



**Texas State Soil and Water Conservation Board
 State Nonpoint Source Grant Program
 FY 2015 Workplan 15-50**

PROJECT SUMMARY PAGE																				
Title of Project	Watershed protection plan development for the Navasota River below Lake Limestone																			
Project Goals	<ul style="list-style-type: none"> • Characterize current bacteria loadings and sources for the watershed • Determine needed levels of loading reduction to restore the waterbody • Work with watershed stakeholders to select and prioritize management measures needed to restore the waterbody • Develop a watershed protection plan for the Navasota River below Lake Limestone 																			
Project Tasks	(1) Project Administration; (2) Quality Assurance; (3) Summarize & Analyze Existing Water Quality Data To Evaluate Bacteria Loadings & Sources; (4) Supplement Available Water Quality Data & Evaluate Bacteria Source Contributions Using Focused Surface Water Quality Monitoring & Bacterial Source Tracking; (5) Coordinate Stakeholder Process To Develop the Watershed Protection Plan.																			
Measures of Success	<ul style="list-style-type: none"> • Bacteria loading established at selected points along the waterbody where sufficient bacteria concentration and stream flow data are available • Levels of loading reduction needed to restore waterbody established • Suite of management practices established and load reductions estimated for each practice calculated • Stakeholder group established and functioning to guide WPP development and future implementation • Completed Navasota River below Lake Limestone watershed protection plan 																			
Project Type	Implementation (); Education (); Planning (X); Assessment (X); Groundwater ()																			
Status of Waterbody on 2012 Texas Integrated Report	<table border="1"> <thead> <tr> <th><u>Segment ID</u></th> <th><u>Parameter of Impairment or Concern</u></th> <th><u>Category</u></th> </tr> </thead> <tbody> <tr> <td>1209</td> <td>bacteria</td> <td>5b</td> </tr> <tr> <td>1209 A, B</td> <td>toxicity in sediment</td> <td>5c</td> </tr> <tr> <td>1209 C, B, L</td> <td>bacteria</td> <td>5a</td> </tr> <tr> <td>1209 E, G, H, I, J, K</td> <td>bacteria</td> <td>5b</td> </tr> <tr> <td>1209 H</td> <td>dissolved oxygen</td> <td>5c</td> </tr> </tbody> </table>	<u>Segment ID</u>	<u>Parameter of Impairment or Concern</u>	<u>Category</u>	1209	bacteria	5b	1209 A, B	toxicity in sediment	5c	1209 C, B, L	bacteria	5a	1209 E, G, H, I, J, K	bacteria	5b	1209 H	dissolved oxygen	5c	
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1209	bacteria	5b																		
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1209 E, G, H, I, J, K	bacteria	5b																		
1209 H	dissolved oxygen	5c																		
Project Location (Statewide or Watershed and County)	Navasota River below Lake Limestone watershed including portions of Brazos, Grimes, Madison, Leon, Limestone, and Robertson counties																			
Key Project Activities	Hire Staff (); Surface Water Quality Monitoring (X); Technical Assistance (X); Education (); Implementation (); BMP Effectiveness Monitoring (); Demonstration (); Planning (X); Modeling (X); Bacterial Source Tracking (X); Other ()																			
2012 Texas NPS Management Program Reference	<ul style="list-style-type: none"> • Component 1: LTG Objectives 1, 2, 6, 7, 8 STG 1 Objectives B, C, D; STG 3 Objectives A, B, D, G • Component 2 • Component 5 																			
Project Costs	\$ 210,532																			
Project Management	Texas A&M AgriLife Research, Texas Water Resources Institute																			
Project Period	October 1, 2014 – September 30, 2016																			

Part I – Applicant Information

Applicant							
Project Lead		Dr. Kevin Wagner					
Title		Associate Director					
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Project Co-Lead		Dr. Terry Gentry					
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Project Co-Lead		Lucas Gregory					
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City	College Station	County	Brazos	State	Texas	Zip Code	77843-2260
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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 and TCEQ.
Texas Water Resources Institute (TWRI)	Provide project administration (Task 1), quality assurance (Task 2), summary and analyses of water quality data (Task 3), collection of water samples and stream flow for BST analysis (Task 4.1), coordination of stakeholder process, and development of the WPP (Task 5)
Department of Soil & Crop Sciences, Soil & Aquatic Microbiology Lab (SAML)	Enumerate E. coli (Task 4.2) and assess relative contributions from cattle, other livestock, wildlife, and human using BST (Task 4.3)
Department of Soil & Crop Sciences, Nutrient & Water Analysis Research Lab (NAWA)	Nutrient analysis including nitrate, nitrite, ammonium, and orthophosphorous (Task 4.4)

