<u>Future Municipal Water Supplies: From Planning to Implementation</u>

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Because of its sheer size, Texas encompasses multiple ecological and hydrologic zones, with different resources, climates, and demands for water. The varied nature of water resources in Texas is particularly evident when examining the state from east to west. The eastern part of Texas is blessed with abundant rainfall in most years, which provides plentiful water resources. West and South Texas are not so blessed. Not surprisingly, water supply has played a large role in the development and population growth throughout the state's history. The Trinity River provides the vast majority of the existing water supplies for the two largest metropolitan areas in the state: the Dallas-Fort Worth metroplex and the Houston metropolitan area. Other rivers and river basins in the state, notably the Sabine and Neches in the east and the Brazos, Colorado, and Guadalupe basins to the west are prolific, resulting from sizable drainage areas, plentiful rainfall in most years, or spring flow contributions. These basins all generate water supplies for cities, industries, and agricultural interests.

The history of water development in Texas begins at the end of the nineteenth century, when the state passed legislation allowing the formal recognition of water rights and the issuance of debt for water supply projects. With the passage of the Conservation Amendment to the Texas Constitution in 1917, the legislature enabled the creation of political subdivisions entitled to issue debt to develop water-related infrastructure. Since the passage of that amendment, literally thousands of such political subdivisions have been formed - from large river authorities charged with conserving, preserving, protecting, and developing the water resources within their boundaries to geographically small municipal utility districts and other water districts created primarily for supporting land development.

Although supplies remain available for development, much of the state's surface water has already been appropriated, and in some areas of the state groundwater resources are not readily available in significant quantities. The Texas Water Development Board (TWDB) projects that by 2010 only 9 million acre-feet per year of surface water supply will be legally and physically available. The state's current annual demand for water has reached more than 16.9 million acre-feet per year and a shortfall of 8.8 million acre-feet of water is projected by 2060. Thus, for the state to successfully respond to future demand, it will have to plan, permit as necessary, and implement water supply projects and strategies over the next several decades. Below is a brief discussion of the state's current water planning protocol, an overview of some of the sources

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of water supplies and strategies available for meeting projected water supply demands, a brief discussion of state and federal permitting that is generally associated with the development of water supply and delivery systems, and a description of the most common means available to finance the implementation of such projects.

Regional and State Water Planning

In 1957 a constitutional amendment created the TWDB in response to the worst drought in the state's history. The drought lasted seven years, and by the end of 1956 more than 96 percent of the counties in the state were considered disaster areas. The epic drought ended in 1957 with a flood that replenished the aquifers, reservoirs, and surface water flows, but public awareness of the lack of drought protection led to the development of a structured system for water planning and strategy implementation. The TWDB was authorized in 1957 to manage and distribute a $200-million water development fund to aid communities in developing reliable water supplies. The legislature also mandated that the TWDB initiate a planning process to project future water needs and determine appropriate steps to address projected shortfalls. The TWDB has been provided with funding and other resources to assist in water supply development, maintenance, and planning from the agency's inception to the present day.

Over the past fifty years, the TWDB has prepared eight state water plans. The early plans were created at a time when the primary method of water supply was the large-scale construction of reservoirs. From 1950 to 1970, more than ninety "major reservoirs" (i.e., reservoirs having a capacity of at least 5000 acre-feet) were constructed in Texas. In addition to providing a reliable source of water, these reservoirs controlled flooding, provided cheap electricity, and offered recreational opportunities. Currently, there are 196 major reservoirs in Texas, and 175 are a source of water supply for the state, region, or local community. More than half of the surface water supply in Texas comes from reservoirs, but the accumulation of sediment in reservoirs will lessen this supply over time. The focus on reservoirs was reflected in the first two state water plans, but by 1980 reservoir construction had declined precipitously because of a lack of viable sites, increased difficulty in environmental permitting, and costs of construction that had risen faster than inflation.

Because of the challenges associated with reservoir development, the water plans of the 1980s and 1990s instead focused on water management and infrastructure development to best utilize existing water resources. The plans became increasingly more open to consider conservation, reuse, desalination, and other water supply proposals to address the growing water supply needs of Texas. The process for developing the state water plan changed over time as well. In 1992, the TWDB increased the participation in the development of the water plan by including stakeholders, the Texas Parks and Wildlife Department, and the Texas Natural Resource Conservation Commission, a predecessor agency of the current Texas Commission on Environmental Quality (TCEQ).

