
**HOUSE COMMITTEE ON NATURAL RESOURCES
TEXAS HOUSE OF REPRESENTATIVES
INTERIM REPORT 2004**

**A REPORT TO THE
HOUSE OF REPRESENTATIVES
79TH TEXAS LEGISLATURE**

**ROBERT R. PUENTE
CHAIRMAN**

**COMMITTEE CLERK/GENERAL COUNSEL
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Committee On
Natural Resources

January 5, 2005

Robert R. Puente
Chairman

P.O. Box 2910
Austin, Texas 78768-2910

The Honorable Tom Craddick
Speaker, Texas House of Representatives
Members of the Texas House of Representatives
Texas State Capitol, Rm. 2W.13
Austin, Texas 78701

Dear Mr. Speaker and Fellow Members:

The Committee on Natural Resources of the Seventy-Eighth Legislature hereby submits its interim report including recommendations for consideration by the Seventy-ninth Legislature.

Respectfully submitted,

A handwritten signature in cursive script that reads "Robert R. Puente".

Robert R. Puente

A handwritten signature in cursive script that reads "Bill Callegari".

William A. "Bill" Callegari

A handwritten signature in cursive script that reads "Robby Cook".

Robert L. "Robby" Cook

A handwritten signature in cursive script that reads "Mike Hamilton".

Mike "Tuffy" Hamilton

A handwritten signature in cursive script that reads "Ruben Hope Jr.".

Ruben Hope Jr.

A handwritten signature in cursive script that reads "Scott Campbell".

Scott Campbell

A handwritten signature in cursive script that reads "Charlie Geren".

Charlie Geren

A handwritten signature in cursive script that reads "Rick Hardcastle".

Richard "Rick" Hardcastle

A handwritten signature in cursive script that reads "Steve Wolens".

Steve Wolens

William A. "Bill" Callegari
Vice-Chairman

Members: Scott Campbell, Robert L. "Robby" Cook, Charlie Geren, Mike "Tuffy" Hamilton,
Richard "Rick" Hardcastle, Ruben Hope Jr., Steve Wolens

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INTRODUCTION

At the beginning of the 78th Legislature, the Honorable Tom Craddick, Speaker of the Texas House of Representatives, appointed nine members to the House Committee on Natural Resources (the committee). The committee membership included the following: Representatives Robert R. Puente (Chairman), William A. “Bill” Callegari (Vice-Chairman), Scott Campbell, Robert L. “Robby” Cook, Charlie Geren, Mike “Tuffy” Hamilton, Richard “Rick” Hardcastle, Ruben Hope Jr., and Steven Wolens.

During the interim, the committee was assigned four charges by the Speaker:

1. Assess the current condition of the Edwards Aquifer and the Edwards Aquifer Authority, including the authority’s ability to meet the current statutory requirements of its enabling legislation, specifically its ability to meet or alter pumping limits contained in the Edwards Aquifer Act;
2. Examine the issues associated with the Texas Commission on Environmental Quality’s authority to amend, impair, interpret or modify the terms of water contracts between willing parties, including the possible impacts the authority could have on the financing of public/private water projects;
3. Evaluate the availability and cost effectiveness of using brackish groundwater and surface water as an alternative source of water supply, including assessing the regulatory changes that are needed to facilitate use of this water source by political subdivisions; and
4. Monitor agencies and programs under the committee’s jurisdiction.

The committee has completed its public hearings and investigations and issued the following final report and recommendations. The committee undertook all three charges as a committee of the whole and no subcommittees were appointed.

The committee wishes to express appreciation to the federal and state agencies, local governments, public and private interests, and concerned citizens who testified at the public hearings for their time and efforts on behalf of the committee.

HOUSE COMMITTEE ON NATURAL RESOURCES

INTERIM STUDY CHARGES AND SUBCOMMITTEE ASSIGNMENTS

COMMITTEE OF THE WHOLE

CHARGE #1: Assess the current condition of the Edwards Aquifer and the Edwards Aquifer Authority, including the authority's ability to meet the current statutory requirements of its enabling legislation, specifically its ability to meet or alter pumping limits contained in the Edwards Aquifer Act.

Robert R. Puente, Chairman
William A. "Bill" Callegari, Vice-Chairman
Scott Campbell
Robert R. "Robby" Cook
Charlie Geren
Mike "Tuffy" Hamilton
Richard "Rick" Hardcastle
Ruben Hope Jr.
Steven Wolens

COMMITTEE OF THE WHOLE

CHARGE #2: Examine the issues associated with the Texas Commission on Environmental Quality's authority to amend, impair, interpret or modify the terms of water contracts between willing parties, including the possible impacts the authority could have on the financing of public/private water projects.

Robert R. Puente, Chairman
William A. "Bill" Callegari, Vice-Chairman
Scott Campbell
Robert R. "Robby" Cook
Charlie Geren
Mike "Tuffy" Hamilton
Richard "Rick" Hardcastle
Ruben Hope Jr.
Steven Wolens

COMMITTEE OF THE WHOLE

CHARGE #3: Evaluate the availability and cost effectiveness of using brackish groundwater and surface water as an alternative source of water supply, including assessing the regulatory changes that are needed to facilitate use of this water source by political subdivisions.

Robert R. Puente, Chairman
William A. "Bill" Callegari, Vice-Chairman
Scott Campbell
Robert R. "Robby" Cook
Charlie Geren
Mike "Tuffy" Hamilton
Richard "Rick" Hardcastle
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Steven Wolens

EDWARDS AQUIFER AUTHORITY

HISTORY¹

The Edwards Aquifer Authority was created by the Texas Legislature to preserve and protect the Edwards Aquifer, which serves the diverse needs of almost two million users in South Central Texas. The Aquifer also flows into springs that are home to diverse ecosystems that contain several threatened and endangered species. The boundaries of the Authority encompass an eight county region including all of Uvalde, Medina and Bexar counties, plus portions of Atascosa, Caldwell, Guadalupe, Comal and Hays Counties.

In 1991, the Lone Star Chapter of the Sierra Club successfully sued the U.S. Fish and Wildlife Service, claiming that the Service was not adequately protecting endangered species that rely on the Edwards Aquifer by failing to ensure minimum springflows at Comal and San Marcos Springs. In his 1993 ruling, federal judge Lucuis Bunton required the Legislature to enact a regulatory plan to limit withdrawals from the aquifer.

The Edwards Aquifer Authority Act (the Act) passed in 1993. However, legal challenges prevented the Authority from operating until June 1996. The Act created a 17 member board of directors that sets policy to manage, conserve, preserve and protect the aquifer and works to increase recharge and prevent waste or pollution of the aquifer. Specifically, the Act authorizes the Authority to issue permits and regulate withdrawals by setting a withdrawal cap of 450,000 acre feet, reduced to 400,000 acre feet in 2008. The Authority is also required to ensure minimum springflows at Comal and San Marcos Springs and adopt a critical period management plan for use in times of drought.

The board has fifteen elected members from the region and two non-voting appointed members to carry out the duties set out in the Act. The Act also established the South Central Texas Water Advisory Committee made up of representatives from downstream counties to interact with the Authority when issues related to downstream water rights are discussed.

