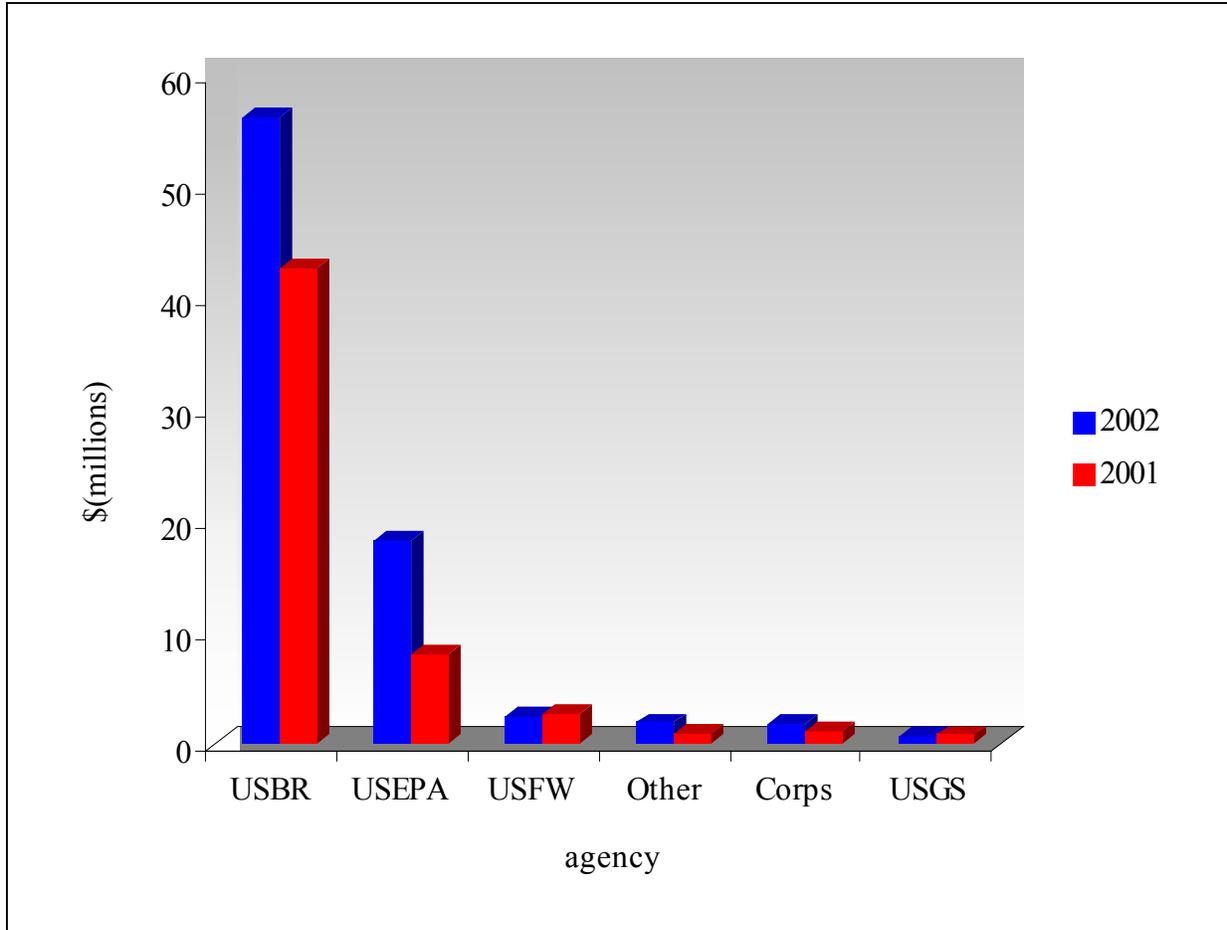
¹¹¹ It is true, however, that in August of 2002 the Senate Energy and Natural Resources Committee passed Senate Bill 976 (sponsored by Senator Dianne Feinstein) to reauthorize Calfed. If enacted and funded by Congress, the bill would provide direct funding for \$1.63 billion over the next three years, which would make up the significant shortfall in Federal monies over the short-term.

¹¹² The Federal Energy and Water Bill for fiscal year 2002 provided \$30 million for Calfed.

1.8 percent in FY 2001 and 2.0 percent in FY 2002 came by way of Corps appropriations. In contrast, USBR appropriations accounted for 77.4 percent in 2001 and 70.0 percent in 2002 (see Figure V-1).