This top-down system changed, however, after the devastating drought of 1996. The drought reminded the public of the imminent need for efficient water planning and development of dependable supplies throughout the state. The water shortage and extensive crop failures across the state spurred legislative action that has reshaped water planning in Texas. In 1997, the 75th Legislature passed Senate Bill 1 (S.B. 1), which rewrote many sections of the Texas Water Code and created a bottom-up approach to water planning. S.B. 1 directed the TWDB to divide the state into regional planning areas based on the agency's assessment of relevant criteria, including: river basin and aquifer locations, utility development patterns, boundaries of political subdivisions, a public involvement and comment process, and existing planning area boundaries. At least once every five years, the TWDB must review the regional planning area boundaries and update them if necessary. In response, the TWDB created sixteen regional water planning groups (RWPGs). Each region is charged with developing its own fifty-year water plan tailored to the unique needs and resources of the area, making recommendations based on data provided by or approved by the TWDB.[1]

Through the regional water planning process, the state water plan is forged out of the grassroots, bottom-up assessments of water needs and supply performed by the RWPGs. The sixteen approved plans are aggregated to form the state water plan. Every five years, the RWPGs are required to prepare revised regional water plans, which again are submitted to the TWDB for approval and inclusion in the revised state water plan. The final state water plan is published by the TWDB and contains a wealth of information and projections of future population, water demand, climate, and alternative water supplies over the next fifty years.

The state water plan is only a guide and is not binding on any agency, but the TCEQ is required to consider approved state and regional water plans when it makes permit decisions regarding surface water rights.[2] Unless the requirement is affirmatively waived, the TCEQ can grant a permit for the appropriation of surface water only if that appropriation addresses a water supply need that is "consistent with the state or approved regional plan" in the area of appropriation.[3] Furthermore, the TCEQ may not issue a water right for municipal purposes unless the region has an approved regional water plan.[4] The state water plan, even if not binding on the TCEQ, also has important implications on the funding for water supply projects. Large-scale regional water supply projects are not eligible for TWDB funding unless the proposed project is consistent with state and regional water plans.[5]

Water Supply Strategies

One of the most important steps in the state water planning process is adequately identifying and considering all water supply options and strategies. There may be a number of sources, or a combination of sources, that can be used to meet projected water supply demands. Traditionally, water suppliers have focused on surface water and groundwater, but with the decreasing availability of these supplies and the increasing protection afforded such natural resources, more emphasis has been placed on nontraditional sources of supply.

A. Surface Water

Surface water is a readily available and renewable source of supply. Within the state, twenty-three surface water basins produce fresh surface water. Regardless of the apparent supply from these basins, existing allocations of surface water will determine whether any particular river

[1] Tex. Water Code § 16.053.
[2] Tex. Water Code § 11.1501.
[3] Tex. Water Code § 11.134(b)(3)(E).
[4] Tex. Water Code § 11.134(c).
[5] Tex. Water Code § 16.053(j).

basin should be considered a viable source of supply. For the most part, surface water is considered "state water." Although there are certain exemptions from permitting, the authority to use state water must be granted by the TCEQ.[6]

B. Groundwater

Groundwater is the most utilized source of water supply in rural areas of Texas and particularly in the western portion of the state, but unlike surface water, groundwater has not been the subject of statewide regulation. Principles of rights to produce groundwater have been established in a series of cases dating back to the early twentieth century. Through these cases, the English common-law "rule of capture" has been ratified by Texas courts, although in the past fifty to sixty years, the legislature has embraced a system of groundwater management by groundwater conservation districts (GCDs). The legislature has created a number of GCDs across the state to regulate groundwater withdrawals within those districts' jurisdictional boundaries.

C. Conjunctive Use

Conjunctive use is the concurrent use of groundwater and surface water supplies to meet demands. Conjunctive use recognizes that an entity can balance its demands by supplementing one source of supply with another. Often alternative supplies are used to meet peak daily demands. Many areas that have historically relied on groundwater supplies have seen demand grow to a level requiring that water sources be supplemented with a renewable source of surface water supplies. As with any project that involves blending distinct sources of supply, conjunctive use requires consideration of water quality as well as quantity. Groundwater resources may have higher levels of total dissolved solids or metals, while surface water supplies may have higher levels of nutrients or bacteria. A utility needs to carefully consider the ramifications of blending these sources. Blending groundwater and surface water sources may produce water with a chemical composition different from that of either individual source. Often, this may change the overall pH of the water, resulting in the precipitation of undesirables into the water source. Additionally, consideration must be given to meeting drinking water quality requirements when potable water is the end use, as well as the potential impact that return flows resulting from such use may have on stream standards compliance.

