

Bryan W. Shaw, Ph.D., *Chairman*
Carlos Rubinstein, *Commissioner*
Toby Baker, *Commissioner*
Zak Covar, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Protecting Texas by Reducing and Preventing Pollution

October 24, 2012

Ms. Leslie Rauscher
US Environmental Protection Agency (EPA)
(6MD-AT) Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: FY11 319(h) Upper San Antonio River Watershed Protection Plan Quality Assurance Project
Plan (QAPP) Grant No. 99614616

Approval Date: October 19, 2012 (Update due by October 19, 2013)

Dear Ms. Rauscher:

The above named QAPP has been approved. The original QAPP and signature page have been uploaded to the Grants Recording Tracking System (GRTS) as documentation of approval.

Should you have any questions, please contact Jack Higginbotham at Jack.Higginbotham@tceq.texas.gov or (512) 239-6699.

Sincerely,

A handwritten signature in black ink, appearing to read "Kerry Niemann".

Kerry Niemann
Team Leader, NPS Team
Office of Water

Bryan W. Shaw, Ph.D., *Chairman*
Carlos Rubinstein, *Commissioner*
Toby Baker, *Commissioner*
Zak Covar, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

October 22, 2012

Patricia M. Carvajal
San Antonio River Authority
100 East Guenther St.
San Antonio, Texas 78204

Re: Upper San Antonio River Watershed Protection Plan (WPP) Quality Assurance Project Plan (QAPP)

Approved: October 19, 2012 (Next update due October 19, 2013)

QAPP Revision Date: October 10, 2012

Dear Ms. Carvajal:

The above named QAPP has been approved. The original document and signature pages are enclosed as documentation of approval.

In accordance with the terms of the QAPP, **please ensure that copies of this document and any subsequent amendments are distributed to each sub-tier participant as noted in Section A3 of the QAPP.** This approval letter must be available for review during a monitoring systems audit.

Should you have questions, please contact me at (512) 239-0425.

Sincerely,


Kyle Ginter
Quality Assurance Specialist

enclosure

cc: Sharon Coleman, Senior Quality Assurance Specialist, MC 165
Jack Higginbotham, Project Manager, MC 203

Jack Higginbotham

From: Jack Higginbotham
Sent: Wednesday, October 24, 2012 8:16 AM
To: Tabitha Kirkland
Subject: RE: USAR WPP Revision QAPP 582-12-10083
Attachments: USAR_WPP_QAPP-FINAL.pdf

Hey Tabitha,

Here's the finalized QAPP.

Jack Higginbotham
Project Manager, Nonpoint Source Pollution Program
Planning & Implementation Section
Water Quality Planning Division
Office of Water

Texas Commission on Environmental Quality
P.O. Box 13087, MC 203
Austin, TX 78711-3087
(512) 239-6699
Fax: (512) 239-1414
e-mail: jack.higginbotham@tceq.texas.gov

From: Tabitha Kirkland
Sent: Thursday, October 18, 2012 8:41 AM
To: Jack Higginbotham
Subject: RE: USAR WPP Revision QAPP 582-12-10083

Jack,

I'll also be getting an electronic executed copy when it's ready, right? I need it to load to SWQMIS.

Tab

From: Jack Higginbotham
Sent: Thursday, October 18, 2012 8:26 AM
To: Tabitha Kirkland; Rebecca Ross
Cc: Nancy Ragland
Subject: USAR WPP Revision QAPP 582-12-10083

Tabitha,

I attached the USAR WPP Revision Monitoring QAPP (contract number 582-12-10083) for your records.

