



**Texas State Soil and Water Conservation Board  
 Clean Water Act §319(h) Nonpoint Source Grant Program  
 FY 2010 Workplan 10-04**

**SUMMARY PAGE**

<b>Title of Project:</b>	Preventing Water Quality Contamination Through the Texas Well Owner Network				
<b>Project Goals:</b>	Improve and protect both well water and surface water quality by improving water quality awareness and knowledge of BMPs for protecting and improving water quality				
<b>Project Tasks:</b>	(1) Project Administration; (2) Development of Texas Well Owner Network (TWON) Educational Materials/Curriculum; (3) Deliver updated TEX*A*Syst Publications, Well Water Screenings, and TWON trainings; (4) Evaluate the effectiveness of TWON trainings				
<b>Measures of Success:</b>	<ul style="list-style-type: none"> <li>• Increase well owner water quality awareness and knowledge of BMPs through distribution of TWON publications as well as updated and renamed TEX*A*Syst publications</li> <li>• Delivery of 14 TWON trainings in selected watersheds</li> <li>• Delivery of at least 30 well water screening events</li> <li>• Measure impact of program delivery through participation in TWON trainings and increased knowledge and understanding of individuals participating in the program</li> </ul>				
<b>Project Type:</b>	Implementation ( ); Education (X); Planning ( ); Assessment ( ); Groundwater (X)				
<b>Status of Water Body: 2008 Texas Water Quality Inventory and 303(d) List</b>	<u>Segment ID:</u> Statewide	<u>Parameter:</u> Bacteria Nitrate	<u>Category:</u> 4 and 5 Concern		
<b>Project Location (Statewide or Watershed and County)</b>	Statewide				
<b>Key Project Activities:</b>	Hire Staff (X); Surface Water Quality Monitoring ( ); Technical Assistance ( ); Education (X); Implementation ( ); BMP Effectiveness Monitoring ( ); Demonstration ( ); Planning ( ); Modeling ( ); Bacterial Source Tracking ( ); Other ( )				
<b>Texas NPS Management Program Elements:</b>	E1, LTG 2, 4, 6, 7; STG 1A, 3A, 3B, 3E E2, E3, E4				
<b>Project Costs:</b>	<b>Federal:</b>	\$474,627	<b>Non-Federal:</b>	\$312,296	<b>Total:</b> \$786,923
<b>Project Management:</b>	<ul style="list-style-type: none"> <li>• Texas Water Resources Institute</li> <li>• Texas A&amp;M AgriLife Extension Service</li> </ul>				
<b>Project Period:</b>	November 1, 2010 – October 31, 2014				

## Part I – Applicant Information

Applicant							
Project Lead		Dr. Kevin Wagner					
Title		Associate Director					
Organization		Texas Water Resources Institute					
E-mail Address		<a href="mailto:klwagner@ag.tamu.edu">klwagner@ag.tamu.edu</a>					
Street Address		1500 Research Parkway, Suite A240, 2260 TAMU					
City	College Station	County	Brazos	State	TX	Zip Code	77843-2260
Telephone Number		979.845.2649		Fax Number		979.845.8554	

Project Co-Lead		Dr. Diane Boellstorff					
Title		Assistant Professor and Extension Specialist					
Organization		Texas A&M AgriLife Extension Service, Dept. of Soil and Crop Sciences					
E-mail Address		<a href="mailto:dboellstorff@tamu.edu">dboellstorff@tamu.edu</a>					
Street Address		370 Olsen Blvd, 2474 TAMU					
City	College Station	County	Brazos	State	TX	Zip Code	77843-2474
Telephone Number		979.458.3562		Fax Number		979.845.0456	

Project Co-Lead		Dr. Mark McFarland					
Title		Professor, Extension Soil Fertility Specialist, State Water Quality Coordinator					
Organization		Texas A&M AgriLife Extension Service, Dept. of Soil and Crop Sciences					
E-mail Address		<a href="mailto:ml-mcfarland@ag.tamu.edu">ml-mcfarland@ag.tamu.edu</a>					
Street Address		370 Olsen Blvd, 2474 TAMU					
City	College Station	County	Brazos	State	TX	Zip Code	77843-2474
Telephone Number		979.845.2425		Fax Number		979.845.0604	

