

**Texas State Soil and Water Conservation Board**  
**Clean Water Act §319(h) Nonpoint Source Grant Program**  
**FY 2019 Workplan 19-06**

SUMMARY PAGE						
Title of Project	Surface Water Quality Monitoring to Support the Implementation of the Plum Creek Watershed Protection Plan					
Project Goals	<ul style="list-style-type: none"> <li>• Generate data of known and acceptable quality for surface and ground water quality monitoring of main stem and tributary stations</li> <li>• Collect water quality data for use in assessing water quality improvement and progress in achieving restoration</li> <li>• Communicate water quality conditions to the public and the Partnership in order to support adaptive management and to expand public knowledge on Plum Creek water quality data</li> <li>• Coordinate and conduct water resources and related environmental outreach/education efforts across the watershed</li> </ul>					
Project Tasks	(1) Project Administration; (2) Quality Assurance; (3) Water Quality Data Collection and Analysis					
Measures of Success	<ul style="list-style-type: none"> <li>• Data of known and acceptable quality are generated for and groundwater quality monitoring of main stem and tributary stations</li> <li>• Water quality data is used to evaluate progress in implementing the Plum Creek WPP and achieving water quality restoration</li> <li>• Water quality data is communicated to the public and the Plum Creek Watershed Partnership Steering Committee</li> </ul>					
Project Type	Implementation (X); Education (X); Planning ( ); Assessment (X); Groundwater ( )					
Status of Waterbody on 2014 Texas Integrated Report	Segment ID 1810	Parameter of Impairment or Concern Bacteria Ammonia-nitrogen; nitrate nitrogen; total phosphorus			Category 4b CN	
Project Location (Statewide or Watershed and County)	Plum Creek Watershed in Caldwell and Hays Counties					
Key Project Activities	Hire Staff ( ); Surface Water Quality Monitoring (X); Technical Assistance (X); Education (X); Implementation (X); BMP Effectiveness Monitoring ( ); Demonstration ( ); Planning ( ); Modeling ( ); Bacterial Source Tracking ( ); Other ( )					
2017 Texas NPS Management Program Reference	<ul style="list-style-type: none"> <li>• Component 1 LTGs 1, 3, 7</li> <li>• Component 1 STGs 1B, 1E, 3G</li> <li>• Component 3</li> </ul>					
Project Costs	Federal	\$344,312	Non-Federal	\$229,419	Total	\$573,731
Project Management	Guadalupe-Blanco River Authority					
Project Period	October 24, 2019 – February 29, 2024					

## Part I – Applicant Information

Applicant							
Project Lead		Elizabeth Edgerton					
Title		Water Quality Program Supervisor					
Organization		Guadalupe-Blanco River Authority					
E-mail Address		<a href="mailto:eedgerton@gbra.org">eedgerton@gbra.org</a>					
Street Address		933 East Court Street					
City	Seguin	County	Guadalupe	State	TX	Zip Code	78155
Telephone Number		830-379-5822			Fax Number		830-379-7478

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.
Guadalupe-Blanco River Authority	Provide project administration, water quality monitoring, data and analysis review, outreach and education , technical assistance

## Part II – Project Information

Project Type									
Surface Water	<input checked="" type="checkbox"/>	Groundwater	<input type="checkbox"/>						
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	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
If yes, identify the document.		Plum Creek Watershed Protection Plan							
If yes, identify the agency/group that developed and/or approved the document.		Plum Creek Watershed Partnership facilitated by AgriLife Extension and TSSWCB			Year Developed		2008		

Watershed Information				
Watershed or Aquifer Name(s)	Hydrologic Unit Code (12 Digit)	Segment ID	Category on 2014 IR	Size (Acres)
Plum Creek	110901050702, 110901050703, 111002030102, 111301050208, 111302090204, 120100040204, 120301010104, 120500030306, 120601020401, 120702010804, 120702010805, 120800020403, 121002030401	1810	4b	288,240

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>2014 Texas Integrated Report</i> , Clean Rivers Program Basin Summary/Highlights Reports, or other documented sources.
<p><b>2014 Texas Integrated Report</b> – Plum Creek has been listed as impaired on the 303d list since 2004 due to bacterial contamination. The geometric mean of data collected on the three assessment units on Plum Creek from December 1, 2005 through November 30, 2012 was 157, 200, 307 cfu/ 100mL downstream to upstream respectively. The assessed 2014 geometric mean for all three assessment units was higher than the geometric mean report in the 2012 assessment (150, 194 and 295 cfu/100 mL).</p> <p><b>Clean Rivers Program 2018 Basin Summary Report</b> - The 2018 Clean Rivers Program Basin Summary Report for the Guadalupe River Basin states that the analysis of the total phosphorus concentrations at the most downstream monitoring station 12640, near the San Marcos River confluence, indicated that they were significantly increasing over the 13 year study period. Total phosphorus significantly correlated with streamflow, and the changes in concentrations at this locations were primarily linked to prolonged drought conditions throughout the watershed and corresponding increases in the proportion of wastewater in the creek. This effect was also noted in the upper portions of the watershed at station 17406, near Uhland, where nitrate nitrogen levels were significantly increasing over time. This portion of the watershed has also experienced increased wastewater nonpoint source influences due expansive population growth in the area. The nitrate nitrogen concentrations were decreasing in the middle portions of the watershed below the City of Lockhart at station 12647 over the same time period. This change was most likely due to dilution effects from rainwater near the City of Lockhart and best management practices (BMPs) associated with the watershed protection plan (WPP) implemented in this portion of the watershed. No significant changes in <i>E. coli</i> concentrations over time have occurred in the watershed. The BMPs implemented by the WPP have been effective in offsetting the increases in nonpoint source runoff associated with extensive population growth.</p> <p><b>Clean Rivers Program Basin Highlights Reports</b> - The Clean Rivers Program Basin Highlights Reports for the Guadalupe River Basin since 2004 comment on the high <i>E. coli</i>, nitrate nitrogen and total phosphorus concentration in the Plum Creek watershed and the implementation efforts that have been undertaken as a part of the watershed protection plan in order to reduce these impairments and concerns. The 2016 Basin highlights report describes low impact development activities undertaken by the Caldwell County and the City of Kyle and community stream cleanups undertaken to address these issues.</p>