D. Reuse

Reuse is a water supply strategy that has gained significant interest in Texas during the last ten to twenty years, but the water rights and water quality laws and regulations associated with reuse are complex. Not only are there distinctions in law between direct and indirect reuse, but there are also legal differences between the indirect reuse of surface water-based effluent and groundwater-based effluent.[7] In plans for a reuse project, there are a number of issues to consider. The first is whether a utility desires to fully control the corpus of the water from creation to the end point of use, or whether the bed and banks of a state watercourse need to be used to convey the water. Second, assuming the utility seeks to use water via indirect reuse, questions arise regarding where the water will be diverted, who can divert and use the water, and water quality impacts.

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[6] *See* Tex. Water Code § 11.121.

[7] *See generally* Tex. Water Code §§ 11.042, 11.046; *see also* 30 Tex. Admin. Code ch. 210 (TCEQ reclaimed water regulations).

E. Conservation

Conservation is also a valuable water supply strategy. Every gallon per capita per day that is saved by a utility serving a population of 10,000 equates to an end-of-year savings of approximately 3.65 million gallons of water. This type of savings can be considered a supply strategy because it serves to reduce the overall demand requirements of a utility. The Texas legislature has recognized the need for conservation. Not only is there a requirement to prepare a water conservation plan before appropriating state water[8], but the legislature has also created a task force to consider and enhance conservation across the state.[9] Conservation is the first water supply strategy employed by many utilities because it is much less costly and more certain than permitting and constructing new facilities. However, conservation alone as a water supply strategy can rarely meet long-term projected demands.

F. Desalination

Desalination involves the treatment and removal of dissolved solids from brackish groundwater or seawater. Seawater is considered within the definition of state water and any desalination project that involves the diversion and use of brackish surface water or seawater is required to have a surface water use permit. Desalination of groundwater may require approval by a GCD. Planning a desalination project raises issues such as the type and cost of treatment that must be used to remove dissolved solids. Membrane technology options include ultrafiltration, nanofiltration, microfiltration, and reverse osmosis, each of which involves the use of a progressively less porous membrane to remove dissolved solids. Additional treatment technologies, such as electrodialysis, can also be employed. Often, however, the limiting factor for a desalination project is how to handle the by-product produced from treatment. In arid portions of the state, the by-product is often disposed of via salt drying beds. In other areas of the state it may be possible to deep well inject the by-product. Where neither of these options exists or is practical, a permit authorizing discharge of the by-product into a receiving water may be obtained.[10]

G. Aquifer Storage and Recovery

Aquifer storage and recovery (ASR) is a means by which entities construct groundwater wells that can inject water into, and subsequently extract water from, a single aquifer. ASR wells are typically used to store surface water that is available during periods of high flow for use during periods of drought. ASR wells can be used to facilitate conjunctive use, and often they assist in offsetting peak pumping demands otherwise dependent on distant or less reliable sources. Securing the authority to operate an ASR well requires that an application be submitted to the TCEQ that includes the same information necessary to appropriate state water, as well as information necessary to demonstrate compliance with the TCEQ injection wells regulations.[11] If an ASR application is filed within the territory of a GCD, the application must also demonstrate cooperation with the district, and it must include permit conditions referencing any contract by and between the applicant and the district.[12]

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[8] Tex. Water Code § 11.1271(a).
[9] Tex. Water Code §§ 10.001–.012 (establishing the Texas Water Conservation Advisory Council).
[10] Tex. Water Code § 26.121.
[11] Tex. Water Code § 27.051; *see also* 30 Tex. Admin. Code ch. 331 (Underground Injection Control).
[12] Tex. Water Code § 11.154(b)(2).