Figure V-1: Federal Appropriations For Calfed Funding By Agency (FY 2001 And 2002)

Source: Calfed Annual Report 2001



V-2.6. Apparently, concerns regarding Calfed’s lack of programmatic balance, along with debate over its proper governance structure stymied efforts for Federal reauthorization for fiscal year 2000-2001.¹¹³ Other criticisms have emerged as well. In testimony on Capitol Hill in March of 2000, Senator John Doolittle and others gave Calfed a “big fat F.” Concerns were expressed given the fact that at the time, over \$210 million had been appropriated to Calfed, but only \$35 million has been expended. Doolittle also noted that there had not been an increase in water supply since the programs inception and further noted that the Delta-Bay had actually lost 300,000 acre-feet of water. In addition, there was and is concern over potential drought

¹¹³ See, Oversight Hearing Committee on Water and Power. The Calfed Program and California Valley Water (CVP) Project Operations. March 30, 2000. Washington D.C. 106th Congress, 2nd Session. Serial No. 1-6-88.

conditions in the future. In a recent report, the Governors Advisory Drought Planning Panel of California stressed that while the long-term implementation of Calfed was intended to help improve water supply reliability, the program was not designed to address extreme or long-term droughts or future state population growth.¹¹⁴

V-2.7. Another area of concern is the regulatory requirements with respect to individual project implementation. Calfed is deemed by many in Congress as an experiment to determine if the regulatory requirements of the Clean Water Act and Endangered Species Act can be met efficiently while balancing the needs of water users including M&I. In the ROD, Calfed states that it will oversee and coordinate regulatory compliance for Calfed action during site specific environmental review and permitting. To facilitate the process, Calfed has published an environmental compliance strategy, and is developing a “permit clearing” house to coordinate and expedite permitting across all Calfed programs. In addition, the Corps, the USBR, USEPA and the California Department of Water Resources have all signed a Memorandum of Understanding (MOU) regarding regulatory activities covered under Section 404 of the CWA that will take during project specific reviews during Phase III of the program. Basically, the signatories of the MOU agreed to:

“rely on information developed at the programmatic level and will not require additional review of programmatic alternatives beyond the scope of the programs and commitments described in the Decision Document [ROD], and will focus on project level alternatives that are consistent with the Decision Document in selecting least environmentally damaging alternatives at the time of the permit decision unless new information is submitted at the time of the Section 404 permit process indicating that the programmatic level of information is incorrect or incomplete in some material manner.”

V-2.8. The Corps is responsible for determining whether new or “missing” information warrants additional review of programmatic alternatives and program commitments after consultation with other agencies and stakeholders. Thus, it appears that Calfed has is resulting in greater collaboration between state and Federal agencies at a programmatic level.

V-3 Calfed as a Potential Model for Texas

V-3.1. From the perspective of Texas water supply, Calfed could serve as a model in terms of overcoming the fragmented Federal, state and local missions, responsibilities and interests with respect to water supply. To the extent that stakeholder fragmentation could be overcome, Federal-state partnerships could streamline regulatory requirements for developing water supply through interregional transfers, additional storage and new conveyance infrastructure. In addition, creation of a “Texfed” could result in direct funding through the Federal legislative mechanism for Texas water supply.

¹¹⁴ Governors Advisory Drought Planning Panel. “Critical Water Shortage Contingency Plan.” December 2000.

V-3.2. However, there are several considerations with respect to pursuing an approach similar to Calfed. First, there is some uncertainty regarding the stability of long-term funding of the program. If a program such as Calfed fails to deliver new water during the next several years, Federal legislators and their constituencies may be reluctant to continue allocating funds through the program. Secondly, despite an apparent increase in collaboration between agencies, site-specific environmental review for individual projects has not yet taken place, and it is not clear whether increased collaboration will result in a streamlined regulatory process when it is time to move forward on water supply infrastructure construction. Lastly, it is not clear whether Calfed has resulted in an absolute increase in Federal appropriations for water supply development in California. In general, there has been a long-term decline in the amount of Federal outlays for water supply infrastructure through the Corps and USBR, and in grant assistance to local and regional water providers. However, a detailed investigation at the state level would be difficult, as there does not appear to be readily available secondary data regarding specific dollar amounts for water supply funding. In addition, it is difficult to track funding for “water supply” because it often comes in many different forms and through many different agencies and funds (Corps, USBR, Safe Water Drinking Fund, Rural Utilities Service etc.).

V-3.3. Despite lingering uncertainties, it appears that Calfed has the potential to be a winner in the long-term, but it may be too early to make a definitive judgment regarding Calfed and implication for other states including Texas. Regardless, from the Corps perspective its greatest role may be in the form of planning assistance with a specific focus on interregional (i.e., interstate and interbasin) water transfers rather than construction given the current limitations in Corps authority with respect to water supply. A Calfed like institution in Texas may make it easier for the Corps to provide its expertise.

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CHAPTER VI: CONCLUSIONS

VI-1. Problems

- In 1997, in response to recent droughts, the Texas Legislature passed Senate Bill 1 to address the water management and planning problems in Texas. This legislation put in place a regional approach to planning by creating 16 regions across the State based on water sources, river basins, economic growth centers and other factors unique to the area. These Regional Water Planning Groups identified water management strategies for entities with projected shortages and developed costs estimates. On a statewide basis, over \$17 billion of improvements (1999 costs) were recommended to meet the projected demands by 2050.
- For many entities within Texas, the improvements to meet the 2050 requirements cannot be completed without outside assistance and present local and state resources may not be sufficient.
- These non-Federal entities desire Corps technical and financial assistance in accomplishing the desperately needed projects.