**2017 Nonpoint Source Management Program** - Nonpoint source contamination is widespread in many Texas aquifers. While there are a variety of pollutants of concern in groundwater, the most widespread contaminant is nitrate. Potential nitrate sources may include failing septic systems, infiltration of stormwater runoff, over application of fertilizer on urban and agricultural land, and naturally occurring nitrate derived from the aquifer matrix. Sampling and analysis of drinking water wells conducted by the Texas Water Development Board (TWDB) in 2013 for the Gulf Coast Aquifer showed 12 wells of 317 sampled exceeded primary maximum contaminant levels for nitrate. From 2003 through 2013, the TWDB sampled 4,645 wells across the state for nitrate, with 1,429 presenting nitrate concentrations that exceeded the maximum contaminant level. An additional 1,751 wells showed the presence of nitrate, but did not exceed the maximum contaminant level (2014 Texas Integrated Report for the Clean Water Act Sections 305(b) and 303(d)). This sampling and analysis underscores the reason for the state's concern for the groundwater quality in Texas and potential impact from nonpoint source pollution.

**2015-2016 USGS Study to identify the Sources Nitrate, and Chemical Loadings in the Geronimo Creek and Plum Creek Watersheds** – The TSSWCB funded the GBRA and USGS to conduct a study of the groundwater and surface water in the Plum Creek Watershed during four synoptic surveys events at varying stream flows. The purpose of this study was to characterize the sources of elevated nitrate nitrogen concentrations in the Plum Creek and underlying Leona aquifer by analyzing Nitrate-N concentrations and stable isotopes of nitrate including delta nitrogen-15 of nitrate ( $\delta^{15}\text{N-NO}_3$ ) and delta oxygen-18 of nitrate ( $\delta^{18}\text{O-NO}_3$ ) throughout the watershed. The report generated by this study found that the analysis of nitrogen isotope values indicates that Plum Creek watershed has multiple sources of nitrate, whose contributions are dependent on the type of site and the streamflow conditions. The report also stated that the sources of the nitrates in the groundwater and springs flows are most likely from diffuse sources that occur in conjunction with the mixing of nitrate from fertilizer applications and septic systems. The best management practices that were described and implemented in the Plum Creek WPP are designed to address both of these sources nonpoint source pollution. During low flow conditions a larger portion of the nitrates in the surface water are associated with WWTF discharges. The surface waters are influenced more by fertilizer and septic sources during higher flows conditions.

## Project Narrative

### Problem/Need Statement

Plum Creek rises in Hays County north of Kyle and runs south through Caldwell County, passing Lockhart and Luling, and eventually joins the San Marcos River at their confluence north of Gonzales County. Plum Creek is 52 miles in length and has a drainage area of 389 mi<sup>2</sup>. According to the *2014 Texas Water Quality Inventory and 303(d) List*, Plum Creek (Segment 1810) is impaired by elevated bacteria concentrations (category 4b) and exhibits nutrient enrichment concerns for ammonia, nitrate+nitrite nitrogen and total phosphorus.

TSSWCB and AgriLife Extension established the Plum Creek Watershed Partnership (PCWP) in April 2006. The PCWP Steering Committee completed the “Plum Creek Watershed Protection Plan” in February 2008. Information about the PCWP is available at <http://gbra.org/plumcreek>. Sources of pollutants identified in the Plum Creek WPP include urban storm water runoff, pet waste, failing or inadequate on-site sewage facilities (septic systems), wastewater treatment facilities, livestock, wildlife, invasive species (feral hogs), and oil and gas production.

Through TSSWCB projects 03-19, 10-07, 14-11 and 17-09 GBRA collected water quality data to fill data gaps. During these projects, sampling of water quality data was severely hampered by drought that covered the watershed, causing the tributaries to run dry and the springs to slow to almost negligible flow.