Part II – Project Information						
Project Type						
Surface Water	X	Groundwater				
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 <i>Texas Coastal NPS Pollution Control Program</i> , or (f) the <i>Texas Groundwater Protection Strategy</i> ?				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 or Aquifer Name(s)	Hydrologic Unit Code (12 Digit)	Segment ID	Category on 2012 IR	Size (Acres)
Navasota River below Lake Limestone	120701030201-204; 0307, 0309; 0401-0407; 0501-0510; 0601-0604; 0701-0707; 0801-0804	1209	5b	1,002,056
Country Club Lake, Fin Feather Lake, Carters Creek, Country Club Branch, Burton Creek	120701030702, 0704	1209 A, B, C, D, L	5a, 5c	43,538
Wickson Creek	120701030602, 0603	1209 E	5b	56,352
Cedar Creek	120701030507, 0508	1209 G	5b	77,089
Duck Creek	120701030403, 0404, 0405, 0406	1209 H	5b	96,211
Gibbons Creek	120701030701, 0705	1209 I	5b	75,671
Shepherd Creek	120701030509	1209 J	5b	16,692
Steele Creek	120701030201, 0202, 0203, 0204	1209 K	5b	118,648

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: <i>2012 Texas Integrated Report</i> , Clean Rivers Program Basin Summary/Highlights Reports, or other documented sources.				
IMPAIRMENTS: 2012 Texas Integrated Report				
Segment 1209: Navasota River Below Lake Limestone - From the confluence with the Brazos River in Grimes County to Sterling C. Robertson Dam in Leon/Robertson County				
<u>Segment</u>	<u>Description</u>	<u>Impairment</u>	<u>Category</u>	<u>Year Listed</u>
1209_03	Portion of Navasota River from confluence with Sandy Branch upstream to confluence with Shepherd Branch in Madison County	Bacteria	5b	2002
1209_05	Portion of Navasota River from confluence with Camp Creek upstream to Lake Limestone Dam in Robertson County	Bacteria	5b	2002

CONCERNS

2012 Texas Integrated Report - Water Bodies with Concerns for Use Attainment and Screening Levels

Segment 1209: Navasota River Below Lake Limestone - From the confluence with the Brazos River in Grimes County to Sterling C. Robertson Dam in Leon/Robertson County

<u>Segment</u>	<u>Description</u>	<u>Parameter</u>	<u>Level of Concern</u>
1209_01	Portion of Navasota River from confluence with Brazos River upstream to confluence with Rocky Creek in Grimes County.	Depressed Dissolved Oxygen	CS
1209_02	Portion of Navasota River from confluence with Rocky Creek upstream to confluence with Sandy Branch in Grimes County.	Depressed Dissolved Oxygen	CS
1209_01	Portion of Navasota River from confluence with Brazos River upstream to confluence with Rocky Creek in Grimes County.	Nitrate	CS
1209_01	Portion of Navasota River from confluence with Brazos River upstream to confluence with Rocky Creek in Grimes County.	Orthophosphorus	CS

SOURCES: 2012 Texas Integrated Report - Potential Sources of Impairments and Concerns

Segment 1209: Navasota River Below Lake Limestone - From the confluence with the Brazos River in Grimes County to Sterling C. Robertson Dam in Leon/Robertson County

AUID: 1209_01	Portion of Navasota River from confluence with Brazos River upstream to confluence with Rocky Creek in Grimes County	
Dissolved Oxygen Grab Screening Level		
CS	Dissolved Oxygen Grab	UNK - Unknown
Nutrient Screening Levels		
CS	Nitrate	NPS - Municipal (Urbanized High Density Area) Runoff; NPS - Non-Point Source; NPS - On-site Treatment Systems (Septic Systems and Similar Decentralized Systems); PS - Municipal Point Source Discharges
CS	Orthophosphorus	UNK - Unknown
AUID: 1209_02	Portion of Navasota River from confluence with Rocky Creek upstream to confluence with Sandy Branch in Grimes County.	
Dissolved Oxygen Grab Screening Level		
CS	Dissolved Oxygen Grab	NPS - Non Point Source
AUID: 1209_03	Portion of Navasota River from confluence with Sandy Branch upstream to confluence with Shepherd Branch in Madison County.	
AUID: 1209_05	Portion of Navasota River from confluence with Camp Creek upstream to Lake Limestone Dam in Robertson County.	
Bacteria Geomean		
NS	<i>E. coli</i>	NPS - Municipal (Urbanized High Density Area) Runoff; NPS - Non-Point Source; NPS - On-site Treatment Systems (Septic Systems and Similar Decentralized Systems); PS - Municipal Point Source Discharges

