Texas State Soil and Water Conservation Board
State Nonpoint Source Grant Program
FY 2017 Workplan 17-56

SUMMARY PAGE			
Title of Project	Continued Statewide Delivery of the Texas Well Owner Network		
Project Goals	• Continued statewide implementation of the Texas Well Owner Network (TWON) program through (1) "Well Educated" programs of 4-6 hours, and (2) "Well Informed" programs of 1-2 hours • Improve and protect well water and surface water quality by increasing awareness of water quality issues and knowledge of best management practices (BMPs) through improved private well management		
Project Tasks	(1) Project Administration; (2) Coordination and delivery of TWON Well Educated and Well Informed events, and (3) Evaluate the effectiveness of TWON trainings		
Measures of Success	• Increase well owner awareness of water quality issues and knowledge of BMPs through distribution of TWON publications and delivery of TWON Well Educated and Well Informed events • Deliver at least 9 TWON Well Educated (4- to 6-hour) events in selected watersheds • Deliver at least 10 TWON Well Informed (1- to 2-hour) events in selected watersheds • Measure impact of program delivery through participation in TWON events and increased knowledge and understanding of individuals participating in the program		
Project Type	Implementation ( ); Education (X); Planning ( ); Assessment ( ); Groundwater (X)		
Status of Waterbody on *2014 Texas Integrated Report*	Segment ID	Parameter of Impairment or Concern	Category
	0207	Bacteria	5b
	0612	Bacteria	5b
	0901	Bacteria, PCBs and Dioxin	5c, 5a, 5a
	1105	Bacteria	5c
	1103	Bacteria, Depressed DO	5a
	1804A	Bacteria	5c
	2311	Depressed DO	5c
	1209	Bacteria	5c
	1217D	Depressed DO	5c
	1221	Bacteria	5c
	1221A	Depressed DO, Bacteria	5b and 5b
		Bacteria	5b
	1221D	Bacteria	5c
	1221F	Bacteria	4a
	1901	Bacteria	5c
	1301	Bacteria	5b
	1302	Bacteria	5b
	1302A	Bacteria	5b
	1302B	Depressed DO	5c
		Bacteria	5c
	1202K	Bacteria	5c
	1908	Chloride	5c
		Bacteria	5b
	1245C	Bacteria	5b
	1245D	Bacteria	5b

	1245F	Bacteria	5b
	1245I	Bacteria and Depressed DO	5c and 5c
	1421	Impaired fish community	5c
	1911	Bacteria	5a
	1911B	Bacteria	5a
	1911C	Bacteria	5a
	1911D	Bacteria	5c
	1911E	Depressed DO	5c
	1911H	Bacteria	5c
	1911I	TDS	5c
	2102	Bacteria	5c
	2201 and 2202	Bacteria, Depressed DO, Dioxin, PCBs	5c, 5b, 5a, 5a
	2422B and D	Depressed DO, Impaired habitat	CS and CS
	1815		
Project Location (Statewide or Watershed and County)	Statewide with priorities for: Adams and Cows Bayous in Adams, Jasper and Newton Counties; **Attoyac Bayou** in Rusk, Nacogdoches, San Augustine, and Shelby Counties**;** **Arroyo Colorado** in Cameron and Willacy Counties; **Bastrop Bayou Watershed** in Brazoria County; **Buck Creek** in Donley, Collingsworth, and Childress Counties; **Dickinson Bayou** in Brazoria and Galveston Counties; **Cedar Bayou** in Chambers, Liberty and Harris Counties; **Concho River** in Irion, Runnels, Sterling, Coke, Reagan, Tom Green, Schleicher, and Concho Counties; **Cypress Creek** in Hays County; Dickinson Bayou in Brazoria and Galveston Counties; **Double Bayou** in Chambers County; **Geronimo Creek Watershed** in Guadalupe and Comal Counties; **Pecos River Watershed** in Texas in Crane, Crockett, Pecos, Reeves, Terrell, Upton, and Ward Counties**; Plum Creek Watershed** in Caldwell, Hays, and Travis Counties**; Lampasas River Watershed** in Bell, Burnet, Coryell, Hamilton, Lampasas, Mills, and Williamson Counties**; Leon River Watershed** below Proctor Lake in Comanche, Hamilton, Erath, , Mills and Bell Counties; **Navasota River** in Grimes, Leon, Robertson, Brazos, Madison and Limestone Counties; **Nueces River** below Lake Corpus Christi in Nueces, Jim Wells and San Patricio Counties; **Lower San Antonio River Watershed** in DeWitt, Goliad, Guadalupe, Karnes, Refugio, Victoria, and Wilson Counties**; Peach Creek** in Bastrop, Caldwell, Fayette, Gonzales and Counties; **San Bernard River Watershed** in Austin, Colorado, Wharton, Fort Bend, and Brazoria Counties; **Lake Granbury Watershed** in Hood, Parker, Palo Pinto, Ranger, Erath, and Jack Counties; **Gilleland Creek** in Travis County; **Lake Houston Area Watersheds** in Grimes, Harris, Liberty, Montgomery, San Jacinto, Walker, and Waller Counties; **Mill Creek** in Washington and Austin Counties; **Upper Cibolo Creek** in Kendall County; **Upper Llano River** watershed in Edwards, Kerr, Kimble, Menard, Real, and Sutton Counties; **Upper Oyster Creek** in Fort Bend County**; Upper San Antonio River** in Bexar County; **and any new watersheds identified for TMDL or WPP development.**		
Key Project Activities	Hire Staff ( ); Surface Water Quality Monitoring ( ); Technical Assistance ( ); Education (X); Implementation ( ); BMP Effectiveness Monitoring ( ); Demonstration ( ); Planning ( ); Modeling ( ); Bacterial Source Tracking ( ); Other ( )		
2012 Texas NPS Management Program Reference	• Component 1 – LTG Objectives 1, 2, 4, 7 • Component 1 – STGs 2C, 3A, 3B, 3D, 3E • Components 2, 3		
Project Costs	$146,362		
Project Management	• Texas Water Resources Institute • Texas A&M AgriLife Extension Service • Texas A&M AgriLife Research		
Project Period	October 1, 2016 – August 31, 2017		