VI-2. Facts

- It is national policy that states and local interests have the primary responsibility in the development and management of their water supplies.
- The Corps may, however, participate and cooperate with states and local interests in development of water supplies in connection with multipurpose water resource projects.
- There are about 4.6 million acre-feet of storage space in 26 Corps reservoir projects in Texas dedicated to municipal and industrial water supply.
- At the time of construction it cost about \$446 million to include this storage in Corps projects. All of this cost has been or is in the process of being repaid through 49 repayment agreements.
- One acre-foot of storage space equates to 325,851 gallons. While the Corps sells storage space and not water, the storage agreements in Texas at any one time could include approximately 1.5 trillion gallons of water for domestic, municipal and industrial use.
- The urban water resource infrastructure is aging.

- Run-off from past industrial development has degraded aquatic ecosystems resulting in deteriorated urban stream corridors and waterfronts.
- There is a lack of sufficient water supplies in numerous urban centers.
- Rural areas, particularly poor rural areas such as Native American reservations, may not have the resources to finance infrastructure improvements for water conveyance.
- Water supply accounted for 0.1% of the Corps total budget for Fiscal Year 2001.
- The Texas State Water Plan, completed in January 2002, recommended over \$17 billion worth of water supply projects to meet the anticipated water supply needs through 2050.
- Current Corps authorities as specified in the 1958 Water Supply Act and as amended through the years limit Corps' participation in water supply and require 100% non-Federal cost recovery. For new projects, the cost must be repaid during the period of construction. For reallocations the cost may be repaid over a period of 30-years.

VI-3. The Challenge

- Make it easier for Corps districts to study storage reallocations at existing Corps reservoir projects through appropriate funding mechanisms.
- Assess current water storage capability at existing Federal reservoirs and the ability to provide dependable and intermittent water supply to urban areas under authorized and alternative storage allocation options.
- Work with state and local governments to make periodic regional assessments of urban water resources needs, including the interstate and inter-basin aspects of the transfer of water. Facilitate the development of contingency plans for regional drought emergencies using interstate supply sources.
- Establish Federal/state/local partnerships to leverage Federal and non-Federal financial and technical resources to provide integrated water-related infrastructure for sustainable development to include brownfields redevelopment, combined sewer overflows, water conveyance infrastructure, and urban stream corridor and water front restoration.
- Implement ability to pay provisions for cost shared projects for water resources infrastructure investments in poor and disadvantaged communities.

VI-4. Direction

- Texas state legislation has promoted consideration of in-stream environmental uses when developing state water and, under state law, those in-stream uses are considered to be beneficial. Also, most Water Resources Development Acts contain, in addition to flood control and navigation authorizations, authorizations for environmental water supply activities. Since these conditions exist, where the purpose of a reservoir is for environmental in-stream flow sustainability during drought periods, M&I water supply storage can be considered. While the probability of justifying such a reservoir may be low (to keep from becoming a single purpose water supply project) and obtaining water rights and paying for the M&I portion of the reservoir would still be a non-Federal responsibility, Federal participation in construction could be possible due to the environmental portion.
- The Corps is generally prohibited from studying and in all cases is prohibited from constructing single purpose water supply projects, even though state or local interests are responsible for 100 percent of the all costs. This conflicts with, for example, the purpose of flood control, which may be constructed just for flood control, and is reimbursed at only a 35 to 50 percent level. Modification of Administration policy to make water supply an equal partner in water resources development, even on a 100% reimbursable basis similar to hydropower, could help meet future challenges in Texas.