WATER QUALITY ISSUES

FEDERAL WATER QUALITY PROGRAMS

Point source pollutants are regulated in many different state and federal programs. Examples of federal programs include the National Pollutant Discharge Elimination System (NPDES), which falls under the Clean Water Act.² The National Primary Drinking Water Regulations provide standards that limit the levels of contaminants in drinking water. The Drinking Water Act also provides guidelines for aesthetic qualities relating to public acceptance of drinking water.³ Finally, a Sole Source Aquifer designation helps protect drinking water supplies in areas with few or no alternative sources to groundwater. Environmental Protection Agency review is required for projects within the designated area receiving federal funds.⁴

STATE WATER QUALITY PROGRAMS⁵

The TCEQ's programs related to water quality over the Edwards Aquifer are implemented through two types of groundwater activities: groundwater protection and groundwater remediation. The agency conducts programs to achieve the overall policy and goals that have been established by either state legislation or through the delegation to the state of federal programs. The TCEQ's Edwards Aquifer Protection Program for Medina, Bexar, Comal, Kinney, Uvalde, Hays, Travis, and Williamson Counties (for activities in the Contributing, Recharge, and Transition zones) is discussed in detail below. This section contains a more generic description of other water quality programs including those which take place over the confined portions of the Edwards Aquifer.

Programs for the Protection of Groundwater

Many activities which could result in the contamination of groundwater, unless protective measures are in place to protect groundwater quality, have to be authorized by the agency through regulatory programs. Some of the regulatory programs require site specific permitting with compliance monitoring, issuing of general statewide permits and/or authorizations by rule, issuing geographic area specific registrations/authorizations, licensing and certification of specialists who conduct activities, issuing operation standards for activities, and tracking and classifying waste.

There are many other nonregulatory groundwater quality protection programs which are conducted by the agency. Some of these programs offer incentives such as technical assistance or financial assistance. Others focus on establishing plans to address potential groundwater contamination scenarios. Educational and outreach programs are also used to raise the awareness of the general or regulated public to specific issues. Many programs incorporate some or all of these elements to promote groundwater quality protection.

Programs for the Remediation of Groundwater

Regulatory programs that ensure the remediation of groundwater contamination require certain actions to be taken by those responsible for the contamination or by those responsible for cleaning it up. The required actions include remediation at permitted and nonpermitted waste disposal facilities, at leaking petroleum storage tanks, and at superfund sites; and spill response. Other programs bring enforcement action against those who violate operating or construction standards and investigate complaints.

The use of the term "nonregulatory programs" in the context of remediation programs reflects the incentive-based programs that are available to address groundwater contamination. Two programs conducted by TCEQ fall into this category: the voluntary cleanup program and the innocent landowner program.

TCEQ EDWARDS AQUIFER PROGRAM (Chapter 213 Rules)⁶

Statutory Requirements

The statutory authority for the Commission to adopt the Edwards Aquifer rules is contained in several parts of the Texas Water Code (TWC) and the Texas Health and Safety Code (THSC). Special protection of the Edwards Aquifer is supported by the various powers and duties given to the Commission. The Edwards Aquifer is expressly recognized under §26.046 of the TWC, which requires the Commission to annually hold a public hearing to receive evidence from the public on action the Commission should take to protect the Edwards Aquifer from pollution. The Edwards Aquifer is defined in §26.046(a) of the TWC as “that portion of an arcuate belt of porous, waterbearing limestones composed of the Comanche Peak, Edwards, and Georgetown formations trending from west to east to northeast through Kinney, Uvalde, Medina, Bexar, Kendall, Comal, and Hays counties, respectively, and as defined in the most recent rules of the Commission for the protection of the quality of the potable underground water in those counties.” Williamson, Hays, and Travis Counties were added to the program based upon the request and support of local government in 1986, 1985, and 1990, respectively.

The Legislature has also provided special funding to the Commission to conduct its Edwards Aquifer Protection Program. Section 26.0461 of the TWC allows the Commission to impose fees for inspecting the construction and maintenance of projects covered by plans and for processing plans or amendments that are subject to review or approval under the Commission’s rules for the protection of the Edwards Aquifer and for inspecting the construction and maintenance of projects covered by those plans. Section 26.051 of the TWC requires the commission to report annually on the Edwards Aquifer Program expenses and allocation of fees.

The Legislature has also provided specific direction to the Commission on the operation of the Edwards Program. Section 26.137 requires the commission to provide for a 30-day comment period in the review process for plans in the Contributing Zone. Section §27.051(h) of the TWC prohibits the Commission from authorizing an injection well that transects or terminates in the Edwards Aquifer with certain exceptions and §26.3476 requires secondary containment for underground storage tanks located over the Edwards or Trinity Aquifers in Bexar and Comal Counties.

General authority for the Commission to adopt the Edwards Aquifer rules is contained in §5.103 of the TWC which provides the Commission with the authority to promulgate rules necessary for the exercise of its jurisdiction and powers provided by the TWC and other laws of Texas, and §5.105 which provides the Commission to establish and approve all general policy of the Commission by rule. Section 26.011 of the TWC provides that the Commission will administer the provisions of Chapter 26 of the TWC and establish the level of quality to be maintained in and control the quality of the water in the state. Waste discharges or impending discharges are subject to rules adopted by the Commission in the public interest. This section also grants the Commission with the powers necessary or convenient to carry out its responsibilities. Section 26.341 of the TWC recognizes that it is the policy of the state to maintain and protect the quality of groundwater and surface water resources from certain substances in underground and aboveground storage tanks that may pollute groundwater and surface water resources, and §26.345 allows the Commission to develop a regulatory program regarding underground and aboveground storage tanks. Section 26.121(a)(2)(B) of the TWC prohibits unauthorized

discharges of waste into or adjacent to waters in the state unless the discharge is authorized by Commission permit or complies with a water pollution and abatement plan approved by the Commission (this phrase was added by the 75th Legislature and refers to plans used in the Edwards Aquifer program). Section 28.011 of the TWC authorizes the Commission to make and enforce rules for the protection and preservation of groundwater quality. Section 361.024 of the THSC provides the Commission with the authority to promulgate rules consistent with the Solid Waste Disposal Act and standards of operation for the management and control of solid waste. Section 366.012 of the THSC provides the Commission with the authority to adopt rules governing the installation of on-site sewage disposal systems. Section 26.401, TWC, gives the goal for groundwater protection to be the existing quality of groundwater not be degraded, consistent with the protection of the public health and welfare, the propagation and protection of terrestrial and aquatic life, the protection of the environment, the operation of existing industries, and the maintenance and enhancement of the long-term economic health of the state. This goal of nondegradation, however, does not mean zero-contaminant discharge.

Program Requirements - Medina, Bexar, Comal, Kinney, Uvalde, Hays, Travis, and Williamson Counties (for activities in the Contributing, Recharge, and Transition zones)

Regulated Areas

Contributing Zone

The areas designated as contributing zone are immediately upstream of the recharge zone where storm water runoff from rainfall flows downstream to the recharge zone. These rules regulate activities in the portions of the contributing zone that are within the counties already regulated under the Edwards Aquifer Program. Regulation within these counties provides protection in areas immediately upstream of the recharge zone; therefore, addressing the geographic area with the greatest potential to impact the quality of water entering the upstream portion of the aquifer without being overly restrictive on the full watersheds.

Recharge Zone

The recharge zone of the Edwards Aquifer is the area where the geologic layers of the aquifer come to the surface, and water can filter directly into the aquifer through cracks, fissures, caves, and other openings in these layers.

Transition Zone

In general, the transition zone is designated in areas where the Edwards Aquifer is in transition from water table conditions to confined (artisan) conditions. In the transition zone, faults with significant vertical movement occur near the southeastern boundary of the recharge zone, cutting through and shifting the overlying confining rock formations. These faults can conduct contaminants downward very quickly to the artesian portion of the aquifer. The artesian aquifer is highly transmissive. Some of these faults are in close proximity to public water supply wells and travel times for contaminants are expected to be short.

Plan Review

Chapter 213 regulates activities that are related to both construction and post construction that might contaminate the aquifer or the streams that feed it. Activities are regulated through the review and approval by the executive director of Edwards Aquifer Protection Plans or Contributing Zone Plans for various activities.