Project Co-Lead		Dr. Saqib Mukhtar					
Title		Professor, Interim Associate Department Head & Extension Program Leader					
Organization		Texas A&M AgriLife Extension Service, Dept. of Biological and Agricultural Engineering					
E-mail Address		<a href="mailto:mukhtar@ag.tamu.edu">mukhtar@ag.tamu.edu</a>					
Street Address		2117 TAMU					
City	College Station	County	Brazos	State	TX	Zip Code	77843-2117
Telephone Number		979.458.1019		Fax Number		979.847.8828	

<b>Project Partners</b>	
<b>Names</b>	<b>Roles &amp; Responsibilities</b>
Texas State Soil and Water Conservation Board (TSSWCB)	Provide state oversight and management of all project activities and ensure coordination of activities with related projects and TCEQ and the Texas Groundwater Protection Committee.
Texas Water Resources Institute (TWRI)	Project coordination and administration. Maintain TWON website/educational material clearinghouse.
Texas A&M AgriLife Extension Service – Department of Soil and Crop Sciences (SCSC)	Establish TWON framework, update educational materials and programs, deliver programs, content management for TWON website/educational material clearinghouse, and conduct program/educational material evaluations.
Texas A&M AgriLife Extension Service – Department of Biological and Agricultural Engineering (BAEN)	Assist with updating TEX*A*Syst and delivering educational programs
Texas Water Development Board and the Texas Alliance of Groundwater Districts	Support coordination with the Texas Alliance of Groundwater Districts as appropriate in order to communicate project goals, activities, training opportunities and achievements accomplishments to affected parties.

## Part II – Project Information

Project Type						
Surface Water	X	Groundwater	X			
Does the project implement recommendations made in a completed WPP or an adopted TMDL or I-Plan?				Yes	No	X
If yes, identify the document.						
If yes, identify the agency/group that developed and/or approved the document.		Year Developed				

Watershed Information				
Watershed Name(s)	Hydrologic Unit Code (8 Digit)	Segment ID	305 (b) Category	Size (Acres)
Statewide	N/A	N/A	N/A	N/A

Water Quality Impairment
Describe all known causes (pollutants of concern) of water quality impairments from any of the following sources: 2008 Texas Water Quality Inventory and 303(d) List, Clean Rivers Program Basin Summary, Basin Highlights Reports or Other Documented Sources.
<p>The U.S. Geological Survey (DeSimone et al. 2009) recently reported that nitrate was the most commonly detected contaminant in private wells derived from man-made sources at concentrations greater than the EPA MCL. A second finding was that total coliform bacteria were detected in 34% of sampled wells. The MCLG for coliform bacteria, including <i>Escherichia coli</i>, in drinking water is zero.</p> <p>For 2003-2008, the Texas Water Development Board reported that for the 3,861 private water wells sampled, the percentage of wells exceeding the nitrate MCL varied from 2% to 50% each year. Additionally, results of well screenings conducted by the Texas A&amp;M AgriLife Extension Service from 2003-2009 indicate that about 33% of private wells in Texas contain fecal coliform bacteria.</p> <p>This project will focus on educating private well owners in WPP and TMDL watersheds and priority aquifers about potential pollutant sources and what steps can be taken to mitigate potential impacts from these sources. As a result of project activities, nitrates and coliform bacteria in groundwater and surface water will be addressed.</p>

## Project Narrative

### Problem/Need Statement

Over 1,000,000 private water wells in Texas provide water to citizens in rural areas and increasingly, to those living on small acreages at the burgeoning rural-urban interface. Public drinking water supplies are generally of good quality and are monitored through requirements of the federal Safe Drinking Water Act; however, private well owners are independently responsible for monitoring the quality of their wells and frequently at greater risk for exposure to compromised water quality. Although not used for consumptive purposes, numerous irrigation wells extract irrigation waters from the same groundwater resources as private drinking wells and can serve as good indicators of drinking water quality in nearby domestic water supplies. Management and protection of private, domestic and irrigation water sources are under the control of the landowner, and therefore, depend primarily on education rather than regulation.

The U.S. Geological Survey (DeSimone et al. 2009) recently reported that nitrate was the most commonly detected contaminant in private wells derived from man-made sources at concentrations greater than the EPA Maximum Contaminant Levels (MCL) for public water supplies. A second finding potentially affecting a greater portion of the population was that total coliform bacteria, a broad group that includes bacteria from soil, water and animal feces, were detected in 34% of sampled wells. The MCLG for coliform bacteria, including *Escherichia coli*, in drinking water is zero because this group is a predictor of the probable presence of pathogenic bacteria.