Facilitated by a local watershed coordinator, implementation of the Plum Creek WPP is currently underway. TSSWCB projects provide technical and financial assistance through the local SWCDs to agricultural producers in developing and implementing water quality management plans (WQMPs). In order to reduce feral hog impacts on the stream, education and technical assistance is being provided by AgriLife Extension to landowners in the watershed on strategies to reduce and manage feral hog populations. The cities of Kyle and Lockhart have completed projects with TCEQ CWA §319(h) funding, including a project to retrofit detention facilities to improve water quality, educate and stencil storm sewer inlets, map existing storm water facilities, implement a dog waste collection station program, and coordinate city “housekeeping” activities designed to improve water quality (street sweeping, creek cleanup days, etc). Additionally, Lockhart evaluated their existing storm water system, identified and prioritized upgrades to the city’s storm water management system including cleaning out and installing storm drain filters, and coordinated creek cleanup days, and household hazardous and electronic waste collection days. An education and outreach campaign was initiated during the watershed planning process that focused on educating watershed residents and landowners on the impacts of specific land use activities, illegal dumping, proper operation and maintenance of OSSFs and proper disposal of pet waste.

To demonstrate improvements in water quality, the Plum Creek WPP describes a water quality monitoring program designed to evaluate the effectiveness of BMPs implemented across the watershed and their impacts on instream water quality. Water quality data will be used in the adaptive management of the WPP in order to evaluate progress in implementing the Plum Creek WPP and achieving water quality restoration.

There is a need to continue the monitoring regime originally funded through TSSWCB project 03-19 and TSSWCB Clean Water Act Section 319 projects 10-07, 14-11 and 17-09. This monitoring project is warranted to provide critical water quality data that will be used to judge the effectiveness of WPP implementation efforts and serve as a tool to quantitatively measure water quality restoration. This effort will continue stakeholder engagement by providing technical assistance and sharing of water quality data by attendance at partnership meetings and maintenance of project website.



collect additional bimonthly ammonia nitrogen and total kjeldahl nitrogen at stations 17406, 12640 and 12647. This will complement the existing routine ambient monitoring regime conducted by GBRA such that the same routine water quality monitoring is conducted monthly at 7 sites in the Plum Creek watershed.

GBRA will conduct targeted watershed monitoring at 34 sites twice per quarter, once under dry weather conditions and once under wet weather conditions, collecting field, conventional, flow and bacteria parameter groups. Sampling period extends through 16 seasons. Spatial, seasonal and meteorological variation will be captured in these snapshots of watershed water quality. If GBRA previously captured the targeted weather conditions in a yearly quarter under similar conditions during the course of routine monitoring, the station will not be resampled.

GBRA will conduct 24-hour DO monitoring at 7 sites monthly during the index period collecting field and flow parameter groups. These sites shall be the same as the sites for routine ambient monitoring. Sampling period extends over 8 months during the index period of each year of the project.

GBRA will conduct effluent monitoring at seven wastewater treatment facilities (WWTFs) once per month collecting field, conventional, flow, bacteria and effluent parameter groups. The sampling period will extend over 48 months. This will characterize WWTF contributions to flow regime and pollutant loadings.

GBRA will conduct spring flow monitoring at 3 springs once per quarter year collecting field, conventional, flow and bacteria parameter groups. The sampling period will extend over 16 seasons. Spatial and seasonal variation in spring flow will be captured. This will characterize groundwater contributions to flow regime and pollutant loadings.

Two aquatic life monitoring events will be performed at the Plum Creek at CR 135 (Station 12640), and Clear Fork of Plum Creek at Salt Flat Road (Station 12556) in order to gage the effects of WPP implementation efforts on the biological assemblages in the watershed. This monitoring will be accompanied by additional 24 hour dissolved oxygen, field and stream flow monitoring data.

GBRA maintains a real-time water quality monitoring station at the Plum Creek upstream of US 183 site (Station 18343) that collects field data every 15 minutes. In order to continue to raise awareness of water quality and stewardship in the Plum Creek watershed and make water quality data available to the public, GBRA maintained this station through month 16 of the grant; continuous monitoring ended because the data was no longer supported under the CWQM QAPP. A link to the public real-time monitoring site, is available on the GBRA website.

GBRA will post monitoring data to the GBRA website in a timely manner. GBRA will summarize the results and activities of this project through inclusion in GBRA's Clean Rivers Program Basin Highlights Report. Additionally, the results and activities of this project will be summarized in quarterly reports to the stakeholders of the PCWP Steering Committee and in revisions to the Plum Creek WPP. GBRA will develop a final Assessment Data Report summarizing water quality data collected through Tasks 3.1-3.6. The Report shall, at a minimum, provide an assessment of water quality with respect to effectiveness of BMPs implemented and a discussion of interim short-term progress in achieving the Plum Creek WPP water quality goals.