Part I – Applicant Information

Applicant							
Project Lead	Dr. Kevin Wagner						
Title	Deputy Director						
Organization	Texas Water Resources Institute, Texas A&M AgriLife Research						
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Project Co-Lead	Dr. Diane E. Boellstorff						
Title	Associate Professor and Extension Water Resource Specialist						
Organization	Texas A&M AgriLife Extension Service, Department of Soil & Crop Sciences						
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Street Address	370 Olsen Blvd, 2474 TAMU						
City	College Station	County	Brazos	State	TX	Zip Code	77843-2474
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Project Co-Lead	Dr. Anish Jantrania						
Title	Associate Professor and Extension Specialist						
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City	Temple	County	Bell	State	TX	Zip Code	76502
Telephone Number	254.774.6014			Fax Number	254.774.6001		

Project Partners	
Names	Roles & Responsibilities
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, TCEQ and the Texas Groundwater Protection Committee.
Texas Water Resources Institute (TWRI), Texas A&M AgriLife Research	Project coordination and administration. Maintain the TWON website/educational material clearinghouse. Assist in development and distribution of TWON press releases and publications.
Texas A&M AgriLife Extension Service – Department of Soil and Crop Sciences (SCSC)	Project coordination with watershed coordinators, County Extension Agents and groundwater conservation districts; update and tailor educational materials and programs to local conditions; deliver programs; provide 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 developing supplemental TWON materials and delivering educational programs.
Texas Water Development Board (TWDB) 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 accomplishments to affected parties.

Part II – Project Information

Project Type							
Surface Water	X	Groundwater	X				
Does the project implement recommendations made in (a) a completed WPP, (b) an adopted TMDL, (c) an approved I-Plan, (d) a Comprehensive Conservation and Management Plan developed under CWA §320, (e) the *Texas Coastal NPS Pollution Control Program*, or (f) the *Texas Groundwater Protection Strategy*?				Yes	X	No	
If yes, identify the document.	Attoyac Bayou Watershed Protection Plan; Buck Creek Watershed Protection Plan; A Watershed Protection Plan for the Arroyo Colorado Phase I; Buck Creek Watershed Protection Plan; Cedar Bayou Watershed Protection Plan; Concho River Watershed Protection Plan; Cypress Creek Watershed Protection Plan; Eight Total Maximum Daily Loads for Indicator Bacteria in Dickinson Bayou and Three Tidal Tributaries; Double Bayou Watershed Protection Plan; Geronimo Creek and Alligator Creeks Watershed Protection Plan; Fifteen TMDLs for Indicator Bacteria in Watersheds of the Lake Houston Area; Lake Granbury Watershed Protection Plan Implementation; Lampasas River Watershed Protection Plan; Implementation Plan for One Total Maximum Daily Load for Bacteria in Gilleland Creek; Leon River Watershed Protection Plan; Lower Nueces River Watershed Protection Plan; One Total Maximum Daily Load for Bacteria in the Lower San Antonio River; One Total Maximum Daily Load for Bacteria in Peach Creek; Mill Creek Watershed Protection Plan; Plum Creek Watershed Protection Plan; Upper Cibolo Creek Watershed Protection Plan; Upper San Antonio River Watershed Protection Plan; San Bernard River Watershed Protection Plan; One TMDL for Bacteria in Upper Oyster Creek						
If yes, identify the agency/group that developed and/or approved the document.	Attoyac Bayou Watershed Partnership facilitated by TWRI and TSSWCB;		Year Developed	2014			
	Arroyo Colorado Watershed Partnership facilitated by Texas Sea Grant, TCEQ and the U.S. EPA			2007			
	Bastrop Bayou Stakeholder Group facilitated by Houston-Galveston Area Council, Galveston Bay Estuary Program and TCEQ; University of Houston, and CDM;			2011			
	Buck Creek Watershed Protection Plan facilitated by TWRI and TSSWCB;			2014			
	Cedar Bayou Watershed Partnership facilitated by the H-GAC, Galveston Bay Estuary Program, TSSWCB, and U.S. EPA			2016			
	Concho River Watershed Advisory Committee facilitated by the Upper Colorado River Authority, TSSWCB, U.S. EPA, and Texas Institute for Applied Environmental Research;			2011			

	Cypress Creek WPP facilitated by The Meadows Center, TCEQ, Texas A&M AgriLife Extension, City of Wimberley, Blue Hole, Hays Trinity Groundwater Conservation District, U.S. EPA, Hays County, Texas Clean Rivers Program, City of Woodcreek, Texas Water Development Board, TSSWCB, Guadalupe-Blanco River Authority (GBRA), and the Wimberley Valley Watershed Association;		2015
	Eight Total Maximum Daily Loads for Indicator Bacteria in Dickinson Bayou and Three Tidal Tributaries; facilitated by TCEQ		2012
	Double Bayou Watershed Partnership facilitated by Galveston Bay Estuary Program, TCEQ, TSSWCB, Houston Advanced Research Center, U.S. Geologic Survey, and Shead Conservation Solutions		2016
	Geronimo Creek Watershed Partnership facilitated by Texas A&M AgriLife Extension Service and TSSWCB;		2012
	One Total Maximum Daily Load for Bacteria in the Lower San Antonio River; facilitated by TCEQ		2008
	One Total Maximum Daily Load for Bacteria in Peach Creek; facilitated by TCEQ		2008
	Landowners and entities in the Pecos River watershed, facilitated by AgriLife Extension, TWRI and TSSWCB;		2008
	Plum Creek Watershed Partnership and facilitated by Texas AgriLife Extension Service and TSSWCB;		2008; 2014
	Lampasas River Watershed Partnership facilitated by Texas A&M AgriLife Research and TSSWCB;		2012
	Landowners and entities in the Leon River watershed, facilitated by Brazos River Authority and TSSWCB;		2012
	Nueces River Watershed Partnership facilitated by the Nueces River Authority		2016