Tributary Impairments, Sources and Concerns: 2012 Texas Integrated Report

Segment	Name	Impairment/Concern	Source
1209 A	Country Club Lake	NS - Sediment Toxicity CS - Total & Ortho Phosphorus CS - Arsenic	NPS - Industrial Land Treatment NPS - Non-Point Source NPS - Non-Point Source
1209 B	Fin Feather Lake	NS - Sediment Toxicity CS - Chl a & Ortho Phosphorus CS - Toxics in Sediment	NPS - Industrial Land Treatment NPS - Urban Runoff/Storm Sewer; Internal Nutrient Recycling NPS - Industrial Land Treatment; Urban Runoff/Storm Sewers
1209 C	Carters Creek	NS - <i>E. coli</i> CS - Chl a, Nitrate, Ortho & Total Phosphorus	NPS - Animal Feeding Operations, Rangeland Grazing; PS - Municipal Point Souces NPS - Animal Feeding Operations, Rangeland Grazing, Urban Stormwater ; PS - Municipal Point Souces,
1209 D	Country Club Branch	NS - <i>E. coli</i>	NPS - Non-Point Source
1209 E	Wickson Creek	NS - <i>E. coli</i>	NPS - Non-Point Source
1209 G	Cedar Creek	NS - <i>E. coli</i> CS - DO Grab CS - Habitat	NPS - Non-Point Source NPS - Natural Sources UNK - Sources Unknown
1209 H	Duck Creek	NS - <i>E. coli</i> NS - DO Grab CS - DO Grab	NPS - Non-Point Source NPS - Natural Sources NPS - Natural Sources
1209 I	Gibbons Creek	NS - <i>E. coli</i> CS - DO Grab	NPS - Non-Point Source NPS - Natural Sources
1209 J	Shepherd Creek	CN - DO Grab CS - DO Grab	UNK - Source Unknown NPS - Natural Sources
1209 L	Burton Creek	NS - <i>E. coli</i> CS - Nitrate, Orthophosphorus	PS - Municipal Point Source Discharges PS - Municipal Point Source Discharges

Project Narrative

Problem/Need Statement

The Navasota River is a part of the larger Brazos River basin and rises in McClennan County. The river is impounded in several locations with Lake Limestone in Freestone, Leon and Limestone Counties being the largest. At the outfall of the Sterling C. Robertson Dam downstream, the Navasota River Below Lake Limestone (Segment 1209) flows south for approximately 126 miles where it joins the Brazos River west of the town of Navasota. While flowing along the boundaries of Brazos, Grimes, Leon, Madison and Robertson counties, the river traverses some of the few remaining bottomland hardwood habitat in the state. According to the *2012 Texas Integrated Report and 303(d) List*, this segment of the river was noted to have elevated levels of *E. coli* that do not support the state's primary contact recreation water quality standard as early as 2002 and still remain elevated according to recently evaluated data. Further this report, suggests potential sources of pollution contributing to the *E. coli* include nonpoint sources from municipal runoff, on-site sewage facilities, municipal point source discharges and other non-point sources.

The Navasota River below Lake Limestone watershed encompasses parts of Brazos, Freestone, Grimes, Leon, Limestone and Robertson counties in east-central Texas. The watershed is predominantly rural and encompasses portions of the Northern Blackland Prairie, Southern Post Oak Savanna, San Antonio Prairie, and Flood Plains and Low Terraces as described in the EPA Level IV Ecoregions of Texas. Specifically, land covers in the watershed are predominantly mixed forests and managed pastures or rangelands. Limited amounts of cropland and urban areas also exist with the cities of Bryan and College Station being the largest by far. With the diverse land uses across the watershed, the development of a watershed protection plan that addresses pollutant loadings from multiple sources is the most appropriate mechanism to restore water quality in the river.