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APPENDIX A: COMPENDIUM OF LEGISLATION PERTINENT TO WATER SUPPLY

1. **Public Law 57-161**, The 1902 Reclamation Act, 17 June 1902. This act *established irrigation in the West as a National policy*. The Act authorized the Secretary of the Interior to locate, construct, operate and maintain works for the storage, diversion, and development of waters for the reclamation of arid and semiarid lands in the Western States (32 Stat. 388, 43 U.S.C. 1457).
 2. **Civil Functions Appropriations Act of 1936**, approved 19 July 1937, *Contributions by States and political subdivisions*. Provides for the Secretary of the Army to receive funds from States or political subdivisions when any flood control or environmental restoration work is modified to provide additional storage capacity for domestic water supply or other conservation storage (50 Stat.515, 33 U.S.C. 701h).
 3. **Public Law 78-534**, 1944 Flood Control Act, 22 December 1944.
 - a. Section 6, *Contracts for Surplus Water*, authorized disposal by the Secretary of the Army, for domestic and industrial uses, of surplus water available at reservoirs (58 Stat. 890, 33 U.S.C. 708).
 - b. Section 8, *Additional Irrigation Works*, provided that Corps reservoirs may include irrigation as a purpose in 17 western states (58 Stat. 891, 43 U.S.C. 390). Section 931 of Public Law 99-662 modified these provisions.
 4. **Public Law 84-99**, Emergency Flood Control Work, 28 June 1955. This act *amends Section 5 of the 1941 Flood Control Act, as amended*. This act authorized an emergency fund, with replenishment on an annual basis, for flood emergency preparation, flood fighting and rescue operations or for repair or restoration of flood control work threatened or destroyed by flood including strengthening or extending deemed necessary by the Chief of Engineers (69 Stat. 186, 33 U.S.C. 701n). Section 82 of Public Law 93-251 and Section 2 of Public Law 95-51 modified these provisions.
 5. **Public Law 85-500**, 1958 River and Harbor Act, 3 July 1958. Title III of this act is entitled *The Water Supply Act of 1958*. Section 301 provided that storage may be included for present and future municipal or industrial water supply in Corps or Bureau of Reclamation projects, the costs plus interest to be repaid by non-Federal entities within the life of the project but not to exceed 50 years after first use for water supply. No more than 30 percent of total project costs may be allocated to future demands. An interest-free period, until supply is first used, but not to exceed ten years, was permitted (72 Stat. 319, 43, U.S.C. 390b). Section 10 of Public Law 87-88 and Section 932 of Public Law 99-662 modified these provisions.
 6. **Public Law 87-88**, Water Pollution Control Act Amendments of 1961, 20 July 1961. Section 10 of this law, *Water Supply Act of 1958 Amendments*, modified the 1958 Water Supply Act with respect to construction cost payments for future water supply demands (75 Stat. 210).
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7. **Public Law 88-140**, 16 October 1963. This law, *Permanent Right to Storage*, extended the non-Federal right to use reservoir water supply storage for the physical life of the project. This removed an uncertainty as to the continued availability of the storage space after the 50-year maximum period previously allowed in contracts (77 Stat. 249, 43 U.S.C. 390-c-e).
8. **Public Law 89-298**, River and Harbor and Flood Control Act of 1965, Public Law 89-298. Title I of this act is entitled “Northeastern United States Water.” In this law Congress recognized that the Federal Government should provide assistance in solutions to water supply problems of metropolitan areas of the northeast United States (79 Stat. 1073).
9. **Public Law 90-577**, Intergovernmental Cooperation Act of 1968. This law provides for cooperation and coordination of activities among levels of government, improved administration of programs for technical services to states and local governments, intergovernmental coordination on policy and administration of development assistance programs within urban areas and periodic Congressional review of such grants-in-aid programs (82 Stat. 1098; 42 U.S.C. 4201). Under this program, the Corps may conduct reimbursable single purpose water supply studies for non-Federal interests.
10. **Public Law 91-611**, River and Harbor and Flood Control Act of 1970, 31 December 1970. Section 221, *Written Agreement*, provides that the construction of any water resources project by the Corps shall not be commenced until each non-Federal interest has entered into a written agreement to furnish its required cooperation for the project (84 Stat. 1831, 42 U.S.C. 1962d-5b). Clarified by Section 4 of Public Law 92-222 and amended by Section 912(a) of Public Law 99-662.
11. **Public Law 92-222**, River Basin Monetary Authorization Act of 1971, 23 December 1971. Section 4, *Written Agreement*, clarifies that Section 221 of Public Law 91-611 does not apply to storage for future water supply (85 Stat. 799).
12. **Public Law 93-251**, Water Resources Development Act of 1974, 7 March 1974.
 - a. Section 22, *Planning Assistance to States*, provides authority for cooperating with any state in preparation of comprehensive plans for water resources development, utilization, and conservation (88 Stat. 21, 42 U.S.C. 1962d-16). This section has been amended by Section 168 of Public Law 94-587 (increase of monetary limits only), Section 605 of Public Law 96-597, Section 921 of Public Law 99-662 (increase in monetary limits only), Section 319 of Public Law 101-640, Section 208 of Public Law 102-80, and Section 221 of Public Law 104-303.
 - b. Section 82, *Emergency Water Supplies*, amends Section 5 of the 1941 Flood Control Act, as amended by Public Law 84-99 (Emergency Flood Control Funds, 28 June 1955) to authorize the provision of emergency supplies of clean drinking water when contaminated supplies are a threat to public health and welfare of locality. Contamination must result from flood (88 Stat. 34).

13. **Public Law 95-51**, Disaster Relief Act of 1974 Appropriations, 20 June 1977. Section 2 further amends Public Law 84-99 to allow the Corps to provide *Emergency Supplies of Water* and to construct wells in drought areas (91 Stat. 233).
14. **Public Law 96-597**, Appropriations Act, U.S. Insular Areas. Section 605 amends the provisions of Section 22, Public Law 93-251 (*Planning Assistance to States*), applicable to Guam, American Samoa, the Virgin Islands, the Northern Marianas, and the Trust Territory of the Pacific Islands (94 Stat. 3482).
15. **Public Law 99-662**, Water Resources Development Act of 1986, 17 November 1986.
 - a. Section 103 (c), *Construction Cost Sharing*, established new cost sharing requirements for municipal and industrial water supply and for agricultural water supply (100 Stat. 4085).
 - b. Section 707, *Capital Investment Needs for Water Resources*, authorized the Assistant Secretary of the Army for Civil Works to estimate long-term capital investment needs for, among other things, municipal and industrial water supply (100 Stat. 4158). This section together with Section 729 of Public Law 99-662, provided the impetus for the *National Drought Study*.
 - c. Section 729, *Study of Water Resources Needs of River Basins and Regions*, requires the Assistant Secretary of the Army for Civil Works, in coordination with the Secretary of the Interior and in consultation with other governmental agencies, to study “water resources needs of river basins and regions of the United States.” This section specifically requires consultation with “State, interstate, and local governments” (100 Stat. 4164). This section together with Section 707 of Public Law 99-662, provided the impetus for the *National Drought Study*.
 - d. Section 917, *Emergency and Disaster Authority*, further amends Section 5 of the 1941 Flood Control Act, as amended, to authorize provision of emergency supplies of clean water, whether for drinking or other critical need (100 Stat. 4192).
 - e. Section 931, *Interim Use of Water Supply for Irrigation*, amends Section 8 of the 1944 Flood Control Act to authorize interim allocation of future municipal and industrial water supply storage in Corps reservoirs for irrigation purposes (100 Stat. 4196).
 - f. Section 932, *Water Supply Act Amendments*, amends the 1958 Water Supply Act in the following respects; eliminates the 10-year interest free period for future water supply; modifies the interest rate formula; limits the repayment period to 30 years; and requires allocated annual operation, maintenance and replacement costs to be reimbursed annually. These amendments apply only to Corps projects and not to Bureau of Reclamation projects (100 Stat. 4196).
 - g. Section 1203, *Dam Safety*, requires non-Federal interests which are participating in reimbursable purposes of a project to share in the costs of modifying Corps dams and

