

A Report on Progress of  
**Water Conservation in Texas**



*Report to 81<sup>st</sup> Legislature  
December 2008*



SUBMITTED BY  
WATER CONSERVATION ADVISORY COUNCIL



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Submitted by  
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Cover photographs courtesy of (left to right) TWDB—water tower; El Paso Water Utilities—reclaimed water system; Robert Mace—rainwater collection tank; Texas Alliance for Water Conservation—irrigation system

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December 1, 2008

An open letter to the Citizens of Texas

Dear Texas Citizens:

**According to the 2007 State Water Plan, conservation accounts for nearly 23 percent of the projected additional water supply needed in 2060—a total of about two million acre-feet per year, which is enough to supply half of the current annual municipal use in Texas.** The key role of conservation in meeting our state’s future water needs led the Texas Legislature to include measures to conserve Texas water as part of omnibus water legislation in the 2007 Regular Session. To begin developing a water conservation strategy for Texas, the Legislature formed the Water Conservation Advisory Council (Council). The Council, consisting of 23 members, has been meeting for over a year, and this is our first report. Outside of our individual professional endeavors, the Council members, as well as others participating as Member Alternates and “Interested Parties,” have volunteered numerous days of time and effort to Council activities. Since formation in September 2007, the Council has held 11 public meetings and many workgroup teleconference sessions. The 23 members of the Water Conservation Advisory Council are honored to serve on the Council and are pleased to submit this first biennial report to the citizens and elected leadership of the State of Texas.



The Council recognizes that true water conservation is achieved by the conservation success of end users. It is imperative that the public become more aware of the need to conserve and motivated to practice water conservation in their daily routines. That is why this letter is addressed to the citizens of Texas in addition to the political leaders of our state.

The Council has developed a proposed plan consisting of three crucial elements, along with a number of key findings and recommendations. We strongly believe that we have a plan for water conservation that will prepare a strong foundation on which to build a successful water conservation program for the future of Texas. To achieve success in water conservation on a local, regional, and state level, the Council believes that efforts must be focused on fulfilling three critical elements to create the necessary framework:

- **Implementation and Measurement**—The cornerstone of any successful program is having the metrics in place to set targets and goals and measure success. These metrics are not in place today for water conservation. The Council believes that meaningful metrics must be developed to set a solid foundation on which to build a water conservation program and measure our implementation success.
- **Public Awareness and Recognition**—Increased awareness and recognition efforts are needed to reach various users, such as industry, agriculture, municipalities, and ultimately the general public. Water users must become aware of the need to conserve and motivated to take the necessary steps for preserving our water resources for future generations.
- **Resources: Information, Tools, and Expertise**—Awareness and recognition programs must be supplemented with data, resources, and expertise so that successes in water conservation can be shared with the largest number of people possible.

The Council strongly believes that the Texas Legislature must begin implementing programs and committing resources toward these priority elements. **All of these elements go hand-in-hand toward promoting and achieving a higher level of water conservation in Texas.** Awareness must be supplemented with information and measurement; measurement alone cannot generate commitment without awareness; and quality information, even when available, is not effective if it is not being used as part of our planning processes. There is no question that the economic future of Texas depends on how well the state is able to manage its water resources. Water conservation is a significant component of the state's water management strategies, and a focused effort is needed now to develop the plans for managing and achieving water conservation success.

In Texas, water is a natural resource under increasing pressure from growing demand. Water resources are crucial for sustainable and economic development, the natural environment, agricultural production, and human health. The 2007 State Water Plan clearly demonstrates the need to manage our precious and limited water resources and documents the need to use every tool at our disposal to ensure that maximum beneficial use is achieved.

The Council believes that our recommendations represent only an initial commitment to this effort, which will likely grow significantly in the future. How well we are able to provide direction today will have a profound effect on the level of resources that will be needed in the future. The Council strongly recommends that the State of Texas commit resources to water conservation by investing a total of \$13.5 million in funding in the next biennium to advance and promote water conservation in Texas.

Many may ask if Texas can afford to make this commitment while there are so many other competing needs. However, we must also ask if Texas can afford any further delays in laying a solid foundation for water conservation. Conservation is a wise investment in Texas' future water supply and is one of the most cost-effective tools we have in meeting our growing demand for water. The Council strongly recommends these fundamental steps be taken now for the future of Texas.

Respectfully submitted,



C.E. Williams  
Presiding Officer, Water Conservation Advisory Council  
For members of the Council

Cc: Governor  
Lt. Governor  
Speaker of the House  
Chairman Senate Natural Resources Committee  
Chairman House Natural Resources Committee  
Members of the Texas Legislature

# Executive Summary

During the 80th Regular Session of the Texas Legislature, Senate Bill 3 (SB 3) and House Bill 4 (HB 4) were introduced and passed. With their passage, the Texas Water Development Board (TWDB) was directed to appoint 23 members to the Water Conservation Advisory Council (Council). The Council was created to provide the Governor, Lieutenant Governor, Speaker of the House of Representatives, Legislature, TWDB, Texas Commission on Environmental Quality, political subdivisions, and the public with the resource of a select council with expertise in water conservation.

The legislation stipulates that the Council be composed of 23 members representing a cross section of water user groups, state agencies, and industry representatives who are appointed by the TWDB. At their August 27, 2007, meeting, the TWDB appointed one member to represent each of the 23 interest groups.

Duties of the Council include the following:

1. Monitoring trends in water conservation implementation.
2. Monitoring new technologies for possible inclusion by the TWDB as best management practices in the Water Conservation Best Management Practices Guide developed by the Water Conservation Implementation Task Force.
3. Monitoring the effectiveness of the TWDB's statewide water conservation public awareness program and associated local involvement in implementing the program.
4. Developing and implementing a state water management resource library.
5. Developing and implementing a public recognition program for water conservation.

6. Monitoring the implementation of water conservation strategies by water users included in regional water plans.
7. Monitoring target and goal guidelines for water conservation to be considered by the TWDB and the Texas Commission on Environmental Quality.
8. Conducting a study to evaluate the desirability of requiring the TWDB to
  - (a) designate as certified water conservation training facilities entities and programs that provide assistance to retail public utilities in developing water conservation plans; and
  - (b) give preference to certified water conservation training facilities in making loans or grants for water conservation training and education activities.

No later than December 1 of each even-numbered year, the Council is to submit to the Governor, Lieutenant Governor, and Speaker of the House of Representatives a report on progress made in water conservation in Texas.

The Council has been meeting for over a year, and this is our first report. Outside of our individual professional endeavors, the Council members, as well as others participating as Member Alternates and "Interested Parties," have volunteered numerous days of time and effort to Council activities. Since formation in September 2007, the Council has held 11 public meetings and many workgroup teleconference sessions. The 23 members of the Water Conservation Advisory Council are honored to serve on the Council and are pleased to submit this first biennial report to the citizens and the elected leadership of the State of Texas.

## *Elements for Success in Water Conservation*

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In Texas, water is a natural resource under increasing pressure from growing demand and changing supplies. Water resources are crucial for sustainable and economic development and for the natural environment, agricultural production, and human health. The state water plan clearly recognizes the need to manage our precious and limited water resources and documents the need to use every tool at our disposal to ensure that maximum beneficial use is achieved. One of the most cost-effective tools we have in meeting the growing demand for water is conservation. According to the 2007 State Water Plan, **conservation accounts for nearly 23 percent of the projected additional water supply needed in 2060—a total of about two million acre-feet per year, which is enough to supply half of the current annual municipal use in Texas** (TWDB, 2007).

The Council recognizes that effective water conservation is achieved by both water suppliers and end users. It is, therefore, imperative that the public become more aware of the need to conserve and motivated to practice water conservation in their daily routines. Awareness and recognition programs must be supplemented with data, resources, and expertise so that successes in water conservation can be shared with the largest number of people possible. Furthermore, it is an absolute necessity to have a means of evaluating progress in order to assess fairly which efforts are achieving the greatest benefits from the level of resources that are being committed.

To achieve success in conservation on a local, regional, and state level, the Council believes that efforts must be focused on fulfilling certain elements. The Council has determined that those elements essential to creating the framework for success in conservation are the following:

- **Implementation and Measurement**

The cornerstone of any successful program is having the metrics in place to set targets and goals and measure success. Conservation-specific metrics are not in place today for water conservation programs. Existing measurements for conservation are inconsistently used and create confusion and misinformation. Because water conservation is a key strategy in meeting the state's future water needs, aggressive steps at local, regional, and state levels should be taken to track and measure the implementation levels and savings of conservation programs. Plans must define specific actions, set targets and goals to monitor progress, and define how progress will be measured. Standardized methodologies and metrics must be developed statewide for the purpose of consistency and uniformity. Establishing more consistent methods for collecting and reporting water use, as well as requiring frequent reporting, will enhance both the quantity and quality of data obtained. As data collected at the state level is enhanced and measurement tools for conservation are refined, the state's planning efforts will be improved, and the most efficient strategies can be pursued.

- **Public Awareness and Recognition**

According to a statewide market research study conducted in 2004, less than 30 percent of citizens know where their water comes from (Tuerff-Davis, 2004). Yet, the same research found citizens are more likely to conserve once they know about their water resources. Increased awareness and recognition efforts are needed to reach various users, such as industry, agriculture, municipalities, and ultimately the general public. To reach multiple audiences successfully, water conservation messaging needs to be consistent and supported with research and data. Technical, financial, and staffing support enhance the effectiveness of any awareness and recognition efforts. Additionally, public recognition of conservation successes is

a key component because it is a way to motivate people, as well as showcase successful examples.

- **Resource Availability: Information, Tools, and Expertise**

As water demand projections depict a growing need for conservation, water user groups will need to refer to tools and resources to develop, implement, and manage effective water conservation programs. Only limited resources currently exist for Texas water conservation programs. An aware and motivated audience must have easy access to information that will assist them in developing good conservation practices. Access to certified training and expertise are also important to help water users apply the most efficient conservation measures. Texas is not unique in our need for conservation; therefore, pursuing opportunities to collaborate with existing national efforts will strengthen the resources for Texas and allow the state to use those resources efficiently. Regional and local conservation programs will be more successful if they have resources and tools for guidance.

The Council strongly believes that the Texas Legislature must begin implementing programs and committing resources in these priority areas. All three elements go hand-in-hand toward promoting

and achieving a higher level of water conservation in Texas. As public awareness evolves, enhancements in analytical information and data collection will improve conservation tools and strategies, and ultimately these collective elements will allow for a more effective planning process. There is no question that the economic future of Texas depends on how well the state is able to manage its water resources. Water conservation is a significant component of the state's water management strategies, and a focused effort is needed now to develop plans for managing and achieving water conservation success.

The Council believes that the recommendations in this report represent only an initial commitment to this effort, which will likely grow significantly in the future. How well we are able to provide direction today will have a profound effect on the level of resources that will be needed in the future. The findings and recommendations outlined by the Council place a strong emphasis on time, commitment, and funding. The ongoing work of the Council will focus on the three main elements outlined above. The Council's progress, however, will depend significantly on the level of resources that are committed. The Council strongly recommends that the State of Texas commit a total of \$13.5 million in funding in the next biennium to advance and promote water conservation in Texas.

# Key Findings and Recommendations

In our initial evaluation of water conservation in Texas, the Council has formulated recommendations regarding the state's role in funding and support, monitoring implementation progress, defining measurement methodology, promoting conservation awareness and recognition, and developing supporting resources that include information, tools, and expertise. The following key findings and recommendations are to be used as a resource for policy considerations pertaining to water conservation efforts.

## Implementation and Measurement

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### Key Finding

*The cornerstone of any successful program is having the metrics in place to set targets and goals and measure success. Existing measurements for the impacts of conservation are inconsistently used and often create confusion and misinformation. Because water conservation is a key strategy in meeting the state's future water needs, aggressive steps at local, regional, and state levels should be taken to track and measure the implementation levels and savings of conservation programs. According to results of a survey letter (Appendix A) sent to the chairs of the regional water planning groups, they are not able to provide any measurements of progress on the current levels of conservation strategy implementation because there are no measurement standards to follow. Nor do the regional water planning groups have the resources to collect and analyze that data. Conservation plans must define specific actions, set targets and goals to monitor progress, and define how progress will be measured. In addition, establishing more consistent methods for collecting and reporting water use will enhance both the quantity and quality of data obtained. With better data, the state's planning efforts can be refined, and the most efficient strategies can be pursued.*

### Recommendation 1

**Develop methodology, metrics, and standards for water conservation implementation measurement and reporting.**

The cornerstone of any successful program is having the metrics in place to set targets and goals and measure success. These metrics are not in place today for water conservation. Meaningful metrics must be developed to set a solid foundation on which to build a water conservation program, set aggressive goals and targets, and measure implementation success. The Council has made good progress toward this recommendation, but considerable work still remains to refine the work and vet the recommendations with all water user groups.

### Recommendation 2

**Develop specific guidelines for how gallons per capita per day should be determined and how it should be applied to population-dependent water use only.**

There is not a standard methodology used by water suppliers to measure gallons per capita per day. There is a municipal gallons per capita calculation completed annually by the Texas Water Development Board for municipalities, which has been generated from water use survey data for many years. This calculation has provided useful information for communities but is not a metric specific to individual water suppliers to help them measure their progress on conservation. In addition, because it is not a methodology easily replicated by water suppliers, they still must each determine their own means of calculating gallons per capita if asked for such figures.

The different figures reported by water suppliers and subsequently used for comparisons create confusion regarding progress in municipal water use and conservation efforts. The tendency of the media or individuals to use gallons per capita per day as a way to compare conservation efforts of communities is also problematic when the metric is not uniformly defined. Therefore, the Council has

determined that it should be a priority to develop standard methodologies for water use metrics and water conservation metrics and definitions. The Council and extended volunteer group members have made significant progress toward completing a new methodology for recording gallons per capita per day. The group proposes to continue efforts and complete work in 2009.

Due to the many variables involved in the total volume of water used in municipal water systems, a total gallons per capita per day value should not be used for comparisons between different utilities.

Many categories of water use (such as agriculture and industry) are not directly related to population data and will require specific water use and conservation metrics that are appropriate for their specific needs. In 2006, municipal water use accounted for only 31 percent of the total water use in Texas.

| <b>Water Use in Texas for 2006</b> |                                |
|------------------------------------|--------------------------------|
| <b>Water Use Category</b>          | <b>Percentage of Total Use</b> |
| Municipal                          | 31                             |
| Manufacturing                      | 9                              |
| Mining                             | 1                              |
| Steam Electric                     | 3                              |
| Livestock                          | 2                              |
| Agricultural Irrigation            | 54                             |

**Recommendation 3**  
**Develop reporting guidelines for improved data collection.**

To improve data quality and consistency, developing online reporting tools for all water data is proposed. The TWDB and Texas Commission on Environmental Quality need additional, specific reporting guidelines to monitor progress effectively in water conservation implementation. Specific guidelines would include standard methodologies for reporting water use and conservation progress. The Council has established an effort to identify changes needed in water use data collection (Appendix B). With requested support, the guidelines can be ready for implementation in 2010.

**Recommendation 4**  
**Expand data collection efforts to include all water providers and water use categories.**

The Council understands the need for a comprehensive data set that reflects all water use in Texas. The TWDB does not currently collect annual water use data directly from wholesalers, although the retail water use surveys include the source of water from wholesalers. A direct survey of wholesalers would provide more comprehensive and usable data for the state’s water planning efforts.

The Council believes that we need to move toward a more comprehensive set of water use data but recognizes that collecting data from individual water users is not a realistic expectation now or in the near future. The best information on water use can come from various sources, such as wholesalers, retailers, groundwater conservation districts, regional water planning groups, and even some trade associations, including those representing the livestock, dairy, power generation, refining, and chemical industries. Some water use data is metered, but often it is extrapolated from other parameters, such as electric power consumption, livestock counts, crop type, and water demand. The Council believes the more comprehensive the data the better our understanding will be of our overall water use, although we recognize that some of the data will be less accurate than other data. In time, the data set will become more complete and more accurate.

**Recommendation 5**  
**Develop a pilot project for water use data reporting.**

Water use surveys are currently collected annually by the TWDB and generate detailed information on water consumption from many water providers. The surveys from the largest users reflect that these users should be able to adjust to proposed changes in reporting, which will make it possible to do more detailed conservation program analysis each year. However, the metrics being recommended for water conservation measurement may require substantial changes for other water suppliers whose data systems are not as complex. Because the proposed reports

may be challenging for smaller water providers, it is important that the reporting requirements and guidelines be well tested before potential reporting standards are considered. A pilot project will enable the Council to test and refine the requirements and analyze how they might be applied to water suppliers of different sizes before rolling them out for everyone to use (Appendix C).

### **Recommendation 6**

#### **Develop a pilot project for determining population figures appropriate for certain water use metrics.**

There are many options for data and methods for estimating current and future populations within communities. When boundaries of water providers match municipal boundaries, population data is easily obtained. However, the challenge is complex when this is not the case. This pilot project will explore the challenges of non-matching boundaries and propose a methodology for population estimation when boundaries do not match. For the TWDB to use one methodology to estimate population within water provider service boundaries, common state data must be used. The State Demographer has agreed to work with volunteer water providers to develop a methodology that could be replicated statewide in the future. “Population Estimation Pilot Project” (Appendix D) outlines the scope of this effort for 2008–2009, the types of volunteer water providers sought, and the benefits of participation.

### **Recommendation 7**

#### **Provide the Council with the necessary resources to sufficiently develop and implement tools to monitor implementation of water conservation strategies recommended in the regional water plans.**

The 2006 Regional Water Plans list a number of water conservation strategies intended for implementation over the next 50 years to help meet 23 percent of projected water supply needs by 2060. The Council initially determined that regional water planning groups could be a good source of information on

implementation of strategies. However, according to results of a survey letter sent to the chairs of the regional water planning groups (Appendix A), with current data they are not able to provide any measurements of progress on the levels of conservation strategy implementation by water user groups because there are no measurement standards to follow. Nor do the regional water planning groups have the resources to collect and analyze that data. To address these issues, the Council recommends that we work with the TWDB to develop a process that can provide the necessary information to include separate studies for at least agricultural and municipal conservation strategies. To accomplish this, the TWDB will need additional funds for staff and consultant services to develop the data necessary to monitor and measure the levels of strategy implementation as requested by the Council.

## *Public Awareness and Recognition*

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### **Key Finding**

*In 2004, a statewide market research study reported that 87 percent of those surveyed said they are more likely to conserve water after learning about conservation (Tuerff-Davis, 2004). Public awareness and education are often cited in the 2006 Regional Water Plans as a water conservation strategy. Public awareness programs are active in a number of areas across the state (Appendix E). However, there is an immediate need for conservation and heightened messaging statewide, particularly in areas of the state where local funding is not available for water conservation messaging or extensive awareness programs. Leadership exists across the state where progressive efforts in water conservation are the standard. Nevertheless, successful water conservation efforts often remain unrecognized, and, therefore, are not profiled or visible to the public. A visible and prestigious public recognition award program would elevate the importance of water conservation-related issues. A measure of success in water conservation depends on the level of stakeholder involvement, commitment, and awareness.*

## **Recommendation 8**

**Expand public awareness of water conservation statewide and coordinate campaigns at the state, regional, and local levels.**

The Texas Legislature should consider expanding the state's role in promoting water conservation awareness by adequately funding the statewide water conservation campaign. Funding from the Legislature to the TWDB should support the full implementation and maintenance of the statewide Water IQ public awareness and education campaign.