H. System Operations

Pursuant to TCEQ regulations, in order to secure the right to divert and use state water for certain uses, an applicant must demonstrate that water is available for appropriation for a sufficient percentage of time. However, if an entity has additional, alternative supplies and can supplement its diversions with other sources, TCEQ rules allow the agency discretion regarding the necessary availability requirement.[13] This type of supplementation is often available through the use of a "system operation" for water supplies. A system operation may include the ability to overdraft one reservoir by relying on the permitted yield of another reservoir or to operate a series of reservoirs or run-of-river rights as a system, thereby allowing diversions or releases from any one reservoir or diversion location to meet water supply obligations. For large utilities with numerous sources of supply, the concept of networking a system of supplies can lead to enhanced yield as well as redundant reliability.

I. Portfolio Management

When planning and implementing water supply strategies, one must consider all supplies available to a utility. Managing a portfolio of supplies is akin to managing a portfolio of monetary investments. The goal is to provide long-term reliable service at the lowest possible cost and risk. A prudent water supplier will evaluate all available water supply options, including the means for more efficient use of existing resources. This may be accomplished through reuse and conservation. A supplier should also consider ways to diversify and limit its exposure to short- and long-term water deficits, often caused by natural disasters such as hurricanes, source water contamination, drought, and catastrophic system collapse. This may include entering into possible partnerships with other suppliers to gain access to additional or backup supply.

Permitting of Water Supply Projects

Once a project is identified in the state and regional water plans as a recommended strategy to meet a community's water supply needs, a water supplier can begin to work toward the realization of that project. Before construction can commence on a specific project, the water supplier may need to obtain a variety of local, state, and federal permits to gain the legal right to construct a project. Permitting a major long-term water project is time intensive and costly, particularly when applications are protested. State and federal permitting for a new reservoir, for example, may take five to ten years to complete, and sometimes more if litigation occurs. Depending on the urgency with which a project must be completed, many water suppliers choose to apply for and obtain all necessary permits before acquiring land for the project, obtaining additional financing, or beginning construction because of the uncertainty involved in the permitting process. Others risk this uncertainty by pursuing certain aspects of the project, such as land acquisition, in conjunction with their applications for the necessary permits.

A. State and Local Permitting

The TCEQ is the agency charged with regulating surface water use, including the issuance of permits to divert and use such state water and the approval of sales and transfers of water already authorized for diversion. Local entities are not typically involved in permitting surface water projects, unless local regulation of real property is involved (for example, property upon which the storage or diversion facilities will be constructed). However, because groundwater is not regulated as state water, depending on the location groundwater projects may involve the

[13] 30 Tex. Admin. Code § 297.42(c).

oversight and approval of local groundwater control districts. Thus, the regulation of a water supply project depends in large part on whether the project is based on surface water or groundwater.

1. Surface Water Permitting

Chapter 11 of the Texas Water Code outlines the legal and regulatory requirements to apply for a new surface water right from the TCEQ, to amend an existing surface water right, to transfer an existing surface water right to a third party, to transfer water supplies to another water basin, and to seek reuse of wastewater effluent. In allocating the right to the use of state water, Texas adheres to the doctrine of prior appropriation, where the actual "use" of water is a major element in acquiring and perfecting a water right.

When an application for a water right is submitted, the threshold issue that the TCEQ must address is whether unappropriated water is actually available for use at the proposed diversion point.[14] The TCEQ makes this determination by use of a water availability model (WAM). Generally, the WAM uses historic flow data and hydrologic conditions as well as consideration of all existing water rights. WAMs can be manipulated to consider other factors, such as return flows from wastewater treatment facilities and the extent to which existing rights are actually being utilized. After the agency determines that water is available for appropriation, the TCEQ staff focuses on other significant issues, including environmental flow needs, whether the proposed diversion will be put to a beneficial use, and whether the proposed diversion will harm the public welfare.[15]

Once issued, permits for water rights identify the date on which the permit was declared administratively complete, which is used for the purpose of setting the priority date for the water right and establishing a water right's place in the hierarchy of the prior appropriation system. Water rights also include provisions related to: (1) the purpose of use for which water can be appropriated, (2) the annual diversion amount, (3) the instantaneous rate at which water can be diverted, (4) a time frame in which construction of storage and diversion facilities must commence and be completed, and (5) any special conditions the agency deems necessary.[16] To maintain flexibility for the use of the water right, applicants might propose a reach of stream from which water can be diverted under the water right. A stream reach, if authorized for a diversion point, allows the permittee options when constructing diversion facilities. Additionally, the purposes for which water may be lawfully appropriated include domestic and municipal, agricultural (including irrigation), industrial, mining, hydroelectric power, navigation, and recreation. Many permittees seek authorizations for multiple purposes of use to respond to water market forces and thereby maintain flexibility for the use of the water and avoid the need for future amendment applications.