List of monitoring locations and frequency of sample by type:

TCEQ Station ID	Site Description	Workplan Task	Monitor Type	DO 24hr	Bacteria	Conventional	Flow	Field	AqHab	Benthics	Nekton
12556	Clear Fork Plum Creek at Salt Flat Road	3.1	RT		45	45	45	45			
12556	Clear Fork Plum Creek at Salt Flat Road	3.2	BF		16	16	16	16			
12556	Clear Fork Plum Creek at Salt Flat Road	3.3	BS	34			34				
12556	Clear Fork Plum Creek at Salt Flat Road	3.6	BS				2	2	2	2	2
12558	Elm Creek at CR 233	3.1	RT		45	45	45	45			
12558	Elm Creek at CR 233	3.2	BF		16	16	16	16			
12558	Elm Creek at CR 233	3.3	BS	34			34				
12640	Plum Creek at CR 135	3.1	RT			23					
12640	Plum Creek at CR 135	3.2	BF		16	16	16	16			
12640	Plum Creek at CR 135	3.3	BS	34			34				
12640	Plum Creek at CR 135	3.6	BS				2	2	2	2	2
12647	Plum Creek at Old McMahan Road (CR 202)	3.1	RT			23					
12647	Plum Creek at Old McMahan Road (CR 202)	3.2	BF		16	16	16	16			
12647	Plum Creek at Old McMahan Road (CR 202)	3.3	BS	34			34				
17406	Plum Creek at Plum Creek Road	3.1	RT			23					
17406	Plum Creek at Plum Creek Road	3.2	BF		16	16	16	16			
17406	Plum Creek at Plum Creek Road	3.3	BS	34			34				
20488	Brushy Creek at Rocky Road (Upstream of NRCS 14)	3.1	RT		45	45	45	45			
20488	Brushy Creek at Rocky Road (Upstream of NRCS 14)	3.2	BF		16	16	16	16			
20448	Brushy Creek at Rocky Road (Upstream of NRCS 14)	3.3	BS	34			34				
20500	West Fork Plum Creek at Biggs Road (CR 131)	3.1	RT		45	45	45	45			
20500	West Fork Plum Creek at Biggs Road (CR 131)	3.2	BF		45	45	45	45			
20500	West Fork Plum Creek at Biggs Road (CR 131)	3.3	BS	34			34				
12555	Salt Branch at FM 1322	3.2	BF		13	13	13	13			
12557	Town Creek at E. Market St. (Upstream of Lockhart #1 WWTP)	3.2	BF		13	13	13	13			
12559	Porter Creek at Dairy Road	3.2	BF		13	13	13	13			
12642	Plum Creek at Biggs Road (CR 131)	3.2	BF		13	13	13	13			
12643	Plum Creek at FM 1322	3.2	BF		13	13	13	13			
12645	Plum Creek at Young Lane (CR 197)	3.2	BF		13	13	13	13			
12648	Plum Creek at CR 186	3.2	BF		13	13	13	13			
12649	Plum Creek at CR 233	3.2	BF		13	13	13	13			
14945	Clear Fork Plum Creek at Old Luling Road (CR 213)	3.2	BF		13	13	13	13			
18343	Plum Creek Upstream of US 183	3.2	BF		13	13	13	13			
20480	Plum Creek Downstream of NRCS 1 Spillway	3.2	BF		13	13	13	13			
20481	Bunton Branch at Heidenreich Lane	3.2	BF		13	13	13	13			
20482	Brushy Creek at FM 2001 (Downstream of NRCS 12)	3.2	BF		13	13	13	13			
20489	Cowpen Creek at Schuelke Road	3.2	BF		13	13	13	13			
20496	Tenney Creek at Tenney Creek Road	3.2	BF		13	13	13	13			
20490	Clear Fork Plum Creek at Farmers Road	3.2	BF		13	13	13	13			
20493	Clear Fork Plum Creek at PR 10 (State Park)	3.2	BF		13	13	13	13			
20497	West Fork Plum Creek at FM 671	3.2	BF		13	13	13	13			
12538	Andrews Branch at CR 131	3.2	BF		13	13	13	13			
20495	Dry Creek at FM 713	3.2	BF		13	13	13	13			
20484	Plum Creek at Heidenreich Lane (Downstream of Kyle WWTP)	3.2	BF		13	13	13	13			



TCEQ Station ID	Site Description	Workplan Task	Monitor Type	DO 24hr	Bacteria	Conventional	Flow	Field	AqHab	Benthics	Nekton
20501	Salt Branch at Salt Flat Road (Upstream of Luling WWTP)	3.2	BF		13	13	13	13			
20498	Copperas Creek at Wattsville Road (CR 140, Downstream of Cal-Maine)	3.2	BF		13	13	13	13			
20505	Richmond Branch at Dacy Lane	3.2	BF		13	13	13	13			
20503	Plum Creek at Lehman Road	3.2	BF		13	13	13	13			
20502	Bunton Branch at Dacy Lane (upstream of NRCS 5)	3.2	BF		13	13	13	13			
20479	Unnamed Tributary at FM 150 near Hawthorn Dr.	3.2	BF		13	13	13	13			
20492	10210-001 City of Lockhart and GBRA #1 (Larremore plant)	3.4	-		45	45	45	45			
20494	10210-002 City of Lockhart and GBRA #2 (FM 20 plant)	3.4	-		45	45	45	45			
20499	10582-001 City of Luling	3.4	-		45	45	45	45			
20486	11041-002 City of Kyle and Aquasource Inc.	3.4	-		45	45	45	45			
99923	11060-001 City of Buda and GBRA	3.4	-		45	45	45	45			
99936	14431-001 GBRA Shadow Creek	3.4	-		45	45	45	45			
99937	14377-001 GBRA Sunfield	3.4	-		45	45	45	45			
20509	Lockhart Springs	3.5	BS		16	16	16	16			
20507	Clear Fork Springs at Borchert Loop (CR 108)	3.5	BS		16	16	16	16			
20508	Boggy Creek Springs at Boggy Creek Road (CR 218)	3.5	BS		16	16	16	16			