## **Recommendation 9**

**Establish a statewide water conservation recognition program.**

The Council recommends that a statewide water conservation recognition award program be established through the Governor's Office to expand the state's role in promoting water conservation awareness. A visible and prestigious public recognition award program would elevate the importance of water conservation-related issues.

## *Resource Availability: Information, Tools, and Expertise*

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### **Key Finding**

*As water demand projections depict a growing need for conservation, water user groups will need to refer to tools and resources to develop, implement, and manage effective water conservation programs. Only limited resources currently exist for Texas water conservation programs.*

*No state-certified water conservation training program currently exists. For the development of water conservation plans, as required by Texas Water Code, Section 13.146, training for retail public utilities is a critical resource need. According to recent legislation, more utilities will be required to submit water*

*conservation plans, and this will, in turn, increase the potential need for training. Because there will be a foreseeable need for training, it will be important to have consistent, uniform, and comprehensive training programs available. Utilities across the state will benefit by having certified training programs to use as a resource.*

## **Recommendation 10**

**Collaborate with national efforts to develop a clearinghouse of resources, tools, and best management practices.**

The Council recommends that the Texas Legislature consider expanding the state's role in developing and perpetuating a state online water management resource library (Appendix F). To accomplish this goal, the Council recommends that Texas work with the Alliance for Water Efficiency to create a national clearinghouse for water conservation information and research, which will also function as a networking portal. The Council believes that Texas will be best served by participating in this national effort so that reliable and quality resources will be available to a variety of audiences.

Just as the original water conservation Best Management Practices Guide (TWDB, 2004) was based on extensive analysis and evaluation, any proposed new or revised best management practice should be subject to a similar process before adoption (Appendix G). The proposed revision should be distributed to the Council, Texas Commission on Environmental Quality, TWDB, and any appropriate technical consultants for review and comment. After receiving the comments and any suggested revisions on the proposal, the TWDB will provide a summary to the Council, which may then provide its recommendation on the proposal. If the proposal receives a favorable recommendation from the Council, Texas Commission on Environmental Quality, and TWDB, the new or revised best management practice can be added to the existing list.

## Recommendation 11

**Direct the Texas Water Development Board to develop a certification process for conservation training programs and provide preference for technical and financial assistance to these certified programs.**

The Council recommends that the Texas Legislature authorize the TWDB to implement a certification process for conservation training programs that assist retail public utilities so they may meet the requirements for developing water conservation plans required under Texas Water Code, Section 13.146. The emphasis should be on certifying programs, providing financial and technical assistance to programs of instruction, and developing materials that provide the necessary information to assist utilities in developing effective conservation plans. A certified process could be associated with one specific entity and facility or could be a program of an entity offering training at multiple locations. It is recognized that this requires additional legislative authorization and funding for the TWDB so they can implement and administer this certification process.

## Funding and Support

For the Council to meet the objectives of the enabling legislation and for the TWDB to be able to provide the required support to the Council, additional funding must be provided to the TWDB, with funds dedicated to carrying out Council recommendations.

The Council recommends the Texas Legislature provide a total of \$13.5 million for the biennium to fund the Council's recommended water conservation efforts. The total funding requests of \$13.5 million include the following:

- TWDB Fiscal Years 2010–2011 Exceptional Items funding request of \$6.2 million for the Council's recommended efforts and public awareness-related activities.
- The Council's funding request for an additional total of \$7.3 million for the biennium to cover both initial costs as well as continuous costs necessary to fully implement the legislative charges to the Council.

|                                | <b>TWDB LAR<br/>for 2010–2011</b> | <b>Council's Additional<br/>Requests for 2010–2011</b> | <b>Total Funding for<br/>Conservation</b> |
|--------------------------------|-----------------------------------|--|---|
| Implementation & Measurement   | \$—                               | \$500,000  | \$500,000                                 |
| Public Awareness & Recognition | \$6,000,000                       | \$6,500,000  | \$12,500,000                              |
| Resource Availability          | \$200,000                         | \$300,000  | \$500,000                                 |
| <b>Total</b>                   | <b>\$6,200,000</b>                | <b>\$7,300,000</b>                                     | <b>\$13,500,000</b>                       |

*The Council's additional funding request of \$7.3 million for the biennium will support the following efforts:*

## **Implementation and Measurement**

1. Developing methodology, metrics, and standards to measure and report water conservation implementation.
2. Developing specific guidelines for how gallons per capita per day should be determined and how it should be applied to population-dependent water use only.
3. Developing reporting guidelines for improved data collection.
4. Expanding data collection efforts to include all water providers and water use categories.
5. Developing a pilot project for water use data reporting. *The Council believes that this recommendation should not require funding this biennium.*
6. Developing a pilot project for determining population figures appropriate for certain water use metrics. *The Council believes that this recommendation should not require funding this biennium.*
7. Provide the Council with the necessary resources to sufficiently develop and implement tools to monitor implementation of water conservation strategies recommended in the regional water plans.

## **Public Awareness and Recognition**

8. Expanding public awareness of water conservation statewide and coordinating campaigns at the state, regional, and local levels.
9. Establishing a statewide water conservation recognition program.

## **Resources: Information, Tools, and Expertise**

10. Collaborating with national efforts to develop a clearinghouse of resources, tools, and best management practices.
11. Directing the TWDB to develop a certification process for conservation training programs and provide preference for technical and financial assistance to these certified programs.

For future biennia, continuing appropriations will be needed to support the following ongoing efforts:

- Providing the Council with the necessary resources to sufficiently monitor implementation of water conservation strategies recommended in the regional water plans.
- Analyzing data reported for water conservation strategies and water use; analysis would be used to support planning and policy over time.
- Training regional water planning groups and water users on new tools, methodologies, reports, and requirements.
- Continuing and long-term implementation, enhancement, and maintenance of the statewide water conservation awareness campaign.
- Enhancing, updating, and maintaining a Texas link with a national clearinghouse and a Texas online resource library that will include an updated Best Management Practices Guide.
- Providing the TWDB with funding to meet and support expanded roles.

# Background

## *Water Conservation Implementation Task Force 2003–2005*

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In 2003 during the 78th Legislative Session, state policy on water conservation in Texas was described as “currently fragmented and lacking focus.” The Legislature determined that such a state policy could potentially compromise Texas’ ability to meet future water supply needs. Understanding the critical role of water conservation, the Legislature considered a broad spectrum of issues related to water conservation. To address some of these issues, the 78th Texas Legislature established the Water Conservation Implementation Task Force (Task Force) via the passage of Senate Bill (SB) 1094. The legislation mandated that the TWDB select the Task Force members.

The Task Force was charged with reviewing, evaluating, and recommending optimum levels of water use efficiency and conservation for Texas, concentrating on issues related to these topics:

- Best management practices.
- Implementation of conservation strategies contained in regional water plans.
- A statewide public awareness program.
- State funding of incentive programs.
- Goals and targets for per capita water use considering climatic and demographic differences.
- Evaluation of state oversight and support of conservation.

In addition, SB 1094 directed the Task Force to develop a Best Management Practices Guide for use by regional water planning groups and political subdivisions responsible for water delivery service.

SB 1094 was effective immediately upon passage and after submitting their report to the 79th Legislature in November 2004, the Task Force was abolished on January 1, 2005.

In their report, the Task Force recommended that a permanently standing Water Conservation Advisory Council be established to advise the Texas Legislature as well as other state agencies on matters regarding water conservation. The 79th Texas Legislature considered numerous aspects of water resource planning and water conservation activities but did not create an advisory council. However, in 2007, the 80th Legislature approved legislation creating the Council.

## *Water Conservation Advisory Council*

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Recognizing the importance of conservation in meeting our future water demand, the 80th Texas Legislature (2007), via passage of SB 3 and HB 4, directed the establishment of a Water Conservation Advisory Council to serve as a select and expert resource to state government and the public on water conservation in Texas. To fulfill our role, the Council has adopted the working definition of water conservation developed by the Water Conservation Implementation Task Force and developed a Council mission statement:

### **Council’s Definition of Water Conservation**

*Those practices, techniques, programs, and technologies that will protect water resources, reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses.*

This definition was derived from the Water Conservation Implementation Task Force of 2004.

### **Council Mission Statement**

*To establish a professional forum for the continuing development of water conservation resources, expertise, and progress evaluation of the highest quality for the benefit of Texas—its state leadership, regional and local governments, and general public.*

## Membership Selection

The Texas Legislature directed the TWDB to select individuals who would be willing to serve voluntarily on the Council. The TWDB was careful to do so in a manner consistent with the Legislature's expressed intent of representing specified interest groups.

The TWDB contacted a large number of water conservation and water supply planning entities and organizations to solicit their nominations for membership on the Council and received numerous nominations. The TWDB evaluated the nominees based on a number of factors, including nominees' demonstrated knowledge of water conservation issues, water planning experience, commitment to serve, and ability to enhance the group's overall cultural and geographic diversity. Council membership was also based on expertise in water conservation and on an

individual's availability to devote adequate time to participate fully in Council activities.

After considerable input from a large number of water conservation and water supply planning entities and organizations, the TWDB approved 23 individuals to serve on the Council. Members of the Council serve staggered terms of six years, with seven or eight members' terms, as applicable, expiring August 31 of each odd-numbered year. In making the initial appointments, the TWDB designated seven members to serve terms expiring August 31, 2009, eight members to serve terms expiring August 31, 2011, and eight members to serve terms expiring August 31, 2013. The TWDB is to fill a vacancy on the Council by appointing a person who has the same qualifications as required for the person who previously held the vacated position.

These are the current Council members:

| Interest Group                                | Member            | Term Ends |
|---|-------------------|-----------|
| Texas Commission on Environmental Quality     | Scott Swanson     | 2011      |
| Texas Department of Agriculture               | Gary Walker       | 2011      |
| Texas Parks and Wildlife Department           | Cindy Loeffler    | 2009      |
| Texas State Soil and Water Conservation Board | Richard Egg       | 2013      |
| Texas Water Development Board                 | Comer Tuck        | 2011      |
| Regional Water Planning Groups                | C.E. Williams     | 2009      |
| Federal Agencies                              | Steven Bednarz    | 2011      |
| Municipalities                                | Karen Guz         | 2011      |
| Groundwater Conservation Districts            | Luana Buckner     | 2013      |
| River Authorities                             | James Parks       | 2009      |
| Environmental Groups                          | Ken Kramer        | 2009      |
| Irrigation Districts                          | Wayne Halbert     | 2013      |
| Institutional Water Users                     | H.W. Bill Hoffman | 2013      |
| Professional Organizations-Water Conservation | Carole Baker      | 2013      |
| Higher Education                              | Vivien Allen      | 2009      |
| Agricultural Groups                           | Wilson Scaling    | 2013      |
| Refining and Chemical Manufacturing           | Karl Fennessey    | 2011      |
| Electric Generation                           | Greg Carter       | 2009      |
| Mining and Recovery of Minerals               | Gene Montgomery   | 2013      |
| Landscape Irrigation and Horticulture         | Kelly Hall        | 2011      |
| Water Control and Improvement Districts       | James Oliver      | 2013      |
| Rural Water Users                             | Janet Adams       | 2009      |
| Municipal Utility Districts                   | Donna Howe        | 2011      |

## Organization of Work

Because the Council recognized the potential value of combining related tasks and duties into areas of focus, we formed five workgroups from our membership. Each workgroup was responsible for addressing its area of focus. The Council agreed that all substantive decisions and/or recommendations made by the workgroups were to be reported back to the full membership for our consideration and final

disposition. Formation of the workgroups provided a helpful focus on the issues and had the added benefit of achieving a voluntary division of labor based on individual member expertise and interest. Council members were encouraged to serve on as many workgroups as they wished, and many served on more than one subgroup. The workgroups and tasks were organized as follows:

| Workgroup   | Legislative Tasks   |
|---|---|
| 1: Public Awareness and Recognition               | <ul style="list-style-type: none"> <li>• Monitor the effectiveness of the statewide water conservation public awareness program developed under Texas Water Code, Section 16.401, and associated local involvement in implementing the program.</li> <li>• Develop and implement a public recognition program for water conservation.</li> </ul>  |
| 2: Metrics and Trends                             | <ul style="list-style-type: none"> <li>• Monitor trends in water conservation implementation.</li> <li>• Monitor target and goal guidelines for water conservation to be considered by the TWDB and Texas Commission on Environmental Quality.</li> </ul>   |
| 3: Regional Plan Implementation                   | <ul style="list-style-type: none"> <li>• Monitor the implementation of water conservation strategies by water users included in regional water plans.</li> </ul>  |
| 4: Resource Library and Best Management Practices | <ul style="list-style-type: none"> <li>• Monitor new technologies for possible inclusion as best management practices in the Best Management Practices Guide developed by the Water Conservation Implementation Task Force under Chapter 109, Acts of the 78th Legislature, Regular Session, 2003.</li> <li>• Develop and implement a state water management resource library.</li> </ul>   |
| 5: Certified Training                             | <ul style="list-style-type: none"> <li>• Conduct a study to evaluate the desirability of requiring the TWDB to               <ol style="list-style-type: none"> <li>1. designate as certified water conservation training facilities entities and programs that provide assistance to retail public utilities in developing water conservation plans under Texas Water Code, Section 13.146.</li> <li>2. give preference to certified water conservation training facilities in making loans or grants for water conservation training and education activities.</li> </ol> </li> </ul> |

## Documents Developed

The following documents have been developed during the activities of the workgroups and Council. These documents are posted at the Council Web site: [www.savetexaswater.org](http://www.savetexaswater.org)

- Council charter
- Council bylaws
- Council agendas and minutes
- Workgroup agendas and minutes

## Decision-Making Process

The operational approach adopted and practiced by the Council included the following:

1. Developing an adopted charter and bylaws. The organizational charter outlines the purpose, goals, form, and function of the Council.
2. Holding agenda-driven, all-day meetings of the full Council every 30–90 days.
3. Ensuring Council meetings would be posted and open to the public and provide an opportunity for public comment.
4. Holding workgroup meetings or discussions as needed in person and/or via teleconference or the Internet.
5. Pursuing consensus on substantive decisions made by the full Council but accepting the passage of motions by a majority vote on the basis of affirmation by two-thirds of the voting Council members present.

All Council meetings were open meetings, posted in the Texas Register and on the TWDB Web site. E-mail advisories were also issued for each meeting. A public comment period was included in each Council meeting. Drafts of Council documents were posted on the TWDB Web site and e-mailed to a large number of interested parties. Information on the draft documents and invitations to comment were also made available. E-mails were sent to interest group members who had requested information on Council reports and activities. Public input was discussed and considered in detail by the Council as it developed this report to the 81st Texas Legislature.

As expected, similar and overlapping recommendations were made by the five workgroups,

and those recommendations were consolidated in the Key Findings and Recommendations section of this report. For example, several workgroups recognized the need to collect accurate data for water use and have consistent metrics to measure water conservation success. The workgroup reports (Appendix H) summarize the legislative tasks, progress, and key findings and recommendations of each group, as well as the activities and future objectives of the groups. This information is organized by group to provide a detailed understanding of the consolidated recommendations and to emphasize the multiple impacts that some recommendations have on the three main elements outlined in this report.

The Council has achieved a good measure of progress on evaluating the legislative tasks and has outlined the work that lies ahead. We urge the state to aggressively pursue every opportunity to achieve a measure of water conservation in Texas. Water conservation will be a long-term and essential endeavor; the ultimate results depend largely on the effort, commitment, and resources that are brought to bear.

To achieve the desired results, the state needs to develop a consensus plan, set targets and goals, and apply the human and financial resources necessary to achieving those goals. The State of Texas must set a priority on conserving our valuable water resources and commit the necessary time, energy, and money to accomplish a full measure of success.

## *State Agency Update*

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The TWDB has been implementing several new water conservation requirements as approved by the 80th Texas Legislature. The Texas Commission on Environmental Quality and the TWDB have adopted rules to carry out the requirement that all retail public water suppliers serving more than 3,300 connections must implement a water conservation plan and report annually to the TWDB. Plans are to be developed by May 2009, and the first annual reports are due May 2010.

Other legislation passed by the 80th Texas Legislature instituted a priority for TWDB funding of water supply projects in the state water plan: those entities that have already demonstrated or will achieve significant water conservation savings will have a higher priority for funding. This prioritization is in place in TWDB rules and is in use. The TWDB requires water conservation plans to be in place for recipients of TWDB loan assistance. These recipients are required to submit annual reports on the status of their water conservation programs. Typical data provided includes number of meters tested or replaced, leaks located and repaired, reduction in water loss, savings resulting from their conservation programs, and their gallons per capita per day for that reporting year. Currently, TWDB staff is tracking about 140 entities from this requirement. Since adopting the 2007 State Water Plan, the TWDB has approved a total of 132 loans serving 95 entities that are required to implement a water conservation plan. These entities are included in the 140 plans referenced above.

In addition, TWDB has or soon will have received water conservation program benefits from three significant research studies conducted since the 2007 State Water Plan was adopted. These studies are an *Urban Landscape Guide*, *Attitudes Toward Water Conservation*, and *High School Education Curriculum*.

All these activities demonstrate there has been significant progress in implementing water conservation strategies included in the 2006 Regional Water Plans and the 2007 State Water Plan.

Through its annual Water Use Survey program, the TWDB has developed an internally standardized method of estimating gallons per capita per day for cities in Texas, with many estimates dating back to the 1960s. These estimates are based on all residential and non-industrial water use in a city and have been used as an effective tool in estimating and projecting

water demands for long-term water supply planning. However, TWDB's estimated gallons per capita per day are not suitable for tracking water conservation implementation. A number of factors (including differences in types and concentration of businesses, private water supply use, and commuting patterns, among others) render TWDB's methods and other current methods of measuring gallons per capita per day less than appropriate for making comparisons between communities and for measuring progress in meeting conservation goals. Until water use can be reliably reported by water providers by more specific type of use, any means of determining gallons per capita per day for the purpose of comparison could be problematic.

For a number of years, the TWDB has maintained online applications to collect data for the annual Water Use Survey as well as a number of other programs. Major initiatives and investments are already being made by the TWDB to upgrade the online Water Use Survey and to modernize data storage and reporting techniques for this and a number of other TWDB applications. In 2006, 63 percent of all surveys were returned (57 percent of municipal surveys and 71 percent of industrial surveys). However, the returned surveys accounted for nearly 80 percent of total water use in the state (72 percent of municipal use and 91 percent of industrial use). The Council and TWDB staff will be working in the coming year to identify what additional detailed information can and should be provided. The final recommended set of data will be vetted with various entities that report water use data. Through this collaborative approach, we will try to arrive at a reasonable process, which can provide the data that will enable measurement of water conservation progress. The Council's goal is that any data collection and reporting process will be consistent statewide and will allow reasonable comparisons of results from all reporting entities.

# References

CUWCC (California Urban Water Conservation Council), 2005, Developing a framework for an alliance for water efficiency, issues and options, 91p.

Tuerff-Davis Enviromedia Inc., 2004, Statewide water conservation public awareness research study, 392 p.

TWDB (Texas Water Development Board), 2004, Water conservation best management practices guide: Texas Water Development Board 362, 258 p.

TWDB (Texas Water Development Board), 2007, Water for Texas 2007, v.1, 39 p.