For portions of the state where surface water supplies are limited, many water supply projects focus on delivering water from a neighboring river basin to areas where supplies can be utilized. Interbasin transfers of surface water are contemplated in the Texas Water Code and are an important tool for water suppliers seeking to move water resources to portions of the state where

[14] Tex. Water Code § 11.134(b)(2).
[15] Tex. Water Code §§ 11.134, 11.147, 11.150, 11.151, 11.152.
[16] Tex. Water Code § 11.135.

they are needed. Texas Water Code section 11.085 provides a permitting framework under which the TCEQ may authorize such transfers of water. In 1997, with the passage of S.B. 1, the widespread amendments to the Texas Water Code included several changes to section 11.085, including the "junior rights provision."[17] The junior rights provision requires that existing water rights that are amended to allow for interbasin transfers of surface waters must be assigned a new priority date (fixed as of the date the amendment application is declared administratively complete by the TCEQ). This adjustment in priority and other changes made to section 11.085 have impeded many interbasin diversions of water. However, certain interbasin transfers are subject to exemptions from the notice and hearing requirements of section 11.085, the junior rights provision, and the other provisions of S.B. 1.

2. *Groundwater Projects*

Historically, the common-law "rule of capture" has been the governing legal principle throughout the state for groundwater use.[18] Under the rule of capture, a landowner can pump as much groundwater as he can use without concern for any detrimental effects on third parties so long as the pumping does not result in a wanton or wasteful use of water, the pumping landowner does not maliciously intend to harm a third party, and the pumping does not cause subsidence. Thus, the rule of capture does not impose limitations on groundwater pumping or use that would protect other groundwater users, nor does it take into consideration long-term sustainability of the groundwater resource.

The legislature has expressed its clear preference for groundwater resource management by local GCDs.[19] GCDs are political subdivisions and conservation and reclamation districts formed under the Conservation Amendment (Tex. Const. art. XVI, § 59) and operating pursuant to each GCD's enabling legislation and the general law of chapter 36 of the Water Code. Currently, at least 144 counties, making up more than half of the total land area in Texas, are either partially or fully within a GCD. More important, the most current TWDB data available reflect that roughly 90 percent of groundwater withdrawals and usage occur within the boundaries of a GCD. Each legislative session since 1997 the legislature has created new GCDs across the state. GCDs are created "[i]n order to provide for the conservation, preservation, protection, recharging, and prevention of waste of groundwater."[20] These goals are reflected in a groundwater management plan developed by the district and approved by the TWDB. One aspect of this process that is particularly important to groundwater projects is the determination of the amount of groundwater that is available for production.

The goals reflected in the groundwater management plan are accomplished by adopting and implementing rules covering permitting, well spacing, and other management tools. The manner in which GCDs manage groundwater resources and employ these regulatory options to regulate the use of groundwater varies significantly from district to district, and depends on local hydrogeological conditions and the priorities of each GCD's board. Texas Water Code chapter 36 gives GCDs the authority to alter the rule of capture by regulating and restricting groundwater

[17] Tex. Water Code § 11.085(s).
[18] *Houston & T.C. Ry. Co. v. East*, 81 S.W. 279 (1904); *Sipriano v. Great Spring Waters of America, Inc.*, 1 S.W.3d 75 (Tex. 1999).
[19] Tex. Water Code § 36.0015.
[20] Tex. Water Code § 36.0015.

production. GCDs often use the permitting process to restrict or limit production from a well. For example:

- A district's rules may limit groundwater production based on tract size or the spacing of wells and may regulate the spacing of wells relative to property lines or adjoining wells.
- Production limits may preserve historic use. When issuing a permit for historic or existing use, a district is prohibited from discriminating between land that is irrigated for production and land that is enrolled in a federal conservation program.
- Production limits may vary within different geographic areas of the district based on differences in the aquifer or in the use of the aquifer.
- A district may require a production permit that controls the rate and amount of withdrawal.
- A district may base production limits on managed depletion.
- A district may base production limits on the service needs or area of a water utility.