Wastewater Disposal

In the recharge zone, the technical report which is part of the plan, must describe the method of wastewater disposal. If wastewater is to be conveyed to a sewage treatment plant for treatment and disposal, the treatment facility must be identified. If wastewater is to be disposed of by an on-site sewage facility, areas either suitable or not suitable for the use of private sewage facilities that will meet the special requirements for on-site sewage facilities located on the Edwards Aquifer recharge zone as specified under the On-site Sewage Facilities rules should be identified.

LOCAL WATER QUALITY PROGRAMS

Local government regulations and ordinances also provide water quality protection in the Edwards region. For example, in San Antonio, the San Antonio Water System (SAWS) currently administers most elements of the city's water quality program. Components of the program include: Water Pollution Abatement Plan (WPAP) review and approval, floodplain preservation areas, floodplain buffer zones, recharge feature protection, pollution prevention criteria, multi-category developments, stormwater detention and treatment, and stormwater best management practices.⁷

The City of San Antonio also administers a underground petroleum storage tank program. The program includes a policy statement that indicates the installation of underground storage tanks and related systems within the recharge zone is inappropriate and that the installation of such systems is allowed only conditionally in the transition zone. The program also provides for monitoring of existing tanks and related systems.⁸

In addition, the city's development code prohibits certain new activities such as dry cleaning plants or auto repair or paint shops on the recharge zone.⁹

EDWARDS AQUIFER AUTHORITY WATER QUALITY PROGRAM

Section 1.08 of the Edwards Aquifer Act states that "The Authority has all the powers, rights, and privileges necessary to manage, conserve, preserve and protect the aquifer and to increase the recharge of, and prevent the waste or pollution of water in the aquifer."

Since the Authority's inception in 1993, the focus of its work has been the development and implementation of a permitting program. Now that the issuance of initial regular permits is almost complete, the Authority has begun work on the water quality portion of its mandate.

In order to receive input from regional stakeholders and formulate recommendations regarding potential water quality rules in the region, especially in light of the need for cooperation with both the TCEQ and other local governments with regulatory powers in the Edwards region, the Authority created a Water Quality Task Force in September 2003.

After a series of meetings and hearings, the task force formulated a report and list of recommendations that was presented to the Authority's Board of Directors in September 2004 and is currently under consideration.

The task force developed its recommendations using the following process:

1. Identifying core issues that would likely affect aquifer water quality.
2. Comparing the list of core issues to current regulations.
3. Establishing a "No Action" recommendation for core issues where current regulations appear to be adequate to protect aquifer water quality.
4. In areas where current regulations do not correspond with the identified core issues; recommendations for action were developed.¹⁰

In developing its recommendations, the task force assumed that any that were implemented by the Authority will be coordinated with other entities (federal, state, county, and city/local) so that any regulatory overlap is minimized.

The core issues that the task force determined to be adequately addressed by other agencies, or that the Authority could not regulate, were designated "no action" items and included such things as prohibiting non-native plants for landscaping in new developments on the recharge and contributing zones and regulating the use of specific building materials on the recharge and contributing zones.¹¹

Within the task force's recommendations, two phrases were commonly used to recommend the Authority's future regulatory role. The two phrases were:

- ***Authority to study the issue.*** The intent of this recommendation response is that the issue is deemed important, but needs further assessment to determine if the issue should be regulated by the Authority. For example, the task force recommended further study with respect to developing methodologies to determine sustainable development; regulating the application of pesticides, herbicides, and fertilizers on the recharge and contributing zones; regulating and expanding point source restrictions on the recharge and contributing zones; and regulating septic systems on the recharge and contributing zones.

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- ***Authority to regulate within the recharge and contributing zone, but work with (or delegate to) local governments which request and have the ability to regulate.*** The intent of this recommendation response is that the issue should be regulated by the Authority over the entire recharge and contributing zone. However, the task force realizes that there are already local entities that currently have jurisdictional authority and programs in certain areas. Therefore, the proposed regulation would allow the Authority to delegate to a local entity. This would be similar to the TCEQ Chapter 213 rules that contain provisions for delegation to local entities. For example, the task force recommended that the Authority regulate hazardous material storage; regulate proposed golf courses (including management and water quality protection plan requirement); regulate the management of stormwater pollution by Best Management Practices; and regulate pollutant loading limits for new construction through a combination of impervious cover limits and performance standards.¹²

With respect to regulating proposed land developments on the recharge zone, the task force recommended that the Authority request delegation from the TCEQ Chapter 213 rules program within the recharge and contributing zones.

The Authority Board has approved moving forward on certain nonregulatory recommendations on education, research, well plugging, and watershed management.¹³

PERMITTING ISSUES

BACKGROUND¹⁴

The Edwards Aquifer Authority Act requires the Authority to issue groundwater withdrawal permits to any person who withdrew and beneficially used Edwards groundwater between June 1, 1972 and May 31, 1993. The total of all these permits may not exceed 450,000 acre-feet by December 31, 2007, and 400,000 acre-feet by January 1, 2008.

The Act also establishes guaranteed “minimum” permit amounts for certain users. Section 1.16(e) of the Act states that “To the extent water is available for permitting, the board shall issue the existing user a permit for withdrawal of an amount of water equal to the user’s maximum beneficial use of water without waste during any one calendar year of the historical period. . . . An existing irrigation user shall receive a permit for not less than two acre-feet a year for each acre of land the user actually irrigated in any one calendar year during the historical period. An existing user who has operated a well for three or more years during the historical period shall receive a permit for at least the average amount of water withdrawn annually during the historical period.”

In 2000, the Authority staff proposed that initial regular permit applicants were entitled to an aggregate of 532,000 acre-feet of groundwater. As a result of the administrative hearing process and continued evaluation of the permit applications, Authority staff anticipates permit applicants are now entitled to an aggregate of 562,000 acre-feet. All the permits cannot be issued until these entitlements are reduced to the 450,000 acre-foot pumping cap.

Since 1996, the Authority's board and staff have analyzed several options for reaching the 450,000 acre-foot pumping cap. In December 2003, the board voted to amend the initial regular permit rules to divide initial regular permits into two portions, one portion of which is interruptible any time aquifer levels drop below certain levels. These amended rules are in effect through 2007, and address the conflict in the Act that requires the Authority to limit pumping from initial regular permits to 450,000 acre-feet per year while also guaranteeing certain minimum permit amounts.

These new rules establish uninterruptible and interruptible groundwater withdrawal rights for most initial regular permits. Uninterruptible groundwater withdrawal rights, commonly known as "senior" rights, represent the amount of groundwater a permittee may use annually, and are only subject to reductions when the Authority is in a declared stage of the demand management/critical period management plan. These withdrawals apply against the pumping cap. Interruptible groundwater withdrawal rights, known as "junior" rights, represent the additional amount of groundwater that may be used any time the aquifer is 665' above mean sea level at the Bexar County index well (Well J-27). These withdrawals do not apply against the pumping cap.

For 2004, the total amount for all initial regular permits issued as of January 1, 2004, is approximately 502,000 acre-feet of groundwater. Authority staff, therefore, calculated each permittee's "senior" right by taking the total amount for all initial regular permit permittees and proportionally reduced each permit by 10.45% to reach the legislated 450,000 acre-foot pumping cap. The "junior" right represents the difference between the "senior" right and a permittee's guaranteed minimum permit as set forth in the Authority's enabling act. Some permittees did not qualify for a "junior" right depending on the circumstances of their individual permit. Applicants still operating under interim authorization in 2004 were not affected by these new rules.