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APPENDIX A:  
Survey Letter to Regional Water Planning Groups

June 3, 2008

<< Address Heading >>

Re: Monitoring Water Conservation Strategy Implementation

Dear << RWPG Chairman >>:

The Water Conservation Advisory Council (Council) has been working diligently to address the charges given to it by the 80th Legislature in Senate Bill 3 and House Bill 4 (80R). As you know, one of the Council's charges is to monitor the implementation of water conservation strategies by water users included in the 16 regional water plans. The Council has no way of directly obtaining this information because the Council is a group of volunteers that lack the resources to collect the necessary information. To address this legislative directive, the Council requests your Region's assistance in obtaining the vital information needed regarding implemented water conservation practices in your area.

The Council needs to obtain the following data in order to respond to this legislative charge:

1. A list of the conservation strategies included in the Region's current Water Plan;
2. The expected water savings on an annual basis for each conservation strategy listed in number one above;
3. A list by water user of the amount of water saved on an annual basis by each conservation strategy implemented; and
4. A list of additional conservation strategies being considered by your region.

We believe that your Regional Planning Group is best qualified and situated to provide this crucial information and we respectfully request that your regional water planning group respond to the Texas Water Development Board (TWDB) with the most accurate information available, by October 1, 2008, and each even numbered year thereafter. Because the TWDB staff is providing some staff assistance to the Council, this information could then be easily forwarded to the Council for inclusion in the Council's biennial report to the Texas Legislature.

The Chairs of Regions A and C have already requested our respective consultants to include this task in our additional funding requests to the TWDB. We need to clearly understand how much conservation is actually being implemented, since almost every regional group has significant conservation strategies contained in their plan.

Thank you for your assistance with this project. Please feel free to contact me with any questions or concerns.

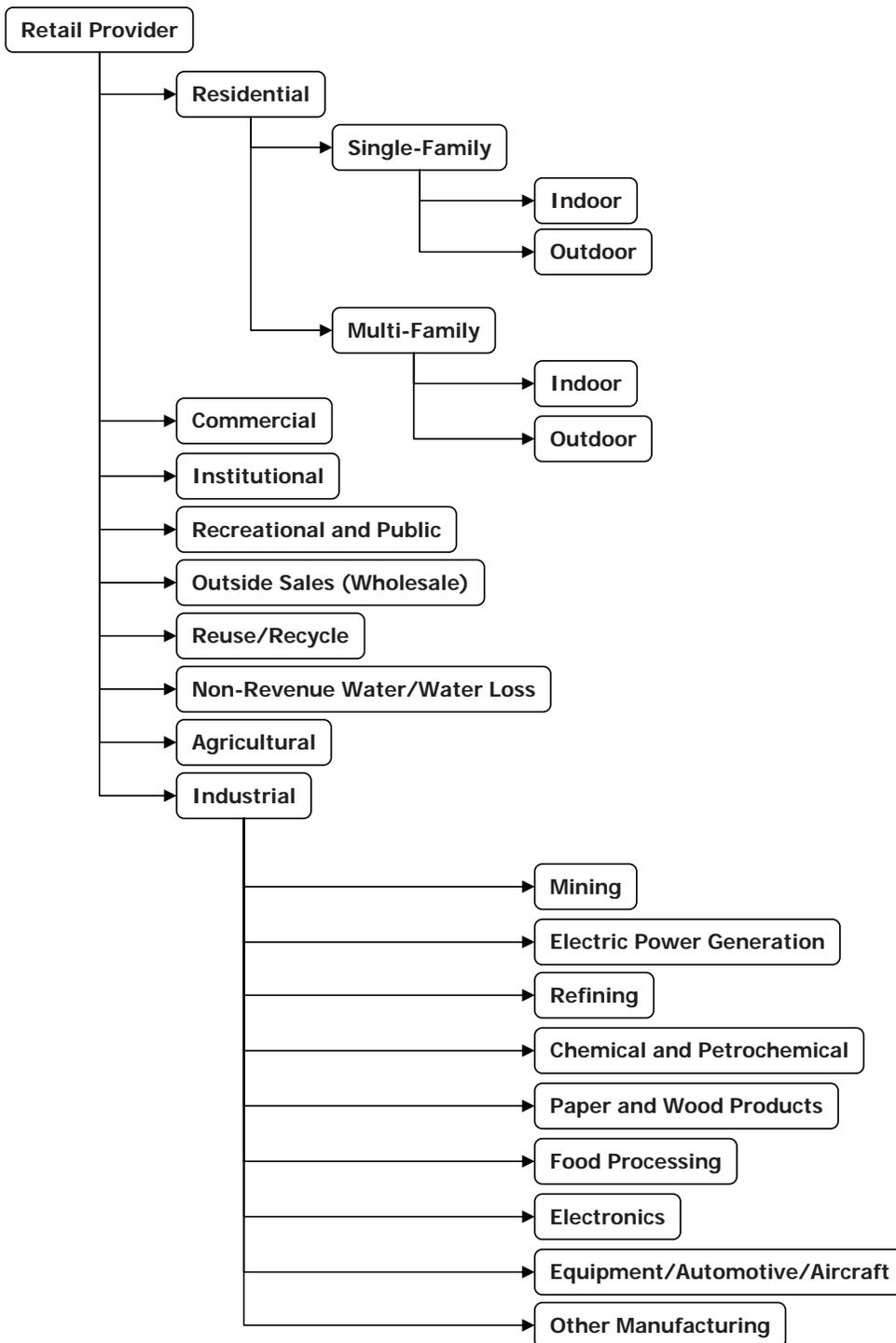
Sincerely,  
C.E. Williams, Chairman  
Texas Water Conservation Advisory Council  
CC: Kevin Ward, Executive Administrator, TWDB

## APPENDIX B:

### Conservation Summary Tool and Report

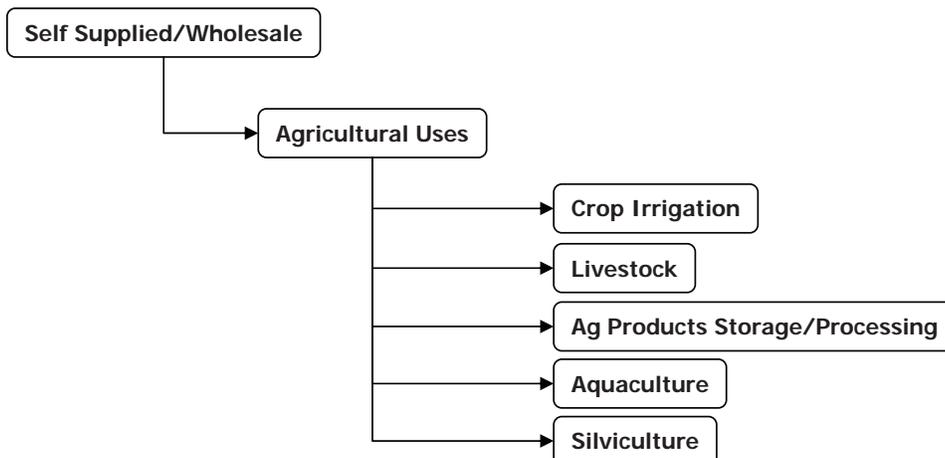
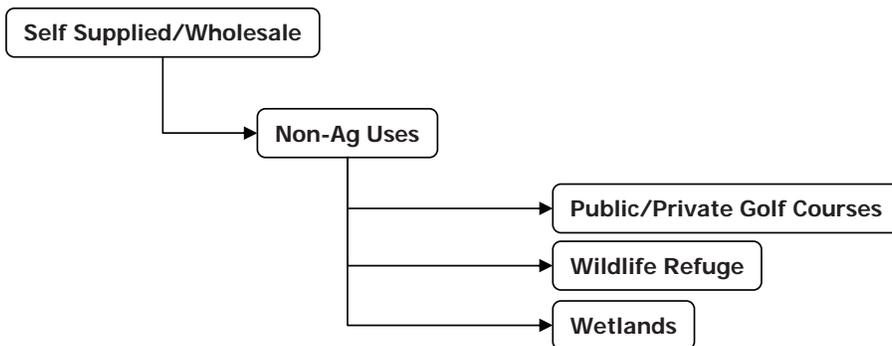
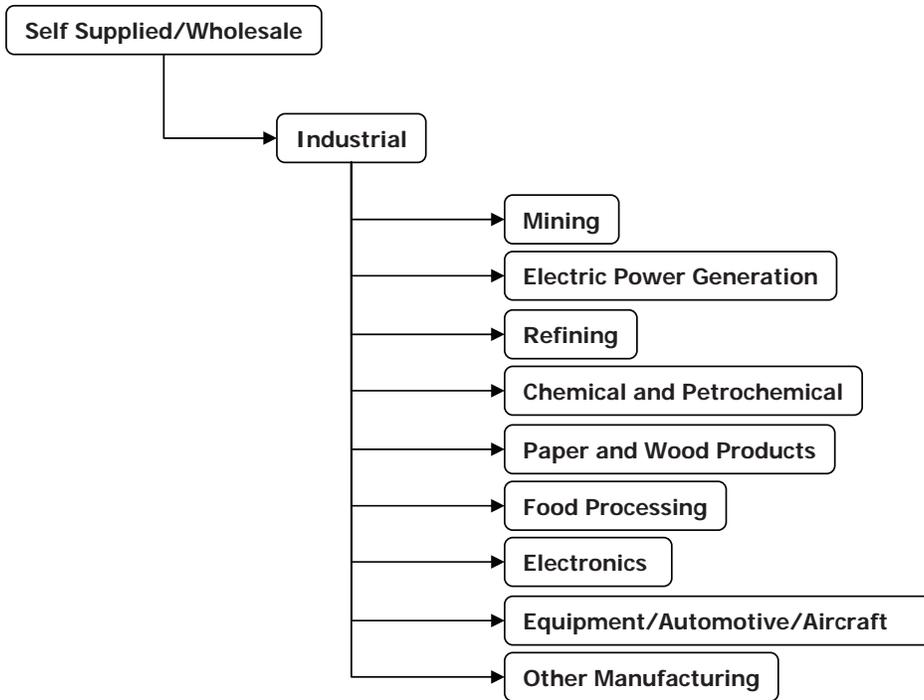
- Flow Charts
- Definitions
- Desired Attributes of Conservation Summary Tool and Report

The retail flow chart provides options to guide reporting on all water sold by retail providers. A retail provider might use all of the categories or only some of them if certain categories do not apply. The wholesale category will be used when a retail provider sells water that is resold by another entity.



Self providers are sites that use significant amounts of self-supplied water resources for their activities. A golf course supplied from its own wells or a power plant with a reservoir are just two examples.

Wholesale providers should report all raw and treated water delivered to their customers. This flow chart provides a comprehensive list of the potential customers a wholesale provider might have.



## Retail Table

The retail table provides options to guide reporting on all water sold by retail providers. A retail provider might use all of the categories or only some of them if certain categories do not apply. The wholesale category will be used when a retail provider sells water that is resold by another entity.

| Category             | Sub-Category                | Description  | Examples  |
|----------------------|-----------------------------|--|---|
| <b>Residential</b>   |                             |  |   |
|                      | Single Family (Indoor Use)  | Residential Properties with Single Family Occupancy                      | Detached Houses, Duplexes with No More than 2 Units   |
|                      | Single Family (Outdoor Use) | Residential Properties with Single Family Occupancy                      | Detached Houses, Duplexes with No More than 2 Units (Irrigation and Other Outdoor Uses)   |
|                      | Multi-Family (Indoor Use)   | Housing for Multiple Families  | Apartments, Mobile Home Parks   |
|                      | Multi-Family (Outdoor Use)  | Housing for Multiple Families  | Apartments, Mobile Home Parks (Irrigation And Other Outdoor Uses)   |
| <b>Commercial</b>    | (Indoor Use)                | Entities Using Water as Part of the Business Process                     | Service Industries, Office Bldgs including Medical and Dental, Car Wash, Hotels, Large Event Venues, Stadiums/Arenas (Not Open Air) Laundromats, Malls/Shopping Centers, Landscaping/Nursery Operators                                    |
|                      | (Outdoor Use)               | Entities Using Water as Part of the Business Process                     | Service Industries, Office Bldgs including Medical and Dental, Car Wash, Hotels, Large Event Venues Stadiums/Arenas (Not Open Air) Laundromats, Malls/Shopping Centers, Landscaping/Nursery Operators (Irrigation and Other Outdoor Uses) |
| <b>Institutional</b> | (Indoor Use)                | Entities Intended to House People for Non-Permanent Residential Purposes | Universities, Schools, Churches, Hospitals, Nursing Homes, Prisons, Military  |

| Category                                 | Sub-Category              | Description   | Examples   |
|--|---------------------------|---|--|
|  | (Outdoor Use)             | Entities Intended to House People for Non-Permanent Residential Purposes  | Universities, Schools, Churches, Hospitals, Nursing Homes, Prisons, Military (Irrigation & Other Outdoor Uses)   |
| <b>Recreational and Public</b>           |                           | Spaces Metered for Recreational Use or Public   | Athletic Fields, Golf Courses, Public Pools, Water Parks, Greenbelts,  |
| <b>Wholesale</b>                         |                           | Sale of Municipal Water to Other Entities For Resale  | Municipalities, Muds, Puds, Rural Water Supply   |
| <b>Reuse (Direct/Indirect), Recycled</b> |                           | Recycled/Reclaimed Water that Is Treated Effluent   | Any Use that Is Treated Effluent   |
| <b>Non-Revenue Water, "Water Loss"</b>   |                           | Difference between What Is Pumped at Source and Metered Use   | System Leaks, Flushing of Water Line, Treatment Process, Inaccurate Metering, Stolen Water/Illegal Connection  |
| <b>Agricultural</b>                      |                           | Water Used to Raise Crops, Livestock, Concentrated Animal Feedings, Ag-Products Storage/Processing, Aquaculture, Silviculture | Farm Products, Tree Farms, Orchards, Range Livestock, Poultry Farms, Cattle Feeding, Grain Elevators, Slaughter Plants, Shrimp Farms, Fish Farm, Aquatic Plant Farms |
| <b>Industrial</b>                        |                           | Process Designed to Convert a Product of Lower Value to Higher Value  |  |
|  | Mining                    | Extraction of Rock & Minerals Either Surface or Subsurface  | Oil & Gas Extraction, Coal Mining, Quarries, Insitu-Mining, Geothermal Mining  |
|  | Electric Power Generation | Water Used to Generate Electricity  | Electric Power Plants, Simple Cycle Gas Turbine Plants, Combined Cycle Plants, Integrated Coal Gasification Plants   |
|  | Refining                  | Processing Raw Materials into Derivative Products for Retail or Products to Be Used in Other Manufacturing                    | Oil & Gas Refining, Steel Mills, Uranium Processing, Precious Metal Extraction, Coal Liquefaction, Ethanol Plants  |

| Category | Sub-Category                      | Description  | Examples   |
|----------|-----------------------------------|--|--|
|          | Chemical and Petrochemical        | Manufacture of Chemical Products or Feedstock  | Petrochemical Plants, Air Product Plants, Hydrogen Generation  |
|          | Food Processing                   | Water Used to Manufacture, Process & Package Food Products   | Beverage Manufacture, Breweries & Distilleries, Frozen Food Products, Canned Foods   |
|          | Electronics                       | Water Used to Manufacture or Operate Electronic Equipment  | Computer & Electronic Products, Electrical Equipment & Components, Appliances  |
|          | Equipment / Automotive / Aircraft | Manufacture, Service & Operation of Equipment and Machinery  | Airports, Auto Assembly Plants, Aircraft Assembly Plants, Machinery & Equipment Manufacturing  |
|          | Paper & Wood Products             | Harvesting, Processing & Manufacturing of Timber and Derivative Products                                   | Saw Mills, Paper Mills, Plywood Mills, Furniture Manufacture, Cardboard Manufacture  |
|          | Other Manufacturing               | Manufacturing or Other Industrial Purposes that Do Not Fit into One of the Other Industrial Use Categories | Plastic & Rubber Products, Non-Metallic Mineral Products, Fabricated Metal Products, Textile Mills, Apparel Manufacturing, Leather & Allied Products |

## Wholesale Table

Wholesale providers should report all raw and treated water delivered to their customers. This table provides a comprehensive list of the potential customers a wholesale provider might have.

| Category          | Sub-Category                      | Description  | Examples   |
|-------------------|-----------------------------------|--|--|
| <b>Retail</b>     |                                   | Water Purchased for Resale   | Municipalities, Utilities  |
| <b>Industrial</b> |                                   | Process Designed to Convert a Product of Lower Value to Higher   |  |
|                   | Mining                            | Extraction of Rock & Minerals Either Surface or Subsurface   | Oil & Gas Extraction, Coal Mining, Quarries, Insitu-Mining, Geothermal Mining  |
|                   | Electric Power Generation         | Water Used to Generate Electricity   | Electric Power Plants, Simple Cycle Gas Turbine Plants, Combined Cycle Plants, Integrated Coal Gasification Plants                                   |
|                   | Refining                          | Processing Raw Materials into Derivative Products for Retail or Products to Be Used in Other Manufacturing | Oil & Gas Refining, Steel Mills, Uranium Processing, Precious Metal Extraction, Coal Liquefaction, Ethanol Plants                                    |
|                   | Chemical and Petrochemical        | Manufacture of Chemical Products or Feedstock  | Petrochemical Plants, Air Product Plants, Hydrogen Generation  |
|                   | Food Processing                   | Water Used to Manufacture, Process, Package Food Products  | Beverage Manufacture, Breweries & Distilleries, Frozen Food Products, Canned Foods   |
|                   | Electronics                       | Water Used to Manufacture or Operate Electronic Equipment  | Computer & Electronic Products, Electrical Equipment & Components, Appliances  |
|                   | Equipment / Automotive / Aircraft | Manufacture, Service, Operation of Equipment & Machinery   | Airports, Auto Assembly Plants, Aircraft Assembly Plants, Machinery & Equipment Manufacturing  |
|                   | Paper & Wood Products             | Harvesting, Processing, Manufacturing of Timber & Derivative Products                                      | Saw Mills, Paper Mills, Plywood Mills, Furniture Manufacture, Cardboard Manufacture  |
|                   | Other Manufacturing               | Manufacturing or Other Industrial Purposes That Do Not Fit into One of the Other Industrial Use Categories | Plastic & Rubber Products, Non-Metallic Mineral Products, Fabricated Metal Products, Textile Mills, Apparel Manufacturing, Leather & Allied Products |

| Category                               | Sub-Category                             | Description   | Examples  |
|--|--|---|---|
| <b>Agriculture</b>                     |  | Water Used to Raise Crops, Livestock, Concentrated Animal Feedings, Ag-Products Storage/Processing, Aquaculture, Silviculture |   |
|  | Crop Irrigation                          | Water Used to Raise Crops   | Cultivated Crops, Pasture, Hay, Vineyards, Tree Farms, Orchards   |
|  | Livestock Operations                     | Raising and Feeding of Animals for Food, Food Products, Recreation, or Other Uses   | Cattle Feeding Operations, Poultry Farms, Dairies, Hog Farms, Horse Farms, Range Livestock, Exotic Animal Farms   |
|  | Agricultural Products Storage/Processing | Water Used to Store or Process Agricultural Products for Sale or Transport  | Grain Elevators, Storage Facilities, Slaughter Plants, Tobacco Product Manufacturing  |
|  | Aquaculture                              | Farming of Freshwater And Saltwater Organisms, including Mollusks, Crustaceans, Aquatic Plants                                | Fish Farms, Oyster Farms, Shrimp Farm, Aquatic Plant Farms  |
|  | Silviculture                             | Controlling Establishment, Growth, Health, Quality, Composition of Forests to Meet Diverse Needs                              | Reforestation   |
|  |  |   |   |
| <b>Non-Agriculture, Other Outdoors</b> |  | Water Used to Irrigate Non-Agriculture Sites Outside of Municipalities, Sustain Wildlife, Restoration of Habitat & Wetlands   | Water Used to Irrigate Golf Courses Not Supplied by Retail Providers, Sustain Environment of Threatened or Endangered Species, Flora & Fauna Management |
|  |  |   |   |
| <b>Non-Revenue Water, "Water Loss"</b> |  | Difference Between What is Pumped at Source & Metered Use   | System Leaks, Flushing of Water Line, Treatment Process, Inaccurate Metering, Stolen Water/Illegal Connection   |