As the Navasota River Below Lake Limestone is a predominantly rural watershed, a Recreational Use Attainability Analysis (RUAA) was initiated on the waterbody in late 2009 to assess the current level of use and historic uses of the waterbody to determine if the currently applied primary contact recreation standard is appropriate. According to information presented by TCEQ at the 2012 Brazos River Basin Clean Rivers Program meeting (available online at: <http://www.brazos.org/Basin%20Highlights/2013-Status-RUAAs-Basin.pdf>), the Navasota River Below Lake Limestone will not be recommended for a standards change from the current primary contact recreation standard. This effectively means that the waterbody will again be designated as a 5c waterbody on the next iteration of the 303(d) List. Additionally, RUAA's are in progress on tributaries of the Navasota River Below Lake Limestone including Country Club Branch (1209D), Wickson Creek (1209E), Cedar Creek (1209G), Duck Creek (1209H), Gibbons Creek (1209I), Shepherd Creek (1209J) and Steele Creek (1209K). Each of these waterbodies is also listed as impaired for elevated levels of bacteria. The results of these RUAA's are not yet available; however, available evidence suggests that several of these waterbodies will not be recommended for a standards change thus cementing their place on the 303(d) List until other measures can be taken. With this recommendation of the Navasota River Below Lake Limestone and the potential recommendation of at least some of its tributaries to remain designated for primary contact recreation use, the development of a plan to restore water quality to meet its designated standards is appropriate. Information gleaned on the use, physical and hydrologic characteristics, and features of the waterbody and documented in the *Central and Southeast Texas Recreational Use Attainability Analyses Project: Navasota River Below Lake Limestone (Segment 1209) Comprehensive RUAA* will be incorporated into the WPP development process as appropriate. (<http://www.tceq.texas.gov/assets/public/waterquality/standards/NavasotabelowLimestoneCompRUAAFinalReport.pdf>)

A supplemental water quality monitoring project that is implementing a portion of the *Implementation Plan for Three TMDLs for Indicator Bacteria in the Carters Creek Watershed* will also provide useful information on pollutant loading (<http://www.tceq.texas.gov/assets/public/waterquality/tmdl/85carters/85A-CartersCreekIPlan-Approved.pdf>) from the largest urbanized area in the watershed and allow updated loading calculations for this subwatershed to be developed.

Further, a substantiated understanding of the sources contributing to the overall *E. coli* loading to the waterbody are needed to enable appropriate plans to be developed. While there are many potential sources contributing *E. coli* within

the waterbody, the relative contribution of their loading is not well understood. Establishing a better understanding of the respective loadings from each source will enable the development of a more effective restoration plan.

Project Narrative

General Project Description (Include Project Location Map)

To address water quality impairments and concerns in the Navasota River below Lake Limestone, as described in the *2012 Texas Integrated Report of Surface Water Quality for Clean Water Act Sections 305(b) and 303(d)* and identified by stakeholders, the Texas Water Resources Institute will initiate a watershed planning process to develop strategies to effectively restore the waterbody to meet state requirements and local stakeholder needs. This project will utilize portions of the “Three-Tier Approach for Bacteria TMDL Development” as recommended in the Bacteria TMDL Task Force Report submitted to TCEQ and TSSWCB. Tier 1 and Tier 2 recommended tasks will be combined to develop a better understanding of the hydrology, water quality, potential causes and sources for the impairment and will cultivate stakeholder ideas to include in the development of a WPP for the Navasota River Below Lake Limestone.