Thanks,

Appendix I: Example Letter to Document Adherence to the QAPP

TO: Hollis Pantalion
Lower Colorado River Authority – ELS
3505 Montopolis Drive
Austin, Texas 78744

FROM: Patricia M. Carvajal
Senior Water Quality Planner / QAO
San Antonio River Authority
P.O. Box 839980
San Antonio, Texas 78283-9980

RE: Upper San Antonio River Watershed Protection Plan Revision #1 Quality Assurance Project Plan

Please sign and return this form by (date) to:

Patricia M. Carvajal
Senior Water Quality Planner/QAO
San Antonio River Authority
P.O. Box 839980
San Antonio, Texas 78283-9980

I acknowledge receipt of the "Upper San Antonio River Watershed Protection Plan Revision #1 Quality Assurance Project Plan". I understand the document(s) describe quality assurance, quality control, data management and reporting, and other technical activities that must be implemented to ensure the results of work performed will satisfy stated performance criteria. My signature on this document signifies that I have read and approved the document contents pertaining to my program. Furthermore, I will ensure that all staff members participating in Clean Rivers Program activities will be required to familiarize themselves with the document contents and adhere to them as well.

Hollis Pantalion 10/10/12
Signature Date

Copies of the signed forms should be sent by the San Antonio River Authority to the TCEQ NPS Project Manager within 60 days of TCEQ approval of the QAPP.

Appendix I: Example Letter to Document Adherence to the QAPP

TO: Charles J. Lorea
San Antonio River Authority
P.O. Box 839980
San Antonio, Texas 78283-9980

FROM: Patricia M. Carvajal
Senior Water Quality Planner / QAO
San Antonio River Authority
P.O. Box 839980
San Antonio, Texas 78283-9980

RE: Upper San Antonio River Watershed Protection Plan Revision #1 Quality Assurance Project Plan

Please sign and return this form by (date) to:

Patricia M. Carvajal
Senior Water Quality Planner/QAO
San Antonio River Authority
P.O. Box 839980
San Antonio, Texas 78283-9980

I acknowledge receipt of the "Upper San Antonio River Watershed Protection Plan Revision #1 Quality Assurance Project Plan". I understand the document(s) describe quality assurance, quality control, data management and reporting, and other technical activities that must be implemented to ensure the results of work performed will satisfy stated performance criteria. My signature on this document signifies that I have read and approved the document contents pertaining to my program. Furthermore, I will ensure that all staff members participating in Clean Rivers Program activities will be required to familiarize themselves with the document contents and adhere to them as well.


Signature _____ Date 10-17-12

Copies of the signed forms should be sent by the San Antonio River Authority to the TCEQ NPS Project Manager within 60 days of TCEQ approval of the QAPP.

Upper San Antonio River Watershed Protection Plan
Quality Assurance Project Plan

San Antonio River Authority
P.O. Box 839980
San Antonio, Texas 78283-9980

Funding Source:

Nonpoint Source Program CWA §319(h)
Prepared in cooperation with the Texas Commission on Environmental Quality
and the U.S. Environmental Protection Agency
Federal ID #99614616
State USAS Grant #905011

Effective Period: One year from date of final approval

Questions concerning this quality assurance project plan should be directed to:

Patricia M. Carvajal
Senior Water Quality Planner
P.O. Box 839980
San Antonio, Texas 78283-9980
(210)302-3672
pmcarvajal@sara-tx.org

JA

A1 APPROVAL PAGE

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

~~MONITORING~~
~~Field Operations Support Division~~ *due 10/19/2012*

Sharon R. Coleman 10/19/2012
~~Stephen Stubbs,~~ *due 10/19/2012* Date
TCEQ QA Manager, *Acting*

[Signature] 10/19/12
Date
Kyle Girten,
Lead NPS QA Specialist
Quality Assurance Team

Water Quality Planning Division

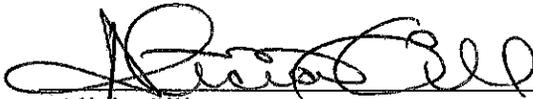
[Signature] 10/19/12
Date
Kebry Niemann, Team Leader
Nonpoint Source Program

[Signature] 10/16/12
Date
Jack Higginbotham,
TCEQ NPS Project Manager

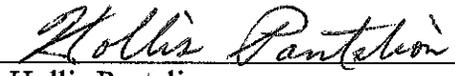
[Signature] 10/18/12
Date
Nancy Ragland, Team Lead
Data Management and Analysis