	and TSSWCB Landowners and entities in the San Bernard River watershed, facilitated by the Houston-Galveston Area Council and TCEQ; The Lake Granbury Watershed Protection Plan Stakeholders Committee facilitated by the Brazos River Authority and TCEQ; Mill Creek Watershed Partnership facilitated by Texas A&M AgriLife Extension Service and the TSSWCB; Upper Cibolo Creek Watershed Partnership facilitated by the City of Boerne, Texas landowners and entities in the Upper Cibolo Creek watershed and the TCEQ; One TMDL for Bacteria in Upper Oyster Creek prepared by the TCEQ; Upper San Antonio River Watershed Partnership facilitated by Texas A&M AgriLife Research, San Antonio River Authority, and the TCEQ		2013 2011 2015 2013 2007 2007; ongoing

Watershed Information				
Watershed or Aquifer Name(s)	Hydrologic Unit Code (12 Digit)	Segment ID	Category on 2012 IR	Size (Acres)
Adams and Cow Bayous	120100051100, 120100051001, 120100051002, 120100051003, 120100051004, 120100051005	0508, 0508A, 0508B, 0508C, 0511, 0511A, 0511B, 0511C, 0511E	4a	160,000
Arroyo Colorado (Lower, Middle and Upper)	121102080700, 121102080600, 121102080100	2201 and 2202	5c	1,169,920
Attoyac Bayou	120200050301 – 120200050307, 120200050401 – 120200050406,	0612	5b	354,629
Bastrop Bayou Tidal	120402050400	1105	5c	138,880
Buck Creek	111201050204, 111201050208, 111201050303, 111201050305 – 111201050307,	0207	5b	184,960

	111201050401 – 111201050407, 111201050501 – 111201050502			
Cedar Bayou Tidal	120402030101, 120402030102, 120402030103, 120402030104, 120402030105, 120402030106	0901	5c	92,800
Concho River	120800041104 120800070204 120901010206 120901020101 120901020103 120901020201- 120901020205 120901020306 120901020501 120901020505- 120901020509 120901030402- 120901030404 120901030504 120901030601- 120901030602 120901030701- 120901030706 120901030801- 120901030804 120901030901- 120901030909 120901031001- 120901031006 120901031101- 120901031105 120901040101 120901040102 120901040104 120901040106 120901040107 120901040203 120901040204 120901040301- 120901040303 120901040305 120901040401 120901040403 120901040404 120901040406- 120901040408 120901040502-	1421	5c	4,200,000

	120901040505 120901040508- 120901040510 120901050101- 120901050107 120901050201- 120901050207 120901050301 120901050302 120901050304- 120901050308 120901050401- 120901050407 120901040103 120901040105 120901040108 120901040205- 120901040207 120901040304 120901040306 120901040402 120901040405 120901040501 120901040506 120901040507 120901020102 120901020302- 120901020305 120901020401- 120901020408 120901020502- 120901020504 120901090102 120901090103 120901090104			
Cypress Creek	121002030202	1815	SI	24,328
Dickinson Bayou	120402040200	1103	5a	63,287
Double Bayou	120402020100	2422B 2422D	5c 5c	89,325
Geronimo Creek (including its tributary, Alligator Creek)	121002020110, 121002020111	1804A	5c	44,152
Gilleland Creek	120903010106	1428C	4a	52,866
Lake O' The Pines	111403050401, 111403050402, 111403050403, 111403050404, 111403050405, 111403050406, 111403050407, 111403060101	0403		
Spring Creek	120401020201, 120401020205,	1008	5c, 5c	

	120401020209, 120401020212, 120401020213			100,148
Spring Branch	120401030101, 120401030102, 120401030104, 120401030105, 120401030110	1010C	5c	114,773
Mill Creek	1207010402	1202K	5c	256,000
North and South Llano River	12090202, 12090203	1415_05, 1415_06	1	605,622 604,228
Navasota River	120701030201-204; 0307, 0309; 0401-0407; 0501-0510; 0601-0604; 0701-0707; 0801-0804	1209	5b	1,002,056
Plum Creek	110901050702, 110901050703, 111002030102, 111301050208, 111302090204, 120100040204, 120301010104, 120500030306, 120601020401, 120702010804, 120702010805, 120800020403, 121002030401 – 121002030403	1810	4b	288,240
Lampasas River (Lampasas River above Stillhouse Hollow Lake, Rocky Creek, Sulphur Creek, Simms Creek)	120702030101 – 120702030509	1217 1217A 1217B 1217C 1217D	5c 5b 2 2 5c	839,800
Leon River below Proctor Lake	120702010501 – 120702010509, 120702010601 – 120702010605, 120702010701 – 120702010705, 120702010801 – 120702010806, 120702010901 – 120702010908, 120702011002	1221	5c	871,488
Lower Nueces River	121101110701, 121101110705	2102	5c	116,862
Lower San Antonio River	121003030202, 121003030205, 121003030206,	1901	4a	776,863