related facilities resulting from changes deemed necessary for safety purposes (100 Stat. 4263).

16. **Public Law 101-640**, Water Resources Development Act of 1990, approved 28 November 1990.
 - a. Section 310(b), *Public Participation*, directs the Secretary of the Army to ensure that significant opportunities for public participation are provided in developing or revising reservoir-operating manuals.
 - b. Section 319, *Fees for Development of State Water Plans*. Amends Section 22 of Public Law 93-251, as amended, to require fees for the development of state water plans, the establishment of a collection procedure, a phase-in for the fees, and how the fees are to be deposited and used (104 Stat. 4642).
 - c. Section 322, *Reduced Price for Certain Water Supply Storage*, provides that a small amount of water supply storage in Corps reservoir projects may be made available for low-income communities at a reduced price (104 Stat. 4643, 33 U.S.C. 2324).
17. **Public Law 102-580**, Water Resources Development Act of 1992, 31 October 1992. Section 208 (*Fees for Development of State Water Plans*), amends Section 22 of Public Law 93-251, as amended, to provide for a credit for in-kind services and to include “Indian Tribes” as available for assistance under his law (106 Stat. 4829).
18. **Public Law 104-303**, Water Resources Development Act of 1996, 12 October 1996. Section 221, *Planning Assistance to States*, amends Section 22 of the Water Resources Development Act of 1974, as amended, to expand the areas of planning effort to include watersheds and ecosystems, and expands the annual program budget to \$10,000,000 and the per state expenditure to \$500,000.

APPENDIX B: AUTHORIZATIONS FOR WATER SUPPLY, WATER QUALITY AND RELATED INFRASTRUCTURE PROJECTS AND STUDIES

Act Section	Provision [1] T = Traditional NT = Non-traditional	New Federal \$(000) [2]	States(s)
WRDA 1986, PL 99-662, 17 November 1986			
401(a)	<u>Santa Ana River Mainstem, CA.</u> Study to investigate the feasibility of including water supply and conservation storage at Prado Dam. T	0	CA
707	<u>Capital Investment Needs for Water Resources.</u> Authorized the Assistant Secretary of the Army for Civil Works to estimate long-term capital investment needs for, among other things, municipal and industrial water supply. T	0	Nationwide
729	<u>Study of Water Resources Needs of River Basins and Regions.</u> Requires the Assistant Secretary of the Army for Civil Works, in coordination with the Secretary of the Interior and in consultation with other governmental agencies, to study “water resources needs of river basins and regions of the United States.” This section specifically requires consultation with “State, interstate, and local governments” T	5,000	Nationwide
818	<u>Brazos River Basin, TX.</u> Modifies Section 10 of the 1946 FCA to insert “or water supply” after “irrigation.” T	0	TX
834	<u>Curwensville Lake.</u> Authorization to construct a water line with pumps in order to provide water for municipal use. NT	225	PA
838	<u>Denison Dam (Lake Texoma).</u> Authorization to reallocate 300,000 acre-feet of hydropower storage to municipal and industrial water supply. T	0	OK & TX
843	<u>Beaver Lake.</u> Authorization to study and undertake a project to preserve and enhance water quality of the lake. NT	3,825	AR
931	<u>Interim use of Water Supply for Irrigation.</u> Authorizes the temporary use of unused municipal and industrial water supply storage for irrigation. T	0	Nationwide
1103	<u>Upper Mississippi River Plan.</u> This is a major environmental restoration authorization for the Corps. This authorization recognized the Upper Mississippi River as a nationally significant ecosystem and a nationally significant commercial navigation system. It authorized the Secretary of the Army to enter into agreements with basin states and to transfer funds to the DOI as necessary to carry out the provisions of the section. In consultation with the DOI and the basin states the Secretary of the Army was also authorized to determine the need for river rehabilitation and environmental enhancement and protection based on the conditions of the environmental, project developments, and projected environmental impacts from implementing any proposal resulting from recommendations made under provisions of the section. T	188,000 over 10- years	IL, IA, MN, MO and WI
1121	<u>Ogallala Aquifer.</u> To establish a comprehensive research and development program to assist those portions of the High Plains region dependent on water from the Ogallala Aquifer. NT	65,000	CO, KS, NE, NM, OK, SD, TX & WY