## Self Providers Table

Self providers are sites that use significant amounts of self-supplied water resources for their activities. A golf course supplied from its own wells or a power plant with a reservoir are just two examples

| Category          | Sub-Category                      | Description  | Examples   |
|-------------------|-----------------------------------|--|--|
| <b>Retail</b>     |                                   | Water Purchased for Resale   | Municipalities, Utilities  |
| <b>Industrial</b> |                                   | Process Designed to Convert a Product of Lower Value to Higher   |  |
|                   | Mining                            | Extraction of Rock & Minerals Either Surface or Subsurface   | Oil & Gas Extraction, Coal Mining, Quarries, Insitu-Mining, Geothermal Mining  |
|                   | Electric Power Generation         | Water Used to Generate Electricity   | Electric Power Plants, Simple Cycle Gas Turbine Plants, Combined Cycle Plants, Coal Gasification Plants  |
|                   | Refining                          | Processing Raw Materials into Derivative Products for Retail or Products to Be Used in Other Manufacturing | Oil & Gas Refining, Steel Mills, Uranium Processing, Precious Metal Extraction, Coal Liquefaction, Ethanol Plants                                    |
|                   | Chemical and Petrochemical        | Manufacture of Chemical Products or Feedstock  | Petro-Chemical Plants, Air Product Plants, Hydrogen Generation   |
|                   | Food Processing                   | Water Used to Manufacture, Process, Package Food Products  | Beverage Manufacture, Breweries & Distilleries, Frozen Food Products, Canned Foods   |
|                   | Electronics                       | Water Used to Manufacture or Operate Electronic Equipment  | Computer & Electronic Products, Electrical Equipment & Components, Appliances  |
|                   | Equipment / Automotive / Aircraft | Manufacture, Service, Operation of Equipment & Machinery   | Airports, Auto Assembly Plants, Aircraft Assembly Plants, Machinery & Equipment Manufacturing  |
|                   | Paper & Wood Products             | Harvesting, Processing, Manufacturing of Timber & Derivative Products                                      | Saw Mills, Paper Mills, Plywood Mills, Furniture Manufacture, Cardboard Manufacture  |
|                   | Other Manufacturing               | Manufacturing or Other Industrial Purposes That Do Not Fit into One of the Other Industrial Use Categories | Plastic & Rubber Products, Non-Metallic Mineral Products, Fabricated Metal Products, Textile Mills, Apparel Manufacturing, Leather & Allied Products |

| Category                               | Sub-Category                             | Description   | Examples  |
|--|--|---|---|
| <b>Agriculture</b>                     |  | Water Used to Raise Crops, Livestock, Concentrated Animal Feedings, Ag-Products Storage/Processing, Aquaculture, Silviculture |   |
|  | Crop Irrigation                          | Water Used to Raise Crops   | Cultivated Crops, Pasture, Hay, Vineyards, Tree Farms, Orchards   |
|  | Livestock Operations                     | Raising and Feeding of Animals for Food, Food Products, Recreation, or Other Uses   | Cattle Feeding Operations, Poultry Farms, Dairies, Hog Farms, Horse Farms, Range Livestock, Exotic Animal Farms   |
|  | Agricultural Products Storage/Processing | Water Used to Store or Process Agricultural Products for Sale or Transport  | Grain Elevators, Storage Facilities, Slaughter Plants, Tobacco Product Manufacturing  |
|  | Aquaculture                              | Farming of Freshwater And Saltwater Organisms, including Mollusks, Crustaceans, Aquatic Plants                                | Fish Farms, Oyster Farms, Shrimp Farm, Aquatic Plant Farms  |
|  | Silviculture                             | Controlling Establishment, Growth, Health, Quality, Composition of Forests to Meet Diverse Needs                              | Reforestation   |
|  |  |   |   |
| <b>Non-Agriculture, Other Outdoors</b> |  | Water Used to Irrigate Non-Agriculture Sites Outside of Municipalities, Sustain Wildlife, Restoration of Habitat & Wetlands   | Water Used to Irrigate Golf Courses Not Supplied by Retail Providers, Sustain Environment of Threatened or Endangered Species, Flora & Fauna Management |
|  |  |   |   |
| <b>Non-Revenue Water, "Water Loss"</b> |  | Difference Between What is Pumped at Source & Metered Use   | System Leaks, Flushing of Water Line, Treatment Process, Inaccurate Metering, Stolen Water/Illegal Connection   |

## Desired Attributes of Conservation Summary Tool and Report:

- Water provider (Entity making report)
- Report period
- Report date
- Water volume units for all reported volumes
- Water supply by category
- Water end user(s)—including wholesale customers
- Current estimate of population
- Number of customer meters or connections
- Description of methodology used to estimate population. If population was determined by multiplying the total number of residential meters by the average number of residents per household, explain how the average was determined.
- Residential split by single/multi family
- Residential split by indoor/outdoor
- Commercial split by indoor/outdoor
- Total water diverted vs. total water sold (non-revenue/lost)

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APPENDIX C:  
Reporting Methodology Pilot Project Description

## Water Use Data Reporting Pilot Project

### **Background:**

The metrics currently being used to measure and compare water use are insufficient for prescriptive evaluation of conservation efforts by water providers. To have reasonable and consistent comparisons of programs, it is critical that additional water use data be collected and reported consistently so that fair comparisons can be made and successes in water conservation can be recognized and shared. Without the ability to look at trends in water use and impact of programs, water providers cannot set meaningful targets and goals and compare their performance with others. Water conservation is a key element of the state water plan, and it is imperative that we measure and track our progress in the implementation of these plans.

### **The Challenge:**

Water use surveys are currently collected annually by the TWDB and generate detailed information on water consumption from many water providers. The surveys from the largest users reflect that these users should be able to adjust to proposed changes in reporting, which will make it possible to do more detailed conservation program analysis each year. However, the metrics being recommended for water conservation measurement may require substantial changes for other water suppliers whose data systems are not as complex. Because the proposed reports may be challenging for smaller water providers, it is important that the reporting requirements and guidelines be well tested before potential new reporting standards are considered. A pilot project will enable the Council to test and refine the new reporting standards and analyze how they might be applied to water suppliers of different sizes before implementation.

This pilot project will develop definitions and guidelines for water use, including categories and sub-categories for reporting the data. The pilot will also develop an online reporting system for this new format, which will facilitate collecting and analyzing the data. The first step toward understanding where opportunities exist for water conservation is to know where the water is currently being used. Once we know where water is used, it will be possible to focus conservation efforts on larger water uses and develop metrics to better understand those uses. With the metrics in place, only then will it be possible to establish realistic goals and targets for conservation and lay out the steps needed to effectively improve water use. Finally, with good measurement and a program aimed at making the necessary improvements, we will be able to make informed conclusions about the success of our efforts. Equally important, we will be able to compare those successes with others. It is through these comparisons that we can continue to find ways to achieve greater levels of success in water conservation.

### **Volunteer Process:**

The Council Metrics and Trends Workgroup will seek a small group of diverse volunteer water providers to participate in this pilot project. Representative volunteer utilities will be selected to include utilities of varied sizes across the state so that a wide range of data collection needs are understood. Because some small water systems are very simple in their data needs, a reporting system must not subject them to any undue reporting requirements. Likewise, some larger utilities serve a very diverse group of users consisting of municipal and industrial customers and perhaps even some agricultural customers. These larger utilities may also sell water to other utilities that, in turn, resell the water. The system needs to meet the needs of these more complex systems as well as the smaller systems so that the ultimate use of the water can be understood and reported. Representatives from these water providers will work with the Council members over the next year to develop the definitions and guidelines for collecting and reporting water use data. In addition, these volunteers will develop the necessary online reporting tools that can be recommended by the Council to the TWDB and Texas Commission on Environmental Quality.

APPENDIX D:  
Population Estimation Pilot Project Description

# Population Estimation Pilot Project

## **Background:**

Estimates of population are important data challenges for water supply planners. It is critical to know how many people a utility serves and to project how many may be served in the future to ensure adequate water supply. At the same time as conservation metrics like gallons per capita per day are calculated, accurate and consistent estimates of population are necessary to have useful trend data.

## **The Challenge:**

There are many options for data and methods for estimating current and future populations within communities. When boundaries of water providers match municipal boundaries, population data is easily obtained. However, the challenge is complex when this is not the case. This pilot project will explore the challenges of non-matching boundaries and propose a methodology for population estimation when boundaries do not match.

For water suppliers needing a population estimate, the project will develop a methodology for estimating current population within water service provider boundaries, using commonly available data. It must be a methodology that can be replicated accurately and consistently by the TWDB in the future. The combination of techniques used should also be reasonable for large urban areas, rural areas, rapidly growing areas, and areas where there may be negative growth.

## **Volunteer Process:**

The Water Conservation Advisory Council Metrics and Trends Workgroup seeks a small group of diverse volunteer water providers to participate in this pilot project. Representative volunteer utilities should include a large utility (over 300,000 connections); a rural city utility; a water control improvement district; a municipal utility district; a mid-sized utility (about 45,000 connections); and a utility with mixed city/urban/extra territorial jurisdictional (ETJ) boundaries. Representatives from these water providers will work with the Council members and the State Demographer over the next year to develop a methodology that the Council can recommend to the TWDB.

## **Expertise Available:**

We are fortunate to have the leadership and expertise of Dr. Karl Eschbach, the State Demographer for the State of Texas and several data experts from the TWDB, including Dr. Dan Hardin who will work on this project. We will also have available information from many utilities regarding how population estimates have already been completed.

## **Advantages of Participation in Pilot Project:**

- Learning more about your customer data.
- Acquiring advanced knowledge of your population estimate.
- Providing input about your community's special population concerns.
- Gaining confidence that the method is fair and reasonable.
- Learning and training staff.

## **Timeline:**

There will be bi-weekly conference calls and periodic face-to-face meetings from January 2009–August 2009. Volunteer utility groups will be established and initial data made available by the end of November 2009.

## APPENDIX E:

### A Brief Synopsis of Active Water Conservation Awareness Programs

The following pages provide brief descriptions of some of the active water conservation programs throughout the state. The cost levels and the scope of program designs vary due to a number of factors.

## **CITY OF DALLAS WATER UTILITIES**

### **Water Conservation Public Awareness Efforts**

Dallas has provided leadership in the area of water conservation education since the early 1980's. However, in 2001, city leaders embarked on a series of water conservation strategies intent on lowering per capita consumption and peak demand. To that end, Dallas was the first major water provider in the region to adopt a lawn and landscape irrigation ordinance expressly prohibiting water waste. A fourth tier was also added to the rate structure for the highest commercial and residential users.

Amid the adoption of the ordinance, funding was approved to develop and implement a full scale water conservation Public Awareness campaign. Branded with the tagline "Save Water. Nothing Can Replace It," this \$1.2 million dollar effort was launched through various forms of print and broadcast media.

Since 2002, the Public Awareness program has been used to augment the city's overall efforts to curb water waste. Dallas currently spends in excess of \$1.3 million annually on the media campaign alone. The primary goal of the campaign is to impact consumer behavior. Each year a post-campaign random survey is conducted to determine the program's effectiveness. Since 2005, 70% of those surveyed have reported positive changes in their behavior upon being exposed to the Public Awareness campaign.

In 2005, the City Council adopted a Five-year Strategic Plan on Water Conservation to serve as another "tool" to reduce water waste and consumption and increase alternative water supplies. The plan is based on a three-pronged approach: city leadership & commitment, enhanced education & outreach and rebate & incentive programs. The following educational programs are examples of the enhanced education & outreach component of the plan:

- ❖ Irrigation System Check-up Program launched in 2006
- ❖ Cooling Tower Audit program for commercial customers launched in 2006
- ❖ Environmental Education Initiative (EEI) launched in 2006 (serves K-12 DISD and RISD students)
  - Collaborative effort between Dept of Sanitation and Dallas Water Utilities
- ❖ In 2006, Dallas area kids elected "DEW" as official Water Conservation Mascot for City of Dallas
- ❖ In 2007, DWU teamed with Tarrant Regional Water District to expand the "Save Water. Nothing Can Replace It" brand beyond Dallas' borders

Initiation of the fourth tier rate structure, the conservation ordinance guidelines (particularly time-of-day watering restrictions), the Public Awareness program and the Five-year Strategic Plan have worked in tandem to produce numerous milestones and achievements. Success is measured by total gallons saved based on system-wide measures and direct programs and services; gallons per capita trends compared to annual rainfall and positive changes in public attitudes and behaviors. Since 2001, some 70 billion gallons have been saved as a result of these efforts. The city's primary goals going forward are to strengthen the program's momentum and continue to exploit all options to reduce consumption and curb peak demand.

## City of San Marcos Water Conservation Activities

These are general descriptions of our public and school info programs from our water conservation plan.

### Public Information

The City maintains an active public information program to educate water customers about the importance of water conservation, and to inform them of effective water conservation techniques. The goal is to reach all water customers through various methods including:

- written materials such as press releases, newsletter articles, and bill inserts;
- visual materials such as recharge zone and vehicle signage;
- water conservation website;
- representation at public events such as the Business Expo and Earth Day;
- presentations for local groups, clubs, and organizations.

The City will continue to develop and expand the public information program as additional resources become available. Future public information programs may include: regularly scheduled mail outs and newspaper ads, billboard advertising, partnering with neighboring water purveyors to provide radio/television spots, and participation in state-wide conservation campaigns.

### School Education

The City is dedicated to increasing water awareness in local public and private schools. The goal is to reach all K-12 students through a variety of school education activities including:

- participation in TSU Groundwater Festival;
- distribution of water conservation book covers;
- water conservation book cover design contest;
- sponsorship of the water education curricula; and
- classroom presentations and teacher workshops.

The City will continue to expand the water education program as additional education resources become available.

Water Conservation Coordinator  
City of San Marcos



**Research shows  
that the more  
people know about  
their water, the  
more willing they  
are to save it.**



**LCRA GENERAL MANAGER TOM MASON, AUSTIN CITY COUNCIL MEMBER LEE LEFFINGWELL AND CEDAR PARK MAYOR BOB LEMON SIGNED A WATER IQ PLEDGE AT A NEWS CONFERENCE ON AUGUST 13, 2008.**



**OUTREACH EVENTS BRING  
WATER-SAVING TIPS TO LOCAL  
COMMUNITIES.**



#### **ABOUT THE PROGRAM**

The Water IQ program is a comprehensive water awareness and education campaign that is focused to change attitudes and behaviors about water use. LCRA began the program in Central Texas in 2006 and dedicated nearly \$500,000 in fall 2006-summer 2007, about \$370,000 in 2008 and plans to spend about \$250,000 for the 2009 season. The City of Austin partners on the program and has spent about \$100,000 and plans to spend about \$675,000 over the next three years.

The program is aimed at people who use the most water. The campaign leverages fun and upbeat messages, often in humorous ways, with the goal of changing the way people think about water and changing their water-use habits. The Water IQ campaign helps make people aware of the source of their water, educates them on the importance of water for our future and offers simple tips to help people save water in their homes and businesses.

#### **BASED ON RESEARCH**

A 2004 comprehensive Water Awareness Research Study conducted for the Texas Water Development Board, showed a direct correlation between people's knowledge of their water source and their willingness to save water. The results of that survey were affirmed by a 2005 survey of residents in the Colorado River basin for LCRA. The survey also indicated that the vast majority of people were willing to save water if it did not mean sacrifice or changing their lifestyle.

#### **CAMPAIGN COMPONENTS**

The Water IQ campaign uses a diverse set of tools to reach the audience with water-saving tips and information including:

- ⇒ Television, radio and print ads,
- ⇒ billboards,
- ⇒ gas station pump-toppers,
- ⇒ water-saving tip sheets,
- ⇒ Web site,
- ⇒ pledge cards,
- ⇒ news conferences and media opportunities and
- ⇒ community outreach with key audiences.

**FOR MORE INFORMATION VISIT [WWW.WATERIQ.ORG](http://WWW.WATERIQ.ORG).**

**WATER IS LIFE!**  
**A Water Conservation Program of the**  
**North Harris County Regional Water Authority**

The Texas Legislature created the North Harris County Regional Water Authority (NHCRWA) in 1999 to secure a long-term supply of potable water and manage the conversion to surface water for approximately 150 utility districts within its boundaries. The enabling legislation also empowered the new agency to “**promote water conservation.**”

NHCRWA quickly established a policy of open and seamless communications with area water users, and initiated a comprehensive outreach effort that included town hall meetings, a newsletter (*Waterline*, with a circulation of 135,000 homes), an informational and educational website ([www.nhcrwa.com](http://www.nhcrwa.com)), speaker’s bureaus, etc.

Because NHCRWA also needed to address the “demand” side of the issue, from the outset, a strong “**use water efficiently**” message has been incorporated into all communications. In 2005, after introducing a water conservation-specific website ([www.StopTheDrop.org](http://www.StopTheDrop.org)), **Water is Life!** was born, pioneering a new approach to water conservation education. Aimed at reaching those not yet committed to wasteful water practices – our children – the program adapts a sterile textbook lesson into an interactive, fun adventure with the primary goal of entertaining kids with an exciting story to capture their attention, and then to teach them before they suspect they are learning.

**Journey to Pansophigus**, a 143-page adventure story is NHCRWA’s gateway for opening young minds and introducing an interactive, hands-on program. The illustrated book includes a band of likable characters, the age old conflict between "good guys" and "bad guys", some nail-biting moments of intrigue, the emergence of reluctant heroes, and a strong, clear message. At the request of the educators, a coloring/activity book was created to, as they suggested, “introduce these wonderful characters to the younger students, as well.” The artist created younger versions of *Journey’s* heroes...and the 20 page coloring book was created for use in K-3<sup>rd</sup> grades. To date, 20,000 copies of this popular resource have been distributed, as well.

**Water is Life!** allows teachers to implement a cross-curriculum approach to education, including reading, math and science learning opportunities. One of the program highlights is an exciting **Water is Life! Mobile Teaching Lab**.

The Lab is housed in a 16-foot, air conditioned trailer – donated by Severn Trent Services – that has been transformed into a traveling exhibit with hands-on displays that teach everything from where our water comes from, to the water cycle, to point-source and non point-source pollution, to how we use our water resources...and much more. This generous gift launched an age-appropriate, hands-on, **travelling** approach to water education...made available to schools, local civic and neighborhood organizations, as well as to local utility districts for special events.