Anju Chalise 10/17/2012
Date
Anju Chalise, NPS QA Specialist
Nonpoint Source Program

Lower Colorado River Authority Environmental Laboratory Services


Alicia Gill
LCRA – ELS Laboratory Manager

10/10/12
Date


Hollis Pantalion
LCRA – ELS Quality Assurance

10/10/12
Date

The San Antonio River Authority will secure written documentation from additional project participants (e.g., sub-contract, laboratories) stating the organization's awareness of and commitment to requirements contained in this quality assurance project plan and any amendments or revisions of this plan. The San Antonio River Authority will maintain this documentation as part of the project's quality assurance records. This documentation will be available for review. Copies of this documentation will also be submitted as deliverables to the TCEQ NPS Project Manager within 30 days of final TCEQ approval of the QAPP. (See sample letter in Attachment 1 of this document.)

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A3 DISTRIBUTION LIST

The Lead NPS QA Specialist will provide original versions of this project plan and any amendments or revisions of this plan to the TCEQ NPS Project Manager and the San Antonio River Authority Project Manager. The TCEQ NPS Project Manager will provide copies to the TCEQ Data Management and Analysis Team Leader and EPA Project Officer within two weeks of approval. The TCEQ NPS Project Manager will document receipt of the plan and maintain this documentation as part of the project's quality assurance records. This documentation will be available for review.

Nancy Ragland, Team Leader
Data Management and Analysis
MC-234
(512) 239-6546

**U.S. Environmental Protection Agency Region 6
State/Tribal Section
1445 Ross Avenue
Suite # 1200
Dallas, TX 75202-2733**

Leslie Rauscher, Project Officer
(214) 665-2773

The San Antonio River Authority will provide copies of this project plan and any amendments or revisions of this plan to each project participant defined in the list below. The San Antonio River Authority will document receipt of the plan by each participant and maintain this documentation as part of the project's quality assurance records. This documentation will be available for review.

San Antonio River Authority
P.O. Box 839980
San Antonio, Texas 78283-9980

Patricia M. Carvajal, Project Manager
(210) 302-3672

Rebecca S. Reeves, ESD Superintendent
(210) 302-3670

Ernest Moran, Watershed Monitoring
Supervisor
(210) 302-3668

Katherine Peché Water Quality Planner Data
Management
(210) 302-3289

Michelle Garza, Environmental Systems
Information Specialist
(210) 302-4242

Larry Larralde, Aquatic Biologist
(210) 302-3208

Karen Sablan, Senior Aquatic Biologist
(210) 302-3673

Ronald Hernandez, Environmental
Investigations Coordinator
(210) 302-3609

Ryan Burke, Aquatic Biologist
(210) 302-3638

Jeanette Hernandez, Quality Assurance
Officer
(210)302-3283

Amanda Nasto, Environmental
Investigations Coordinator
(210)302-3676

San Antonio River Authority Regional Environmental Laboratory

Charles J. Lorea, IV Laboratory Supervisor
(210)302-3674

Jeanette Hernandez, Laboratory QA Officer
(210)302-3283

Lower Colorado River Authority Environmental Laboratory Services

Alicia Gill, LCRA Laboratory Manager
(512) 356-6022

Hollis Pantalion, LCRA Quality Assurance
Officer
(512) 356-6022

LIST OF ACRONYMS

A&P	Assessment and Planning
AWRL	Ambient Water Reporting Limit
BMP	Best Management Practice
CAP	Corrective Action Plan
COC	Chain of Custody
CRP	Clean Rivers Program
CWA	Clean Water Act
DFIRM	Digital Flood Insurance Rate Map
DOC	Demonstration of Capability
DMP	Data Management Plan
DMRG	Data Management Reference Guide
DM&A	Data Management and Analysis
DQO	Data Quality Objective
DTS	SQL Data Transformation Package
EPA	Environmental Protection Agency
ESD	Environmental Sciences Department
GIS	Geographic Information System
GPS	Global Positioning System
HEC-RAS	Hydrologic Engineering Centers River Analysis System
HVAC	Heating, Ventilation and Air Conditioning
IT	Information Technology
LCRA-ELS	Lower Colorado River Authority Environmental Laboratory Services
LIMS	Laboratory Information Management System
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection
LOQ	Limit of Quantitation
NCR	Non Conformance Report
NELAP	National Environmental Laboratory Accreditation Program
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source