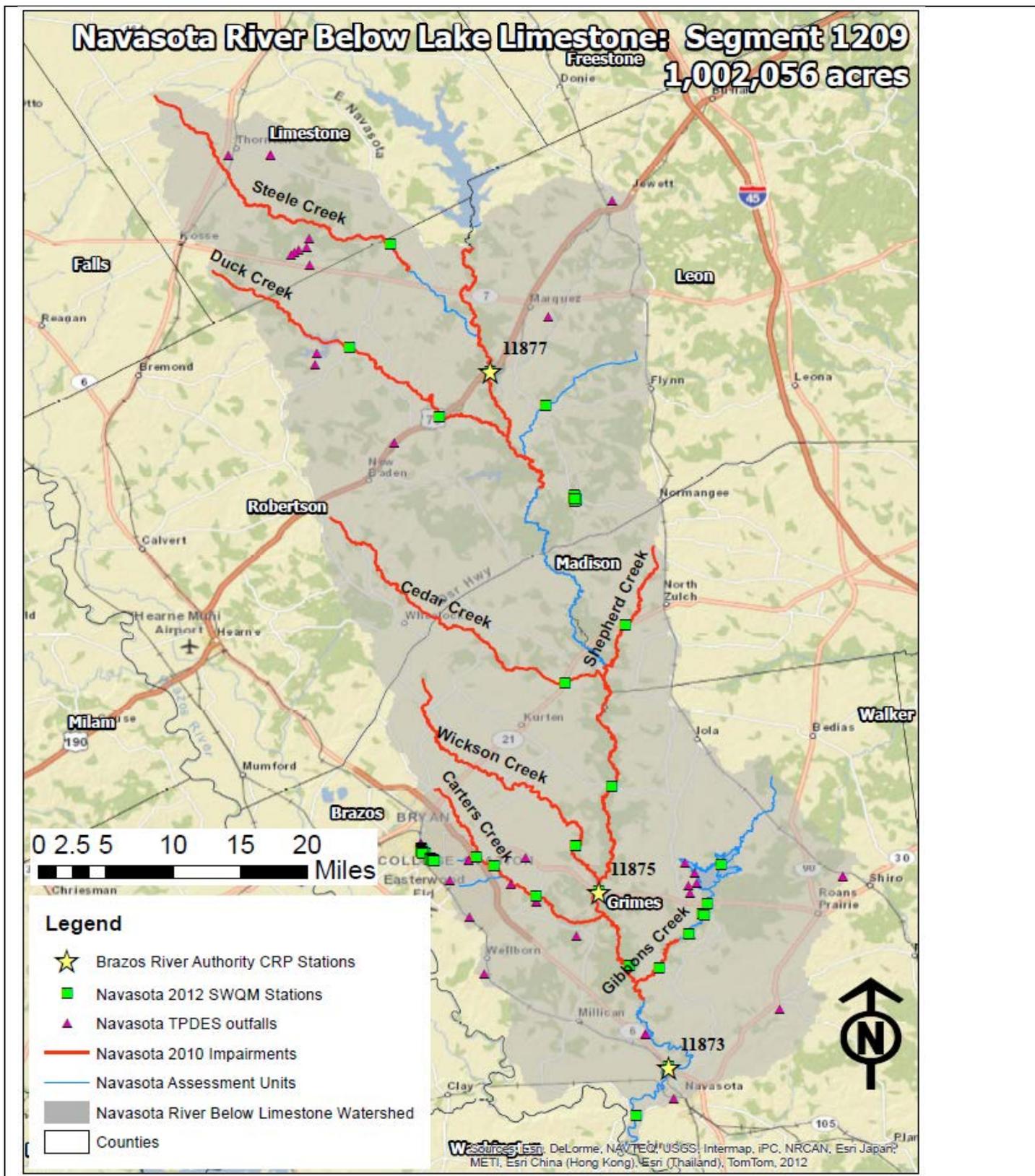
Local participation will be a cornerstone of this planning process as it will ultimately be up to these same entities, groups and individuals to implement the WPP once completed and approved. TWRI will facilitate the development of an organized stakeholder group by working with landowners, public officials, special interest groups and agencies that have been identified as potential participants. Members of this group will be asked to provide guidance on pollutant sources assessments, establishment of water quality goals, and selection of management strategies during the development of the WPP. Routine stakeholder meetings and meetings with local soil and water conservation districts (SWCDs) will be held to ensure the continued engagement of stakeholders in the planning process. Additionally, a project website will be developed and hosted to serve as an informational resource for the watershed.

Data gathering and subsequent assessments of this data will also support the development of the WPP. TWRI will gather and utilize existing data and prior studies to identify water quality issues, characterize the watershed, identify potential sources of pollution, evaluate current loadings, establish needed loading reductions, and prioritize critical areas for implementation. Load duration curves (LDCs) will be utilized to determine needed loading reductions at critical points in the watershed, while the development of a watershed GIS supplemented with stakeholder feedback will allow critical areas within the watershed needing specific management prescriptions to be identified systematically.

Supplemental water quality monitoring will also be conducted. TWRI will conduct bi-weekly sampling and streamflow monitoring at a key index site for the waterbody (TCEQ Station 11785) for one year. Duplicate samples will be collected with one set being delivered to the Soil and Aquatic Microbiology Lab (SAML) at Texas A&M for *E. coli* enumeration using EPA 1603 method and the other being delivered to the Nutrient and Water Analysis Laboratory (NAWA) for non-regulatory nutrient analysis including nitrate, nitrite, ammonium, and orthophosphorous. Monitoring this site, which is in the downstream impaired portion of the river, will provide much needed *E. coli* counts and stream flow data that will improve LDC loading and loading reduction estimates. Bacterial source tracking will also be conducted on water samples collected at this site. SAML will perform both library-dependent and library independent methods to each of the water samples collected through this project. In total, 96 *E. coli* isolates will be screened with the ERIC-PCR/RP library dependent method and each sample will be processed to determine the presence or absence of *Bacteroidales* using library independent methods. Collectively, this will allow for a more detailed understanding of the temporal variability in water quality as well as the specific sources of bacterial loading to the river; all of which will be conveyed to watershed stakeholders to enhance their understanding of the watershed and facilitate informed WPP development.

Using information gleaned through this project, TWRI will work with stakeholders to develop a WPP that satisfies EPA’s 9 key elements of watershed based plans. In short, the developed WPP will clearly define pollutant sources and estimated loadings, will establish management recommendations and estimate their pollutant loading reductions. Additionally, the plan will also describe technical and financial assistance needs, an education plan, a project schedule

with interim measurable milestones, indicators to measure progress and a long-term monitoring plan.