These broad findings of the USGS study are similar to those reported in Texas. For 2003-2008, the Texas Water Development Board reported that for the 3,861 private water wells sampled, the percentage of wells exceeding the nitrate MCL varied from 2% to 50% each year, depending on which regions of Texas were targeted for sampling ([www.twdb.state.tx.us/mapping/](http://www.twdb.state.tx.us/mapping/)). Additionally, results of well screenings conducted by the Texas A&M AgriLife Extension Service from 2003-2009 indicate that about 33% of private wells in Texas contain fecal coliform bacteria.

TEX\*A\*Syst is a series of publications developed in 1996 to help rural residents assess the risk of groundwater pollution, and to describe BMPs that can help protect groundwater. The TEX\*A\*Syst publications were developed roughly 15 years ago and require updating to reflect current laws and regulations guiding private well maintenance and management, and development of improved BMPs for protecting ground water. The two categories of the most common private well pollutants, fecal coliform bacteria and nutrients, also are the most frequent cause of stream impairment or concern in Texas. It is likely that in many cases, local release of fecal coliform bacteria and nutrients is not limited to contamination of the property owner's private well and that these contaminants are transported off-site and contribute to pollutant loadings in surface waterbodies.

To address these issues affecting both surface and groundwater, SCSC, BAEN and TWRI will develop the Texas Well Owner Network (TWON) designed to deliver a science-based, community-responsive education curriculum. The TWON will focus on protecting groundwater quality and aquifer integrity, but also will complement the successful Texas Watershed Stewards program by emphasizing BMPs addressing potential contamination of surface water by sources also contaminating private domestic and irrigation wells and jeopardizing aquifer integrity. The TWON will train Texans regarding water quality and BMPs for protecting their wells and surface waters, which will avert off-site transport of contaminants (bacteria and nutrients) to surface waters, prevent contamination of underlying aquifers, and safeguard the health of landowners and their families. As a result, this program will support on-going watershed protection planning efforts being conducted by TSSWCB and others by expanding the reach of these programs to additional audiences and resulting in greater implementation of BMPs for water quality improvement and protection.

## Project Narrative

### General Project Description

This project will build both institutional and local capacity to improve and protect both well water and surface water quality by improving water quality awareness and knowledge of BMPs for protecting and improving water quality. This will not only safeguard well water quality for landowners and their families and others relying on the availability of high quality groundwater stored by aquifers associated with local wells, but it will help improve surface water quality as well. Because improved understanding of water quality, human impacts, and management practices to improve well and surface water quality will help to forestall off-site transport of coliform bacteria and nutrients to surface waters, the TWON will be an effective tool to bring to bear in WPP and TMDL implementation where investigations indicate bacterial and nutrient contributions. This will be achieved by (1) development of TWON curriculum; (2) delivery of TWON educational materials and trainings; and (3) evaluation and assessment of the program so that needed modifications and improvements can be made.

SCSC will hire a TWON Coordinator. The TWON Coordinator with assistance from Project Co-Leads and the SCSC and BAEN Program Specialists, will update TEX\*A\*Syst materials and rename them to accompany TWON educational materials. Existing TEX\*A\*Syst publications provide information on a range of topics and BMPs including:

- Improving Wellhead Management and Conditions
- Improving Pesticide Storage and Handling
- Improving Fertilizer Storage and Handling
- Improving Petroleum Product Storage
- Improving Hazardous Waste Management
- Improving Household Wastewater Treatment
- Improving Livestock Manure Storage and Treatment Facilities and Holding Pen Management

In addition to updating and renaming TEX\*A\*Syst, the TWON Coordinator, with assistance from Project Co-Leads and the BAEN and SCSC Program Specialists, will develop and adapt additional educational resources to create a science-based, community-responsive TWON education curriculum, which will be utilized to train a network of private well managers regarding BMPs for safeguarding private well water quality and aquifer integrity. Topics which may be included in the curriculum include:

- Interpretation of well water screening results
- Watershed and groundwater hydrology and the importance to neighbors and the public of safeguarding aquifer integrity and groundwater quality
- Proper siting of drinking water wells and avoiding improper well construction techniques
- Proper maintenance and protection of the wellhead
- Solid and hazardous household waste management
- Aging and failure of wells Locating and properly plugging abandoned wells
- Improperly sited and functioning on-site wastewater treatment systems
- Maintenance, aging and failure of on-site wastewater treatment systems
- Effects of land use changes on well water quality
- Successful methods of sharing TWON information with neighbors and community

SCSC will work with the TSSWCB and other state and local organizations to select locations for the Well Water Screenings and TWON trainings. SCSC will coordinate efforts with state agencies and organizations already involved in WPP/TMDL processes or who are planning future WPP/TMDL processes in specific watersheds. During the second year, a minimum of 6 TWON trainings will be provided and during year three, at least 8 trainings will be offered. Trainings will be delivered by the TWON Coordinator, BAEN and/or SCSC Program Specialists and/or the SCSC Assistant Professor and Extension Specialist.