The goal from the outset has been to develop interesting, informative, and user-friendly teaching materials, hands-on experiments and a flexibility to make the program work in a variety of classroom or neighborhood settings. The **Mobile Teaching Lab** began traveling to schools within the Authority’s boundaries in the fall of 2006. In the spring of 2008 alone, more than 5,000 students and 2500 families and/or MUD customers visited the Mobile Teaching Lab. The Lab also participated in science fairs and school events where even more area residents enjoyed the interactive displays.

Educators now reserve the Lab months ahead of time, as competition is fierce during the months when water topics occupy the curriculum.

NHCRWA brings this innovative program to the schools *at no cost* to those schools or to the students. The Authority provided some seed money to help get the program off the ground but since the outset, funding for the classroom materials has come from various industry consultants (water service and utility management companies, engineering firms, private corporations and law firms).

The initial 20,000-copy printing of *Journey* and the accompanying Readers' Guide was soon followed by a second 15,000-copy printing. All these copies have either already been distributed to classrooms in five ISDs, or are committed for the 2008-09 school year. *Journey* ended with the promise of a sequel – currently nearing completion – which deals with the critical issue of source water protection. Distribution of this new book is expected to begin this fall in Houston-area schools.

Another component of NHCRWA's program is a series of educator resource CDs, including a digitized Teacher's Resource Guide for the entire program; an interactive, animated hydrologic cycle CD; a series of *Kid-to-Kid* 'water' videos for showing in the classroom; and a Reduce, Reuse, Recycle CD with information and activities in the recycling and composting arenas. Ongoing educator workshops encourage teachers to try new age-appropriate activities developed for the program, and provide an open channel for key input and suggestions. A special password section of the Authority's website is devoted to the educational materials, and allows interaction with the teachers and their students.

From all indications, the WATER IS LIFE! Program is a welcome and sought-after resource in elementary and intermediate school classrooms....a strong foundation upon which additional programs and materials will be built.

**NOTE:** *Once launched by the NHCRWA, other Authorities and MUDs have also become sponsors of this program. Today, sponsors include: West Harris County Regional Water Authority, the North Fort Bend Water Authority, the City of Houston's Drinking Water Department, and multiple utility districts, engineering firms, attorneys, and operators.*



*Water IQ: Know Your Water*

Implementation of a Local Water Education and Conservation Campaign

The NTMWD serves over 1.6 million consumers through its 13 Member Cities and over 57 Customers which include cities, utility districts and water supply corporations in the North Texas area. With the onset of the regional drought from 2005-2007, and as the extreme hot and dry weather continued to persist, the NTMWD saw a trend for sharp increases in water consumption. The NTMWD acknowledged the need to redirect consumer water use behaviors through education and public awareness. The focus over the past three fiscal years has been to increase awareness and to educate the public on the need to use water wisely, efficiently, and to conserve in order to extend our existing water supply to meet the ever-increasing water demands due to continued growth and ongoing threats of drought conditions.

In order to educate the public on the wise and efficient use of their water supply, in 2006 the NTMWD employed EnviroMedia Social Marketing, an environmental public relations firm, to develop a water awareness and media campaign utilizing the state “Water IQ: Know Your Water” program. The NTMWD was the first in the State of Texas to implement “Water IQ: Know Your Water.” “Water IQ: Know Your Water” was launched in 2006 at a cost of \$2 million, continued in 2007 at \$1.8 million, and continues through 2008 at \$1.6 million. The program has been implemented in phases to provide a highly publicized water awareness public education campaign.

Some of the program objectives are to:

- Raise awareness of the need to conserve our water supplies both in times when the reservoirs are full and in times when drought conditions exist.
- Provide homeowners and businesses with easy, sensible tips that help them reduce both outdoor and indoor water usage during normal daily activities.
- Advance awareness of local water supplies. Market research indicates that consumers who know the natural source of their water supply are more likely to conserve water.
- Educate consumers that water is a finite resource and each person should do his/her part to use water wisely and extend our natural resource.

The following describes some of the components of the campaign:

**Broadcast Media** - Through a series of television commercials and radio spots, the messaging for the campaign persistently communicates the need for consumers to change water use behaviors to save water inside and outside the home. Reiteration of the messages helps to reinforce the conservation messages in the minds of consumers. The television commercials have also been made available to NTMWD Member Cities and Customers for use on local government or school district channels as available for further outreach opportunities.

**Print Media** - Through the use of outdoor billboards strategically placed within the NTMWD service area, use of newspaper advertisements, and shopping mall advertisements, consistent conservation messaging is continually reinforced.

**Outreach Programs** - Community and business outreach events are offered which provide the opportunity to interact with consumers to bring awareness for the need to conserve our finite resources of water and to promote participation in conservation. During these events, large displays (2008 is a larger than life sprinkler head) draw attendees to an electronic kiosk where staff encourages participants to take a Water IQ quiz. Participants are asked to sign a pledge card, promising to continually strive to implement water conservation strategies in the future.

### **Web Site**

As part of the NTMWD funded program, an interactive Water IQ Web site has been developed which focuses specifically on providing education about conservation of our water resources. The Web site messaging ties in to the local television advertising themes used each year to reconfirm the conservation messaging.

During the drought of 2005-07 with the initiation of the WIQ program and the water management strategies implemented by the NTMWD, Member Cities, and Customers, the NTMWD estimates that a reduction of 200 million gallons per day during the peak summer months was achieved. It is estimated that an annualized reduction in water deliveries is between 10-12 percent, which equates to approximately 27,000 acre-feet per year. The NTMWD has continued to see reductions below the estimated consumption level that is possible to occur during the continued high temperatures and the lessening of water management strategies within the region served. The NTMWD attributes the reduction in water deliveries to the heightened awareness of water use and the ongoing WIQ campaign.



## Panhandle Groundwater Conservation District (PGCD)

Panhandle Groundwater Conservation District's (PGCD) Public Awareness and education on water conservation includes a number of different programs. All of the programs take a different approach in order to affect the largest group of people of different ages.

Our education program includes fourth and fifth grade curriculums targeted towards not only water conservation, but other water topics including the major rivers of Texas, the water cycle, water treatment, etc. The fourth grade curriculum consists of the *Major Rivers* program developed by the Texas Water Development Board. These *Major Rivers* kits include a teacher's guide and student packets which are normally delivered to the schools during September. During the 2007-2008 school year, we delivered 2,500 student packets. The cost of this program including the kits, staff time and driving was about \$2,500.

The fifth grade program consists of a one hour water conservation presentation, an indoor water saving kit, and a water wheel. During the 2007-2008 school year, we spoke to 2,908 fifth grade students in 52 schools. The cost of this program including gas, salaries, water kits and water wheel, was \$7.43 a student which totals to \$21,606.

Other parts of our education program include water conservation book covers delivered to the schools, scholarships provided to three qualifying high school students, and other student orientated activities such as county agricultural fairs and earth day. The book covers cost \$2,424, scholarships totaled to \$9,000, and the other activities were about \$500.

In addition to our education program, PGCD also has other public information programs that include television advertising, lawn gauges, quarterly newsletters and requested informational presentations. The television advertising began last year with the start of Water IQ, and the District has continued through this year. The total cost of advertising on three separate networks from May through October in 2008 was \$35,000.

Along with the advertising, PGCD helps to promote proper lawn watering with the distribution of lawn gauges throughout the District. Lawn gauges, a tool that will measure how much water your lawn receives from sprinklers, along with an informational brochure of proper lawn watering techniques, correct types of grass to plant, and how much water lawns need, are delivered to every lawn and garden center. The cost of this program was about \$1,000.

PGCD also likes to keep the public informed of its activities and remind them of our public services which is achieved by publishing a quarterly newsletter. The newsletter contains information about board meetings, upcoming events and meetings, and the July newsletter contains depletion map information for the District's aquifers. The cost of publishing the newsletters was \$10,600. Along with our newsletter, PGCD also gives several public informational meetings that are requested from organizations throughout the year.

**Tarrant Regional Water District (TRWD)**  
**Water Conservation Public Awareness and Education Program**



As the water supplier for 1.7 million residents across an 11-county service area in North Texas, Tarrant Regional Water District is committed to educating consumers about the importance of water conservation. One of the primary ways it seeks to reduce consumption and water waste is by changing the public's water-use habits.

TRWD is in its second year of sharing a public awareness message urging citizens to conserve water. The campaign, originally created by the city of Dallas, revolves around the theme "Save Water. Nothing can replace it." This partnership between Dallas and the Water District has allowed the message to reach a broader audience in Tarrant County and beyond.

The collaboration unifies the public outreach efforts of two of the largest water suppliers in the state of Texas. Together the two entities provide water to approximately four million users or nearly 20 percent of the state's population. Joint use of the save water campaign has given one voice to water conservation awareness initiatives across much of North Texas.

TRWD kicked off a \$400,000 save water outreach program in late spring 2007. The initial launch was primarily done through print advertising – billboards, newspapers and magazines. The water district also funded some advertising on cable television.

The conservation outreach program was expanded in 2008 to include radio, more television spots during peak viewing hours, including morning and evening news programs, and new billboards encouraging responsible water use outdoors. The wider coverage was made possible by a considerable increase in the advertising budget. To date the water district has spent \$686,000 on a mix of messages in newspapers, magazines, billboards, television and radio.

The aggressive outreach campaign coupled with new municipal water conservation policies that include time of day watering restrictions and rate structures targeting

excessive water users has led to an estimated ten percent annual reduction (10 billion gallons  $\pm$ ) in peak demands across the TRWD service area. One customer, the Trinity River Authority, is also deferring the expansion of its Tarrant County drinking water treatment plant until 2017 as a direct result of “demonstrated reductions in peak water treatment demands.” The savings will add up to an estimated \$40 million.

Water conservation is gaining traction in North Texas. Even as the population increases, water use on a per person basis is on the decline. TRWD intends to make sure the downward trend in water consumption continues and that good water-use habits are reinforced through its public awareness and education program.

## **Wells Branch Water Conservation Program Rain Water Harvesting and More**

The project became apparent in that Wells Branch is a wholesale customer of the City of Austin. In working with Austin, they have expressed repeated concern about their ability to service all the water needs for their wholesale customers at the highest demand period. Therefore, the Wells Branch Municipal Utility District (The District ) began a research project supported by the City of Austin to try to limit the increase in water usage. The first phase was to research available storage facilities which would contain an adequate amount of water and would look attractive in a park setting. Simultaneously, we installed in cooperation with the city of Austin a rainwater runoff measurement devise to help determine the effectiveness of a rainwater catchment system.

Our research revealed that a tank system marketed by Timber Tanks of America would best meet our needs for a functional system and one that did not detract from the surroundings. We then installed an 18,000 Gallon tank as our first instillation and installed gutters on our community center to catch all of the runoff. We also drilled a well to irrigate the park system and supplement the water tank during periods of lack of rain. With these two installations we were able to completely disconnect three large water meters from the water system and completely use untreated water for approximately 35 acres of park system including a soccer field, baseball field, 1889 Historic Homestead and the surrounding playground and facilities.

With this success we then renovated an old homestead well in a more remote portion of Wells Branch and installed a pump and 5 poly tanks, each holding 1500 gallons. We were less concerned about the looks in this more remote area, but with the same goal of reduced use of city water. While the well is small with only about 20 gallons per minute, by installing the multiple connected tanks we can pump during the day when we do not water and then have sufficient water to water 6 soccer fields during the prime water hours. We were able to disconnect another water meter using this technology.

We continued to gain experience in water containment and took a very bold step to install a huge system using our new 10,000 square foot recreation center as the vehicle. While we were planning the center we determined to install the necessary gutter system to catch all the water and not connect the irrigation system to the public water supply. We had to meet a challenge as to how to get the water into a storage tank, 37,000 gallons, that was as tall as the building being constructed. We dug a pit and installed a 1500 gallon poly tank with a pump system to transport the water into the larger storage tank. The building gutter system is fed into the smaller tank by gravity flow along with the condensation lines for the huge air conditioner systems.

This system will irrigate 12 acres including a soccer field and office grounds. We have determined that we have sufficient water capacity to extend the lines to include a second soccer field that is presently on city water.

This system worked so well that we also installed two hidden 3500 gallon Poly tanks behind our youth complex to catch rainwater, supplemented by a well that was already operational. This installation allowed us to disconnect two neighborhood developments landscaping from the treated water system and provided runoff water to do all the irrigation.

Our final portion of the present park conservation program included a recapture of water in a filtration pond that is also fed by a natural spring running at about 20 gallons per minute. We built a one foot high containment pool and installed a series of 5 pumps without a tank. These pumps serve to irrigate the area around the pond and limit the need for city water irrigation. There is some excess water that is available which is then pumped about one-quarter mile to a 3 acre pond to insure its freshness and an adequate level for the wild life in the area.

The pond is then stocked and used as a youth fishing venue twice a year in addition to serving as a habitat to abundance of ducks and other animal life. This pond has a meditation garden, fishing dock, and boat ramp. It offers a quiet family setting and a haven for joggers.

The total coverage of this portion of the Wells Branch conservation program is the irrigation of almost 50 acres including 9 soccer fields and one baseball field and a fresh water supply for aquatic life in a scenic neighborhood pond. It allowed us to disconnect 8 large irrigation meters and saved the City of Austin from treating many thousand gallons of water.

## Texas Water Development Board Education Programs

The Texas Water Development Board (TWDB) educates Texans with valuable information about the importance of water conservation and motivates Texans to develop a long-term water conservation ethic. TWDB staff has developed and implemented many programs and strategies to increase water conservation through public awareness and education. In the past year, staff has been active in increasing participation at exhibits and outreach events, including outreach to water supply utilities, local political subdivisions, nonprofits, other state agencies, and businesses across the state. In addition, staff has promoted water conservation education programs, revised existing water conservation brochures, and developed other public awareness and education material.

### Education

TWDB scientific research forms the cornerstone for the education programs. They include units developed for specific age groups and range from coloring books for younger children to complete curricula for older students, with teacher's guides and Texas Essential Skills and Knowledge (TEKS) guidelines.

The TWDB Kids Web site serves as the gateway to the agency's K-12 conservation education resources. The Web site features visualizations, interactive games, and other activities to help students learn key concepts about water conservation.

Major Rivers (developed and copyrighted by the Lower Colorado River Authority), along with his horse, Aquifer, has been visiting Texas 4<sup>th</sup> and 5<sup>th</sup> grade classrooms for the past 20 years. Texas educators are showing an ever-increasing interest in the Major Rivers water resource educational program. In 2008, the TWDB received 56 orders from separate entities including 14 new to the program. These orders will reach 1,631 classrooms, potentially reaching 58,320 students and their parents. New resources offered this year include an electronic version of the educational package and a Spanish-language version of student workbooks and home leaflets.

Raising Your Water IQ is an inquiry-based approach to teaching middle school students about Texas water resources. The free curriculum has a teacher's guide and lessons that offer community-based service learning opportunities. Relevant TEKS standards are listed in the teacher's guide. The program was updated in 2008 and includes a CD-ROM with a teacher's guide, games, maps, and key TWDB reports, such as the 2007 State Water Plan and Water Conservation Best Management Practices Guide.

The TWDB has an ongoing research contract for a new Web-based curriculum that will support high school science and engineering classes. The program will offer students access to data from TWDB and other resources. It is scheduled for release in 2010.

Know Your Texas Water is a Web-based education resource for teachers and parents who would like to know more about Texas water.

## Public Awareness

The TWDB promotes water conservation public awareness through outreach events, materials, and education. Information is provided across the state to help other entities with their own public awareness programs.

TWDB staff has offered outreach and education to the citizens of Texas through workshops and conferences throughout the year. Other activities include securing partnerships with various entities and developing contacts throughout the state with other public awareness and education leaders.

Additional materials, such as water conservation brochures, have been updated and redesigned. Many other materials are being developed, including a guide on how utilities can work with local media, fact sheets, press releases, user agreements, program guidelines, and additional informative brochures.

Another program that is currently used to promote public awareness is the brand “Water IQ: Know Your Water.” This program provides information on water saving practices, raises awareness about the importance of water efficiency, and helps Texans use less water. It is designed to complement and support existing local and regional water conservation efforts.

Future expected strategies include the implementation of a balanced statewide communication mix, such as creating added-value support for outreach programs, continuing the development of existing education programs, and adding new education programs geared for an adult audience.

A Web site dedicated to a public awareness program is in development. This Web site will provide general information about water conservation in the State of Texas. One unique feature that will be offered is a zip code locator. A zip code can be entered into a search box and if the zip code is located in an area where a specific entity has a local water conservation Web site, the user will be re-directed to that specific site. However, if the zip code is not located, the user will be directed to the TWDB water conservation public awareness Web site. Other features of the Web site may possibly include background information, importance of conservation, education resources, and outreach, event, and workshop information.

For Texans to conserve water, they need to know about the water issues and understand how those issues affect their lives. When Texans know the source of their water and the challenges of meeting future water needs, they are more likely to participate in water conservation programs. Conservation is the most cost-effective means of securing a future water supply. Education, outreach, and public awareness are an important part of any conservation plan.

## Agricultural Water Conservation Awareness Programs

### Texas Department of Agriculture

Created by the Texas Legislature in 1907, the mission of the Texas Department of Agriculture (TDA) is to develop and promote agriculture, horticulture, and other industries that grow, process, or produce products in this state.

Because agriculture depends heavily on water, the TDA is involved in water planning, water quality, and water conservation initiatives. The Interest Rate Reduction Program, a program of TDA's Texas Agricultural Finance Authority, allows for commercial lending at below-market rates to qualified applicants for projects including the implementation of water conservation techniques or the purchase of water conservation equipment. Through the Texas Israel Exchange Program, the TDA supports research to improve water and energy efficiency in production agriculture.

To support conservation awareness statewide, the TDA seeks to partner with other governmental and non-governmental entities to promote existing water conservation initiatives. The department offers access to media and constituent outreach mediums, such as public service announcements, newsletters, commentaries, and other direct outreach methods.

### Texas State Soil and Water Conservation Board

#### *Summer Teacher Workshops*

Soil and Water Conservation District workshops are held each summer for teachers interested in conservation and natural resource issues. The workshops are held in various parts of the state in cooperation with local districts and the Texas State Soil and Water Conservation Board. Teachers can get their required continuing education units while experiencing nature and the outdoors.

#### *Soil and Water Stewardship Public Speaking Contest*

The Soil and Water Stewardship Public Speaking Contest is open to high school agricultural science students interested in conservation. The contest is aimed at broadening students' interest and knowledge of conservation and expanding their understanding of the need to depend on and take care of the world around them for survival. The contest is implemented through the Texas Future Farmers of America, with contests at the local, area, and state level.

#### *Texas Conservation Awards Poster Contest*

Sponsored by the Texas State Soil and Water Conservation Board and the Association of Texas Soil and Water Conservation Districts, this poster contest is open to boys and girls, ages 12 and under. The contest is designed to demonstrate the importance of conservation and taking care of one's surroundings, while giving contestants an opportunity to express their artistic ability.

### *Texas Conservation Awards Essay Contest*

The Essay Contest is open to boys and girls, ages 18 and under in two categories. One contest is for those 13 and under and the other is for those 14–18 years of age. The contest is designed to express to students the importance of soil and water resources and how they are linked to providing food and clean water.

### *Texas State Soil and Water Conservation Board Video Library Catalog*

There are over 200 conservation-related videos available. No rental fees are assessed to those wishing to borrow the videos from the library. Borrowing privileges are for two weeks and must be returned upon the date specified by the librarian.