Also, the new rules delay the pumping cap issue until December 31, 2007, are temporary, and expire on December 31, 2007. These new rules also eliminate the need for the Authority to purchase initial regular permits in excess of 450,000 acre-feet that could have had an initial cost of \$100 — \$200 million, or the need for the Authority to reduce these permits without paying compensation. The permits issued so far exceed the pumping cap by slightly more than 50,000 acre-feet. Making the junior portion of the permit available under certain aquifer conditions helps to protect springflow over the next four years, until such time as a habitat conservation plan is in place for the region.

SOUTH CENTRAL TEXAS WATER ADVISORY COMMITTEE

The South Central Texas Water Advisory Committee (SCTWAC), representing the downstream counties, has asserted that the Board has in effect increased the cap on withdrawals without meeting the Act's requirements for such action and the rules could adversely impact downstream water interests.¹⁵

The Act expressly allows the Board to adjust the cap on authorized withdrawals if the Board determines that additional water is available from the aquifer. The Board must make this determination, however, in consultation with appropriate state and federal agencies.¹⁶

While Authority staff estimate - based on historical data - that it is highly unlikely that the 450,000 acre foot cap will be breached, SCTWAC is concerned that the junior and senior

groundwater withdrawal rights will lead to increased withdrawals from the aquifer when aquifer levels are high, causing the aquifer to drop to low levels sooner at the beginning of severe droughts and stay at lower levels throughout.¹⁷

In addition, SCTWAC contends that the ability of downstream water rights holders to rely on base flows provided by the Comal and San Marcos Springs during droughts could be reduced or eliminated.¹⁸

TCEQ AUTHORITY WITH RESPECT TO EDWARDS AQUIFER AUTHORITY BOARD ACTIONS¹⁹

The Edwards Aquifer Authority Act (the Act) provides an opportunity for the South Central Texas Water Advisory Committee (Advisory Committee) to appeal to the Texas Commission on Environmental Quality's Commissioners (Commission) any action by the Edwards Aquifer Authority's (EAA) Board that is considered prejudicial to downstream water interests. Prior to appealing to the Commission, the Advisory Committee is required, by resolution, to request from the EAA reconsideration of action.

Section 1.10(f) of the Act states: *“The Advisory Committee by resolution may request the board to reconsider any board action that is considered prejudicial to downstream water interests. If the board review does not result in a resolution satisfactory to the advisory committee, the advisory committee by resolution may request the commission to review the action. The commission shall review the action and may make a recommendation to the board. If the board determines that the board's action is contrary to an action of the commission affecting downstream interests, the board shall reverse itself.”*

The Commission, after review of the action, may make a recommendation to the EAA on an appeal. The Act does not provide the Commission the authority to reverse an action of the Board. It is up to the Board to determine whether the action is contrary to an action of the Commission that affects downstream interests. If the Board determines the action is contrary, they are required to reverse their decision.

To summarize, there is no general or specific provision in the Texas Water Code or the Edwards Aquifer Authority Act (the Act) providing for the appeal of the Edwards Aquifer Authority's Board (Board) action, including rules, to the Commission that would result in the Commission overturning the rule or action.

Under Section 1.02 of the Act, the EAA is a conservation and reclamation district created under Article XVI, Section 59 of the Texas Constitution. Therefore, the Commission has a continuing right of supervision over the EAA under Texas Water Code (TWC), Section 12.081. Under its continuing right of supervision, the Commission may: 1) inquire into the competence, fitness, or reputation of any board member; 2) require audits, or other financial information, inspections, evaluations, and engineering reports; 3) issue subpoenas; 4) conduct investigation and hearings; and 5) issue rules necessary to supervise districts.

The Commission has not exercised its continuing right of supervision over districts in the day to

day operations of a district; the Board is elected to manage the affairs of the district. Note that there is no general provision in the Water Code providing for the appeal of district rules to the Commission.

SCTWAC RESPONSE

SCTWAC formally requested the Edwards Aquifer Authority Board to reconsider its action adopting the “bifurcated” permit rules, and upon reconsideration, to repeal the rules and replace them with revised permit rules calling for a proportional reduction of all regular permits, with term permits to be issued to meet proven interim needs. The Board, however, voted not to reconsider the rules in May 2004. In response, SCTWAC invoked its authority under the Act to request TCEQ to intervene and review the Board action and to find the rules in conflict with water rights held by users in the Guadalupe River basin downstream of the Comal and San Marcos Springs.²⁰

The appeal is currently under consideration at TCEQ.

PUBLIC HEARINGS

The House Committee on Natural Resources held a public hearing on the EAA charge on September 20, 2004, at 10 a.m. at the San Antonio City Council Chambers. The following persons testified on the charge:

Mr. Richard Alles, Self and Aqua
Mr. Jerry Arriaga,
Mr. Enrique Barrera, The City of San Antonio
Ms. Stephanie Bergeron Perdue, Texas Commission on Environmental
Quality
Mr. Thomas Boehme, Self and Texas Farm Bureau
Ms. Susan Butler, San Antonio Water System
Mr. Bobby Caldwell, Texas Commission on Environmental Quality
Mr. Loyd Cortez, Alamo Group of the Sierra Club
Mr. Jerry N. Day, Self and San Geronimo Valley
Mr. Gregory M. Ellis, The Edwards Aquifer Authority
Mr. Michael Guerra, The Real Estate Council of San Antonio
Mr. Scott Halty, San Antonio Water System
Mr. Neil Hernandez, Self and San Geronimo Valley
Ms. Kathy Hill, Citizens to Protect the Greater Government Canyon Area
Mr. Larry Hoffman, Regional Clean Air and Water Assn.
Mr. David K. Langford, Self and Texas Wildlife Assn.
Mr. Doug Leonhard, San Antonio Water System
Mr. Gary Middleton, The Guadalupe Basin Coalition
Mr. Douglas Miller, The Edwards Aquifer Authority
Mr. Jay Millikin, Self and Comal County Commissioners Court
Mr. Kirk Patterson
Ms. AnnaLisa Peace, Greater Edwards Aquifer Alliance

Mr. George Rice
Mr. Darby Riley, Water Quality Task Force of the Edwards Aquifer Authority
Ms. Loren Ross, Self and Greater Edwards Aquifer Alliance
Mr. Gregory Rothe, San Antonio River Authority
Mr. Geary Schindel, The Edwards Aquifer Authority
Mr. Mark B. Taylor, South Central Texas Water Advisory Committee
Mr. Todd Votteler, The Guadalupe-Blanco River Authority
Ms. Diane Wassenich, Self and San Marcos River Foundation
Mr. W.E. West, Jr., Guadalupe-Blanco River Authority

FINDINGS AND RECOMMENDATIONS

FINDING NO. 1: Water quality in the Edwards Aquifer is currently regulated through various federal, state, and local government statutes and ordinances. In addition, Texas law provides the Edwards Aquifer Authority the ability to enact regulations to protect water quality. Even with current programs in place, there remains significant concern regarding water pollution and support for the Authority's involvement in water quality protection in the region.

It is imperative, however, that new regulations implemented by the Authority avoid duplication and unnecessary expense for stakeholders and those paying EAA aquifer management fees.

RECOMMENDATION NO. 1: The Authority should continue to study and develop appropriate water quality regulations within its boundaries. In developing its regulations, the Authority should work closely with state and local entities to ensure coordination between governing bodies and minimization of regulatory overlap. In addition, the Authority should continue to explore the potential for delegation of TCEQ Edwards programs. The Legislature should also continue to monitor and review the Authority's regulatory powers with respect to water quality, including the potential for consolidation of regulatory powers in one governmental body.

FINDING NO. 2: Pursuant to the Edwards Aquifer Act, the Authority must establish a permitting process which will allow the Authority to comply with pumping limits of 450,000 acre-feet per year, and ultimately by January 1, 2008, 400,000 acre-feet per year. The reason the cap has become an issue is the Authority must reconcile the 450,000 acre-feet per year cap and certain statutory minimums contained in the Act. Because of this conflict, initial regular permits that became effective January 1, 2004 have caused the total of all permits to exceed the pumping cap.