Tasks, Objectives and Schedules				
Task 1	Project Administration			
Costs	\$26,317			
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 th of January, April, July and October. QPRs shall be distributed to all Project Partners.			
	Start Date	Month 1	Completion Date	Month 24
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 24
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 24
Deliverables	<ul style="list-style-type: none"> • QPRs in electronic format • Reimbursement forms and necessary documentation in hard copy format 			

Tasks, Objectives and Schedules				
Task 2	Quality Assurance			
Costs	\$5,263			
Objective	To develop data quality objectives (DQOs) and quality assurance/control (QA/QC) activities to ensure data of known and acceptable quality are generated through this project.			
Subtask 2.1	TWRI will develop a QAPP for activities in Tasks 3-4 consistent with the most recent versions of <i>EPA Requirements for Quality Assurance Project Plans (QA/R-5)</i> and the <i>TSSWCB Environmental Data Quality Management Plan</i> . All monitoring procedures and methods prescribed in the QAPP shall be consistent with the guidelines detailed in the <i>TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue (RG-415)</i> and <i>Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data (RG-416)</i> . [Consistency with Title 30, Chapter 25 of the Texas Administrative Code, <i>Environmental Testing Laboratory Accreditation and Certification</i> , which describes Texas' approach to implementing the National Environmental Laboratory Accreditation Conference (NELAC) standards, shall be required where applicable.]			
	Start Date	Month 1	Completion Date	Month 6
Subtask 2.2	TWRI will implement approved QAPPs. TWRI will submit revisions and necessary amendments as needed.			
	Start Date	Month 6	Completion Date	Month 24
Deliverables	<ul style="list-style-type: none"> • QAPPs approved by TSSWCB in both electronic and hard copy formats • Approved revisions and amendments to QAPP, as needed • Data of known and acceptable quality as reported through Task 3-4 			

Tasks, Objectives and Schedules				
Task 3	Summarize and analyze existing water quality data to evaluate bacteria loadings and sources			
Costs	\$63,160			
Objective	To illustrate historical water quality in the basin and assess the potentially broad-based sources of impairment through the collection, aggregation and assessment of known existing data, information, and previously developed reports regarding water quality and potential sources of pollution or pollutants within the basin.			
Subtask 3.1	TWRI will gather existing <i>E. coli</i> , flow and other relevant water quality data for the basin from TCEQ, CRP, USGS, and other sources as appropriate.			
	Start Date	Month 2	Completion Date	Month 18
Subtask 3.2	TWRI will gather Texas Pollutant Discharge Elimination System (TPDES) permit info for all permitted facilities.			
	Start Date	Month 2	Completion Date	Month 8
Subtask 3.3	TWRI will assess the number of existing water quality management plans in targeted basins and determine the current level and type of best management practice implementation existing.			
	Start Date	Month 2	Completion Date	Month 8
Subtask 3.4	TWRI will assemble existing GIS data and develop needed maps including: watersheds and subwatersheds, land use/land cover, soils, topography, wastewater treatment facility locations, permitted confined animal feeding operation locations, geology, monitoring site locations, etc. as appropriate.			
	Start Date	Month 2	Completion Date	Month 24
Subtask 3.5	TWRI will assess OSSF numbers and locations using available information and will estimate OSSF densities in other areas of the watershed utilizing published methods.			
	Start Date	Month 2	Completion Date	Month 18
Subtask 3.6	TWRI will compile prior reports and publications if present and will glean relevant information from them related to pollutant loadings, sources and uses of the waterbody.			
	Start Date	Month 1	Completion Date	Month 12
Subtask 3.7	TWRI will develop load duration curves (LDCs) for all sites in the watershed with adequate data to determine current loadings, total allowable load to meet standards, and the reductions needed to attain water quality standards.			
	Start Date	Month 6	Completion Date	Month 18
Subtask 3.8	TWRI will assess bacteria sources and potential pollutant contributions from those sources in the watershed using GIS-based methods that incorporate known or estimated animal populations and established methods for pollutant production.			
	Start Date	Month 6	Completion Date	Month 18
Deliverables	<ul style="list-style-type: none"> Watershed maps as appropriate for stakeholder meetings and included in the WPP LDCs developed were feasible illustrating needed loading reductions to restore water quality Summarized findings on TPDES permittees, WQMPs, OSSF density and distribution, existing reports, LDCs and pollutant loadings included in the final WPP as appropriate and necessary 			