To encourage participation and engage attendees during the TWON training, voluntary private well water screening will be offered by Texas A&M AgriLife Extension, which has periodically conducted preliminary well screenings for bacteria, nitrates and salinity coupled with follow-up sample analysis and interpretation. In addition to during the

comprehensive TWON trainings, a minimum of 30 well screening events will be delivered throughout the course of the project to provide wellhead protection information and recommendations for remediating well contamination, if appropriate. Screenings will be delivered by the SCSC Assistant Professor and Extension Specialist, TWON Coordinator and the SCSC Program Specialist, as appropriate.

Well screening event educational programming will include individual water sample analyses (as described below) for and by participants, as well as an overview of most of the topics discussed in detail during comprehensive TWON trainings. Well screening events will be scheduled for areas with water segments not listed as impaired for bacteria and where County Extension Agents anticipate that greater attendance will result from short and extremely focused events not lasting more than two hours. In areas where water bodies are listed as impaired for bacteria, by WPP work group or TSSWCB request, or where residents are experiencing a high frequency of well-related issues, the project will encourage scheduling of more comprehensive, 6-hour TWON trainings, which will cover topics listed above in greater detail and also will include individual water analyses/well screening. For both well screening and TWON events, participants will arrive with private well water samples, collected using SWFTL water collection procedures (<http://soiltesting.tamu.edu/files/waterweb1.pdf>), which they will personally test and screen, under the supervision of the workshop coordinator, for fecal coliform bacteria, nitrate and salinity concentrations. Most participants will be personally responsible for the cost of their water sample screening analysis (approximately \$5/sample), but for underserved and student audiences, and by individual request through the County Extension Agent, costs of analyses will be underwritten by the project through the purchase of necessary supplies. Participants will develop their own screening results and for those with positive results, remediation instructions and/or a recommendation and instructions will be given for sending follow-up samples to an accredited NELAC laboratory to perform drinking water analyses. During most of the trainings, results of bacterial screenings will not be available before the training is completed. Bacterial screening results and as appropriate, remediation instructions or recommendation for additional testing will be mailed to the participants, which allows participants to receive bacterial screening results privately. As a result of the training, participants will more clearly understand the relationships between practices in or near the well and the quality of water available for drinking and irrigation by their families and by other families pumping from the same formation.

Finally, in order to increase delivery of the educational materials to a greater audience, the educational materials will be transformed into an online format that is more readily available to the public.

An evaluation approach will be used to measure both knowledge and behavior changes of individuals participating in the program. A pre-test/post-test evaluation strategy will be implemented at the beginning and end of the training program. The pre-test will ask knowledge-based questions and the post-test will measure knowledge change of participants. In addition, the post-test will include 'intentions to change' questions that will focus on behaviors that participants should adopt based on what they have learned.

A six month follow-up survey instrument will also be administered to participants via online survey technology. Emails will be sent to program participants to ascertain what practices were truly adopted sixth months after the program. For those individuals that do not have email, traditional mailing techniques will be used to collect these data.