Tasks, Objectives and Schedules						
Task 1	Project Administration					
Costs	Federal	\$0	Non-Federal	\$25,000	Total	\$25,000
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	GBRA 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 1 <sup>st</sup> of January, April, July and October. QPRs shall be distributed to all Project Partners.					
	Start Date	Month 1		Completion Date	Month 53	
Subtask 1.2	GBRA 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 53	
Subtask 1.3	GBRA 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. GBRA will develop lists of action items needed following each project coordination meeting and distribute to project personnel.					
	Start Date	Month 1		Completion Date	Month 53	
Subtask 1.4	GBRA will develop a Final Report that summarizes activities completed and conclusions reached during the project and discusses the extent to which project goals and measures of success have been achieved.					
	Start Date	Month 1		Completion Date	Month 53	
Deliverables	<ul style="list-style-type: none"> <li>QPRs in electronic format</li> <li>Reimbursement Forms and necessary documentation in hard copy format</li> <li>Final Report in electronic and hard copy formats</li> </ul>					

Tasks, Objectives and Schedules						
Task 2	Quality Assurance					
Costs	Federal	\$0	Non-Federal	\$3,000	Total	\$3,000
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	GBRA will develop a QAPP for activities in Task #3 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 3	
Subtask 2.2	GBRA will implement the approved QAPP. GBRA will submit revisions and necessary amendments to the QAPP as needed.					
	Start Date	Month 4		Completion Date	Month 53	
Deliverables	<ul style="list-style-type: none"> <li>QAPP approved by TSSWCB and EPA in both electronic and hard copy formats</li> <li>Approved revisions and amendments to QAPP, as needed</li> <li>Data of known and acceptable quality as reported through Task #3</li> </ul>					

Tasks, Objectives and Schedules						
Task 3	Water Quality Data Collection & Analysis					
Costs	Federal	\$344,312	Non-Federal	\$201,419	Total	\$545,731
Objective	To collect water quality data in the Plum Creek watershed in order to maintain a continuous data record during the implementation of the Plum Creek WPP.					
Subtask 3.1	GBRA will conduct routine ambient monitoring at four sites once per month, collecting field, conventional, flow and bacteria parameter groups. The sampling period extends over 48 months. The number of samples planned for collection through this subtask is 184. Currently, routine ambient monitoring is conducted monthly at three stations by GBRA (17406, 12640 and 12647) through the Clean Rivers Program. GBRA will also collect additional bimonthly total kjeldahl nitrogen and ammonia nitrogen as a part of this subtask, at the three Clean Rivers Program monitoring stations in order to supplement current bimonthly CRP sampling for these parameters. The number of supplemental nutrient samples planned for collection at stations 17406, 1264, and 12647 under this subtask is 69. Sampling through this subtask will complement existing routine ambient monitoring regimes such that the same routine water quality monitoring is conducted monthly at seven sites in the Plum Creek watershed.					
	Field parameters are pH, temperature, dissolved oxygen and conductance. Conventional parameters are total suspended solids, turbidity, sulfate, chloride, nitrate nitrogen, ammonia nitrogen, total kjeldahl nitrogen, chlorophyll-a, pheophytin, total hardness, and total phosphorus. Flow parameters are flow collected by gage, electric, mechanical or Doppler, including severity. Bacteria parameter is <i>E. coli</i> . The GBRA's Regional Laboratory will conduct sample analysis.					
Start Date	Month 4		Completion Date	Month 53		