	121003030403, 121003030404, 121003030501, 121003030503, 121003030505, 121003030604 – 121003030608, 121003040405			
San Bernard River	120904010101, 120904010102, 120904010104, 120904010109, 120904010205, 120904010207, 120904010302, 120904010304 – 120904010306, 120904010308	1301 1302 1302A 1302B	5c 5a 5c 5c	672,000
Lake Granbury	120602010601 – 0608, 120602010701 – 0706, 120602010801 – 120602010809, 120602010901 – 120602010907, 120602011001 – 120602011004, 120602011101 – 120602011110, 120602011201 – 120602011208	1205	2	1,335,138
Upper Cibolo Creek	1210030402	1908	5c	49,210
Upper Oyster Creek	120402050100, 120402050200, 120701040403	1245C 1245D 1245F 1245I	5b	65,649
Upper San Antonio River (and Apache Creek, Alazan Creek, San Pedro Creek, Sixmile Creek, Picosa Creek, Martinez Creek)	1210030306	1911 1911B 1911C 1911D 1911E 1911H 1911I	5c 5a 5a 5a 5c 5c 5c	80,000

Water Quality Impairment

Describe all known causes (i.e., pollutants of concern) and sources (e.g., agricultural, silvicultural) of water quality impairments or concerns from any of the following sources: *2014 Texas Integrated Report,* Clean Rivers Program Basin Summary/Highlights Reports, or other documented sources.

This project will continue statewide implementation of the TWON program. Watersheds and aquifers will be selected in collaboration with the TSSWCB and with input from other interested groups including groundwater conservation districts (GCDs), County Extension Agents (CEAs), river authorities and Soil and Water Conservation Districts (SWCDs). Many of the watersheds and aquifers selected are described in the *Texas NPS Management Program* or identified as impaired in the *2012 Texas Integrated Report*.

The U.S. Geological Survey (USGS, DeSimone et al. 2009) 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 Level (MCL). A second finding was that total coliform bacteria were detected in 34% of sampled wells. The MCL goal for fecal coliform bacteria, including *Escherichia coli*, in drinking water is zero.

For 2003-2008, the TWDB 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 the region. 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 coliform bacteria.

Segment ID	Body Name	Impairment	Code
0207	Buck Creek (Lower Prairie Dog Town Fork)	Bacteria	5b
0508 and 0511	Adams and Cow Bayou	Bacteria, Depressed DO, pH	4a
0612	Attoyac Bayou	Bacteria	5b
0901	Cedar Bayou Tidal	Bacteria, PCBs, Dioxin	5c, 5a, 5a
1105	Bastrop Bayou Tidal	Bacteria	5c
1103	Dickinson Bayou	Bacteria, Depressed DO Dioxin, PCBs	5a and 5b 5a and 5a
1202K	Mill Creek	Bacteria	5c
1804A	Geronimo Creek	Bacteria	5c
2311	Upper Pecos River	Depressed DO	5c
1810	Plum Creek	Bacteria	4b
1209	Navasota River	Bacteria	5c
1217B	Sulphur Creek	Depressed DO	5c
1217D	North Fork Rocky Creek	Depressed DO	5b
1221	Leon River below Proctor Lake	Bacteria	5c
1221A	Resley Creek	Bacteria and Depressed DO	5b and 5b
1221D	Indian Creek	Bacteria	5b
1221F	Walnut Creek	Bacteria	5c
1901	Lower San Antonio River	Bacteria	4a
1301	San Bernard River Tidal	Bacteria	5c
1302	San Bernard River Above Tidal	Bacteria	5b
1302A	Gum Tree Branch	Bacteria	5b
1302B	West Bernard Creek	Bacteria and Depressed DO	5b and 5c
1421	Concho River	Bacteria and Depressed DO	5c and 5c
2102	Lower Nueces	TDS	5c
2201 and 2202	Arroyo Colorado	Bacteria	5c
2422B	Double Bayou West Fork	Bacteria, Depressed DO Dioxin, PCBs	5c and 5b 5a and 5a
2422D	Double Bayou East Fork	Bacteria, Dioxin, PCBs	5c, 5a, 5a

Water Quality Concerns			
0612	Attoyac Bayou	Bacteria	CN
0207	Buck Creek	Chlorophyll-a	CS
0207A	Buck Creek from OK state line to S of Hedley	Nitrate	CS
1804A	Geronimo Creek	Nitrate	CS
1217B	Sulphur Creek	Depressed DO	CS
1221	Leon River Below Proctor lake	Chlorophyll-a	CS
		Depressed DO	CS
1221A	Resley Creek	Chlorophyll-a	CS
		Nitrate	CS
		Bacteria	CN
		Orthophosphorus	CS
1221B	South Leon River	Depressed DO	CS
1221D	Indian Creek	Depressed DO	CN
		Nitrate	CS
		Orthophosphorus	CS
1205	Lake Granbury	Chlorophyll-a	CS
1901	Lower San Antonio River	Bacteria	CN
		Chlorophyll-a	CS
		Nitrate	CS
		Orthophosphorus	CS
		Total phosphorus	CS
2311	Upper Pecos River	Bacteria	CN
		Chlorophyll-a	CS
		Depressed DO	CS
		Golden alga	CN
1810	Plum Creek	Depressed DO	CS
		Nitrate	CS
		Orthophosphorus	CS
		Total phosphorus	CS
1301	San Bernard River Tidal	Chlorophyll-a	CS
1302	San Bernard River Above Tidal	Depressed DO	CS
1302A	Gum Tree Branch	Bacteria	CN
		Depressed DO	CS
1302B	West Bernard Creek	Depressed DO	CS
Special Interest			
0207A	Buck Creek	Bacteria	WAP
1205	Lake Granbury	Bacteria	WAP
1217	Lampasas River Above Stillhouse Hollow Lake	Bacteria	WAP
1415	Upper Llano	-	WAP
1815	Cypress Creek	Depressed DO, Impaired fish community, Impaired habitat, Impaired macrobenthic community	WAP

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 in the 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.