A significant issue for GCDs is their authority to regulate the export of groundwater across their boundaries. New projects to transport groundwater from one area of the state to another are a popular means for addressing water shortages. GCDs are authorized to adopt rules requiring permits for groundwater transports (either increases of previous arrangements or new transfers) out of their boundaries. However, districts cannot prohibit the export of groundwater if the purchase was in effect on or before June 1, 1997.

Groundwater-based projects became more complex in 2005 with the enactment of a process of regionalized decisions on water availability using groundwater management areas (GMAs) as the planning regions.[21] GCDs in each GMA participate in joint planning as part of the state's overall water planning process and to identify the "desired future condition" (DFC) of the aquifers in the area. The DFC is submitted to the TWDB, which will translate it into an estimate of the amount of water that could be withdrawn from the aquifers while maintaining the desired future condition. This water estimate is called the "managed available groundwater" (MAG). This, effectively, is the new term for groundwater availability. A GCD uses the MAG numbers in its groundwater management plan and in groundwater production permitting decisions.

B. Federal Permitting

Depending on the scope of a particular water supply project, federal permitting under the Clean Water Act (CWA) and assessments related to environmental impacts under the National Environmental Policy Act (NEPA) may be required and certainly add another layer of challenges and delays to a water supply project. CWA permits and NEPA procedures involve the oversight of or consultation with agencies such as the Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers (USACE), and the Fish and Wildlife Service.

1. Clean Water Act Section 404

The USACE section 404 permit program specifically applies to the discharge of "dredged or fill material" into "waters of the United States."[22] The U.S. Constitution grants Congress the power to regulate "navigable waters" under the Commerce Clause. The extent to which non-navigable

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[21] Act of May 30, 2005, 79th Leg., R.S., ch. 970, 2005 Tex. Gen. Laws 3249.
[22] 33 C.F.R. § 323.

waters with some proximity to navigable waters are regulated under the CWA is unclear because a major point of contention under the CWA is which bodies of water are subject to CWA jurisdiction and protection.[23] Thus, a threshold question for any water supply project that may be discharging dredge or fill material is whether such discharge is into jurisdictional "navigable waters." The discharge of "dredge material" and the discharge of "fill material" are very broadly defined within the USACE's regulations but are often triggered for major water supply projects that include significant development activities, land clearing, placement of riprap, liners, slope paving, the installation of pipeline that crosses navigable waters, or the construction of a dam.

Most large-scale dredge and fill discharges require an individual permit from the USACE. Before it can be issued, however, a section 404 permit requires public notice and hearing, a consideration of alternatives, public interest review, and conformity with EPA guidelines. The public interest review associated with a section 404 permit involves an extensive analysis of the effects a discharge will have on the short and long-term physical, chemical, and biological elements that make up the aquatic ecosystem.[24] A section 404 permit will also be subjected to the procedural requirements of NEPA, but the public interest review in the two statutes overlap significantly.

Before seeking 404 permit authorization, a water supplier must ensure that it has conducted a thorough alternatives assessment and can demonstrate that the proposed project will have the least environmental impact and is justified economically. Such an assessment should identify the water supply project as the only practicable alternative, while considering environmental impacts, economics, and the overall project purpose.[25] A section 404 permit will not be issued if there is a practicable alternative that would have less impact on the aquatic ecosystem.

2. *Clean Water Act Section 401*

Under CWA section 401, any applicant for a federal permit to conduct an activity that may cause a discharge into waters of the United States must obtain certification that the discharge will comply with state water quality standards adopted by the state in which the discharge will originate.[26] Certification under section 401 ensures that each state is involved in decisions made by the federal government that affect its water quality. With the exception of oil and gas exploration, the TCEQ is the state agency that administers the section 401 certification program.

The TCEQ has developed a tiered system for evaluating all individual section 404 permit applications based on the project size and the amount of state water affected. Tier I projects are small projects that affect less than 3 acres of water in the state or less than 1500 linear feet of streams. The TCEQ has determined that incorporating certain best management practices (BMPs) and other outlined requirements into Tier I projects will sufficiently minimize impacts to water quality. Therefore, applicants that want to utilize Tier I for small projects should include a signed Tier I checklist with their application for an individual section 404 permit to the USACE. The Tier I checklist includes the selection and incorporation of applicable BMPs for erosion

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[23] *Rapanos v. United States*, 547 U.S. 715 (2006); *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001).
[24] 40 C.F.R. § 230.11.
[25] 40 C.F.R. § 230.10(a)(2) .
[26] 33 U.S.C. § 1341(a).

control, post-construction total suspended solids control, and sedimentation control necessary for the proposed project.