Tasks, Objectives and Schedules						
Task 1:	Project Administration					
Costs:	Federal:	\$24,732	Non-Federal:	\$18,154	Total:	\$42,886
Objective:	To effectively administer, coordinate and monitor all work performed under this project including technical and financial supervision and preparation of status reports.					
Subtask 1.1:	TWRI will prepare electronic quarterly progress reports (QPRs) for submission to the TSSWCB. QPRs shall document all activities performed within a quarter and shall be submitted by the 15 <sup>th</sup> of January, April, July and October. QPRs shall be posted to the project website and distributed to all project partners.					
	Start Date:	Month 1		Completion Date:	Month 36	
Subtask 1.2:	TWRI will perform accounting functions for project funds and will submit appropriate Reimbursement Forms to TSSWCB at least quarterly.					
	Start Date:	Month 1		Completion Date:	Month 36	
Subtask 1.3:	TWRI will host coordination meetings, conference calls, or TTVN meetings, as appropriate, with project partners in order to efficiently and effectively achieve project goals, coordinate efforts and summarize activities and achievements made throughout the course of this project. TWRI will develop lists of action items needed following each project coordination meeting and distribute to project personnel.					
	Start Date:	Month 1		Completion Date:	Month 36	
Subtask 1.4:	TWRI and SCSC will attend and participate in the Texas Groundwater Protection Committee and subcommittee meetings, Texas Alliance of Groundwater Districts conferences, and other meetings as appropriate in order to communicate project goals, activities and achievements accomplishments to affected parties.					
	Start Date:	Month 1		Completion Date:	Month 36	
Subtask 1.5:	TWRI in collaboration with SCSC, will create (Months 1-3), host and maintain (Months 4-36) a website to serve as a clearinghouse for TWON information and resources including updated and renamed, web-adapted Tex*A*Syst educational materials and online delivery of TWON.					
	Start Date:	Month 1		Completion Date:	Month 36	
Subtask 1.6:	TWRI and SCSC will develop a project final report.					
	Start Date:	Month 33		Completion Date:	Month 36	
Deliverables	<ul style="list-style-type: none"> <li>• Quarterly progress reports in electronic format</li> <li>• Reimbursement Forms and necessary documentation in hard copy format</li> <li>• Lists of action items from project coordination meetings</li> <li>• Number of unique visitors to TWON website</li> <li>• Final Report summarizing the results of the project</li> </ul>					

Tasks, Objectives and Schedules						
Task 2:	Development of TWON Educational Materials/Curriculum					
Costs:	Federal:	\$125,178	Non-Federal:	\$75,119	Total:	\$200,297
Objective:	Update and rename existing TEX*A*Syst materials and develop and adapt additional educational resources to create a science-based, community-responsive TWON education curriculum to train Texans regarding BMPs for protecting their wells, which will safeguard the health of landowners and their families, prevent contamination of underlying aquifers, and prevent off-site transport of contaminants to surface waters.					
Subtask 2.1:	SCSC will employ a TWON Coordinator to develop and deliver the TWON curriculum in selected watersheds.					
	Start Date:	Month 1		Completion Date:	Month 6	
Subtask 2.2:	<p>Update and rename existing TEX*A*Syst documents to reflect changes/improvements in laws and regulations and private well management, maintenance and protection. Revisions will be developed by the TWON Coordinator, with significant assistance from Project Co-Leads and the BAEN Program Specialist. Updated publications will include:</p> <ul style="list-style-type: none"> <li>• Improving Wellhead Management and Conditions</li> <li>• Improving Pesticide Storage and Handling</li> <li>• Improving Fertilizer Storage and Handling</li> <li>• Improving Petroleum Product Storage</li> <li>• Improving Hazardous Waste Management</li> <li>• Improving Household Wastewater Treatment</li> <li>• Improving Livestock Manure Storage and Treatment Facilities and Holding Pen Management</li> </ul> <p>All documents, educational materials, etc. will be provided to the TSSWCB for review and comment prior to dissemination.</p>					
	Start Date:	Month 6		Completion Date:	Month 18	
Subtask 2.3:	<p>Develop and adapt additional educational resources to create a TWON curriculum. Resources will be developed by the TWON Coordinator, with significant assistance from Project Co-Leads and the BAEN Program Specialist. Specific components or modules of the curriculum include:</p> <ul style="list-style-type: none"> <li>• Watershed and groundwater hydrology and the importance to neighbors and the public of safeguarding aquifer integrity and groundwater quality</li> <li>• Proper siting of drinking water wells and avoiding improper well construction techniques</li> <li>• Proper maintenance and protection of the wellhead</li> <li>• Solid and hazardous household waste management</li> <li>• Aging and failure of wells</li> <li>• Locating and properly plugging abandoned wells</li> <li>• Improperly sited and functioning on-site wastewater treatment systems</li> <li>• Maintenance, aging and failure of on-site wastewater treatment systems</li> <li>• Effects of land use changes on well water quality</li> <li>• Successful methods of sharing TWON information with neighbors and community.</li> </ul> <p>TWON curriculum will include a handbook for participants, standardized presentations for program delivery and availability of program materials online.</p> <p>All documents, educational materials, etc. will be provided to the TSSWCB for review and comment prior to dissemination.</p>					
	Start Date:	Month 6		Completion Date:	Month 18	
Deliverables	<ul style="list-style-type: none"> <li>• Updated and renamed TEX*A*Syst materials (including online formats)</li> <li>• TWON curriculum (handbook, presentations and online availability)</li> </ul>					