Texas Water Assessment – Review of Corps Water Supply Authorities, Policies and Related Land Resources

Act Section	Provision [1] T = Traditional NT = Non-traditional	New Federal \$(000) [2]	States(s)
1135	<u>Project Modifications for Improvement of Environment</u> . Authorizes the review of water resources projects to determine the need for modifications in the structures and operations of such projects for the purpose improving the quality of the environment in the public interest. T	0	Nationwide
1141	<u>Groundwater Recharge</u> . Authorization to plan, engineer and design a project for recharge of groundwater in the drainage basis of the Tucson and Scottsdale, AZ metropolitan areas. NT	250	AZ
1157	<u>Miami River Water Quality Commission</u> . Authority to make a grant to establish a commission to develop a plan for improving the water quality of the Miami River and tributaries. NT	50	FL
Total WRDA '86	13 Sections (4 of which apply nationwide); 8 sections traditional and 5 non-traditional	262,350	18
WRDA 1988, PL 101-676, 17 November 1988			
23	<u>Louisiana Water Supply</u> . Authorized to review the water supply problems related to drought at a water supply reservoir and to respond as appropriate. NT	0	LA
Total WRDA '88	1 Section; non-traditional	0	1
WRDA 1990, PL 101-640, 28 November 1990			
116(d)	<u>Southern California Infrastructure Restoration</u> . Conduct a feasibility study, in consultation with FEMA, on the problems and alternative solutions of the infrastructure of the region. NT	1,500	CA
116(g)	<u>Santa Rosa, CA</u> . Authorize a study to evaluate storage facilities associated with wastewater reclamation and irrigation. NT	0	CA
116(p)	<u>Water Supply, Minnesota and North Dakota</u> . Conduct a study to determine alternate plans to augment flows in the Red River of the North including plans to supplement flows for municipal, industrial, agricultural, and fish and wildlife purposes. NT	0	MN & ND
116(w)	<u>Buffalo, New York</u> . To evaluate a city plan on flooding and associated water quality problems (including those associated with combined sewer over flow, sewer backups and riverside outfalls. NT	0	NY
116(x)	<u>Caesar's Creek Lake, Ohio</u> . To conduct a study of the water supply needs of Clinton County, Ohio. NT	0	OH
116(y)	<u>Liberty, Ohio</u> . To conduct a study of the water supply needs of the city. NT	0	OH
116(z)	<u>Washingtonville, Ohio</u> . To conduct a study of the water supply needs of the city. NT	0	OH
116(dd)	<u>Radium Removal</u> . To study and provide technical assistance to small communities on methods of mitigating radium contamination in ground water used as a source of public drinking water. NT	0	Nationwide
Total WRDA '90	8 Sections (including one nationwide); all non-traditional	1,500	5
WRDA 1992, PL 102-580, 31 October 1992			
114	<u>Brockton, MA</u> . Study of water supply needs and of water quality and quantity to meet future needs. NT	0	MA
217	<u>Reuse of Wastewater</u> . Authorizes assistance to non-Federal interests for planning and design of reuse systems. NT	5,000	CA

Appendix B: Authorizations for Water Supply, Water Quality
and Related Infrastructure Projects and Studies

Act Section	Provision [1] T = Traditional NT = Non-traditional	New Federal \$(000) [2]	States(s)
218	<u>Demonstration of Waste Water Technology, Santa Clara Valley Water District and San Jose, CA.</u> Authorized, in cooperation with EPA, to provide design and construction assistance to the Water District for demonstrating and field testing public use innovative processes which advance the technology of waste water reuse and treatment and which promote the use of treated waste water for critical water supply purposes. NT	10,000	CA
219	<u>Environmental Infrastructure.</u> Authorizes technical and planning and design assistance. NT	5,000 *	Nationwide
220	<u>Environmental Infrastructure Assistance.</u> Authorizes assistance in design and construction of water transmission line. NT	5,000	AR
221	<u>Environmental Infrastructure Assistance.</u> Authorizes design and construction assistance for Combined Sewer System and storm water projects. NT	7,000	NY
222	<u>Environmental Infrastructure Assistance.</u> Authorizes design and construction assistance for storm water project. NT	200	NY
304	<u>Broad Top Region of Pennsylvania.</u> Authorizes a Watershed Reclamation and Wetlands Pilot Project along the Juniata River and its tributaries, PA. NT	5,500 *	PA
307	<u>Water Quality Projects.</u> Authorizes design and construction of storm water projects. NT	70,000 *	LA, ME, NY, & RI
313	<u>South Central Pennsylvania Environmental Restoration Infrastructure and Resource Protection Development.</u> Establishes a pilot program for design and construction of wastewater treatment facilities, water supply storage, treatment and distribution facilities and surface water development and protection. NT	17,000	PA
322	<u>Water Supply needs of Mahoning Valley Sanitary District, Ohio.</u> Cooperate with the state in review of water supply needs. NT	0	OH
324	<u>Hackensack Meadowlands Area.</u> Authorizes design and construction assistance for an environmental improvement program. NT	5,000	NJ
340	<u>Southern West Virginia Environmental Restoration and Infrastructure Resources Protection Development Project.</u> Modified by Section 359 of WRDA '96. NT	5,000 *	WV
362	<u>Quonset Point-Davisville, Rhode Island.</u> Authority to construct two water supply towers and relocate sewer lines. NT	1,875	RI
Total WRDA '92	14 sections (including one nationwide); all non-traditional	136,075	11
WRDA 1996, Public Law 104-303, 12 October 1996			
359	<u>Southern West Virginia.</u> Modifies cost sharing and increases funding levels of Section 340 of WRDA '92. NT	15,000 *	VW
401	<u>Rural Sanitation Projects.</u> Authorize a study to report on the advisability and capability of the Corps to implement rural sanitation projects for rural and native villages in Alaska. NT	0	AK
503	<u>Watershed Management, Restoration and Development.</u> Authority to provide technical, planning and design assistance to non-Federal interests for carrying out watershed management, restoration and development projects at specific locations. NT	15,000	AZ, CA, GA, NE, WV