This led to the development and adoption of the "bifurcated" permit rules adopted by the Board in December 2003. Opponents of the new system claim that the Board has in effect increased the cap without meeting the statutory requirements for such action and that the rules could adversely affect downstream interests.

RECOMMENDATION NO. 2: While the Authority has adopted its bifurcated permitting

system as a temporary means of reconciling the conflict between the pumping cap and the statutory minimums contained in the Act, the Legislature should continue to explore - with input from the Board, permit holders, and stakeholders in the region - the need for statutory changes to address the conflict, including but not limited to increasing or delaying the pumping cap and authorizing the issuance of revenue bonds to pay for permit retirement.

TCEQ CONTRACT REVIEW AUTHORITY

INTRODUCTION

Several provisions of the Texas Water Code authorize the Texas Commission on Environmental Quality (TCEQ) to review and modify water supply contracts. Specifically, a person may request TCEQ review of the rates contained in a wholesale contract.²¹ If the agency finds that rates adversely affect the public interest, it may set new rates.²²

During the 78th Texas Legislative Session, HB 2184 was introduced to prohibit the TCEQ from exercising this authority. Namely, the legislation would have prohibited the TCEQ from amending, interpreting, impairing, or modifying a written contract for the wholesale provision of water.

Although HB 2184, as substituted, was approved by the House Committee on Natural Resources, the legislation did not ultimately pass into law during the 78th Legislative Session. However, the issue was recommended for further study during the interim by the committee as a whole.

BACKGROUND

In the past, the TCEQ (specifically its predecessor agencies) routinely set a rate using established methodology where a written contract existed. The approach to these cases changed with a lawsuit filed by the City of Fort Worth. The lawsuit concerned a wholesale sewer rate dispute with the City of Arlington and was decided by the Austin Court of Appeals in 1994. The court found in *Texas Water Comm'n v. City of Fort Worth*, 875 S.W. 2d 332 (Tex.App.--Austin 1994, writ denied), that the TCEQ may not set aside a contract rate and set a new one unless the commission first finds that the contract rate adversely affects the public interest. The court primarily based this decision on the constitutional provision prohibiting the impairment of contracts.

As a result of this case, the TCEQ adopted rules that establish criteria for determining when a rate found in a written contract adversely affects the public interest. To date, few, if any, wholesale purchaser has successfully shown that a contract rate adversely affected the public interest.

STATUTORY AUTHORITY²³

TCEQ has authority to review a decision by a provider on wholesale water or sewer rates under Texas Water Code (TWC), §13.043(f) if an appeal is filed within 90 days after the date the notice of the decision is received from the wholesale provider. In addition, TCEQ has authority to review rates for surface water under TWC, §§11.036-11.041 and 12.013 at any time an appeal is filed. If the rates are charged pursuant to a written contract, there is a bifurcated hearing process under Chapter 290, Subchapter I (§§291.128-291.138). The first hearing is on whether the rates charged under the contract adversely affect the public interest. If the commission determines that the rates do not adversely affect the public interest, the appeal is denied. If the

commission determines the rates adversely affect the public interest, a second hearing is held to determine whether the rates are just and reasonable.

TCEQ also has authority to require a water supplier to provide surface water that has been requested by a person entitled to receive the surface water, either pursuant to a contract or otherwise, if a complaint is filed under TWC, §11.041. The complainant must show: (1) they are entitled to receive or use the surface water; (2) they are willing to pay a just and reasonable price; (3) the supplier has available surface water not contracted to others; and (4) the supplier has not supplied available surface water, or the price demanded is not reasonable and just or is discriminatory. This provision does not apply to groundwater.

Under TWC, §11.042(a), TCEQ has further authority over conveyance of stored and conserved water under contract and conveyed via bed and banks. The Texas Administrative Code (TAC), Title 30, §295.111(a) requires that a copy of the contract be filed with the Executive Director. The method and calculation of carriage losses under the contract is subject to the Executive Director's review and approval. Under 30 TAC §297.92, TCEQ may require that the contract be changed if it finds that the change is necessary to protect vested rights or prevent the undue loss of water.

TCEQ has further authority to require that water right permit applicants submit water conservation plans and drought contingency plans under TWC, §§11.1271 and 11.1272, respectively. TCEQ rules require that water conservation plans for: (1) municipal uses by public water suppliers [30 TAC §288.2(a)(2)(C)], (2) a system providing agricultural uses to more than one user [30 TAC §288.4(a)(3)(G)], and (3) wholesale water suppliers [30 TAC §288.5(1)(F)], include a requirement that every water supply contract must contain water conservation requirements. 30 TAC §288.22(a)(7) also requires that drought contingency plans for a wholesale water supplier include a provision requiring that every wholesale contract contain a provision stating that in case of shortage resulting from drought, the water will be divided according to TWC, §11.039.

Finally, agency rules require that contracts to supply treated or untreated state water be filed with the executive director, and retail public utilities that provide water based on a wholesale supply file a copy of the wholesale water supply contract with the water supply division of the TCEQ.

STATUTORY LENDING REQUIREMENTS²⁴

Under TWC §12.013(c), the TCEQ may use any reasonable basis for fixing rates but the agency may not fix a rate which is less than the amount required to meet the debt service and bond coverage obligations of that entity. Further, in passing on a loan application for financial assistance, the Texas Water Development Board (TWDB) must consider the availability of revenue for the ultimate repayment of the cost of the project. In addition, the TWDB must make findings before acquiring a facility or interest in a facility. namely, the agency must affirmatively find that it is reasonable to expect that the state will recover its investment in the facility. Finally, the TWDB may approve an application for financing if the agency finds that the revenue or taxes pledged by the political subdivision will be sufficient to meet all the obligations assumed by the political subdivision during the succeeding period of not more than 50 years.

ANALYSIS OF THE PROBLEM²⁵

Note: This section reproduced in its entirety from the Bill Analysis of HB 2184, 78th Texas Legislature, provided by the House Research Organization.

Supporters of the legislation state that the agency's authority under current law discourages investment in new water supply projects. TCEQ can amend rates agreed upon by willing parties to a contract if it makes a determination that the rates adversely affect the public interest. While protecting the public interest is important, the agency's power to set new water rates in a long-term contract is viewed as a risk by potential lenders for a new water supply project.

For example, if a small company sought to build a water desalination plant to provide nearby municipalities, before building the project it would negotiate long-term contracts (such as 30 years or longer) to supply the water. The company then would submit the plans for the project, along with the contracts, to investment banks in Chicago or New York that could finance the project. Before lending \$200 million to finance a new desalination plants, however, the lender would scrutinize the company's plans and contracts. Unfortunately, TCEQ's power to change the rates midway through the contract could cause a potential lender to increase the loan interest rate or deny the loan altogether.

By removing TCEQ's authority to amend contracts, the bill would discourage people from entering into contracts with no intention of delivering. It would encourage honest negotiations of contract terms. TCEQ currently processes five or fewer wholesale rate cases per year because most are settled before reaching the commission level. The high proportion of settlements may be an indication that entities mainly use the agency's authority as a bargaining tool and a means to achieve an end. Moreover, the agency's authority to amend contracts between willing parties puts the agency in a difficult position as arbiter of the contract.

The bill would eliminate only TCEQ's authority to amend wholesale water supply contracts. It would not affect the agency's ability to amend other contracts and guard against unscrupulous retail providers. Wholesale water contracts are necessary to procure financing for expensive

water projects. The purpose of the bill is to encourage investment in water supply projects, not to remove agency authority. The bill would not affect retail contracts because these usually are not involved in financing for water supply projects.