Tasks, Objectives and Schedules				
Task 4	Supplement available water quality data and evaluate bacteria source contributions using focused surface water quality monitoring and bacterial source tracking			
Costs	\$84,212			
Objective	To assess supplement the existing water quality data set with additional surface water quality monitoring and to identify bacterial contributions from cattle, other livestock, wildlife, and humans through the use of bacterial source tracking			
Subtask 4.1	TWRI will collect water samples and record stream flow when feasible from TCEQ Station 11875 located downstream of Highway 30 east of College Station bi-weekly for one year.			
	Start Date	Month 6	Completion Date	Month 18
Subtask 4.2	SAML will enumerate <i>E. coli</i> in the 24 water samples collected using EPA method 1603.			
	Start Date	Month 6	Completion Date	Month 18
Subtask 4.3	SAML will analyze 96 <i>E. coli</i> isolates from the 24 water samples using ERIC-PCR and RiboPrinting. Results will be compared with known isolates from the previously developed Texas <i>E. coli</i> BST Library to assess relative contributions from cattle, other livestock, wildlife, and humans. Each sample will also be processed to detect the presence or absence of known strains of <i>Bacteroidales</i> fecal bacteria.			
	Start Date	Month 6	Completion Date	Month 18
Subtask 4.4	NAWA will analyze 24 water samples received for nitrate, nitrite, ammonium, and orthophosphorus. These data will be non-regulatory and will not be uploaded into SWQMIS.			
	Start Date	Month 6	Completion Date	Month 18
Subtask 4.5	TWRI will develop and manage a waterbody specific database for storing collected water quality data. TWRI will also facilitate data transmittal to the TCEQ SWQMIS database and ensure that data are formatted consistent with the TCEQ DMRG.			
	Start Date	Month 6	Completion Date	Month 24
Deliverables	<ul style="list-style-type: none"> Water quality monitoring data collected and submitted to TCEQ for inclusion in SWQMIS BST results summarized and included in the WPP 			

Tasks, Objectives and Schedules				
Task 5	Coordinate stakeholder process to develop WPP			
Costs	\$31,580			
Objective	To organize and coordinate watershed stakeholders to facilitate the development of a 9-element WPP for the watershed through a stakeholder driven process			
Subtask 5.1	TWRI will assemble a stakeholder group to provide input and assist in the development of a WPP. The stakeholder group will be made up of landowners, elected officials, agency representatives, industry groups, and others as appropriate.			
	Start Date	Month 1	Completion Date	Month 24
Subtask 5.2	The stakeholder group will meet quarterly, or as needed to provide input on the development of the WPP.			
	Start Date	Month 1	Completion Date	Month 24
Subtask 5.3	TWRI will also meet semi-annually with each SWCD to discuss the status of the plan and obtain input from the SWCDs regarding the WPP.			
	Start Date	Month 1	Completion Date	Month 24
Subtask 5.4	TWRI will develop (Months 1-3), host and maintain (Months 3-24) a website for the dissemination of information on watershed planning activities.			
	Start Date	Month 1	Completion Date	Month 24
Subtask 5.5	TWRI will develop a WPP for watershed stakeholders based on criteria set forth in the USEPA FY2004 NPS Program and Grants Guidelines for States and Territories. Findings from Tasks 3-5 will be utilized as appropriate to develop the 9-element WPP.			
	Start Date	Month 12	Completion Date	Month 24
Deliverables	<ul style="list-style-type: none"> Stakeholder meeting notices, news releases, agendas, summaries, meeting materials developed, distributed and posted on the project website Watershed website established and maintained Draft Watershed Protection Plan Final Watershed Protection Plan 			

Project Goals (Expand from Summary Page)
<p>The goals of this project revolve around the concept of developing a watershed protection plan that, when fully implemented, will restore the water quality of the Navasota River Below Lake Limestone to meeting the state's primary contact recreation standards. To accomplish this overarching goal, existing bacteria loadings will be calculated using load reduction curves that are based on existing and supplemental water quality and streamflow data. Once established, this will allow the needed levels of pollutant loading reduction to restore the waterbody to be established. Using this information, the project team will aid watershed stakeholders in selecting appropriate management practices to achieve these needed pollutant loading reductions. Estimated pollutant loading reductions for each practice will be established and the plan will include a sufficient level of planned implementation so that when these estimated loads are aggregated, they will achieve the loading reduction goal. Collectively, this information will be combined into the Navasota River WPP that will meet EPA's 9 key elements required of watershed protection plans. Additionally, a stakeholder group will be established and will guide the development of the Navasota WPP. This group will be structured to consist of an equitable division of representatives from impacted parties across the watershed.</p>

Measures of Success (Expand from Summary Page)