Management and protection of private water wells are under the control of the landowner, and therefore, depend primarily on education rather than regulation. To address the issues described above, which affect both surface water and groundwater, SCSC, BAEN and TWRI have developed TWON to deliver a science-based, community-responsive education curriculum. TWON focuses on protecting groundwater quality and aquifer integrity, and also complements the successful Texas Watershed Steward program by emphasizing the importance of implementing BMPs. The two most common private well pollutants, fecal coliform bacteria and nutrients, also are the most frequent cause of waterbody 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.

TWON provides training to Texans regarding water quality and BMPs for protecting their wells and surface waters, which averts off-site transport of contaminants (bacteria and nutrients) to surface waters, prevents contamination of underlying aquifers, and safeguards the health of landowners and their families. As a result, this program supports 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. This project builds upon and continues the impact of TSSWCB projects #10-04 and 13-08, "Preventing Water Quality Contamination Through the Texas Well Owner Network" and "Statewide Delivery of the Texas Well Owner Network." Project information is at twon.tamu.edu and a final report for the initial TWON project (10-04) is available at http://twri.tamu.edu/media/545634/tr-463.pdf

Project Narrative

General Project Description (Include Project Location Map)

This project will continue statewide implementation of the TWON program, which builds institutional and local capacity to improve and protect both well water and surface water quality by improving awareness of water quality issues and increasing knowledge of BMPs. The training includes methods for safeguarding well water quality for landowners and their families and others relying on the availability of high quality groundwater stored by aquifers. 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, TWON is an effective tool to bring to bear in WPP and TMDL implementation where investigations indicate bacterial and nutrient contributions. The program is delivered through (1) "Well Educated" programs of 4-6 hours, (2) "Well Informed" programs of 1-2 hours, and (3) evaluation of the program so that needed modifications and improvements can be made. Both versions of the program include opportunities for participants to have a water well sample screened for bacteria, nitrate and total dissolved solids (TDS). Program activities, deliverables, accounting and reporting will be managed by TWRI in cooperation with SCSC and BAEN.

TWON Water Well Events. A minimum of 10 TWON Well Informed and nine TWON Well Educated programs will be delivered throughout the project to provide wellhead protection information and recommendations for remediating well contamination, if appropriate. Educational materials such as the TWON Handbook, factsheets and PowerPoint modules developed through TSSWCB projects #10-04 and 13-08, "Preventing Water Quality Contamination Through the Texas Well Owner Network" and "Statewide Delivery of the Texas Well Owner Network," will be utilized. Trainings will be delivered by the TWON Coordinator, BAEN and/or SCSC Program Specialists and/or the SCSC Assistant Professor

and Extension Specialist, as appropriate. TWON educational programs are delivered in two forms: 1) Well Informed events will be scheduled for areas where the watershed coordinator or county Extension agent recommends short and extremely focused events not lasting more than two hours, and 2) Well Educated programs will usually be delivered in other areas for more comprehensive, specific topics through a 4 to 6 hour event.

TWON Educational Program Topics. The TWON education curriculum emphasizes BMPs for safeguarding private well water quality and aquifer integrity. The TWON curriculum and publications include the following topics:

- 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
- Proper household waste management
- 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
- Locating and properly plugging abandoned wells

Selection of Screening/Training Locations. SCSC will collaborate with the TSSWCB and other state and local organizations to select locations for TWON 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.

Well Water Analyses. For both TWON Well Educated and Well Informed events, participants will be encouraged to arrive with private well water samples, collected using the Soil, Water and Forage Testing Laboratory water collection procedures (http://soiltesting.tamu.edu/files/waterweb1.pdf). Samples will be screened for nitrate, salinity concentrations and arsenic for areas where these contaminants are of concern according to the *Texas NPS Management Program* Appendix D Groundwater Constituents of Concern Report. For participants 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.

Screening for *E. coli* bacteria will either be conducted on-site or at Texas A&M University by the SCSC Program Specialist or nearby NELAC-certified laboratory representatives will be available at the beginning of the program to accept samples for analyses at their laboratories or participants will be issued a discounted voucher to be taken to the nearest cooperating NELAC-certified lab. During most of the screenings, results of bacterial analyses will not be available before the training is completed. Bacterial screening results and as appropriate, remediation instructions or recommendations for additional testing will be emailed or mailed to the participants, which allows them to receive bacterial screening results privately. Participants who use the voucher provided during the longer 4- to 6-hour trainings to submit a sample for bacterial analyses to a NELAC-certified lab will have begun the recommended practice of testing their water annually for fecal-indicator bacteria. TWON will request participants' permission to receive copies of bacterial lab results so that appropriate remediation recommendations and materials may be forwarded to those with positive analyses.