Opponents of the legislation argue that the bill would remove an important regulatory tool. The state long has regulated basic services, such as water, gas, or electricity, to protect the public interest, ensuring that customers are not at the mercy of profiteers. Currently, large water companies around the world are envisioning water service as the next market to be deregulated, similar to the frenzied effort to deregulate the electricity market in the 1990s. Eliminating the agency's authority to review wholesale water supply contracts would be a short-sighted policy especially now.

Further, investment bankers have little reason to be concerned about TCEQ's authority to review rates. The agency has been generous to water wholesalers in the past and processes only a few cases per year. To change a rate the agency must find, according to specific criteria, that the protested rate adversely affects the public interest. Meeting this high standard is a burden for a party seeking a new rate.

Opponents also stated that the agency's authority protects purchasers or sellers from being exploited in a wholesale water contract. Not all contracts are created equal; many contain onerous provisions that are not fully understood by one party until much later. The agency needs the power to ensure that the public is not harmed or disadvantaged by a contract entered into by someone else. Moreover, as the guardian of Texas' natural resources for the public, the state should have the right to review contracts for the wholesale provision of our most important natural resource.

In addition, the legislation proposed in the 78th session could be too broad in its scope and could have unintended consequences. By eliminating TCEQ's authority to amend, interpret, impair, or modify a wholesale water supply contract notwithstanding any other law, the bill could create a means to circumvent other TCEQ authority. For instance, unscrupulous people could enter into a sham contract in order to avoid certain other TCEQ regulations.

PUBLIC HEARINGS

The House Committee on Natural Resources held a public hearing on this charge on March 24, 2004, at 1:30 p.m. in Room E2.010, Capitol Extension. The following persons testified on the charge:

Ms. Kathleen Hartnett White. Chairman, Texas Commission on Environmental Quality; and
Mr. J. Kevin Ward, Texas Water Development Board.

FINDING AND RECOMMENDATION

FINDING: The authority of the TCEQ to review and amend water supply contracts is limited to instances that involve the public interest. The agency has based the public interest standard on an opinion by the Austin Court of Appeals that determined this was not an unconstitutional interference with contracts as long as it was based on protection of the public health and welfare. Since this standard was incorporated, the rate review of water supply contracts has rarely been triggered. However, if the TCEQ process of reviewing water supply contracts became more commonplace, it could inhibit the interest of long-term investors in water supply contracts.

RECOMMENDATION: The state should continue to monitor and review the authority of the TCEQ to amend and interpret water supply contracts to ensure that this process does not discourage private investment in water supply contracts across the state.

BRACKISH GROUNDWATER AND SURFACE WATER

INTRODUCTION

In order to provide an adequate water supply for their growing populations, Texas and other western states have begun to focus on alternative sources such as desalination of surface and groundwater across the state. Several regional water planning groups have considered this option, and the Texas Water Development Board (TWDB) has launched several new projects.

According to Ken Ramirez and Patrick Lee in “Desalination: Opportunities and Constraints,” “desalination is becoming more cost effective in the United States, as demands for potable water increase and the cost of desalination falls because of technological advances.”²⁶ However, the authors also point out that several constraints still exist to large-scale seawater desalination. Namely, “the most significant constraints are cost, environmental concerns, legal issues (mostly involving permitting), and source water quality.”²⁷

BACKGROUND

In 2001, Texas passed SB 2, an omnibus water bill that included a statute recognizing the importance of desalination to the state’s future water supplies. This legislation authorized the use of state funds for desalination projects through the Water Loan Assistance Fund and allowed for tax benefits for desalination projects.²⁸

The most important legislation regarding desalination efforts in Texas, however, was HB1370, enacted by the 78th Texas Legislature. The legislation requires the TWDB to study the development of cost-effective water supplies from desalination of seawater.²⁹ The bill also requires the TWDB to pursue federal funding for desalination projects in Texas.³⁰ Further, the agency must issue a biennial progress report on the implementation of seawater desalination in Texas.³¹

The report must include the following: results of TWDB studies and activities on seawater desalination; an evaluation of research, regulatory, technical, and financial obstacles to seawater desalination projects; an evaluation of the state’s role in developing large-scale seawater desalination projects; and the anticipated general revenue appropriation necessary to continue studying seawater desalination in the next biennium.³²

Prior to HB 1370, the TWDB was involved in Governor Rick Perry’s efforts to develop recommendations on large-scale desalination projects.³³ Based on this effort, the TWDB considered statements of interest and project proposals.³⁴ After studying these proposals, the TWDB recommended three demonstration projects for implementation, in Corpus Christi, Brownsville, and Freeport. In addition, the TWDB awarded research grants for these projects and has sponsored workshops and research efforts in desalination.

COST OF DESALINATION

The most promising technology for large-scale seawater desalination is reverse osmosis.³⁵ This technology was developed by the Department of Defense more than 30 year ago, and it uses high powered pumps to force salt water through membranes with microscopic pores. This process produces potable water and leaves behind the salt. Finally, the reverse osmosis (RO) process used in modern desalination plants produces “bottle-quality” water that exceeds state and federal drinking water quality standards.³⁶

The costs of using reverse osmosis to treat both brackish groundwater and seawater have decreased dramatically in the past 20 years and are expected to continue to decline.³⁷ Currently, desalination of brackish groundwater costs \$300-\$500 per acre-foot, and desalination of seawater costs \$800-\$1,300 per acre-foot.³⁸ Treatment of surface water, however, is projected to increase in price over the next five years, as secondary treatment standards go into effect.³⁹ In the Rio Grande Valley, soaring costs of surface water rights make reverse osmosis a very economical alternative.⁴⁰

PERMITTING REQUIREMENTS⁴¹

One of the constraints to implementation of desalination efforts in Texas has been the discharge produced by the process. When salt is removed from water, a discharge is produced that is highly salient, and this discharge can prove harmful to the environment. In order to regulate this discharge, several permits must be considered.

Regulatory requirements for desalination facilities can include permits for disposal of concentrated waste streams and plan approval for public drinking water facilities, as well as permits for the appropriation of surface water rights in some instances.

There are a variety of methods associated with disposal of the concentrated waste stream. The discharge or land application of brine concentrate requires either a Texas Commission on Environmental Quality (TCEQ) Texas Pollutant Discharge Elimination System (TPDES) Permit or a Texas Land Application Permit (TLAP). With each of these disposal options, there are environmental issues to consider:

Environmental Concerns for Disposal Options

1. Discharge to marine surface waters (*TPDES individual permit required*)

There are no numerical water quality standards for salinity or total dissolved solids (TDS) in Texas, and discharges with substantially elevated salinity can adversely affect the natural salinity gradient and aquatic ecosystems of estuaries and tidal rivers. Substances other than major salts (metals, toxic substances, and naturally occurring radioactive materials) are concentrated by membrane technology desalination and can be a possible concern.

2. Discharge to freshwater surface water (*TPDES individual permit required*)

Multiple uses of freshwater surface water are adversely affected by an increase in salinity, and typical TDS concentrations of brine concentrate are much greater than water quality standards. Further, substances other than major salts (metals, toxic substances, and naturally occurring radioactive materials) are concentrated by membrane technology desalination and can be a possible concern.

3. Irrigation (*TLAP individual permit required*)

Any buildup of salt constituents can become toxic to the crop and/or the soil biosphere. Without the crop and soil mechanisms, there is an increased probability of impacting surface waters and/or impacting groundwater.

4. Surface Impoundment Evaporation (*TLAP individual permit required*)

No discharge to water in the state is authorized by this disposal method. Disposal is entirely dependent on the evaporation rates in the location of the facility, and the impoundments must be sized properly and lined to appropriately deal with overflow and prevent discharges to groundwater.