Tasks, Objectives and Schedules						
Task 3:	Deliver updated and renamed TEX*A*Syst Publications, Well Water Screenings, and TWON trainings					
Costs:	Federal:	\$282,762	Non-Federal:	\$186,413	Total:	\$469,175
Objective:	Deliver updated and renamed TEX*A*Syst publications, well water screenings, and 6-hour TWON trainings in watersheds with WPPs, TMDLs and priority aquifers.					
Subtask 3.1:	SCSC will develop a preliminary list of watersheds where the Well Water Screenings and TWON trainings will be delivered. SCSC will work with the TSSWCB and other state and local organizations to select locations for these training events. SCSC will coordinate efforts with state agencies and organizations already involved in WPP/TMDL processes or who are planning future WPP/TMDL processes in specific watersheds.					
	Start Date:	Month 6		Completion Date:	Month 36	
Subtask 3.2:	SCSC with assistance from TWRI will develop and disseminate informational materials in order to actively market well water screenings and TWON trainings including news releases, internet postings, newsletter announcements, public/conference presentations, flyers, etc. As appropriate TWRI will include information on the project in the <i>txH<sub>2</sub>O</i> , <i>Conservation Matters</i> e-letter, and <i>AgriLife</i> news. All announcements, letters, and publications will be provided to the TSSWCB for review and comment prior to dissemination.					
	Start Date:	Month 12		Completion Date:	Month 36	
Subtask 3.3:	Deliver 6-hour TWON trainings in selected watersheds, with the minimum goal being 6 trainings in year 2, and 8 trainings in year 3 to increase local understanding of the factors which can adversely impact well water quality and provide access to the knowledge and tools which can be employed to prevent and/or resolve them. Trainings will be delivered by the TWON Coordinator, and a combination of the BAEN and SCSC Program Specialists and the SCSC Assistant Professor and Extension Specialist.					
	Start Date:	Month 13		Completion Date:	Month 36	
Subtask 3.4:	Deliver well screening events to provide well-head protection information and recommendations for remediating well contamination, if appropriate. Screenings will be delivered by the SCSC Assistant Professor and Extension Specialist, TWON Coordinator and/or the SCSC Program Specialist as appropriate. A minimum of 30 well screening events will be delivered throughout the course of the project. Well screening event educational programming will include an overview of the topics discussed in more detail during comprehensive TWON trainings. Well screening events will be conducted in conjunction with TWON trainings as well as other Texas A&M AgriLife Extension programs.					
	Start Date:	Month 13		Completion Date:	Month 36	
Deliverables	<ul style="list-style-type: none"> <li>• List of program delivery watersheds selected in cooperation with TSSWCB, updated as needed</li> <li>• Delivery of 14 TWON trainings</li> <li>• Delivery of at least 30 well water screening events</li> <li>• Meeting notices, materials, agendas and attendance lists for TWON trainings and well screening events</li> <li>• Press releases, newspaper articles, newsletters and other public information, as developed and disseminated</li> </ul>					

<b>Tasks, Objectives and Schedules</b>						
Task 4:	Evaluate the effectiveness of the TWON trainings					
Costs:	Federal:	\$41,955	Non-Federal:	\$32,610	Total:	\$74,565
Objective:	To measure both knowledge and behavior changes of individuals participating in the program.					
Subtask 4.1:	SCSC will develop and deliver pre-test/post-test evaluation strategy to evaluate increased knowledge by individuals participating in the TWON trainings regarding program principles, appropriate BMPs, and other activities; to address proper private well management, to evaluate participant satisfaction with the program; and to evaluate participant's intentions to change their behavior as a result of the TWON training.					
	Start Date:	Month 6		Completion Date:	Month 36	
Subtask 4.2:	SCSC will develop and deliver 6 month follow-up survey via online techniques to assess behavior changes adopted and other activities (such as number of neighbors contacted) by TWON training participants.					
	Start Date:	Month 13		Completion Date:	Month 36	
Subtask 4.3:	SCSC will analyze results obtained from the pre-test/post-test and 6 month follow-up evaluations using descriptive, correlational, and analysis of variances statistical procedures.					
	Start Date:	Month 15		Completion Date:	Month 36	
Subtask 4.4:	SCSC will modify educational program and materials as appropriate.					
	Start Date:	Month 30		Completion Date:	Month 36	
Deliverables	<ul style="list-style-type: none"> <li>• Pre-test/post-test evaluation for TWON training.</li> <li>• Follow-up survey assessments for TWON training.</li> <li>• Results from evaluation approach</li> </ul>					