Subtask 3.2	<p>GBRA will conduct targeted watershed monitoring at 34 sites twice per season, once under dry weather conditions and once under wet weather conditions (weather permitting) collecting field, conventional, flow and bacteria parameter groups. Of these 34 sites, 7 sites will be the same as the sites for routine ambient monitoring described in subtask 3.1, allowing for 27 sites of targeted watershed monitoring. If the targeted weather conditions were already captured at a station during the routine monthly monitoring described in subtask 3.1, then a separate biased for flow sample will not be collected under the similar weather conditions at the affected station during the applicable yearly quarter for this subtask.</p> <p>The QAPP developed in Task 2 will precisely identify the sites. Sampling period extends through 16 yearly quarters. Total number of sample events scheduled for collection through this subtask is 359. Spatial, seasonal and meteorological variation will be captured in these snapshots of watershed water quality.</p> <p>Field parameters are pH, temperature, dissolved oxygen and conductance. Conventional parameters are total suspended solids, nitrate nitrogen, ammonia nitrogen, total kjeldahl nitrogen, and total phosphorus. Flow parameters are flow collected by gage, electric, mechanical or Doppler, including severity. Bacteria parameter is <i>E. coli</i>. The GBRA's Regional Laboratory will conduct sample analysis.</p>				
	<table border="1"> <tr> <td data-bbox="297 800 602 835">Start Date</td> <td data-bbox="602 800 915 835">Month 4</td> <td data-bbox="915 800 1229 835">Completion Date</td> <td data-bbox="1229 800 1528 835">Month 53</td> </tr> </table>	Start Date	Month 4	Completion Date	Month 53
Start Date	Month 4	Completion Date	Month 53		
Subtask 3.3	<p>GBRA will conduct 24-hour DO monitoring at 7 sites monthly during the index period collecting field and flow parameter groups. These sites shall be the same as the sites for routine ambient monitoring described in Task 3. Sampling period extends over 8 months during the index period between March 15 and October 15. Samples will be collected during the index periods that fall in 35 months of the project. Total number of sample events scheduled for collection through this subtask is 231.</p> <p>Field parameters are pH, temperature, conductivity and dissolved oxygen. Flow parameters are flow collected by gage, electric, mechanical or Doppler, including severity.</p>				
	<table border="1"> <tr> <td data-bbox="297 1108 602 1144">Start Date</td> <td data-bbox="602 1108 915 1144">Month 4</td> <td data-bbox="915 1108 1229 1144">Completion Date</td> <td data-bbox="1229 1108 1528 1144">Month 48</td> </tr> </table>	Start Date	Month 4	Completion Date	Month 48
Start Date	Month 4	Completion Date	Month 48		
Subtask 3.4	<p>GBRA will conduct effluent monitoring at 7 WWTFs once per month, collecting field, conventional, flow, bacteria and effluent parameter groups. Sampling period extends through 48 months. Total number of sample events scheduled for collection through this subtask is 322.</p> <p>Field parameters are pH, temperature, conductivity and dissolved oxygen. Conventional parameters are total suspended solids, sulfate, chloride, nitrate nitrogen, ammonia nitrogen, total kjeldahl nitrogen and total phosphorus. Flow parameters are flow collected by gage, electric, mechanical or Doppler, including severity. Bacteria parameters are <i>E. coli</i>. Effluent parameters are BOD, and CBOD. The GBRA's Regional Laboratory will conduct sample analysis.</p>				
	<table border="1"> <tr> <td data-bbox="297 1476 602 1512">Start Date</td> <td data-bbox="602 1476 915 1512">Month 4</td> <td data-bbox="915 1476 1229 1512">Completion Date</td> <td data-bbox="1229 1476 1528 1512">Month 53</td> </tr> </table>	Start Date	Month 4	Completion Date	Month 53
Start Date	Month 4	Completion Date	Month 53		
Subtask 3.5	<p>The GBRA will conduct spring flow monitoring at 3 springs once per yearly quarter collecting field, conventional, flow and bacteria parameter groups.</p> <p>Sampling period extends through 16 seasons. Total number of sample events scheduled for collection through this subtask is 45. Spatial and seasonal variation in spring flow will be captured.</p> <p>Field parameters are pH, temperature, conductivity and dissolved oxygen. Conventional parameters are total suspended solids, sulfate, chloride, nitrate nitrogen, ammonia nitrogen, total kjeldahl nitrogen and total phosphorus. Flow parameters are flow collected by gage, electric, mechanical or Doppler, including severity. Bacteria parameters are <i>E. coli</i>. The GBRA's Regional Laboratory will conduct sample analysis.</p>				
	<table border="1"> <tr> <td data-bbox="297 1871 602 1906">Start Date</td> <td data-bbox="602 1871 915 1906">Month 4</td> <td data-bbox="915 1871 1229 1906">Completion Date</td> <td data-bbox="1229 1871 1528 1906">Month 53</td> </tr> </table>	Start Date	Month 4	Completion Date	Month 53
Start Date	Month 4	Completion Date	Month 53		