5. Discharges to Publicly Owned Treatment Works (POTWs) (*no TCEQ permit required*) The volume and salinity of the concentrate may affect the ability of the POTW to accept the wastewater.

6. Underground Injection (*UIC permit required*)

An individual permit is required if disposal will occur below the base of underground drinking water, and disposal of a waste stream that is not hazardous and cannot degrade an underground drinking water source is authorized by rule.

In issuing permits for the disposal of these substances, the TCEQ also considers some additional issues. For example, co-locating of desalination facilities with existing or new power plants would require consideration of the requirements of Clean Water Act Section 316 (b), or the best technology available to minimize environmental impacts of cooling water intake structures.

Further, disposal units (ie. treatment of brine concentrate) cannot be constructed until a permit is received or an Authorization to Construct (ATC) is granted by the TCEQ. Construction of the water treatment (desalination) unit does not require an ATC, and the executive director and commission may consider ATCs on an as-needed basis when specific criteria are met.

TCEQ is also charged with the approval of plans of facilities for desalination of drinking water and the permitting of water rights, when surface water or seawater is used. In addition, plans and specifications on the drinking water treatment process (reverse osmosis or electrodialysis) must be submitted to the Water Supply Division for approval prior to construction.

When an innovative technology for the treatment of public drinking water is proposed, a professional engineer must provide pilot test data at the proposed installation site or data collected at a similar full-scale water treatment plant that demonstrates that the proposed project will produce water that meets federal and state drinking water standards. A full scale pilot study will also be

reviewed by staff to confirm design capacities, blending ratios, monitoring points in the plant and other features described in the pilot study and preliminary reports.

Staff will also make an on-site evaluation prior to final design to determine compliance with regulations governing distances to waste discharge points, marinas, septic tanks, or other sources of contamination. Further, continuous monitoring of the product water may be required, if the desalination process is also being used for microbial treatment of the drinking water.

Finally, water rights permits or permit amendments must be obtained for diversion of surface water or seawater. Water rights applications for diversion of seawater are simplified because there is no water availability issue, and diversions of seawater from a bay or arm of the Gulf of Mexico can be used in any basin without the need for an interbasin transfer authorization.

CURRENT TEXAS WATER DEVELOPMENT BOARD CONTRACTS

Three regional water facility planning studies with a focus on seawater desalination supplies have been initially completed at the TWDB. In August 2003, the TWDB authorized \$1.5 million in grants for the preparation of feasibility and regional water facility planning studies to determine the technical and economic viability of demonstration seawater desalination projects in Brownsville, Corpus Christi and Freeport. The three proposed projects identified potential customers for the proposed projects and the benefits and costs of creating additional drought-proof water supply sources based on seawater desalination.

Reports for the three planning studies were submitted to the TWDB by the grant recipients and include information regarding the following components: customer base determination, project facilities (including in-take, pre-treatment, treatment, concentrate management and disposal), transmission lines, permitting requirements, project financing and implementation, and any other pertinent recommendations. The TWDB submitted its biennial report on seawater desalination in December 2004. Below are summaries of each planning project:

Lower Rio Grande Valley-Brownsville⁴²

The proposed project consists of an initial phase of a 25 million gallon per days (mgd) reverse osmosis plant to begin operations in the year 2010. Contingent upon future service agreements with neighboring cities in Cameron and Hidalgo counties, the plant could be expanded to 100 mgd by the year 2040. The site for the plant is the Brownsville Port Authority's complex, approximately 10 miles from the coastline and 6 miles away from the Brownsville distribution system. Certain elements of the project are sized to meet future expansions. The source water intake consists of a screened structure on the side of the Brownsville Ship Channel. The concentrate disposal is through an open ocean diffused discharge outfall line 15 miles away from the plant, including approximately 3 miles into the Gulf of Mexico.

The initial 25 mgd phase of the project would serve the Brownsville system. The project's greatest benefit is that it would add diversity to the Brownsville water supply portfolio and it would lessen the area's critical dependence on the Rio Grande River.

The capital cost of the project is estimated at \$151 million. The annual operation and maintenance (O&M) is estimated at \$11.8 million; energy costs represent approximately 59 percent of the O&M cost and are based on an electric utility rate of 5.45 cents per kilowatt-hour (¢/kW-h).

The Brownsville Public Utility Board (PUB) estimates that, in order to maintain the affordability of its water utility rate, it would need a subsidy of \$13.8 million per year, equivalent to \$494 per acre-ft to begin implementation of this project.

Corpus Christi⁴³

The proposed project consists of a 25 mgd reverse-osmosis plant to begin operations in the year 2010. The site for the plant is the Barney Davis Power Plant, conveniently close to the Corpus Christi water distribution system. The project will require of an open ocean intake and an open ocean concentrate disposal system.

One of the project's greatest potential advantages is the option to co-locate with the Barney Davis Power Plant and use its intake and discharge facilities; however, the study considered this option and concluded that the hyper-salinity of Laguna Madre exceeds the maximum salinity requirements for the project. The study also determined that discharge of the desalination plant's concentrate to Oso Bay is not advisable because of environmental concerns.

The capital cost of the project is estimated at \$197 million. The annual O&M is estimated at \$17,518,000; energy costs represent approximately 42 percent of the O&M and are based on an electric utility rate of 6.5¢/kW-h.

The City of Corpus Christi estimates that, in order to maintain a zero impact to its customer base from the implementation of the desalination project, it would need a subsidy of \$24 million per year, equivalent to \$1,055 per acre-ft in order to implement this project. Additionally, the projected cash flow assumes \$5 million/year from water sales to San Antonio.

Freeport⁴⁴

The proposed project consists initially of a 10 mgd reverse-osmosis plant to begin operations in the year 2010. The plant site is located at the Dow Chemical Complex in Freeport. The plant would be designed to take advantage of Dow Chemical's existing infrastructure and access to both ocean water and river water; thus, the project's concept is to treat river water preferentially to lower the produced water cost and, when river water is not available, shift to seawater.

The initial targeted project customer is the Brazosport Water Authority (BWA), which would initially be served with 6.5 to 9.2 mgd. A new 15 mile transmission line would convey water from the desalination plant site to the BWA distribution system. The BWA is a regional provider of surface water in the area currently supplying water to seven communities – Lake Jackson, Freeport, Angleton, Clute, Oyster Creek, Richwood, and Brazoria. Future expansions of up to 50 mgd, and potentially greater, would supply northern Brazoria and eastern Fort Bend counties as demands increase.

The capital cost of the project is estimated at \$93.1 million. The annual O&M is estimated at \$7.3 million; energy costs represent approximately 43 percent of the O&M.

The Brazos River Authority estimates that, in order to maintain a zero impact to the targeted customer base from the implementation of the desalination project, a subsidy equivalent to approximately \$8.0 million per year, equivalent to \$765 per acre-foot, would be needed in order to implement this project.

OTHER STUDIES

In addition to the execution of the seawater feasibility studies, TWDB has provided funding for various desalination-research studies during the biennium. Also, TWDB was awarded a grant by the U. S. Bureau of Reclamation, Desalination Research Program, as detailed below.

Feasibility Study of Product Water Desalination-Texas Engineering Extension Service (TEES), Texas A&M University).⁴⁵

Large quantities of produced water are brought to the surface in Texas as a result of natural resource extraction activities. The proposed research will assess the economic and technological feasibility of desalting produced water resulting from these activities to develop water of sufficient quality to meet certain local water supply needs and to allow consideration of disposal options other than well injection

Development of Permitting and Development Decision Model for Desalination Projects in Texas.⁴⁶

This study developed a permitting and development decision model for desalination projects in Texas. The draft report lists 20 major permits and approvals for a seawater desalination plant and transmission lines. It estimates that the permitting process could take from 18 to 24 months to complete.