### Texas Water Development Board

The Texas Water Development Board provides educational materials at farm and ranch shows, agricultural-related trade shows and conferences, 4-H Water Camp, and other events. The TWDB has several education programs that include agricultural water conservation.

The TWDB's mission is to provide leadership, planning, financial assistance, information, and education for the conservation and responsible development of water for Texas. Currently, the TWDB administers agricultural loan and grant programs to provide local political subdivisions and other state agencies with financial assistance for developing and implementing agricultural water conservation programs. The TWDB has initiated several major projects to help irrigators adopt agricultural best management practices. The Agricultural Water Conservation Demonstration Initiatives are producer-led projects for the Texas Southern High Plains ([www.depts.ttu.edu/tawc](http://www.depts.ttu.edu/tawc)) and the Lower Rio Grande Valley ([www.hidcc1.org/node/6](http://www.hidcc1.org/node/6)). As part of its educational outreach, the TWDB also funds the Precision Irrigation Network, other irrigation water conservation demonstrations, and the statewide Irrigation Training Project for agricultural producers. In addition, the TWDB provides financial assistance to groundwater conservation and irrigation districts to encourage the voluntary use of water-measuring meters by interested irrigators. Through these programs, a substantial number of field demonstration sites have been established throughout the state.

## USDA-Natural Resources Conservation Service

The Natural Resources Conservation Service is a federal agency that works hand-in-hand with the people of Texas to improve and protect their soil, water, and other natural resources. For decades, private landowners have voluntarily worked with specialists from the Natural Resources Conservation Service to prevent erosion, improve water quality, and promote sustainable agriculture.

The Natural Resources Conservation Service employs soil conservationists, rangeland management specialists, soil scientists, agronomists, biologists, engineers, geologists, engineers, and foresters. These experts help landowners develop conservation plans, create and restore wetlands, and restore and manage other natural ecosystems. This service includes providing advice on nutrient and animal waste management and watershed planning.

The Natural Resources Conservation Service was initially focused on preventing soil erosion on America's farmland. Over the years, Americans have become concerned with a broader array of natural resource issues. In response, the agency has broadened its technical services in order to provide science-based solutions to address America's ever-changing environmental concerns. Although farmers and ranchers remain the primary customers, the agency also provides technical assistance to city planners, watershed groups, state and local governments, and civic organizations.

APPENDIX F:  
An Evaluation of Parameters and Elements for Resource Library

## An Evaluation of Parameters and Elements for a Resource Library

The greatest level of success in water conservation can only be achieved when information is put in the hands of the largest number of stakeholders. Having a resource library that contains information about water conservation that all can access and use is seen as a key element to a successful water conservation program in Texas. This task is aimed at defining the parameters for organizing water conservation information resources that all stakeholders can access **and** developing a process for distributing new information to relevant stakeholders. Obviously, this resource library must capture any new technologies so they can be shared quickly. Therefore, the resource library cannot be simply a database for collecting and storing information, it must also contain a comprehensive search engine and a forum for getting the information in the hands of those who can use it.

These are key elements of an online resource library for water conservation:

1. Easy search capability – the utility of the system will depend heavily on having a search function that is easy to use and enables users to quickly drill down to find the information they are seeking.
2. Single gateway to all water conservation resources – Water conservation is not just a Texas issue; good information about water conservation is universal. Therefore, it is imperative that the online resource library provide access to all available resources in Texas state government, other states, colleges and universities, associations and interest groups, and the public. The more comprehensive the available resources, the greater the utility of the resource library.
3. Documentation of information source – Because peer review of all information is virtually impossible, it will be necessary to provide specific documentation of all resources so that the user can make an informed decision on the validity of the information, the application to his interests, and whom to contact about the information.
4. Process to capture new technologies – Successes and new water conservation techniques need to be quickly identified and incorporated into the resource library. Water conservation, like so many processes, is an evolving process that can be refined and improved over time. The quicker that we are able to share successes and failures, the shorter the time it takes to achieve the greatest measure of success. The resource library needs to be able to document these successes and failures and quickly alert all interested persons when new information is available.
5. An alert system to enable anyone to identify subjects of interest – Persons with specific information needs for water conservation should be able to register those needs so that they can be notified when existing information is revised or new information becomes available.
6. Discussion forums to enable information exchange – The ability to seek knowledgeable input and help on specific needs will greatly enhance the utility of the online resource library. When users are unable to find exactly what they

are seeking or need clarification of information that they have found, a discussion forum provides a way of getting help from willing experts and those with water conservation experience. A discussion forum also provides a means by which users can provide feedback on information they find in the system that will enable the person who published it to correct or update it.

7. Marketing effort to generate awareness of the online resource library – Once the online resource library is activated, information about it needs to be advertised in all public awareness programs within state governments, colleges and universities, associations, and the public media.

**What Information Should Be Flagged:**

- Source of the information and contact if possible
- Author(s)
- Title
- Type of information (journal article, research report, handbook, BMP guide, etc.)
- Topics (key words) and abstract
- Target user groups
- Water conservation categories (a list of categories needs to be developed for the resource library and posted on the Web site probably as the first cut at refining a search).

**Source of Information:**

The TWDB staff has begun to develop a comprehensive listing of websites of water related studies. This effort is initially focused on Texas information but can be expanded to include other states, federal agencies, colleges and universities and various associations and interest groups.

**Cost to Develop and Maintain:**

Once we have a good description of the online resource library, some estimates of the cost to develop and implement the library need to be made. Also, annual maintenance of the system will need to be estimated. All of this will be part of any funding proposal the Council decides to recommend.

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APPENDIX G:  
Internal Development Procedures for Water Conservation  
Best Management Practices Guide

## Internal Development Procedures for Water Conservation Best Management Practices (BMP) Guide

### Introduction

Experience in water conservation program implementation over the decades has resulted in a body of knowledge in Texas, across the United States, and around the world. Practitioners have shared these experiences and adopted the approach of the best management practice (BMP). Best management practices are **voluntary** efficiency measures that save a quantifiable amount of water, either directly or indirectly, and can be implemented within a specified timeframe. A BMP is structured for delivering a conservation measure or series of measures that is useful, proven, cost effective, and generally accepted among conservation experts.

In Texas, water conservation BMPs are designed to fit into the state's water resource planning process as one alternative to meeting future water needs. As a result, each BMP must be clearly defined in its schedule of implementation, expected water savings, and costs of implementation. The structure of each BMP has several elements that describe the efficiency measures, implementation techniques, schedule of implementation, scope, water savings estimation procedures, cost effectiveness considerations, and references to assist end users in planning and implementation.

Texas originally adopted 55 water conservation BMPs in November 2004 as part of the report prepared by the Texas Water Conservation Implementation Task Force, a volunteer group of Texas citizens with experience in and commitment to using Texas water more efficiently. The Task Force was created by the 78<sup>th</sup> Texas Legislature under Senate Bill 1094. The Legislature charged the Task Force with reviewing, evaluating, and recommending optimum levels of water use efficiency and conservation for the state. These BMPs were prepared in partial fulfillment of this charge. The Task Force recommended that these BMPs be reviewed and updated and that additional ones added, as needed, to provide an ongoing resource of successful water conservation practices that can be shared with all water user groups.

It was no coincidence that the recommendation "BMPs are Voluntary" was the #1 recommendation of the Task Force. The full text of the recommendation was:

**Recommendation #1—Best Management Practices are Voluntary**

Best management practices contained in the BMP Guide are voluntary efficiency measures that save a quantifiable amount of water, either directly or indirectly, and can be implemented within a specified timeframe. The BMPs are not exclusive of other meaningful conservation techniques that an entity might use in formulating a state-required water conservation plan. At the discretion of each user, BMPs may be implemented individually, in whole or in part, or be combined with other BMPs or other water conservation techniques to form a comprehensive water conservation program. The adoption of any BMP is entirely voluntary, although it is recognized that once adopted, certain BMPs may have some regulatory aspects to them (e.g., implementation of a local city ordinance) (TWDB, 2004).

The Task Force unanimously agreed that the Texas water conservation BMPs must be in accordance with the state's philosophy of region-based water planning. The Task Force firmly asserted that applying a mandatory set of BMPs throughout Texas would **not** be appropriate. One size does not fit all in a state characterized by wide variations in climate, geography, municipal demographics, water utility and service profiles, and agricultural and industrial needs. State policies adopted to guide the implementation of water conservation, including water reuse, in Texas must acknowledge the fundamental decision-making primacy and prerogative of regional water planning groups, municipalities, industrial and agricultural water users, and water providers.

### Organization of Best Management Practices

The best management practices are organized into three sections, for municipal, industrial, and agricultural water user groups. Each BMP is organized to be of assistance in conservation planning, program development, implementation, and evaluation. Although the BMPs are tools that can be used in designing specific water conservation programs, they are designed to be stand-alone practices. The BMPs can be evaluated for potential water savings and cost effectiveness for consideration in the regional water planning process. Within each planning region, a range of variations exist at the local water user level, which requires more specific analysis from prospective end users prior to adopting a BMP. The BMPs are not exclusive of other meaningful conservation techniques that an entity might use in formulating a water conservation plan. At the discretion of each user, BMPs may be implemented individually, in whole, or in part, or be combined with other BMPs or other water conservation techniques to form a comprehensive water conservation program.

Each BMP is structured into nine standardized sections (A-I), which are described in general terms below.

#### *A. Applicability*

The specific type of water user group that could potentially benefit from the BMP is described, as are the general goals for water efficiency that the BMP addresses.

#### *B. Description*

This section provides an explanation of the specifics of the conservation measure(s) included in the BMP. The best available technology that is proven and cost effective is recommended. Often a best available technology may not yet be cost effective to be implemented by all water users. Highly efficient water conservation measures that will produce cost-effective results are mentioned.

Example: The current standard for water-efficient toilets is 1.6 gallons per flush ("gpf"). Lower flush volume toilets exist, such as dual flush toilets that flush 1.6 gallons per flush for solid waste and 0.8 gallons per flush for liquid waste, but they are not widely available in the United States. Since this technology is new and few models are available, costs are currently high but are expected to fall as additional models become available. As prices fall, this technology will become more cost effective.

### *C. Implementation*

The basic steps to implement the BMP are described. If the description section includes multiple actions to complete the BMP, the implementation section will suggest all the necessary steps for achieving the water savings in the description.

### *D. Schedule*

In BMPs that have multiple implementation steps, a recommended schedule for implementation is included.

### *E. Scope*

For simpler BMPs, the scope is complete when the steps described in the implementation section have been achieved. For more complicated BMPs, the scope indicates the level of implementation necessary to consider the BMP complete. Where different levels of implementation or constraints are present, these are described.

### *F. Documentation*

To track the progress of a BMP, the water user should collect certain data to document progress implementing the BMP and evaluating actual water savings. This section identifies the recommended data.

### *G. Determination of Water Savings*

This section specifies information necessary to calculate water savings from implementing the BMP and may include statistical or mathematical formulas when appropriate.

### *H. Cost-Effectiveness Considerations*

Basic costs of implementing the specific BMP are explained. Due to the wide variety in actual costs based upon size of program and location, ranges of costs are given where appropriate. In many cases, costs and expenses can be reduced or spread out when multiple BMPs are implemented by an entity. This section primarily serves to remind the users of costs to consider when performing a cost-effectiveness analysis.

### *I. References for Additional Information*

The BMP concludes with a listing of resources that can assist a water user in implementing the BMP.

## New BMPs

For planning purposes, water conservation BMPs are not limited to those listed in the Water Conservation Best Management Practices Guide (Guide) (TWDB, 2004).

The Task Force acknowledged that the efficient use of water as a natural resource is an important planning objective and an economical means of operation and recommended that water user groups of all types evaluate the BMPs for use in their area.

Each of the original 55 BMPs was prepared through literature research and with the insight and experience of Task Force members, TWDB, and technical consultants to provide information based upon real world results of conservation program

implementation. Conservation program managers wishing to use the BMPs in program delivery should pay close attention to the Implementation, Schedule, Scope, and Documentation sections. Each of these sections contains information that can assist existing conservation programs, as well as new conservation efforts to increase their effectiveness. Each BMP also includes a reference section with additional resources to assist conservation practitioners in delivering high-quality programs with real water savings.

The Task Force developed the original Guide as a tool for advancing the practice and effectiveness of water conservation in Texas. The insights distilled in the report's BMPs came from years of conservation practice. That same experience led the Task Force to view it as a living document, with the recognition that further implementation of conservation practices will bring new insight, more study will provide new information, and new technology will improve savings. The Task Force members encouraged conservation managers, planners, practitioners, and policy makers to give feedback to the TWDB about the Guide in the hopes that it will be updated regularly over the years ahead.

### Adding New Best Management Practices (BMPs)

Just as the original 55 BMPs were based on extensive analysis and evaluation, any BMP being proposed should be subject to a similar process before being adopted:

1. Anyone proposing to add a new water conservation BMP should submit an actual draft of the BMP to the TWDB.
2. The proposed BMP will be distributed to the Water Conservation Advisory Council (Council), Texas Commission on Environmental Quality, and any technical consultants the TWDB finds appropriate for review and comment.
3. After receiving the comments and any suggested revisions on the proposed new BMP, the TWDB will provide a summary to the Council, which may then provide recommendations on the new BMP.
4. If the proposal receives a favorable recommendation from the Council, the TWDB and Texas Commission on Environmental Quality will review the proposed or revised BMP with the contributor of the proposal as to its adherence with Texas Water Code, Section 11.002 (15), which reads as follows:

"best management practices" means those voluntary efficiency measures developed by the commission and the board that save a quantifiable amount of water, either directly or indirectly, and that can be implemented within a specified time frame.
5. Once all interested parties are in agreement, the new BMP can be added to the existing list of BMPs.

### Revising (or Removing) Existing BMPs

It is very likely that future experience could produce new insights and valuable information about existing BMPs. With the goal of having each BMP be the best

resource possible to water users, new information must be added to achieve the greatest possible benefit. Revisions to (or removal of) any BMP should be reviewed and considered as follows:

1. Anyone proposing to revise a Texas water conservation BMP should submit to the TWDB an edited copy of the BMP clearly highlighting the proposed changes. Proposals to remove a BMP should provide clear arguments that the BMP is no longer an appropriate water conservation practice.
2. The proposed BMP will be reviewed by the TWDB. Obvious corrections require very limited review. Changes that the TWDB considers to be substantive will be distributed to the Council, Texas Commission on Environmental Quality, and any technical consultants the TWDB finds appropriate for review and comment.
3. All review comments will be considered by the TWDB. The final decision to revise the BMP will be made by the TWDB after a final recommendation by the Council.
4. If the proposal receives a favorable recommendation from the Council, the TWDB and Texas Commission on Environmental Quality will review the proposed or revised BMP with the contributor of the proposal to agree on a final draft.
5. All parties that participated in the review of the proposal (step 2 above) will be given an opportunity to comment on the final draft.
6. Once all interested parties are in agreement, the BMP will be revised (or removed).

The process of revising, removing, or adding BMPs must weigh the value of getting useful and timely information into the hands of water planners and policy makers against the need for extreme accuracy. Recognizing that water conservation technologies are constantly evolving, getting information in the hands of the user in a timely manner is, in fact, the method that will cause the evolution to take place and will serve to accelerate that evolution. It is, therefore, the recommendation of the Council that distribution of timely information that is considered to be correct based on our current level of understanding be encouraged. BMPs should be living documents and as such can be improved over time but will provide a valuable resource during that time.

## APPENDIX H:

### Workgroup Reports

#### Public Awareness and Recognition

- Legislative Tasks
- Summary of Progress
- Key Findings/Recommendations
- Activities Report
- Future Objectives

#### Metrics and Trends

- Legislative Tasks
- Summary of Progress
- Key Findings/Recommendations
- Activities Report
- Future Objectives

#### Regional Plan Implementation

- Legislative Tasks
- Summary of Progress
- Key Findings/Recommendations
- Activities Report
- Future Objectives

#### Resource Library and Best Management Practices

- Legislative Tasks
- Summary of Progress
- Key Findings/Recommendations
- Activities Report
- Future Objectives

#### Certified Training Programs

- Legislative Tasks
- Summary of Progress
- Key Findings/Recommendations
- Activities Report

## Public Awareness and Recognition

### **Legislative Tasks**

With the passage of Senate Bill 3 (SB 3) and House Bill 4 (HB 4), the Water Conservation Advisory Council (Council) was directed to focus our attention on a series of tasks and duties. Included in the duties of the Council, are the following two charges:

- Task 3: Monitor the effectiveness of the statewide water conservation public awareness program developed under Section 16.401 and associated local involvement in implementation of the program.*
- Task 5: Develop and implement a public recognition program for water conservation.*

The Council decided that we were charged with monitoring the success of public awareness programs at the state and local levels and recommending ways to improve conservation awareness efforts. Additionally, the Council understood that we are to develop a public recognition program. Within our span of limitations, the Council desires to recommend ways to improve public awareness, public recognition, and public policy as related to water conservation awareness, outreach, and education.

### **Summary of Progress**

This workgroup became known as the Public Awareness and Recognition workgroup. The workgroup and Council determined that the best approach to addressing these charges was to establish a program proposal for promoting Water IQ as the statewide awareness program, to begin efforts to gather preliminary information, and to identify some long-term targets and goals in water conservation awareness.

As the Council began to identify the need for more data and the future need for more comprehensive awareness programs, we recognized that there will also be a need to evaluate the effectiveness of educational awareness programs and standardize measurements of how water conservation is calculated and reported.

The Council is actively working on an online voluntary survey to canvas the existing efforts around the state involving local public awareness and recognition programs. At this time the survey is only voluntary. However, there is a need for retrieval of this type of data and for consistent response rates on the data request. A survey like this may provide some preliminary baseline research.

The wise and efficient use of the state's water resources is a vital component to meeting the current and future water needs of the state. A state-funded water awareness and conservation campaign is critical to the basic understanding of water knowledge and the need for modifying consumers' inefficient water practices. The development and implementation of the Water IQ: Know Your Water campaign was tailored after the state's successful anti-pollution campaign "Don't Mess with Texas." Although Water IQ is in its infancy and has been implemented only in parts of the state with local funding, the program could be available for statewide use with legislative appropriations. State funding of the Water IQ water awareness campaign would expand the program's implementation across the state and would provide for reinforced, long-term water use behavior changes.

Because the Council strongly supports the continued implementation of the statewide campaign for water conservation, we are actively pursuing ways to enhance and maintain the public awareness program. Through many discussions, the Council is confident that the implementation of Water IQ, the ongoing statewide water conservation awareness program, has the potential to strengthen existing local water conservation programs and boost public awareness in areas of the state that do not have local programs.

### **Findings and Recommendations**

In our preliminary evaluation of public awareness programs and public recognition programs in the state, the Council has formulated our recommendations regarding the state's role in promoting, further developing, and implementing the Water IQ Campaign, as well as establishing reporting standards. We have also recommended elevating the profile of water conservation efforts by establishing a high-level recognition award. The following key findings and recommendations are to be used as a resource for policy considerations pertaining to water conservation efforts.

#### **Key Finding 1:**

*Public awareness and education are often cited in the 2007 State Water Plan as a strategy. In an effort to evaluate or measure the progress of public awareness as a strategy, there needs to be data available and methods for measuring, tracking, and monitoring the progress of public awareness or other educational outreach strategies.*

In the 2007 State Water Plan, conservation education and awareness strategies can vary in level and technique from one water supplier and one water user group to another. Current water conservation plan requirements and annual reporting requirements call for program overviews as opposed to comprehensive tracking of progress.