Any project that requires a section 404 individual permit and does not qualify for Tier I review or for which the applicant elects not to incorporate Tier I criteria is considered a Tier II project. Tier II projects are subject to an individual certification review by the TCEQ. A Certification Questionnaire and Alternatives Analysis Checklist must be submitted to the TCEQ for section 401 approval. Applicants completing the Certification Questionnaire are required to provide information about the potential impacts the disposal of waste materials from a project may have on the surface water quality in the state. The Alternatives Analysis Checklist generally covers the same requirements used for determining the practicable alternative for section 404 permit purposes. This checklist relates to determining how project needs could be satisfied in a way that does not affect surface water, how the project could be redesigned to fit the site without affecting surface water, how the project could be minimized, what other sites were considered, and possible consequences of not building the project. The TCEQ will not certify a discharge if (1) there is a practicable alternative to the proposed discharge that would have less adverse impacts on the environment, (2) appropriate steps are not taken to minimize adverse impacts, (3) mitigation is not undertaken for all unavoidable adverse impacts, or (4) the executive director determines that the impacts of the project are so significant that mitigation will not compensate for the damage of the project.[27]

3. *National Environmental Policy Act*

NEPA is integral to many water supply projects because the issuance of federal permits under section 404 of the CWA is conditioned upon NEPA compliance. NEPA is a procedural statute that can influence the decision-making process of any federal agency (such as the USACE) by requiring the agency to consider environmental impacts, alternatives, and mitigation strategies for projects pursued by the federal government or projects sanctioned through the issuance of a federal permit.

NEPA procedures are required whenever "a proposal . . . for legislation or other major federal actions significantly [affects] the human environment."[28] "Major federal actions" include a federal agency's issuance of permits, such as section 404 permits for water projects, the use of federal funds to construct projects, like federal flood control projects, and authorizing activities that occur on federal lands. NEPA requires a consideration of the consequences of the agency action and possible alternatives that are less damaging to the environment. NEPA is not required if the agency action falls within a limited number of categorical exemptions or has been previously determined to have no significant environmental impact.[29]

When NEPA does apply, the agency authorizing the major federal action must prepare an environmental assessment (EA). This relatively short document is issued to determine whether an agency needs to prepare an environmental impact statement (EIS) or that lengthy process can be avoided by a finding of no significant impact (FONSI). A FONSI can be issued when a determination is made in the EA that an EIS is not necessary. In order for a FONSI to be valid,

[27] 30 Tex. Admin. Code § 279.11.
[28] 40 C.F.R. § 1508.5.
[29] 40 C.F.R. § 1508.4.

the agency must prepare an adequate EA. In an EIS, the agency must evaluate alternatives to the proposed action that might be employed to meet the objective. An alternative may be less environmentally damaging or it may make the proposed action unnecessary.

Funding Considerations for Water Supply Projects

After a water supply project has secured the necessary permits, it may be brought "on-line" through project implementation. New water supplies cannot be successfully and reliably obtained without adequate funding to support the completion of the project design, site and equipment acquisition, construction, and operations and maintenance of the project once constructed. Creating a delivery system for large quantities of water also typically requires a significant expenditure of money that exceeds the existing financial capabilities of the project sponsor and the project's end users. Most projects require public funding to allow implementation of a water supply system of an adequate scale to meet present and future demands.

A. Public Entity Financing Options

Many options are available to structure debt issued by a public entity for project implementation. The nuances of particular financing options vary depending on the type of entity. The Conservation Amendment to the Texas Constitution authorizes conservation and reclamation districts created by the state to issue debt to further the purposes of the amendment through new water supply projects and management practices.[30] Political subdivisions in Texas are also authorized, with approval from the state, to issue debt to supply funding for public works projects throughout the project's life cycle, including planning, land acquisition, construction, and routine maintenance phases.[31] A rigorous assessment of the risks and costs involved in each potential financing avenue is necessary to allow for reliable and economically sustainable water supply delivery to end users. Public entity financing options include:

- General Obligation Bonds, which are issued by a political subdivision for a specifically approved public-purpose project and are secured by the full faith and credit of the public entity through its power of *ad valorem* taxation.
- Revenue Bonds, which are issued on the foundation of a pledge of revenues that will be generated from the sale of services or water generated by the project. The amount of financing available through revenue bonds is limited by the amount that rates for water services can be feasibly increased.
- Certificates of Obligation/Double-Barreled Bonds, which are similar to a GOB and available for funding projects.
- Contract Revenue Bonds, which can be issued based on wholesale contracts entered into with third-party users, such as regional river authorities or entities created by a political subdivision for water services.
- Anticipation Notes, which allow municipalities to fund water supply projects based on an ordinance passed by the city council. These bonds may be secured by a pledge of revenues, projected revenues, *ad valorem* taxes, or already authorized bonds that the city may issue if necessary to repay the debt.
- Public Property Finance Contractual Obligations, wherein a political subdivision or governmental agency is authorized by statute to purchase equipment or other personal

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[30] *See* Tex. Const. art. XVI, § 59.
[31] Tex. Const. art. III, § 49-d-4.

property necessary for implementing a water supply project.

- Commercial Paper Program, which may be used to obtain funding for capital improvements through a short-term note program.
- Nonprofit Corporations, which can be created to avoid the constitutional prohibition against the lending of credit and can help to implement, finance, or operate a water supply project. These corporations are specifically exempt from article 3, section 52 of the Texas Constitution and are authorized to issue taxable and tax-exempt bonds. Often nonprofit corporations are created to be used as a conduit for channeling money necessary for project implementation, and they are also used to implement water supply projects operated under a public-private partnership.

B. Texas Water Development Board Funding

The TWDB is charged with water planning and administering financing for water projects. In House Bill 1 (H.B. 1), the 80th Texas Legislature appropriated monies to allow for deferred debt service payments to the TWDB in order to provide reduced-interest loan rates and deferral of annual principal and interest payments for state water plan projects funded through the Water Infrastructure Fund (WIF). The WIF is designed to fund current water project needs and pre-construction environmental and engineering studies. Up to ten years of payment deferral for principal and interest is available to conduct pre-construction studies. All political subdivisions of the state and nonprofit water supply corporations are eligible to apply for assistance from the WIF. In addition to WIF funding, H.B. 1 provided funding for debt service payments for the State Participation and Economically Distressed Areas Programs to fund state water plan projects. Public and some private entities are eligible to receive funding from these programs.

Other TWDB administered funding is available for water supply projects through the following funds:

- Agricultural Water Conservation Fund, which funds research, technical assistance, education and technologies associated with agricultural water conservation.
- Economically Distressed Areas Program, which can finance water or wastewater services for economically distressed areas.
- Drinking Water State Revolving Fund Program, which funds all aspects of the implementation of water-related infrastructure as well as source water protection.
- Rural Water Assistance Fund Program, which aid in the planning, acquisition, and construction of water supply infrastructure in rural areas.
- Clean Water State Revolving Fund Program, which is available for planning, land acquisition, project construction, wastewater treatment, reuse projects, and nonpoint source pollution control.
- State Participation in Regional Water and Wastewater Facilities Program, wherein the TWDB provides funding to political subdivisions and public entities for the construction of regional water or wastewater projects.
- Water and Wastewater Loan Program, which makes loans available to political subdivisions and nonprofit water supply corporations for water supply projects.
- Regional Facility Planning Grant Program, which provides funding to political subdivisions authorized to implement regional water supply projects to support research into potential alternatives that could be used to meet present and future regional needs.

Conclusion

The 2007 Texas State Water Plan identifies the need to develop 8.8 million acre-feet of additional water supplies in order to meet the state's projected demands in 2060, the planning horizon required by law. Development of these supplies is the subject of significant planning and permitting requirements, and adequate funding is essential to project development. State law provides that water supply projects requiring state water rights permitting or state funding be consistent with approved regional and state water plans. Depending on the source of supply, permitting the storage and use of water by the state or a GCD may also be required, and federal permits are necessary for permits involving construction activities in federally regulated waters. These activities involve compliance with state and federal procedures, which often require years to complete. Finally, adequate funding for planning, permitting, site and right-of-way acquisitions, and construction of projects is necessary for new water supplies to be developed.

The 2012 Texas State Water Plan is in the process of being drafted and water suppliers across the state will be looking to that document as a guide for developing water projects. The 2011 Texas legislative session will likely address issues related to funding for future water projects and guidance as to how our state agencies should be reviewing and overseeing such projects.