Texas Water Assessment – Review of Corps Water Supply Authorities, Policies and Related Land Resources

Act Section	Provision [1] T = Traditional NT = Non-traditional	New Federal \$(000) [2]	States(s)
504	<u>Environmental Infrastructure</u> . Amend Section 219 of WRDA '92 by adding specific authorizations of appropriations for construction assistance for six specific environmental infrastructure projects. NT	73,000 *	DC & MD, GA, KY, MI, MS, NH
522	<u>Jackson County, AL</u> . Authority to provide technical, planning and design assistance for wastewater treatment and related facilities, remediation of point and non-point sources of pollution and contaminated riverbed sediments. NT	3,000	AL
531	<u>Southern and Eastern Kentucky</u> . Authority to establish a program to provide environmental assistance to non-Federal interests to design and construct water related environmental infrastructure including wastewater treatment, water supply and surface water protection and development. NT	10,000	KY
552	<u>New York City Watershed</u> . Authority to provide design and construction assistance for environmental infrastructure and resource protection and development projects in the watershed to protect and enhance the quality and quantity of the New York City water supply. NT	22,500	NY
566	<u>Southeastern Pennsylvania</u> . Authority to establish a program to provide environmental assistance to non-Federal interests to design and construct water related environmental infrastructure including wastewater treatment, water supply, and surface water protection and development. NT	25,000	PA
585	<u>Overflow Management Facility</u> . Authority to provide assistance to Narragansett Bay Commission for the construction of a combined river overflow management facility. NT	30,000	RI
Total WRDA '96	9 Sections; all non-traditional	188,500	15
WRDA 1999, Public Law 106-53, 17 August 1999			
101(b)(4)	<u>Success Dam, Tule River Basin, CA</u> . Authorizes a project for flood damage reduction and water supply. T	11,635	CA
101(b)(15)	<u>Howard Hanson Dam, WA</u> . Authorizes a project for water supply and ecosystem restoration. NT	36,900	WA
211	<u>Watershed Management, Restoration and Development</u> . Expands Section 503 of WRDA '96 to extend authorization assistance to sites in six additional states. NT	0	FL, IL, NV, NC, OR
212	<u>Flood Mitigation and Riverine Restoration Program</u> . Authorizes a program for the purpose of conducting projects to reduce flood hazards and restore the natural functions and values of rivers throughout the United States. T	200,000	AZ, CA, KY, MN, ND, NH, NJ, NM, NY, NC, OH, OR, PA, RI, SD, VA, WI
331	<u>Jackson County Mississippi</u> . Modifies Section 219(c)(5) of WRDA '92 to provide cost sharing credit. NT	0	MS
340	<u>New York City Watershed</u> . Modifies Section 552 of WRDA '96 to change local cooperation wording. Increases \$22.5 million to \$42.5 million. NT	20,000 *	NY

Appendix B: Authorizations for Water Supply, Water Quality
and Related Infrastructure Projects and Studies