Subtask 3.6	GBRA will perform multi-day aquatic life monitoring events on the Plum at CR 135 (Station 12640) and the Clear Fork of Plum Creek at CR 128 (Station 12556), in order to gage the effectiveness of implementation efforts on the abundance and diversity of aquatic life at these stations. GBRA will perform an assessment of the biological assemblages and the biological habitat two times at each station during the biological index period (March 15 - October 15). At least one of the assessments performed at each station will occur during the biological critical period (July 1 – September 30). Native Texas wildlife specimens will be collected under a Texas Parks and Wildlife scientific collection permit. This event will be also be accompanied by 24 dissolved oxygen monitoring, field and flow parameter groups; specific parameters are defined in Subtasks 3.1 and 3.3.				
	<table border="1"> <tr> <td data-bbox="297 531 602 562">Start Date</td> <td data-bbox="602 531 919 562">Month 4</td> <td data-bbox="919 531 1230 562">Completion Date</td> <td data-bbox="1230 531 1531 562">Month 36</td> </tr> </table>	Start Date	Month 4	Completion Date	Month 36
Start Date	Month 4	Completion Date	Month 36		
Subtask 3.7	GBRA will transfer monitoring data from activities in subtasks 3.1-3.6 to TCEQ for inclusion in the TCEQ SWQMIS at least biannually. Data will be transferred in the correct format using the TCEQ file structure along with a completed Data Summary, as described in the most recent version of the <i>TCEQ Surface Water Quality Monitoring Data Management Reference Guide</i> . GBRA will post data from monitoring activities collected in subtasks 3.1-3.5 to the project website in a timely manner. Data Correction Request Forms will be submitted to TSSWCB whenever errors are discovered in data already reported. All monitoring data files, data summary reports and data correction request forms will also be provided to Extension. GBRA will input monitoring regime, as detailed in the QAPP, into the TCEQ CMS.				
	<table border="1"> <tr> <td data-bbox="297 867 602 898">Start Date</td> <td data-bbox="602 867 919 898">Month 4</td> <td data-bbox="919 867 1230 898">Completion Date</td> <td data-bbox="1230 867 1531 898">Month 16</td> </tr> </table>	Start Date	Month 4	Completion Date	Month 16
Start Date	Month 4	Completion Date	Month 16		
Subtask 3.8	GBRA will continue to maintain a real-time water quality monitoring station on the Plum Creek upstream of US 183 (18343) that collects field parameters and turbidity every 15 minutes. The data from this station, as a part of the TCEQ Continuous Water Quality Monitoring Network (CWQMN), is available to the public through TCEQ’s CWQMN website and through links available on the GBRA website. The QAPP for this site is maintained by the TCEQ.				
	<table border="1"> <tr> <td data-bbox="297 1077 602 1108">Start Date</td> <td data-bbox="602 1077 919 1108">Month 4</td> <td data-bbox="919 1077 1230 1108">Completion Date</td> <td data-bbox="1230 1077 1531 1108">Month 53</td> </tr> </table>	Start Date	Month 4	Completion Date	Month 53
Start Date	Month 4	Completion Date	Month 53		
Subtask 3.9	GBRA will develop a final Assessment Data Report summarizing water quality data collected through Task 3. The Report shall, at a minimum, provide an assessment of water quality with respect to effectiveness of BMPs implemented and a discussion of interim short-term progress in achieving the Plum Creek WPP water quality goals. GBRA will summarize the results from Task 3 in the GBRA’s Clean Rivers Program Basin Highlights Report. GBRA will provide updates on the results and activities of Task 3 to the Steering Committee.				
	<table border="1"> <tr> <td data-bbox="297 1308 602 1339">Start Date</td> <td data-bbox="602 1308 919 1339">Month 4</td> <td data-bbox="919 1308 1230 1339">Completion Date</td> <td data-bbox="1230 1308 1531 1339">Month 53</td> </tr> </table>	Start Date	Month 4	Completion Date	Month 53
Start Date	Month 4	Completion Date	Month 53		
Deliverables	<ul style="list-style-type: none"> <li>• Monitoring data files and Data Summary in electronic format</li> <li>• Data correction request forms (as needed) in electronic format</li> <li>• Monitoring data updates posted to the project webpage</li> <li>• Summary of findings from monitoring activities included in GBRA Clean Rivers Program (CRP) Basin Highlights Report (BHR) in both electronic and hardcopy formats</li> <li>• Final Assessment Data Report in both electronic and hard copy formats</li> </ul>				

**Project Goals (Expand from Summary Page)**

- Generate data of known and acceptable quality for surface water quality monitoring (routine ambient, targeted watershed, 24-hour D.O, Aquatic Life monitoring, WWTF effluent and spring flow) of main stem and tributary stations on segment 1810 (Plum Creek) for field, conventional, flow, bacteria, 24 hour dissolved oxygen, nekton, benthic macroinvertebrates, aquatic habitat and effluent parameters
- Support the implementation of the Plum Creek WPP by collecting water quality data for use in evaluating the effectiveness of BMPs, and in assessing water quality improvement and progress in achieving restoration.
- Communicate water quality conditions to the public and to the Partnership on project results and activities in order to support adaptive management of the Plum Creek WPP and to expand public knowledge on Plum Creek water quality data.

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

- Provide technical assistance to the Partnership through collection and interpretation of water quality data.
- Data of known and acceptable quality are generated for surface water quality monitoring (routine ambient, targeted watershed, 24-hour D.O, Aquatic Life Monitoring, WWTF effluent and spring flow) of main stem and tributary stations on main stem and tributary stations on segment 1810 (Plum Creek) for field, conventional, flow, bacteria, 24 hour dissolved oxygen, nekton, benthic macroinvertebrates, aquatic habitat and effluent parameters
- Water quality data is used to evaluate progress in implementing the Plum Creek WPP and achieving water quality restoration.
- Water quality data is communicated to the public and the Partnership in a timely fashion.

**2017 Texas NPS Management Program Reference (Expand from Summary Page)**

**Components, Goals, and Objectives**

Component One – Explicit short and long-term goals, objectives and strategies to restore and protect surface and groundwater, as appropriate.

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

- Objective 1 – Focus nonpoint source abatement efforts, implementation strategies, and available resources in watershed and aquifers identified as impacted by nonpoint source pollution
- Objective 3 – Support the implementation of state, regional, and local programs to reduce nonpoint source pollution, such as the implementation of strategies defined in TMDL I-Plans, WPPs, and other water quality planning efforts in the state
- Objective 7 – Increase overall public awareness of nonpoint source issues and prevention activities

Short-Term Goal One – Data Collection and Assessment

- Objective B – Ensure that monitoring procedures meet quality assurance requirements and are in compliance with EPA-approved TCEQ or TSSWCB Quality Management Plans
- Objective E – Conduct monitoring to determine the effectiveness of TMDL I-Plans, WPPs and BMP implementation

Short-Term Goal Three – Education

- Objective G – Implement public outreach and education to maintain and restore water quality in water bodies impacted by nonpoint source pollution

Component Three – Combination of statewide nonpoint source programs and on-the-ground projects achieve water quality benefits; efforts are well-integrated with other relevant state and federal programs.