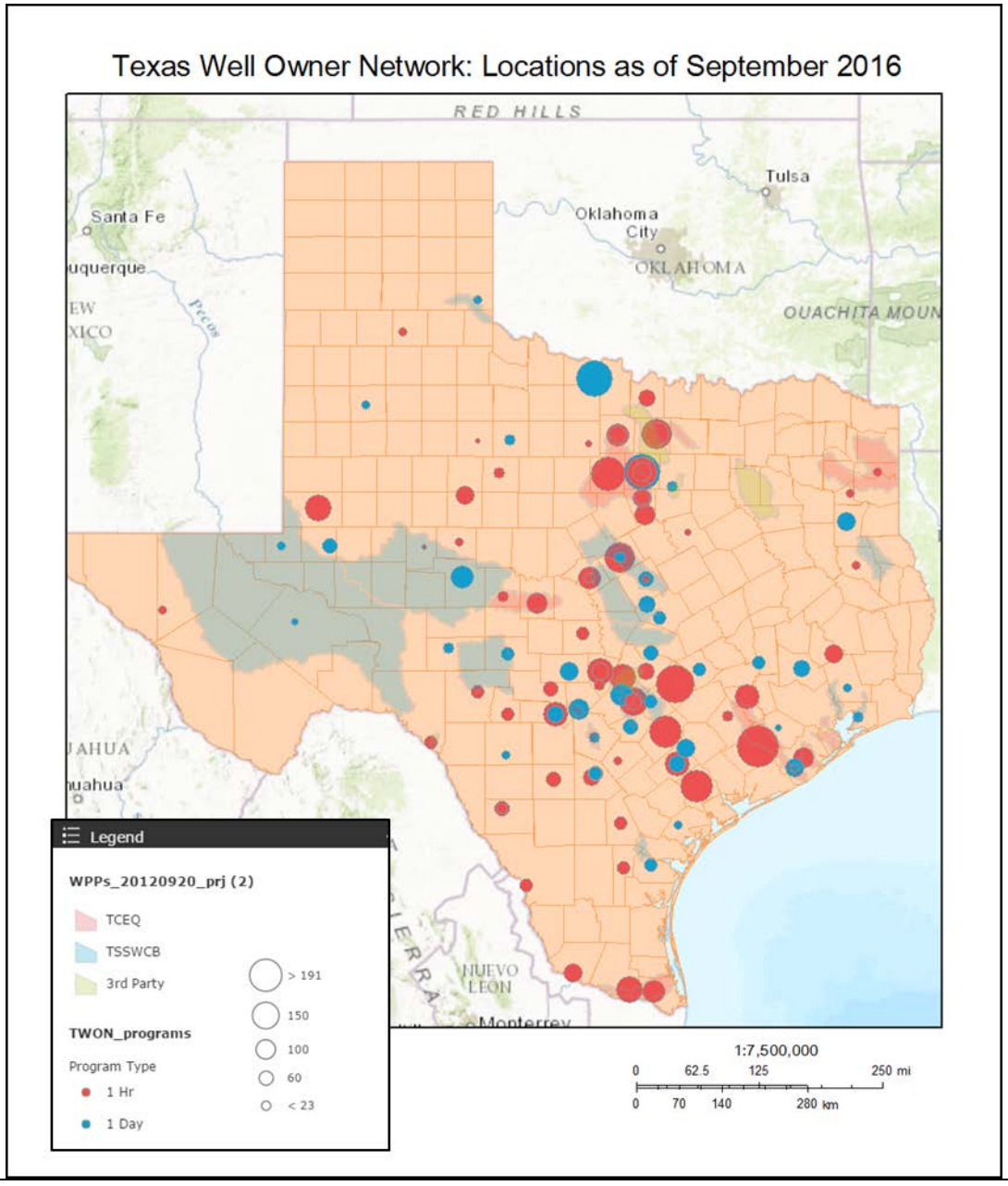
Most participants will be responsible for the cost of their water sample screening analysis (approximately $10-$20/sample depending on the laboratory or supplies used). Previous experience with private well water screenings has indicated that requiring a nominal fee improves attendance because the community perceives the program as being developed for all rather than targeting those with financial need. However, for underserved and student audiences, and by individual request through the CEA or watershed coordinator, costs of analyses will be underwritten by the project through the purchase of necessary supplies.

As a result of the training, participants will more clearly understand the relationships between practices in or near their well and the quality of water available for their families and other families pumping from the same formation. To

increase delivery of the educational materials to a greater audience, any new or updated TWON educational materials will continue to be posted online (http://twon.tamu.edu/fact-sheets/) as they are developed to make them readily available to the public.

Assessment. An evaluation approach that was developed through TSSWCB projects #10-04 and #13-08 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 each training event. 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 one year follow-up evaluation instrument will also be administered to participants via online technology. Emails will be sent to program participants to determine which practices were adopted one year after the program.



Tasks, Objectives and Schedules				
Task 1	Project Administration			
Costs	$7,318			
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 1st of March, June, September, and December. QPRs shall be distributed to all Project Partners.			
	Start Date	Month 3	Completion Date	Month 11
Subtask 1.2	TWRI will perform accounting functions for project funds and will submit appropriate Reimbursement Forms through SRS to TSSWCB at least quarterly.			
	Start Date	Month 1	Completion Date	Month 11
Subtask 1.3	TWRI will host coordination meetings or conference calls, at least quarterly, with Project Partners to discuss project activities, project schedule, communication needs, deliverables and other requirements. 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 11
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 accomplished to affected parties.			
	Start Date	Month 1	Completion Date	Month 11
Subtask 1.5	TWRI, in collaboration with SCSC, will maintain the TWON website (twon.tamu.edu) to serve as a clearinghouse for TWON information and resources. Unique visitors will be tracked through the website and reported in QPRs.			
	Start Date	Month 1	Completion Date	Month 11
Subtask 1.6	TWRI, in collaboration with SCSC, will develop a Final Report that summarizes activities completed and conclusions reached during the project and discuss the extent to which project goals and measures of success have been achieved.			
	Start Date	Month 33	Completion Date	Month 11
Deliverables	• QPRs in electronic format • Reimbursement Forms and necessary documentation in hard copy format • Final Report in electronic and hard copy formats			