#### **Recommendation 1a:**

*The Council recommends the Legislature fund the TWDB for the development of a reporting tool that will allow all regional water planning groups to report uniform and consistent data to the TWDB. These reports will be used to monitor and measure the effectiveness of the public awareness, educational, and outreach strategies in their regions.*

#### **Recommendation 1b:**

*The Council recommends funding from the Legislature to enhance reporting tools used by water user groups. Funding will assist regional water planning groups in using this collected data to monitor and measure the effectiveness of the public awareness, educational, and outreach strategies in their regions.*

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#### **Key Finding 2:**

*Because of the variations in local conservation programs, water conservation messaging and awareness in the state is currently varied and largely limited to large population areas. In areas of the state where funding is not available for water conservation messaging or extensive awareness programs, there is an immediate need for conservation information and heightened messaging.*

Levels of water conservation efforts differ from one region to another because of differences in audiences, water supply sources, demands on supplies, levels of drought conditions, and geographic locations. In areas that have awareness programs, local funding has been used to develop and implement programs that reach a local or limited regional audience. In areas of the state where local funding is limited or becomes limited, the need exists for resources and support in the form of media spots, materials, and other forms of messaging.

Recommendation 2a:

*The Texas Legislature should consider expanding the state's role in promoting water conservation awareness by fully implementing the statewide water conservation campaign. Funding from the Legislature to the TWDB should support the implementation and maintenance of the Water IQ Campaign as the state-produced water conservation campaign.*

The cost of a comprehensive statewide water awareness campaign would be \$10-12 million dollars annually. To date, approximately \$7 million dollars has been invested in pilot programs by local water entities (Appendix E). The Council recommends that the state provide funding to assist in this area so that the program can be expanded across the state to achieve the most effective impact. The initial research done for the Water IQ campaign showed that the majority of Texans do not know their source of water, and the issue of water supply is not on their radar screen. The state needs to match funding to raise the level of understanding about water supplies and challenges so that Texas citizens become part of the solution.

Recommendation 2b:

*The Council supports the TWDB's Legislative Appropriations Request Exceptional Item request to provide funding for Water IQ.*

The Water IQ campaign would provide strength in uniform and consistent messaging. The campaign is intended to work with programs established at the local level and would use print, audio, and TV media. Outreach material would be developed in English and Spanish. Although there are entities in Texas using the Water IQ brand, in other areas of the state limited funding is a barrier to the development of water conservation messaging. As the need for water conservation awareness and messaging increases, so does the support for Water IQ. The state would benefit greatly from this type of support. The TWDB Exceptional Item for statewide public awareness programs requests \$6.0 million for the biennium.

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Key Finding 3:

*Leadership exists across the state where progressive efforts in water conservation are the standard. However, successful water conservation efforts remain unrecognized and, therefore, are not profiled or visible to the public. A measure of success in water conservation depends on the level of stakeholder involvement, commitment, and awareness.*

Recommendation 3a:

*The Council recommends that a statewide recognition award program be established through the Governor's Office to expand the state's role in promoting water conservation awareness. A visible and prestigious public recognition award would elevate the importance of water conservation-related issues.*

The statewide recognition award program could be established through the Governor's Office, with nominations coming from the Council. It would promote and raise the visibility of water conservation and related issues and place a profile directly in front of the decision makers. For the short term, the Council could consider giving out recognition awards throughout the year.

### **Activities Report**

The Council has kept an open record of their activities and any related documents produced. From September 2007 through November 2008, the Council has conducted the following activities:

#### Meetings

There have been five meetings of the Public Awareness and Recognition workgroup by telephone conference call or meeting. All materials and minutes developed are available at [www.savetexaswater.org](http://www.savetexaswater.org).

#### Documents and Resources Developed

The following resources have been developed during the activity of the Public Awareness and Recognition workgroup:

- ❖ Awareness and Recognition Online Survey
- ❖ Web site entitled: [www.savetexaswater.org](http://www.savetexaswater.org)
- ❖ "A Brief Synopsis of Active Water Conservation Awareness Programs" (Appendix E)

### **Future Objectives**

- ❖ Continue to implement a method for ongoing research to collect information on monitoring and measuring the progress of awareness efforts and public outreach campaigns.
- ❖ Evaluate and manage educational components tied into the annual progress reports.
- ❖ Develop a guide for conducting water conservation outreach campaigns.
- ❖ Develop and support statewide workshops to address water providers' needs for promoting water conservation approaches while maintaining financial stability.
- ❖ Seek permanent funding for statewide water conservation awareness program.

## Metrics and Trends

### **Legislative Tasks**

With the passage of Senate Bill 3 (SB 3) and House Bill 4 (HB 4), the Water Conservation Advisory Council (Council) was directed to focus our attention on a series of tasks and duties. Included in the duties of the Council are the following two charges:

*Task 1 Monitor trends in water conservation implementation.*

*Task 7 Monitor target and goal guidelines for water conservation to be considered by the TWDB and Texas Commission on Environmental Quality.*

The Council felt that in order to focus on how conservation progress is measured over time, a prerequisite would be to develop methods of monitoring targets and goal guidelines. The Council determined that the initial requirement for meeting this charge is to determine the scope, attributes, and requirements of developing necessary methodologies and metrics.

### **Summary of Progress**

Communities need help in tracking water conservation progress, and the reporting of information such as water savings and water loss needs to be facilitated. This report outlines the first steps that the Council believes must be taken to obtain data on how water is being used and to determine what is working in water conservation and what resources water providers need to achieve long-term water savings that will stretch water supplies.

Tracking conservation progress in Texas should be a high priority. The 2007 State Water Plan calls for 23 percent of our future additional water supply to come from increased water efficiencies. Although conservation plans are required and will help meet this goal, it does not appear that adequate quantitative or qualitative tracking of conservation efforts is taking place. Wholesale water providers are currently not required to submit information on water use and water sales to the TWDB.

For many reasons, there is inadequate information and data collection. For some entities, there are no tools, staffing resources, or knowledge on how to acquire and submit requested information. For other entities, there are budgeting factors that do not allow for the time and money to allocate resources to such efforts. Some respondents that do reply to the TWDB's request for data and information provide incomplete or inaccurate data. Additionally, some entities simply choose not to respond because there are no major consequences for noncompliance. The Council believes that three areas needing improvements are the 1) implementation of data collection from wholesale water providers, 2) development of standardized methodologies for data and information reporting, and 3) enforcement of existing legislative requirements for reporting.

The Council decided to prioritize tasks to begin addressing these areas of focus. Below is a detailed description of those priorities.

## Organization of Priorities

1. *Define water use categories and visually display the reporting process.*

The workgroup analyzed end use of water to divide all water used into unique categories. The objective is that these categories are similar in the way the water is used. Their similarities will drive common metrics and conservation programs. The proposed categories are described with examples in the “Conservation Summary Tool and Report” (Appendix B).

2. *Determine which water use categories are appropriate for gallons per capita per day metrics.*

Gallons per capita per day is a metric that has been historically used for tracking conservation trends in Texas; however, the methodology has not been standardized. The Texas Commission on Environmental Quality, TWDB, Water Conservation Implementation Task Force, and others have defined and calculated gallons per capita per day using different methodologies for different purposes. This has resulted in confusion when the metric has been used to compare water use and conservation progress.

In addition, water suppliers have not used a standard methodology to measure gallons per capita per day. The various gallons per capita per day figures reported annually by water suppliers and by the TWDB create confusion regarding progress in water conservation. The tendency of the media or individuals to use gallons per capita per day as a way to compare communities on their conservation efforts is also problematic when the metric is not uniformly defined. Therefore, the Council determined that the Metrics and Trends workgroup should make it a priority to define a standard methodology for calculating gallons per capita per day for Texas water conservation reporting.

The Council also agreed that gallons per capita per day should not be the only metric used for monitoring water conservation progress. Additional metrics will be needed to track efforts in water use categories that are less influenced by population. Therefore, a standard gallons per capita per day method will be one metric from this workgroup but not the only measurement tool.

The Council determined that there are categories where a gallons per capita per day metric is appropriate and others where it is only a partial factor. Residential categories of single family and multi-family water use are population related. The most detailed data will include a residential gallons per capita per day figure and a break down of this between single-family and multi-family use.

There are also other water uses for which a gallons per capita per day metric may provide some of the trend information desired for measurement of conservation progress but not the entire picture. Categories like this include the following examples:

- ❖ Commercial water use
- ❖ Institutional water use
- ❖ Recreational and aesthetic water

The amount of water used in the above categories can be partially influenced by the population that resides in the water service area. There are often other factors that can also influence the per capita report, such as the number of daytime commuters that come into a service area routinely or visitors for short-term water use. Therefore, it will be expected that the water uses listed above will be analyzed in the future by other metrics and, if appropriate, by gallons per capita per day.

3. *Determine the types of water use categories that require other forms of metrics.*

There are some categories that the workgroup felt should be set aside for development of other metrics because they are not influenced by population:

- ❖ Industry
- ❖ Outside sales
- ❖ Agriculture
- ❖ Non-revenue - Unaccounted for water
- ❖ Reuse: direct or indirect/recycled effluent

4. *Create a pilot project focus group to develop and propose a standard population estimation methodology that could be used in the future by the TWDB to estimate current population within water provider service areas. Population estimation is a required element for calculating gallons per capita per day with accuracy.*

Background:

Estimating specific area population is complex and imperfect even when completed by demographers and census experts. However, having a reasonable method for estimating current population that is shared by water suppliers is a critical component of an accurate value for gallons per capita per day determination and reporting. If different methodologies are used, it is entirely possible to have results that vary by as much as 5-10 percent. Such a difference can result in different gallons per capita per day reports for each year by different utilities.

Although it is a special challenge to estimate population following unique water supply service area boundaries, there are many advantages to doing this well:

- a. This allows better mechanisms for tracking progress of conservation programs as they are implemented by water suppliers.
- b. The ability to follow a variety of defined areas will also allow water suppliers to refine their goals based on what may be very different demographics within their service area.

- c. The ability to check current population figures against those that were formerly estimated in long-term supply plans will provide an important determination regarding whether or not the supply plan will actually meet the future goals.

Accept Population Estimates from Water Providers in 2008–2009

Because a common methodology will require a year or more to develop, the workgroup recommends that water providers be asked to turn in what they have been using as population estimates in upcoming reports. They will also be asked to provide a basic description of the reasoning behind their estimate. This background information will be valuable to the workgroup as a statewide methodology is sought. The interim data will also allow progress to begin on tracking end use of water and gallons per capita per day figures for the proposed categories.

Population Estimation Pilot Project Proposed for 2008–2009 (Appendix D):

There are many options for data and methods for estimating current and future populations within communities. However, in order for the TWDB to use one methodology to estimate population within water provider service boundaries, common state data must be used. The State Demographer has agreed to work with volunteer water providers to develop a methodology that could be replicated statewide in the future. The document “Population Estimation Pilot Project” (Appendix D) outlines the scope of this effort for 2008–2009, the types of volunteer water providers sought, and the benefits of participation. The expected timeline for this pilot project is September 2008 through June 2009. If accepted, the methodology would be available for TWDB implementation in 2010.

Commuter Population Challenge:

The workgroup decided that for the coming year the focus on population estimates would be on the number of people who physically reside within each service area. There are water use categories, such as commercial, institutional, and recreational, that are influenced by commuters. Although the total population number within a service area will be used for an initial gallons per capita per day metric for these categories, it is planned that there will be additional metrics developed soon. Those additional metrics may address the increased consumption that could be due to commuters.

5. *Outline steps involved in calculating gallons per capita per day metrics.*

A basic guide for providing data by water use category should reference the water use categories and their definitions. A proposal for a transition to providing more subsets of data will be made based on community size. It is expected that larger water suppliers may have more sophisticated data available to report on more categories of gallons per capita per day than smaller communities.

6. *Propose an initial reporting format for gallons per capita per day and other basic data from water suppliers.*
7. *Identify any problems in gathering information on water use from current reporting requirements.*
8. *Develop a pilot project to test a data collection system so that data management issues can be tried and perfected on a limited number of participants before a final system is implemented statewide.*

## **Key Findings/Recommendations**

### **Finding 1:**

*Additional funding is needed for state agencies to improve the quality of water conservation reports filed with the TWDB and Texas Commission on Environmental Quality and the rate of report filing by water suppliers.*

### **Recommendation 1a:**

*The Council has proposed that the TWDB begin surveying all water providers.*

The Council believes that data should be collected from all water providers to better ascertain qualitative and quantitative data.

### **Recommendation 1b:**

*The Council has proposed an upgrade in the data being collected so that new metrics to measure progress can be applied. These proposals will be meaningless without the staff, computer programming, and strong policies that will help get good data to the TWDB and Council.*

The Council believes that areas needing improvements are the development of standardized methodologies for data and information reporting and the enforcement of existing legislative requirements for reporting.

The Council also believes that a pilot project should be implemented with a limited number of participants in order to refine the procedures and policies before it can be implemented statewide.

### **Recommendation 1c:**

*The Council recommends that the TWDB use the Council's proposed "Conservation Summary Tool and Report" (Appendix B).*

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### **Finding 2:**

*The current population estimation methodologies are used differently and to various extents by water providers across the state. Without consistency and uniformity in calculating population estimates, other data such as conservation savings calculations, demand projections, and gallons per capita per day may not provide the best representation of information for conservation monitoring purposes.*

Recommendation 2a:

*The Council recommends that the Texas Legislature provide funding assistance to the TWDB so that the agency can establish resources and data to develop a methodology for improving population estimations within water provider boundaries, which would allow for consistency and uniformity across the state.*

Gallons per capita per day calculations cannot be completed without accurate population estimates. Until now, evaluations of gallons per capita per day have followed municipal lines rather than water provider lines because more specific population data has not been available. This is problematic because conservation programs are offered by water providers. A methodology will be proposed by the Council for implementation by 2010, but resources of staff and computer programs will be needed to make this tool something that can be successfully implemented statewide.

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Finding 3:

*As new methodologies and better structures for conservation programs are established, there will be a need to provide training and technical assistance to educate and inform water providers on how to properly use tools and resources.*

Recommendation 3a:

*The Council and TWDB should consider an outreach effort through professional organizations to assist water providers in improving their reporting of water use data. As many water providers consider upgrades to their customer service software or look at how to sort their data for reports, they will have new options to consider, based on the proposed flow charts from the work of the Council. Getting water providers to follow a common language in describing end use of water to their customers will be an important part of ultimately helping them get those customers to be efficient. The TWDB, Council, and workgroup can assist in this transition by making presentations at workshops and conferences or to local water providers.*

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Finding 4:

*Total gallons per capita per day is a metric that was intended to provide insight into a community's total use of water. Total or global gallons per capita per day may be a good metric for some communities to have as a reflection of how much water they are using and for planning purposes if their service population is basically residential. However, for purposes of comparing one community to another, there should be a different metric that appropriately reflects conservation progress.*

Global metrics that measure total water use as opposed to total gallons per capita per day are more appropriate tools. For example, a water provider could look at total water use and then break down that total into categories. Total use

divided by population does not provide the best data because some categories are not population dependent.

Recommendation 4a:

*The state needs to focus on developing a useful way of analyzing total system use so that entities are able to understand how that use is broken out across their major water use categories. Such a tool should then be used as a means to measure performance or accomplishment in the area of conservation.*

Total gallons per capita per day is a metric that takes all water sent through a delivery system and divides it by the total population in the water provider service area. However, it is not included in the “Conservation Summary Tool and Report” proposed by the Council because it is not an appropriate metric to compare one water provider or community to another.

In communities where there could be very large industrial water use and a relatively small population, the total gallons per capita per day figure would be inflated. An increase in industrial production could make it go up in one year despite strong efforts in residential conservation or even in per unit industrial conservation. A similar problem could be evident in a community with a large agricultural water use component. In these situations, the total gallons per capita per day does not tell the entire story of the community’s water use and, therefore, should not be used to compare one community to another.

## **Activities Report**

The Council has kept an open record of their activities and any related documents produced. From September 2007 through November 2008, the Council has conducted the following activities:

### Meetings

There have been nine meetings of the Metrics and Trends workgroup by telephone conference call or meeting. All materials and minutes developed are available at [www.savetexaswater.org](http://www.savetexaswater.org).

### Documents and Resources Developed

The following documents have been developed by the Metrics and Trends workgroup:

- ❖ Conservation Summary Tool and Report (Appendix B)
  - Flow charts
  - Definitions
  - Desired Attributes of Conservation Summary Tool and Report
- ❖ “Reporting Methodology Pilot Project Description” ( Appendix C )
- ❖ “Population Estimation Pilot Project Description” ( Appendix D)

## Future Objectives

- ❖ Obtain high quality data or, in some cases initial base data, from water suppliers that will establish accurate baselines for water consumption in different categories of use.
- ❖ Standardize ways that consumption data and population data are reported by water suppliers.
- ❖ Have a standard “Conservation Summary Report” for each water supplier that becomes increasingly sophisticated as programs, data, and metrics evolve.
- ❖ Develop ways to help water suppliers use their “Conservation Summary Report” to target their conservation program plans.
- ❖ Develop guidelines for gallons per capita per day targets that can be used by water suppliers to set and measure programs against goals. These guidelines might address some of the following issues:
  - *How to normalize by weather. What is the dry year goal for residential versus the wet year goal?*
  - *What is a reasonable rate of drop to expect in gallons per capita per day categories given a substantial annual investment in conservation?*
  - *How to report on trends that are impacting gallons per capita per day in different sectors, such as a growth in high-income housing, additional commercial growth, or new industry that brings in either tourists or commuters each day.*
- ❖ Add non-gallons per capita per day metrics to conservation reports so that industrial and agricultural water conservation programs can be tracked for progress.

## Regional Plan Implementation

### **Legislative Tasks**

With the passage of Senate Bill 3 (SB 3) and House Bill 4 (HB 4), the Water Conservational Advisory Council (Council) was directed to focus our attention on a series of tasks and duties. Included in the duties of the Council is the following charge:

*Task 6. Monitor the implementation of water conservation strategies by water users included in regional water plans.*

In response, the Council determined the most appropriate course of action needed to evaluate the implementation of the water conservation strategies was to survey the state's 16 regional water planning groups (planning groups) in order to measure progress in each region in implementing the water conservation strategies outlined in the 2007 State Water Plan.

### **Summary of Progress**

After discussions during workgroup conference calls and meetings of the full Council, a survey (Appendix A) of the planning groups was developed and adopted. The survey requested the following information:

- 1: A list of conservation strategies included in the region's current water plan.*
- 2: The expected water savings on an annual basis for each conservation strategy listed in response to request number one.*
- 3: A list by water user of the amount of water saved on an annual basis by each conservation strategy implemented.*
- 4: A list of additional water conservation strategies being considered by the planning group.*

In June 2008, the Council's Presiding Officer provided the four-part survey to the chairs of the 16 planning groups. The Council requested that the planning groups submit their survey responses to the TWDB no later than October 1, 2008.

Additionally, the Council requested that the planning groups update the surveys each even-numbered year following the initial 2008 submission. All surveys will be submitted to the TWDB because the agency is responsible for providing staff assistance to the Council.