<b>Project Goals (Expand from NPS Summary Page)</b>
To improve and protect both well water and surface water quality by improving water quality awareness and knowledge of BMPs for protecting and improving water quality. This will be achieved by (1) development of TWON educational materials as well as updated and renamed TEX*A*Syst materials; (2) delivery of TWON educational materials and trainings and well water screening events; and (3) evaluation and assessment of the program so that needed modifications and improvements can be made.

**Measures of Success (Expand from NPS Summary Page)**

- Increase well owner water quality awareness and knowledge of BMPs through:
  - Distribution of updated and renamed TEX\*A\*Syst and TWON publications via the internet, TWON trainings, and other events
  - Delivery of 14 TWON trainings in selected watersheds
  - Delivery of at least 30 well water screening events
- Measure impact of program delivery through:
  - Numbers of citizens participating in TWON trainings, water well screening events, and unique visitors to website
  - Increased knowledge and understanding of individuals participating in the program, as measured by surveys and pre/post evaluations

**2005 Texas Nonpoint Source Management Program Reference (Expand from NPS Summary Page)**

**Goals and/or Milestone(s)**

Element 1: Explicit short- and long-term goals, objectives ... that protect surface and groundwater.

**Long-Term Goals**

LTG 2: Support the implementation of state, regional and local programs to prevent NPS pollution through assessment, implementation and education.

LTG 4: Support the implementation of state, regional and local programs to reduce NPS pollution...

LTG 6: Increase overall public awareness of NPS issues and prevention activities

LTG 7: Enhance public participation and outreach by providing forums for citizens and industry to contribute their ideas and concerns about the water quality management process

**Short-Term Goals**

STG 1: Data collection and assessment: coordinate with appropriate federal, state, regional and local entities, ..., citizen groups and target CWA §319(h) grant funds towards water quality assessment activities in high priority NPS impacted watersheds, vulnerable and impacted aquifers, ...

- Objective A: Identify surface water bodies and aquifers from the *TWQI and 303(d) List and Joint Groundwater Report* that need additional information to characterize non-attainment of designated uses and quality standards....

STG 3: Education: conduct education and technology transfer activities to help increase awareness of NPS pollution and prevent activities contributing to the degradation of water bodies, including aquifers, by NPS pollution

- Objective A: Enhance existing outreach programs at the state, regional and local levels to maximize the effectiveness of NPS education

- Objective B: Administer programs to educate citizens about water quality and their potential role in causing NPS pollution

- Objective E: Implement outreach activities identified in the *Texas Groundwater Protection Strategy* to prevent NPS impacts to groundwater

Element 2: Working partnerships and linkages to appropriate state, ..., regional and local entities, private sector groups and Federal agencies.

Element 3: Balanced approach that emphasizes both state-wide nonpoint source programs and on-the-ground management of individual watersheds.

Element 4: Abatement of water quality impairments from nonpoint source pollution and prevention of significant threats to water quality from present and future nonpoint source activities.

**Part III – Financial Information**

<b>Budget Summary</b>			
Federal	\$474,627	% of total project	60%
Non-Federal	\$312,296	% of total project (at least 40%)	40%
Total	\$786,923	Total	100%
Category	Federal	Non-Federal	Total
Personnel & Fringe Benefits	\$344,221	\$205,073	\$549,294
Travel	\$31,258	\$0	\$31,258
Equipment	\$0	\$0	\$0
Supplies	\$15,875	\$0	\$15,875
Contractual	\$0	\$0	\$0
Construction	\$0	\$0	\$0
Other	\$21,365	\$6,750	\$28,115
Total Direct Costs	\$412,719	\$211,823	\$624,542
Indirect Costs (≤15%)	\$61,908	\$55,074	\$116,982
Unrecovered IDC	\$0	\$45,399	45,399
Total Project Costs	\$474,627	\$312,296	\$786,923

The TSSWCB CWA §319(h) Nonpoint Source Grant Program has a 60/40% match requirement. The cooperating entity will be reimbursed 60% from federal funds and must contribute a minimum of 40% of the total costs to conduct the project. The 40% match must be from non-federal sources and should be described in the budget justification. Reimbursable indirect costs are limited to 15% of total federal direct costs. The project budget generally covers a three year period.