Tasks, Objectives and Schedules				
Task 2	Coordination and delivery of TWON screenings and trainings			
Costs	$124,408			
Objective	Deliver TWON Well Informed 1- to 2-hour screenings and TWON Well Educated 4- to 6-hour trainings in priority watersheds and aquifers.			
Subtask 2.1	SCSC will continue to employ an Extension Program Specialist who will serve as the full-time TWON Program Coordinator and will be responsible for the general oversight and coordination of all project activities and for promoting, coordinating and/or delivering the TWON training events. SCSC will coordinate with the TSSWCB and other state and local organizations already involved in WPP/TMDL processes or who are planning future WPP/TMDL processes in specific watersheds to select locations for the TWON Well Educated and Well Informed events. SCSC and TSSWCB will periodically make collaborative decisions to re-prioritize and add/remove locations from the list.			
	Start Date	Month 1	Completion Date	Month 11

Subtask 2.2	SCSC with assistance from TWRI will develop and disseminate informational materials to actively market TWON events including news releases, internet and social media postings, newsletter announcements, public/conference presentations, flyers, etc. As appropriate, TWRI will include information on the project in the *txH2O*, *Conservation Matters* e-letter and *AgriLife Today*. All announcements, letters and publications will be provided to the TSSWCB for review and comment prior to dissemination.			
	Start Date	Month 1	Completion Date	Month 11
Subtask 2.3	Deliver 1- to 2-hour Well Informed events to provide well-head protection information and recommendations for remediating well contamination, if appropriate. Well Informed educational events will be delivered by the SCSC Assistant Professor and Extension Specialist, TWON Coordinator and/or the SCSC Program Specialist as appropriate. A minimum of ten Well Informed events will be delivered throughout the project. Events will include opportunity for participant water samples to be screened for fecal indicator bacteria, nitrate and TDS and an overview of the well management topics discussed in more detail during comprehensive TWON Well Educated Events.			
	Start Date	Month 1	Completion Date	Month 11
Subtask 2.4	Deliver 4- to 6-hour TWON Well Educated events in selected watersheds, with the minimum goal being nine events delivered throughout the course of the project to increase local understanding of the factors that can adversely impact well water quality, and provide information and tools to prevent and/or resolve them. Well Educated events will include a well water quality screening opportunity for participants. Well Educated events 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 1	Completion Date	Month 11
Deliverables	• List of program delivery watersheds selected in cooperation with TSSWCB, updated as needed • Delivery of at least nine 4- to 6-hour TWON Well Educated events • Delivery of at least ten 1- to 2-hour TWON Well Informed events • Meeting notices, materials, agendas and attendance lists for TWON events • Press releases, newspaper articles, newsletters and other public information, as developed and disseminated			

Tasks, Objectives and Schedules				
Task 3	Evaluate TWON effectiveness			
Costs	$14,636			
Objective	To measure both knowledge and behavior changes of individuals participating in the program			
Subtask 3.1	SCSC will administer pre-test and post-test evaluations to evaluate knowledge increases by individuals participating in TWON regarding program principles, appropriate BMPs addressing proper private well management, participant satisfaction with the program and attendees' intentions to change their behavior as a result of their participation.			
	Start Date	Month 1	Completion Date	Month 11
Subtask 3.2	SCSC will administer one year follow-up evaluations via online techniques to assess behavior changes adopted and other activities by TWON Well Educated participants.			
	Start Date	Month 1	Completion Date	Month 11
Subtask 3.3	SCSC will analyze results obtained from the pre-test/post-test and one-year follow-up evaluations using descriptive summary statistics.			
	Start Date	Month 3	Completion Date	Month 11
Subtask 3.4	SCSC will modify the educational program and materials as appropriate.			
	Start Date	Month 3	Completion Date	Month 11
Deliverables	• Pre-test/post-test evaluation results for TWON training • Follow-up evaluations for TWON training			

Project Goals (Expand from Summary Page)

This project will continue statewide implementation of the TWON through (1) Well Educated programs of 4 to 6 hours, and (2) Well Informed programs of 1 to 2 hours. The goals of the project are to improve and protect both groundwater and surface water quality by increasing awareness of water quality issues and knowledge of BMPs through improved private well management. Project goals will be achieved through (1) nine Well Educated programs, (2) 10 Well Informed programs, and (3) evaluation of the program to measure knowledge gained, BMPs adopted and to determine if modifications and improvements need to be made to the programs. Both versions of the program include opportunities for participants to have a water well sample screened for fecal indicator bacteria, nitrate and TDS. If water quality standards are exceeded, recommendations for determining contamination sources and resolving issues are provided.

Measures of Success (Expand from Summary Page)

Increase well owner awareness of water quality issues and knowledge of BMPs through:

- Distribution of TWON publications and delivery of TWON well screenings and trainings
- Delivery of at least nine 4 to 6-hour TWON Well Educated programs in selected watersheds
- Delivery of at least ten 1- to 2-hour Well Informed programs.

Measure impact of program delivery through:

- Numbers of citizens participating in TWON programs and unique visitors to website
- Increased knowledge and understanding of individuals participating in the program, as measured by pre-/post-tests and one-year follow-up evaluations
- Intention to adopt or adoption of recommended BMPs as indicated by pre-/post-tests and 6-month follow-up evaluations.