The information gathered from this survey is intended to be used by water user groups, water suppliers, and the planning groups to provide insight about their water conservation strategies. In the future, results from this survey will supplement other data received from the planning groups.

### **Summary of Responses Received**

As noted in the responses from the planning groups, answers to survey questions one and two can be obtained from the regional water plans. The answer to survey question three requires extensive activity for which the planning groups are not currently adequately funded. In general, the answer to survey question four may not be available until the 2011 Regional Water Plans are completed. However, some planning groups have attempted to form a partial list of new strategies that were not originally included in the 2006 Regional Water Plans.

All of the planning groups that responded indicated that it would be difficult at this time to provide from their respective region a list by water user of the amount of water saved on an annual basis by each conservation strategy implemented. Gathering that information would require additional time and effort on the part of each region's consultant and that, in turn, requires additional funding. In general, the planning groups appear to be challenged in trying to carry out all of the tasks already assigned to them with the limited funding available, so adding this task to their workload underscores the need for specific funding to complete the task.

Several of the groups did provide estimates of the cost of the additional activity to answer question three. By using some cost estimates from different regions with varying levels of effort required for this task, the Council developed an estimate of the additional funding needed for the planning groups.

A detailed compilation and description of the water conservation strategies in each region is available at [www.savetexaswater.org](http://www.savetexaswater.org)

From the data available in the 2007 State Water Plan, the table below provides a summary of regional water plan data for 2010 Water Demand, 2010 Water Supply Needs, 2010 Water Conservation Strategies, 2010 Water Reuse Strategies, and Status of Strategy Implementation. The volume of conservation and reuse strategies in 2010 is the volume of water to be supplied by these strategies in addition to whatever amount that was in place in the base year of 2000.

2007 State Water Plan Data

| RWPG  | Demand<br>2010<br>(acre-feet) | *Needs<br>2010<br>(acre-feet) | Conservation<br>Strategies<br>2010 (acre-<br>feet) | Conservation<br>Strategies<br>Implemented | Reuse<br>Strategies<br>2010<br>(acre-<br>feet) | Reuse<br>Strategies<br>Implemented |
|-------|-------------------------------|-------------------------------|----------------------------------------------------|-------------------------------------------|------------------------------------------------|------------------------------------|
| A     | 1,864,748                     | (310,554)                     | 120,612                                            | Unknown                                   | 2,300                                          | Unknown                            |
| B     | 171,164                       | (880)                         | 253                                                | Unknown                                   | None                                           | Unknown                            |
| C     | 1,768,464                     | (336,390)                     | 53,070                                             | Unknown                                   | 301,692                                        | Unknown                            |
| D     | 561,076                       | (10,764)                      | None**                                             | Unknown                                   | 476                                            | Unknown                            |
| E     | 662,608                       | (193,171)                     | 29,359                                             | Unknown                                   | 2,387                                          | Unknown                            |
| F     | 807,453                       | (223,023)                     | 2,699                                              | Unknown                                   | None                                           | Unknown                            |
| G     | 835,691                       | (141,800)                     | 13,582                                             | Unknown                                   | 3,458                                          | Unknown                            |
| H     | 2,314,094                     | (279,996)                     | 119,286                                            | Unknown                                   | 7,855                                          | Unknown                            |
| I     | 896,455                       | (18,142)                      | 187                                                | Unknown                                   | 1,660                                          | Unknown                            |
| J     | 51,844                        | (2,065)                       | 1,498                                              | Unknown                                   | None                                           | Unknown                            |
| K     | 1,078,041                     | (246,055)                     | 14,547                                             | Unknown                                   | 62,253                                         | Unknown                            |
| L     | 985,237                       | (156,598)                     | 31,971                                             | Unknown                                   | 20,299                                         | Unknown                            |
| M     | 1,474,242                     | (436,796)                     | 130,183                                            | Unknown                                   | 3,316                                          | Unknown                            |
| N     | 226,691                       | (3,404)                       | 1,625                                              | Unknown                                   | 250                                            | Unknown                            |
| O     | 4,388,459                     | (1,266,820)                   | 560,205                                            | Unknown                                   | None                                           | Unknown                            |
| P     | 225,561                       | (50,655)                      | None ***                                           | Unknown                                   | None                                           | Unknown                            |
| STATE | 18,311,828                    | (3,677,113)                   | 1,079,077                                          | Unknown                                   | 443,030                                        | Unknown                            |

\* Needs are shortages in the available water supplies needed to meet the projected water demands.

\*\* Conservation was considered for water user groups with unmet demands and a usage rate greater than 140 gallons per capita per day, but other options were determined to be more economical.

\*\*\* Water conservation was not recommended as a strategy because it was not the most cost-effective method to meet irrigation needs, which are the only needs of the region. Region P did recommend continued agricultural water conservation practices as one of its policy recommendations.

RWPG = Regional Water Planning Group

A detailed compilation and description of the specific water conservation strategies in each region is available at [www.savetexaswater.org](http://www.savetexaswater.org).

### Findings and Recommendations

Findings and recommendations related to the Council's charge to monitor the implementation of water conservation strategies by water users should be considered a resource for the Legislature to monitor water conservation efforts.

#### Key Finding 1:

*The 2006 Regional Water Plans list a number of water conservation strategies intended to be implemented over the next 50 years to help meet demand projections. Planning groups are currently not able to provide any measurements of progress on the levels of*

*strategy implementation because there are no measurement standards to follow, nor do they have the resources to collect and analyze that data.*

Planning groups must continuously and consistently acquire pertinent data allowing them to 1) conduct surveys that adequately monitor implementation strategies and 2) estimate water savings accurately from the conservation strategies. Due to the limitations of information noted above, at this time the Council will not be able to provide a comprehensive comparison by region of the water conservation strategies proposed in the regional water plans and the conservation strategies implemented in the regions. Nor will the Council be able to compare the acre-feet of water anticipated to be conserved with the acre-feet actually conserved.

Recommendation 1a:

*State funding is needed for the TWDB to fund planning group efforts in order to develop the data necessary to monitor and measure the levels of strategy implementation.*

The Council has identified that there is a need for specific funding for planning groups to conduct the proposed survey and monitor the implementation and savings that result from the water conservation measures. Without such information, it will be impossible to evaluate how effective water conservation strategies in the state and regional water plans are in helping to meet future water needs. The survey results may also be used to identify effective conservation initiatives and to provide a means of promoting these initiatives at both the state and/or local levels through both funding and/or policy support.

Recommendation 1b:

*Funding is needed each biennium for planning groups to assist in obtaining the data as requested.*

The Council has identified that there is a need for additional funding for planning groups to adequately and continuously conduct this data collection and analysis over time. Due to the legislative appropriations process, each biennium the TWDB is provided funding for the planning groups. This funding is based on the scopes of work the planning groups submit. Funds for studying the implementation of water conservation strategies will need to be incorporated into this process.

## **Activities Report**

The Council has kept an open record of their activities and any related documents produced. From September 2007 through November 2008, the Council has conducted the following activities:

### Meetings

There have been five meetings of the Regional Plan Implementation workgroup by telephone conference call or meeting. All materials and minutes developed are available at [www.savetexaswater.org](http://www.savetexaswater.org).

### Documents and Resources Developed

The following document has been developed during the activity of the Regional Plan Implementation workgroup:

- ❖ Survey Letter to Regional Water Planning Groups (Appendix A)

### **Future Objectives**

The Council plans to continue monitoring the implementation of water conservation strategies by requesting that the planning groups submit the four-part survey on a biennial basis in even-numbered years.

Another option may be updating the planning group surveys on a five-year cycle to ensure beneficial and complete data. A five-year update would be timed to coincide with the timelines for Water Conservation and Drought Contingency Plans required by the Texas Commission on Environmental Quality and the updated regional water plans.

The Council believes that survey data may assist the Council and Legislature in addressing the charges presented in SB 3 and HB 4 (80R). These charges include monitoring trends in water conservation implementation, developing and implementing a public recognition program for water conservation, and monitoring target and goal guidelines for water conservation to be considered by the TWDB and Texas Commission on Environmental Quality.

## Resource Library and Best Management Practices

### **Legislative Tasks**

With the passage of Senate Bill 3 (SB 3) and House Bill 4 (HB 4), the Water Conservational Advisory Council (Council) was directed to focus our attention on a series of tasks and duties. Included in the duties of the Council, are the following two charges:

- Task 2. Monitor new technologies for possible inclusion by the TWDB as best management practices in the Best Management Practices Guide developed by the Water Conservation Implementation Task Force under Chapter 109, Acts of the 78th Legislature, Regular Session, 2003.*
- Task 4. Develop and implement a state water management resource library.*

The Council decided that a requisite for monitoring new technologies for possible inclusion in the Best Management Practices Guide was to first establish a standard procedure of updates and revisions intended to maintain the integrity and quality of the guidance tool. Additionally, the Council understood that we are to develop a state water management resource library. The initial requirement for meeting this charge is to determine the elements, scope, and requirements of this resource library.

### **Summary of Progress**

The Council clearly recognizes that the greatest level of success in water conservation can only be achieved when information is put in the hands of the largest number of stakeholders. Having a resource library that contains information about water conservation that all can access and use is seen as a key element to a successful water conservation program in Texas.

The Council began by defining the parameters for organizing water conservation information resources that all stakeholders can access and by developing a process for pushing new information out to relevant stakeholders. The Council believes that a resource library must capture any new technologies so they can be shared quickly with all relevant stakeholders. It was determined that the resource library cannot be simply a database for collecting information; it must also incorporate a system for getting the information in the hands of those who can use it. It is also intended to have the current edition of the Best Management Practices Guide incorporated into the resource library.

The Council prepared two documents related to the two legislative tasks. “Internal Development Procedures for Water Conservation Best Management Practices (BMP) Guide” (Appendix G) describes a methodology revising and adding to the Best Management Practices Guide. This document relates to legislative task number two.

The second document, “An Evaluation of Parameters and Elements for a Resource Library,” (Appendix F) outlines the key elements of an online resource library for water conservation. This document relates to legislative task number four.

Additional work is needed to provide more specificity to the library proposal, but little additional progress can be made unless some funding can be provided to begin the development of the library.

The Council has also been reviewing the possibility of forming a cooperative effort with the Alliance for Water Efficiency to develop a national water conservation clearinghouse. The goals of the national project align with the goals and charges of the Council. The state's online resource library and the national clearinghouse have the potential to complement each other and enhance the magnitude and quality of both resources.

### **Findings and Recommendations**

The Council has formulated the following key findings and recommendations regarding the state's role to guide policy considerations pertaining to water conservation efforts for legislative tasks two and four.

#### **Finding 1:**

*As water demand projections depict a growing need for conservation, water user groups will need to refer to tools and resources to develop, implement, and manage effective water conservation programs.*

#### **Recommendation 1:**

*The Council recommends that Texas agencies work with the Alliance for Water Efficiency to create a national clearinghouse for water conservation information and research, which will also function as a networking portal. The Council believes that Texas will be best served by participating in this national effort so that reliable and quality resources will be available to a variety of audiences.*

Water conservation is a rapidly growing water supply strategy in Texas, as well as throughout the rest of the nation. It is important to note that conservation efforts, programs, and strategies are identified as components for long-term plans for sustainable supplies here in Texas. Effective conservation efforts, programs, and strategies will rely on the quality and quantity of resources, guidance tools, research, and practices.

In a report to establish the Alliance for Water Efficiency, it was stated that, "It is important to note that this clearinghouse concept is not just a web site program; it is an active technical assistance outreach, fully staffed, in the following areas:

- Improving the overall knowledge base of individuals and organizations related to water-efficiency products and practices;
- Creating a broad-based platform for the development of cost-effective outreach and implementation of water-efficiency programs in the U.S.;
- Acting as the focal point for technical exchanges on the topic of water-efficiency with organizations inside and outside of the U.S.; and
- Fostering the research, development, and manufacture of water-efficient products for U.S. applications.
- There is a clear and compelling need for a national water efficiency information clearinghouse and a web network portal to serve a diverse community of users." (CUWCC, 2005)

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#### Finding 2:

*To best use a limited resource and increase the public's awareness of the need to conserve, quality resources, information, strategies, and best management practices need to be available for reference.*

#### Recommendation 2:

*The Council recommends that the Texas Legislature consider expanding the state's role in developing and perpetuating a state online water management resource library. The Council recommends that the State of Texas commit \$150,000 per year for the next two years toward developing a Texas online water management resource library and portal to integrate with a national clearinghouse. The Council understands that the TWDB has requested Exceptional Item funding of \$100,000 per fiscal year specifically for this task but believes that \$150,000 per fiscal year would better meet the needs for the Council's vision for this activity.*

We strongly believe that water conservation will only be achieved by having a well-informed and involved public. This commitment must also recognize that successful development of a Texas library will require continued commitment and support to sustain a ready network of water conservation information. Long term, the program will require continuing funding to maintain and update the system. These costs will be defined during development and reported to the Legislature in the 2010 Council report.

#### **Activities Report**

The Council has kept an open record of their activities and any related documents produced. From September 2007 through November 2008, the Council has conducted the following activities:

##### Meetings

There have been five meetings of the Resource Library and Best Management Practices workgroup by telephone conference call or meeting. All materials developed and minutes are available at [www.savetexaswater.org](http://www.savetexaswater.org).

##### Documents and Resources Developed

The following documents have been developed during the activity of the Resource Library and Best Management Practices workgroup:

- ❖ "Internal Development Procedures for Water Conservation Best Management Practices Guide" ( Appendix G)
- ❖ "An Evaluation of Parameters and Elements for a Resource Library" (Appendix F)

#### **Future Objectives**

The Council realizes the critical need to share water conservation information with water professionals and the ultimate stakeholders, the general public. To address that need successfully, we must have the funding in place to create and maintain an information portal and a Texas Water Conservation Resource Library, both of which could be integrated with other water conservation efforts nationally and could be used to improve public awareness and education. Although we have a general concept of how the information portal and library would be designed, further study and additional resources will be required to determine the best way to create these resources.

## Certified Training Programs

### **Legislative Task**

With the passage of Senate Bill 3 (SB 3) and House Bill 4 (HB 4), the Water Conservation Advisory Council (Council) was directed to focus our attention on a series of tasks and duties. Included in the duties of the Council, is the following charge:

- Task 8: Designation of certified water conservation training facilities study.*
- (a) The council shall conduct a study to evaluate the desirability of requiring the TWDB to:*
    - (1) designate as certified water conservation training facilities entities and programs that provide assistance to retail public utilities in developing water conservation plans under Section 13.146; and*
    - (2) give preference to certified water conservation training facilities in making loans or grants for water conservation training and education activities.*
  - (b) Not later than December 1, 2008, the council shall submit a written report containing the findings of the study and the recommendations of the council to the governor, lieutenant governor, and speaker of the House of Representatives.*
  - (c) This section expires June 1, 2009.*

### **Summary of Progress**

Under Section 3 of House Bill 4 and Section 2.03 of Senate Bill 3, the 80<sup>th</sup> Texas Legislature directed the Council to study and evaluate the possibility of the TWDB giving funding preference to entities that provide certified water conservation training and programs. A workgroup of members of the Council and other interested participants was formed. Input to the study process included three open record telephone conference calls, discussions before the full Council, review of draft material, and an on-site visit to the Tech H<sub>2</sub>O-Water Resource Learning Center in El Paso, Texas, by the Council' Presiding Officer.

### Key Concepts and Requirements of the Legislation:

- The Council believes that the primary intent of the legislation was directed to providing assistance to and training of retail public utilities so that they may meet the requirements for developing water conservation plans required under Texas Water Code, Section 13.146.
- As stated in the legislation, another intent is to allow the TWDB to certify specific facilities, entities, and programs for water conservation training.
- An additional intent is for the TWDB to be able to give preference to those certified facilities, entities, and programs if and when the TWDB can provide financial assistance for water conservation training and education activities.
- The Council must provide the Governor, Lieutenant Governor, and Legislature with the findings and recommendations of the Council.

Texas is a large and diverse state. Many not-for-profit organizations already offer some conservation plan related training as part of their regular conferences and program activities across Texas. These programs are held at hotels, local utility training facilities, and convention centers at a variety of locations. This format has proven to be cost effective. It offers the training to a wider number of utilities than a training at a set building or facility that could be located far from many utilities who wish to send personnel. Providing financial assistance to these training programs, as opposed to funding an individual building or facility, should be the emphasis of any financial assistance.

Entities that have provided water conservation training in the past range from state agencies, including the TWDB and Texas Commission on Environmental Quality, to organizations such as the Texas Rural Water Association, Texas Water Utilities Association, and the Texas Section of the American Water Works Association. It is also conceivable that private entities could offer certified programs in order to perform such training for profit.

Based on this input, the Council agreed on the following concepts:

- The emphasis should be on certifying programs and providing financial and technical assistance to programs of instruction and developing materials that provide the necessary information to assist utilities in developing effective conservation plans as required under Texas Water Code, Section 13.146.
- If authorized by the Texas Legislature, the TWDB should give preference in funding to programs that have had their program content certified by the agency.
- It is also recognized that this requires additional legislative authorization and funding for the TWDB so that they can implement and administer a certification process.

The findings and recommendations of the report are based on a 15-month effort, including three special conference calls open to the public, review of drafts, and full Council meeting deliberation of the findings.

## **Findings and Recommendations**

Finding 1:

*For the development of water conservation plans, as required by Texas Water Code, Section 13.146, training for retail public utilities is needed. As a result of recent legislation, more utilities will be required to submit water conservation plans, which will, in turn, increase the potential need for training. Because there will be a foreseeable need for training, it will be important to have consistent, uniform, and comprehensive training programs available. Utilities across the state will benefit by having certified training programs to use as a resource.*

The legislation is not directed to these programs:

- The provision of water conservation education and training activities for the general public.
- The training that would be required for the certification of water conservation professionals.
- The development of an operator certification program for water conservation specialists.

Recommendation 1:

*The Council recommends that the Texas Legislature authorize the TWDB to implement a certification process. The Council also recommends that the Legislature fund the TWDB to provide financial assistance and continued technical assistance to programs that aid retail public utilities in developing water conservation plans under Texas Water Code Section, 13.146.*

The TWDB should give preference to certified programs when providing financial assistance for training programs.

- Certified training programs should focus on tools, techniques, and methods that go into developing and implementing effective utility-based water conservation plans and programs. This can range from content aimed at specifics of the requirements under Texas Water Code, Section 13.146, to program elements, such as development of educational programs, outdoor and indoor water conservation program elements, or non-residential water conservation programs.
- The TWDB should give preference to certified programs when providing any available financial assistance before providing such assistance to programs that have not been certified.
- Entities should be required to submit their programs to the TWDB for approval and certification before consideration for funding from the agency.

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Recommendation 2:

*Additional program authorization and funding will be required to enable the TWDB to put this certification process into practice. To meet and support this expanded role, funding for both financial assistance and additional technical assistance activities by the TWDB will be needed.*

- The TWDB currently provides limited training in this area. It does not, however, have authorization to certify programs, adequate financial resources to provide funding of certified training programs, or funding for the additional staff needed to administer such a program.

### **Activities Report**

The Council has kept an open record of their activities and any related documents produced. From September 2007 through November 2008, the Council has conducted the following activity:

#### Meetings

There have been three meetings of the Certified Training Programs workgroup by telephone conference call or meeting. All materials and minutes developed are available at [www.savetexaswater.org](http://www.savetexaswater.org)



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