<b>Budget Justification (Federal)</b>		
Category	Total Amount	Justification
Personnel & Fringe Benefits	\$344,221	<ul style="list-style-type: none"> <li>○ TWRI Project Manager @ 10% effort               <ul style="list-style-type: none"> <li>▪ Plus fringe benefits 17.7% plus group health of \$591/month</li> </ul> </li> <li>○ TWRI IT Associate @ 5% effort               <ul style="list-style-type: none"> <li>▪ Plus fringe benefits 17.7% plus group health of \$591/month</li> </ul> </li> <li>○ BAEN Program Specialist @ 21% effort               <ul style="list-style-type: none"> <li>▪ Plus fringe benefits 17.7% plus group health of \$591/month</li> </ul> </li> <li>○ SCSC Program Specialist I @ 33% effort               <ul style="list-style-type: none"> <li>▪ Plus fringe benefits 17.7% plus group health of \$591/month</li> </ul> </li> <li>○ TWON Coordinator @ 100% effort               <ul style="list-style-type: none"> <li>▪ Plus fringe benefits 17.7% plus group health of \$591/month</li> </ul> </li> </ul>
Travel	\$31,258	<ul style="list-style-type: none"> <li>○ TWRI Travel @ \$200/yr to participate in program delivery</li> <li>○ BAEN Travel @ \$500 in yr 1 &amp; \$1,200/yr in yrs. 2-4 to deliver TWON training and well screening</li> <li>○ SCSC Ext. Water Resource Spec. @ \$2,500 in yr 1, \$5,000 in yr 2, \$5,357 in yr 3 &amp; \$1,000 in year 4 to deliver TWON trainings and to present program results at a National Water Quality conference</li> <li>○ SCSC Program Specialist I @ \$1,100/yr in yrs 1&amp;2, \$3,500 in yr 3 &amp; \$1,000 in yr 4 to deliver TWON training and well screening</li> <li>○ TWON Coordinator @ \$500 in yr 1 &amp; \$1,767 in yrs 2-4 to present information at TWON trainings and well screening events in yrs 2, 3 &amp; 4</li> </ul>
Equipment	\$0	N/A
Supplies	\$15,875	<p>SCSC Supplies: desktop computer for publication development \$1,100 in yr 1          laptop computer for program delivery \$1,100 in yr 1          water sample analysis devices &amp; supplies \$1,000 in yr 1          water sample analysis supplies \$800/yr in yrs 2, 3 &amp; 4          map development \$500 in yrs 1-3          other project/training misc. supplies \$8,445</p> <p>BAEN Supplies: supplies for educational props development and maintenance \$110 in yrs 2-4</p>
Contractual	\$0	N/A
Construction	\$0	N/A
Other	\$21,365	Publications @ \$5,000 in yr 1 & 2, and \$4,116.50 in yrs 3 & 4 PhD Student Tuition and Fees for the additional well screenings - \$3,132
Indirect	\$61,908	15% of Total Direct Federal

<b>Budget Justification (Non-Federal)</b>		
Category	Total Amount	Justification
Personnel & Fringe Benefits	\$205,073	<ul style="list-style-type: none"> <li>○ TWRI Project Manager @ 4% effort               <ul style="list-style-type: none"> <li>○ Plus fringe benefits 17.7% plus group health of \$591/month</li> </ul> </li> <li>○ TWRI Acting Director @ 3% effort               <ul style="list-style-type: none"> <li>○ Plus fringe benefits 17.7% plus group health of \$591/month</li> </ul> </li> <li>○ BAEN Assoc. Dept. Head @ 5% effort               <ul style="list-style-type: none"> <li>○ Plus fringe benefits 17.7% plus group health of \$591/month</li> </ul> </li> <li>○ SCSC Extension Water Resource Spec. @ 50% effort               <ul style="list-style-type: none"> <li>○ Plus fringe benefits 17.7% plus group health of \$591/month</li> </ul> </li> </ul>
Travel	\$0	N/A
Equipment	\$0	N/A

Supplies	\$0	N/A
Contractual	\$0	N/A
Construction	\$0	N/A
Other	\$6,750	Water Well Screening @ \$2,250/yr (\$5/sample * 45/training * 10 trainings/yr)
Indirect	\$55,074	26% of Total Direct Non-Federal Costs
Unrecovered IDC	\$45,399	11% of Total Direct Federal