Please pass the salt: Grant of the U.S. Bureau of Reclamation to the Texas Water Development Board.⁴⁷

The objective of this study is to evaluate the use of depleted oil fields as sites for injection wells to dispose of concentrate from desalination plants. Unfortunately, the current permitting environment does not allow this option. Instead, desalination plant operators would be expected to apply for a Class I permit (millions of dollars and years) instead of using a Class II permitted well (which only requires thousands of dollars and months for a permit). The purpose of this study was to show that oil fields could accept injected concentrate from desalination plants and to recommend changes to statute and rules that would allow the disposal of concentrate in oil fields.

Capacitive deionization technology: Testing of a new type of electrode being developed by CDT Inc. Texas Water Resources Institute-Texas A&M University.⁴⁸

The testing of this technology consisted of desalination of brines representing brackish groundwater from saline aquifers. Laboratory tests were to determine the performance efficiency of the technology and the power and other operational costs of the technology. The draft report confirmed the ion removal capability of the technology. An important drawback, however, is the inability to adequately regenerate the cells using a minimal amount of clean water. The research found problems with the material selected for the cell and its flow design. These design and operation concerns, coupled with cost issues will require significant further development before an operational cell will be available.

BRACKISH GROUNDWATER PROJECTS⁴⁹

Desalination of brackish groundwater, as opposed to seawater desalination, is also increasingly being considered as an alternative water supply, especially in the Rio Grande Valley. For example, the Texas Water Development Board and the Brownsville Public Utility Board partnered on a brackish groundwater desalination pilot study in 1995. This feasibility study laid the groundwork for all current desalination projects in the Rio Grande Valley.

Today, several desalination plants are operating in the Rio Grande Valley and several more are under construction. Due to widespread interest, the Rio Grande Regional Water Planning Group (Region M) amended its water plan in August 2003 to include brackish groundwater and seawater desalination as a recommended water management strategy. More than 30 water user groups in the region indicated their strategies had changed since the first plan was adopted and that they were actively considering desalination as an option.

DESALINATION IN PRACTICE⁵⁰

The Southmost Regional Water Authority is the largest regional brackish groundwater desalination plant in the state. The plant provides 7.5 million gallons per day of high quality drinking water to some 150,000 residents of Brownsville, Los Fresnos, Indian Lake, and Valley Municipal Utility District No. 2, and to the Brownsville Navigation District. This supply will fill more than 40 percent of the annual water needs of each entity, decreasing dependency on the overused and overallocated Rio Grande.

The Valley Municipal Utility District No. 2 completed the region's first municipal brackish groundwater desalination facility in 1999. Producing 20,000 gallons per day, the plant provides 30 percent of the district's water supply.

The North Alamo Water Supply Corporation has plans to construct at least four reverse osmosis desalination plants within two years in northern Willacy and Cameron counties.

The new North Cameron Regional Water Authority, which includes North Alamo Water Supply Corporation, East Rio Hondo Water Supply Corporation, and the City of Primera, is self-financing a 2 million gallons per day reverse osmosis desalination plant to treat brackish groundwater.

PUBLIC HEARINGS

The House Committee on Natural Resources held a public hearing on this charge on March 24, 2004, at 1:30 p.m. in Room E2.010, Capitol Extension. The following persons testified on the charge:

Mr. John S. Bruciak, Southmost Regional Water Authority/ Brownsville PUB
Mr. Ron Massey, City of Corpus Christi
Mr. Jorge Arroyo, Texas Water Development Board
Ms. Margaret Hoffman, Texas Commission on Environmental Quality
Mr. Robert W. Lifford, NRS Consulting Engineers-Harlingen
Ms. Susan Morgan, Brazos River Authority

FINDING AND RECOMMENDATION

FINDING: Brackish groundwater and surface water desalination are rapidly becoming viable options for supplying water in Texas. The progress made through research and projects supported by the Texas Water Development Board will pave the way for a potentially infinite supply of water for Texas citizens. However, several constraints still exist to the prolific use of this water source including cost, permitting issues, and environmental concerns.

RECOMMENDATION: The state should continue to support the current efforts by the Texas Water Development Board to research and explore this water supply option, especially with respect to potential impediments. Further, the state should support and promote all the current desalination projects underway across the state and continue to examine avenues for additional proposals.

ENDNOTES

- ¹ Background information for this section provided by the Edwards Aquifer Authority. See also The Edwards Aquifer Homepage by Gregg Eckhardt at www.edwardsaquifer.net.
- ² Final Report of Recommendations, Edwards Aquifer Authority Water Quality Advisory Task Force, September 2004.
- ³ Id.
- ⁴ Id.
- ⁵ This section provided by the Texas Commission on Environmental Quality.
- ⁶ This section provided by the Texas Commission on Environmental Quality.
- ⁷ Final Report of Recommendations, Edwards Aquifer Authority Water Quality Task Force, September 2004.
- ⁸ Id.
- ⁹ Id.
- ¹⁰ Final Report of Recommendations, Edwards Aquifer Authority Water Quality Task Force, September 2004.
- ¹¹ Id.
- ¹² Id.
- ¹³ Id.
- ¹⁴ This section provided by the Edwards Aquifer Authority.
- ¹⁵ Report of the Effectiveness of the Edwards Aquifer Authority, South Central Texas Water Advisory Committee, October 2004, p. 3-1.
- ¹⁶ Id.
- ¹⁷ Id. at p. 3-2.
- ¹⁸ Id.
- ¹⁹ This section provided by the Texas Commission on Environmental Quality.
- ²⁰ Report of the Effectiveness of the Edwards Aquifer Authority, South Central Texas Water Advisory Committee, October 2004, p. 3-3, 3-4.
- ²¹ House Research Organization, Bill Analysis CSHB 2184, 78th Legislature, May 9, 2003.
- ²² Id.
- ²³ This section provided by the Texas Commission on Environmental Quality.
- ²⁴ This section provided by the Texas Water Development Board.
- ²⁵ House Research Organization, Bill Analysis CSHB 2184, 78th Legislature, May 9, 2003.
- ²⁶ Ramirez, Ken & Patrick Lee, "Desalination: Opportunities and Constraints" *Texas Bar Journal*, March 2004.
- ²⁷ Id.
- ²⁸ Id.
- ²⁹ House Research Organization, Bill Analysis HB 1370, 78th Legislature, April 23, 2003.
- ³⁰ Id.
- ³¹ Id.
- ³² Id.
- ³³ Ramirez, Ken & Patrick Lee, "Desalination: Opportunities and Constraints" *Texas Bar Journal*, March 2004.
- ³⁴ Id.
- ³⁵ Id.
- ³⁶ Norris, Bill, "Testimony Prepared for the House Natural Resources Committee," NRS Government Relations Office, Public Hearing of the House Committee on Natural Resources, March 24, 2004 (Austin).
- ³⁷ Id.
- ³⁸ Id.
- ³⁹ Id.
- ⁴⁰ Id.
- ⁴¹ Background for this section provided by the Texas Commission on Environmental Quality.
- ⁴² The Future of Desalination in Texas, Volume I, Biennial Report on Seawater Desalination, Texas Water Development Board, December 2004, Section 1.
- ⁴³ Id.
- ⁴⁴ Id.
- ⁴⁵ Id. (Excerpt includes entire paragraph).
- ⁴⁶ Id. (Excerpt includes entire paragraph).
- ⁴⁷ Id. (Excerpt includes entire paragraph).

⁴⁸ Id. (Excerpt includes entire paragraph).

⁴⁹ Norris, Bill, "Testimony Prepared for the House Natural Resources Committee," NRS Government Relations Office, Public Hearing of the House Committee on Natural Resources, March 24, 2004 (Austin).

⁵⁰ Id.