***2012 Texas NPS Management Program* Reference (Expand from Summary Page)**
Components, Goals, and Objectives
Component 1 – Explicit short- and long-term goals, objectives and strategies that protect surface and ground water. LTG: Protect and restore water quality affected by NPS pollution through assessment, implementation and education 1. Focus NPS abatement efforts …and available resources in watersheds and aquifers as identified as impacted by NPS pollution. 2. Support the implementation of state, regional, and local programs to prevent NPS pollution through assessment …and education. 4. Support the implementation of state, regional, and local programs to reduce NPS pollution to groundwater through the *Texas Groundwater Protection Strategy*, based on the potential for degradation with respect to use. 7. Increase overall public awareness of NPS issues and prevention activities. STG Two – Implementation: Implement TMDL I-Plans and/or WPPs and other state, regional and local plans/programs to reduce NPS pollution…potentially degraded with respect to use criteria by NPS pollution. • Objective C – Develop and implement BMPs to address NPS constituents of concern in aquifers identified as impacted by or vulnerable to NPS pollution. STG Three – Education: Conduct education and technology transfer activities to help increase awareness of NPS pollution and activities which contribute to the degradation of waterbodies, including aquifers, by NPS. • 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 D – Conduct outreach through the CRP, AgriLife Extension, SWCDs, and others to enable stakeholders and the public to participate in decision-making and provide a more complete understanding of water quality issues and how they relate to each citizen. Objective E – Implement outreach and education activities identified in the *Texas Groundwater Protection Strategy* to prevent NPS impacts to groundwater.
Component 2 - Working partnerships and linkages to appropriate State, interstate, Tribal, regional, and local entities, private sector groups, and Federal agencies.
Component 3 - Balanced approach that emphasizes both statewide NPS programs and on-the-ground management of individual watersheds.

EPA State Categorical Program Grants – Workplan Essential Elements ***FY 2011-2015 EPA Strategic Plan* Reference**
Strategic Plan Goal – Goal 2 Protecting America's Waters
Strategic Plan Objective – Objective 2.2 Protect and Restore Watersheds and Aquatic Ecosystems

Part III – Financial Information

Category	Total
Personnel	$ 4,354
Fringe Benefits	$ 1,412
Travel	$ 50
Equipment	$ 0
Supplies	$ 0
Contractual	$ 138,524
Construction	$ 0
Other	$ 1,000
Total Direct Costs	$ 145,340
Indirect Costs (≤ 15%)	$ 1,022
Total Project Costs	$ 146,362

Budget Justification – Lead: Texas Water Resources Institute		
Category	Total Amount	Justification
Personnel	$ 4,354	• TWRI Program Manager, $55,366 annually at 8.33% per year plus a 3% increase
Fringe Benefits	$ 1,412	• Fringe benefits for full-time faculty/staff are calculated at 17.8% of salaries and $695/month
Travel	$ 50	• TWRI travel includes mileage at the state rate for project meetings and mileage for travel to TGPC and other related meetings statewide. ($50)
Equipment	$ 0	• N/A
Supplies	$ 0	• N/A
Contractual*	$ 138,524	• Texas A&M AgriLife Extension Service
Construction	$ 0	• N/A
Other	$ 1,000	• Data Analysis Team website maintenance fees ($1,000)
Indirect	$ 1,022	• 15% of total direct costs. The subcontract to AgriLife Extension is internal, therefore, no IDC is charged on top of the subcontract costs.

Budget Justification (Federal) – Contractual: Texas A&M AgriLife Extension Service		
Category	Total Amount	Justification
Personnel	$ 87,386	• SCSC TWON Coordinator, $68,322 annually at 100% • SCSC Extension Program Specialist, $56,051 annually at 25% • BAEN Extension Program Specialist, $51,100 annually at 20% * salaries include a 3% increase
Fringe Benefits	$ 26,640	• Fringe benefits for full-time faculty/staff are calculated at 17.8% of salaries and $695/month
Travel	$ 4,000	• SCSC Extension Water Resource Specialist, Extension Program Specialist and TWON Coordinator travel for TWON Well Educated trainings, TWON Well Informed screenings and related meetings statewide includes mileage at the state rate. Lodging and per diem are also included at the state rate for the locations when an overnight stay is necessary due to distance and associated Concur travel system usage fees. Funds may also be for specialist and program specialists to disseminate information regarding the successful delivery of the TWON program at national, international and state conferences such as the SWCD Directors annual conference. ($3,000): o a minimum of nine TWON Well Educated locations/year x 1 night x 3 individuals (program specialists and other Extension personnel necessary for support of training events) x $129 per night + mileage at the state rate for trips ranging from 100-500 miles roundtrip o a minimum of 10 TWON Well Informed locations/year x 2 nights x 1 individual (program specialist) x $129 per night + mileage at the state rate for trips ranging from 100-500 miles roundtrip. • BAEN Extension Program Specialist travel to TWON Well Educated trainings and meetings statewide. Travel includes mileage at the state rate; lodging and per diem are also included at the state rate for the locations when an overnight stay is necessary due to distance; and associated Concur travel system usage fees. ($1,000): o a minimum of nine TWON Well Educated locations/year x 1 night x 1 individual (BAEN program specialist or Extension specialist) x $129 per night + mileage at the state rate for trips ranging from 100-500 miles roundtrip
Equipment	$ 0	• N/A
Supplies	$ 500	• SCSC supplies for training and screening materials include: plastic bins for transporting materials (replacing damaged ones from repeated use), pens and pencils, water sample analysis devices (e.g. Colilert apparatus and reagents, TDS probe, nitrate strips and arsenic screening materials), and general office supplies to include flash drives, paper, scissors, mailing labels, portfolios and name tags as well as other misc. supplies needed for delivering trainings and screenings. Quantity of these items will vary depending on the number of anticipated participants/RSVPs for each event. ($250) • BAEN supplies for materials at trainings ($250)
Contractual*	$ 0	• N/A
Construction	$ 0	• N/A

Other	$ 1,930	• Costs for printing training and screening materials ($1,000) • Conference fees ($250) • Postage ($30) • Cell phone plan(s) allowances for phone usage while on the road for trainings/screenings ($400) • Facility rental ($250)
Indirect	$ 18,068	• 15% of modified total direct costs