Act Section	Provision [1] T = Traditional NT = Non-traditional	New Federal \$(000) [2]	States(s)
343	<u>Broken Bow Lake</u> . Project modified to require a seasonal adjustment to the top of the conservation pool in the interest of water and related resources. T	0	OK
351	<u>South Central Pennsylvania</u> . Modifies Section 313(g)(3) of WRDA '92 to increase appropriations and cost sharing (increases \$80 million to \$180 million). NT	100,000 *	PA
374	<u>White River Basin, AR and MO</u> . Authorizes project operation modifications and storage reallocations in the interest of trout fisheries. NT	0	AR & MO
403	<u>Greers Ferry Lake, AR</u> . Conduct a study to determine the feasibility of constructing water intake facilities. NT	0	AR
502	<u>Environmental Infrastructure</u> . Modifies Section 219(e) of WRDA '92 to increase appropriations and to authorize additional assistance at 43 projects in 20 different states. The assistance to include, but not necessarily limited: to eliminate or control combined sewer overflows, or for water related infrastructure, or groundwater recharge, or wastewater infrastructure projects, or wastewater treatment, or to provide water supply facilities, or for a project for recycled water or for industrial water reuse project. NT	494, 000 *	CA, CT, GA, IN, LA, MA, MI, MO, MS, NC, NH, NJ, NY, OR, OK, PA, SC, TN, UT & VA
513	<u>Design and Construction Assistance</u> . Modifies Section 507 of WRDA '96 to include "expansion and improvement of Long Pine Run Dam, PA and associated water infrastructure." NT	5,000	PA
521	<u>Beaver Lake, AR</u> . Reallocate storage in Beaver Lake at no cost to the local water districts. NT	0	AR
531	<u>Kanopolis Lake, KS</u> . Offers the State of Kansas the right to purchase storage at certain prescribed costs. NT	0	KS
532	<u>Southeastern and Eastern Kentucky</u> . Modifies Section 531 of WRDA '96 to increase (from \$10 to \$25 million) funding and to expand to include "small stream flooding, local storm water drainage, and related problems." NT	15,000 *	KY
545	<u>Sardis Reservoir, OK</u> . Offers the State of Oklahoma the right to purchase storage a certain prescribed costs. NT	0	OK
548	<u>Bradford and Sullivan Counties, PA</u> . Authority to provide assistance for water-related infrastructure and resource protection and development projects. NT	0	PA
552	<u>Southeastern Pennsylvania</u> . Modifies Section 566(b) of WRDA '96 to include "environmental restoration" as well as the originally authorized water supply and related facilities. NT	0	PA
560	<u>Abandoned and Inactive Noncoal Mine Restoration</u> . Authority to provide technical, planning and design assistance to Federal and non-Federal interests for carrying out projects to address water quality problems caused by drainage and related activities from abandoned and inactive noncoal mines. NT	5,000	Nationwide
569	<u>Northeastern Minnesota</u> . Authorizes a pilot program to provide environmental infrastructure assistance to non-Federal interests to include design and construction for wastewater treatment and related facilities, water supply and related facilities, environmental restoration, and surface water resource protection and development. NT	40,000 *	MN

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Act Section	Provision [1] T = Traditional NT = Non-traditional	New Federal \$(000) [2]	States(s)
570	<u>Alaska</u> . Authorizes a pilot program to provide environmental assistance to non-Federal interests to include design and construction for wastewater treatment and related facilities, water supply and related facilities, and surface water resource protection and development. NT	25,000	AK
571	<u>Central West Virginia</u> . Authorizes a pilot program to provide environmental assistance to non-Federal interests to include design and construction for wastewater treatment and related facilities, water supply and related facilities, and surface water resource protection and development. NT	10,000	WV
573	<u>Onondaga Lake, NY</u> . Authorization to plan, design and construct projects that are consistent with the Onondaga Lake Management Plan and comply with the amended consent judgment and the project labor agreement for the environmental restoration, conservation and management of Onondaga Lake, NY. NT	1,000	NY
592	<u>Mississippi</u> . Authorizes a pilot program to provide environmental assistance to non-Federal interests to include design and construction assistance for projects for wastewater treatment and related facilities, elimination or control of combined sewer overflows, water supply and related facilities environmental restoration, and surface water resource protection and development. NT	25,000	MS
593	<u>Central New Mexico</u> . Authorizes a pilot program to provide environmental assistance to non-Federal interests to include design and construction assistance for projects for wastewater treatment and related facilities, water supply, conservation, and related facilities, storm water retention and remediation, environmental restoration, and surface water resource protection and development. NT	25,000	NM
594	<u>Ohio</u> . Authorizes a program to provide environmental assistance in the form of design and construction to non-Federal interests to include wastewater treatment and related facilities; combined sewer overflow, water supply, storage, treatment, and related facilities; mine drainage; environmental restoration; and surface water resources protection and development. NT	60,000	OH
595	<u>Rural Nevada and Montana</u> . Authorizes a program to provide environmental assistance to non-Federal interests in the form of design and construction assistance for projects for wastewater treatment and related facilities, water supply and related facilities, environmental restoration and surface water resource protection and development. NT	50,000	MT & NV
Total WRDA '99	27 Sections (including one nationwide); 3 traditional and 24 non-traditional	1,123,535	33
WRDA 2000, Public Law 106-540, 11 December 2000			
337	<u>Buchanan, Dickenson, and Russell Counties, VA</u> . Authority to reallocate storage to water supply in the John Flannagan Reservoir under the authority of Section 322 of WRDA '90. NT	0	VA
447	<u>Fremont, Ohio</u> . To conduct a study to determine the feasibility of carrying out projects for water supply and environmental restoration at the Ballville Dam. NT	0	OH
Total WRDA 00	2 Sections; both non-traditional	0	2

Footnotes for Appendix B:

1. While detailed records are not available, traditional provisions are more than likely part of the Administration's proposal and non-traditional provisions are more than likely Congressional adds.
2. Dollar values shown are the authorized appropriations in the legislation. Sections with an asterisks (*), (available only for Fiscal Years 1992 - 2002, indicate funding was received. Actual funding, however, may have been greater than, less than, or as authorized.