Estimated Load Reductions Expected (Only applicable to Implementation Project Type)
N/A

EPA State Categorical Program Grants – Workplan Essential Elements FY 2018-2022 EPA Strategic Plan Reference
Strategic Plan Goal – Goal 1 Core Mission
Strategic Plan Objective – Objective 1.2 Provide for Clean and Safe Water

**Part III – Financial Information**

Budget Summary				
Federal	\$	344,312	% of total project	60%
Non-Federal	\$	229,419	% of total project	40%
Total	\$	573,731	Total	100%
Category		Federal	Non-Federal	Total
Personnel	\$	0	\$ 105,661	\$ 105,661
Fringe Benefits	\$	0	\$ 42,793	\$ 42,793
Travel	\$	12,037	\$ 0	\$ 12,037
Equipment	\$	32,916	\$ 0	\$ 32,916
Supplies	\$	13,444	\$ 0	\$ 13,444
Contractual	\$	0	\$ 0	\$ 0
Construction	\$	0	\$ 0	\$ 0
Other	\$	285,915	\$ 46,097	\$ 332,012
Total Direct Costs	\$	344,312	\$ 194,551	\$ 538,863
Indirect Costs 33%	\$	0	\$ 34,868	\$ 34,868
Total Project Costs	\$	344,312	\$ 229,419	\$ 573,731

<b>Budget Justification (Federal)</b>		
Category	Total Amount	Justification
Personnel	\$ 0	N/A
Fringe Benefits	\$ 0	N/A
Travel	\$ 12,037	Mileage for sample collection at the federal rate: <ul style="list-style-type: none"> <li>• Routine Ambient monitoring (average of 108 miles per monitoring event for 45 events)</li> <li>• Targeted Watershed monitoring (average of 236 miles per monitoring event for 13 events)</li> <li>• 24-hour D.O. monitoring (average of 108 miles per monitoring event for 24 events)</li> <li>• WWTFs effluent (average of 117 miles per monitoring event for 48 events)</li> <li>• Continuous monitoring maintenance at Station 18343 (average of 78 miles for 16 events)</li> <li>• Aquatic Life Monitoring at Stations 12640 and 12556 (average of 60 miles for 4 events)</li> </ul>
Equipment	\$ 32,916	Two YSI EXO3 Sondes with attached sensors to measure temperature, dissolved oxygen, pH, specific conductance and turbidity (\$25,926) OTT MF Pro Flow Meter with Velocity Sensor & Wading Rod (\$6,990)
Supplies	\$ 13,444	Supplies for water quality monitoring bottles (\$6,245), field probe replacement parts: pH sensor, DO membrane, conductivity/temperature sensor (\$3,674), probe calibration reagents (\$2,180), write-in-rain paper (\$300), biological monitoring supplies (\$645), GPS for field sampling routes (\$400)
Contractual*	\$ 0	N/A
Construction	\$ 0	N/A
Other	\$ 285,915	Analyses of water quality monitoring samples described in Task 3: <ul style="list-style-type: none"> <li>• 4 Routine sites once per month for 45 months (\$69,289)</li> <li>• Supplemental nutrients at 3 routine sites bimonthly (\$5,874)</li> <li>• 34 Wet targeted sites once per season for 5 seasons (\$36,370)</li> <li>• 27 Dry targeted sites once per season for 7 seasons (\$40,323)</li> <li>• 7 WWTFs once per month for 45 months (\$123,123)</li> <li>• 3 Spring sites once per season for 16 seasons (\$9,936)</li> <li>• Maintenance and repair costs for field equipment (\$1,000)</li> </ul>
Indirect	\$ 0	N/A

<b>Budget Justification (Non-Federal)</b>		
<b>Category</b>	<b>Total Amount</b>	<b>Justification</b>
Personnel	\$ 105,661	Water Quality Program Supervisor (0.04 FTE per year for 4 years) Aquatic Biologist (0.15 FTE per year for 4 years) Water Quality Field Technician (0.2 FTE per year for Tech #1 for 4 years, and Tech #2 for 1 year) Habitat Conservation Plan Coordinator (0.01 FTE for 1.5 years) Education Administrator (0.01 FTE per year for 4 years) Education Administrative Technical Specialist (0.01 FTE per year for 4 years)
Fringe Benefits	\$ 42,793	Fringe calculated at 40.5% of non-federal personnel
Travel	\$ 0	N/A
Equipment	\$ 0	N/A
Supplies	\$ 0	N/A
Contractual*	\$ 0	N/A
Construction	\$ 0	N/A
Other	\$ 46,097	Clean Rivers Program monitoring at stations 12640, 12647 and 17406 (\$34,889); Volunteer labor calculated at a rate of \$12/hour for volunteer events such as Chisholm Trail, Lockhart Justice Center Rain Garden maintenance, and Annual Cleanups for an approximate total of 644 volunteer hours; Texas Stream Team Match Contribution (\$1080); GBRA Intern calculated at a rate of \$12/hour for approximately 200 intern hours.
Indirect	\$ 34,868	Indirect calculated at 33.0% of non-federal personnel