- (1) Coordination and engagement of a watershed stakeholder committee that equally represents all stakeholder groups in the watershed and gives them a platform to guide future management of their watershed completed
- (2) Completed GIS of the watershed supported by watershed reconnaissance with potential pollutant sources identified thus providing the most up-to-date source of information on watershed characteristics which will support watershed load reduction estimates, management strategy selection, implementation location prioritization and WPP development
- (3) Collection and analysis of quality assured data generated for sampled watershed sites to support LDC development, and a better understanding of the temporal variation in bacterial loading
- (4) Completion of LDC analysis to be used to develop needed pollutant load reductions
- (5) Completed Bacterial Source Tracking analysis to verify the identity of bacterial contamination sources contributing to bacterial loads in the river which should receive priority management
- (7) Completed WPP approved by stakeholders, TSSWCB and EPA; the WPP will outline the voluntary management approach desired by watershed landowners and stakeholders

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 ... water.

Long-Term Goal – Protect and restore water quality affected by NPS pollution through assessment,..., and education.

Objectives

- 1 – Focus NPS abatement efforts, ...available resources in watersheds identified as impacted by NPS pollution in the latest state approved *Texas Water Quality Inventory and 303(d) List*.
- 2 – Support the implementation of state, regional and local programs to prevent NPS pollution through assessment... and education.
- 6 – Develop partnerships, relationships... to facilitate collective, cooperative approaches to manage NPS pollution.
- 7 – Increase overall public awareness of NPS issues and prevention activities.
- 8 – 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

Goal One – Data Collection and Assessment: Coordinate with appropriate federal, state, regional and local entities, and stakeholder groups to target water quality assessment activities in high priority, NPS-impacted watersheds...

- Objective B – Ensure that monitoring procedures meet quality assurance requirements and are in compliance with EPA-approved TSSWCB Quality Management Plans.
- Objective C – Conduct special studies to determine sources of NPS pollution and gain information to target TMDL and BMP implementation.
- Objective D – Develop ... WPPs to maintain and restore water quality in water bodies identified as impacted by NPS pollution.

Goal Three – Education: Conduct education... activities to help increase awareness of NPS pollution and prevent activities which contribute to the degradation of water bodies... by NPS pollution.

- Objective A – Enhance existing outreach programs at the ... local level 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 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 G – Implement public outreach and education to maintain and restore water quality in water bodies impacted by NPS pollution.

Component 2 – Working partnerships and linkages with appropriate state, ... regional, and local entities, private sector groups and Federal agencies.

Component 5 –Identify waters and their watersheds impaired by NPS pollution... Progressively address these identified waters by conducting more detailed watershed assessments and developing watershed plans...

Part III – Financial Information

Budget Summary	
Category	Costs
Personnel	\$ 108,544
Fringe Benefits	\$ 30,694
Travel	\$ 3,640
Equipment	\$ 0
Supplies	\$ 11,690
Contractual	\$ 0
Construction	\$ 0
Other	\$ 28,503
Total Direct Costs	\$ 183,071
Indirect Costs (≤15%)	\$ 27,461
Total Project Costs	\$ 210,532

Budget Justification		
Category	Total Amount	Justification
Personnel	\$ 108,544	TWRI Associate Director @ 0.06 FTE: \$10,442 TWRI Project Specialist & QAO @ 0.50 FTE: \$64,269 TWRI Program Manager @ 0.08 FTE: \$11,745 SCSC Post Doc @ 0.13 FTE: \$11,688 TWRI Student Worker: 10 hrs weekly @ \$10/hr: \$10,400
Fringe Benefits	\$ 30,694	Salaried Employee Fringe Benefits Calculated at: 0.18 * salary + \$647/mo. Student Fringe Benefits Calculated at: 0.103 * salary
Travel	\$ 3,640	State vehicle mileage: 7,280 miles @ \$0.50/mi
Equipment	\$ 0	N/A
Supplies	\$ 11,690	SCSC Lab Supplies for <i>E. coli</i> enumeration and BST analysis: \$10,680 - includes media, reagents, lab consumables TWRI Field Sampling Supplies: \$810 - includes ice, sampling containers/consumables, calibration standards, rubber boots, waders TWRI Misc. Office Supplies: \$200
Contractual	\$ 0	N/A
Construction	\$ 0	N/A
Other	\$ 28,503	NAWA Lab Nutrient Analysis: \$1,200 = 24 samples @ \$50/sample TWRI WPP and Meeting Material Printing: \$2,475 TWRI/IRNR GTR Lab Fee: \$13,330 = 2 months @ \$6,665/mo. For GIS support TWRI Communications Team Services: \$10,973 = 2 months @ \$5,486.50/mo. For Communications Resource Development Postage Fees: \$50 Single Seat Kayak: \$350 Computer Software and Peripherals: \$125
Indirect	\$ 27,461	15% of Total Federal Direct Costs