OPP	Operating Permit Program
PM	Project Manager
PO	Project Officer
QA/QC	Quality Assurance/Quality Control
QAM	Quality Assurance Manual
QM	Quality Manual /Quality Manager
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QAS	Quality Assurance Specialist
QMP	Quality Management Plan
RPD	Relative Percent Difference
SARA	San Antonio River Authority
SARA-REL	San Antonio River Authority Regional Environmental Laboratory
SLOC	Station Location
SOP	Standard Operating Procedure
SQL	Structured Query Language
SWQM	Surface Water Quality Monitoring
SWQMIS	Surface Water Quality Monitoring Information System
TCEQ	Texas Commission on Environmental Quality
TMDL	Total Maximum Daily Load
TSWQS	Texas Surface Water Quality Standards
USGS	U.S. Geological Survey
WQI	Water Quality Inventory

A4 PROJECT/TASK ORGANIZATION

TCEQ

Field Operations Support Division

Kyle Girten

Lead NPS QA Specialist

Assists the TCEQ Project Manager in QA related issues. Serves on planning team for NPS projects. Participates in the planning, development, approval, implementation, and maintenance of the QAPP. Determines conformance with program quality system requirements. Coordinates or performs audits, as deemed necessary and using a wide variety of assessment guidelines and tools. Concurs with proposed corrective actions and verifications. Monitors corrective action. Provides technical expertise and/or consultation on quality services. Provides a point of contact at the TCEQ to resolve QA issues. Recommends to TCEQ management that work be stopped in order to safe guard project and programmatic objectives, worker safety, public health, or environmental protection.

Water Quality Planning Division

Kerry Niemann, Team Leader

NPS Program

Responsible for management and oversight of the TCEQ NPS Program. Oversees the development of QA guidance for the NPS program to be sure it is within pertinent frameworks of the TCEQ. Monitors the effectiveness of the program quality system. Reviews and approves all NPS projects, internal QA audits, corrective actions, reports, work plans, and contracts. Enforces corrective action, as required. Ensures NPS personnel are fully trained and adequately staffed.

Jack Higginbotham

TCEQ NPS Project Manager

Maintains a thorough knowledge of work activities, commitments, deliverables, and time frames associated with projects. Develops lines of communication and working relationships between the San Antonio River Authority, the TCEQ, and the EPA. Tracks deliverables to ensure that tasks are completed as specified in the contract. Responsible for ensuring that the project deliverables are submitted on time and are of acceptable quality and quantity to achieve project objectives. Serves on planning team for NPS projects. Participates in the development, approval, implementation, and maintenance of the QAPP. Assists the TCEQ QAS in technical review of the QAPP. Responsible for verifying that the QAPP is followed by the San Antonio River Authority. Notifies the TCEQ QAS of particular circumstances which may adversely affect the quality of data derived from the collection and analysis of samples. Enforces corrective action.

Anju Chalise**NPS Quality Assurance Specialist**

Assists Lead QAS with NPS QA management. Serves as liaison between NPS management and Agency QA management. Responsible for NPS guidance development related to program quality assurance. Serves on planning team for NPS projects. Participates in the development, approval, implementation, and maintenance of the QAPP.

Rebecca Ross**NPS Data Manager**

Responsible for coordination and tracking of NPS data sets from initial submittal through NPS Project Manager review and approval. Ensures that data is reported following instructions in the Surface Water Quality Monitoring Data Management Reference Guide (January 2012, or most current version). Runs automated data validation checks in SWQMIS and coordinates data verification and error correction with NPS Project Managers' data review. Generates SWQMIS summary reports to assist NPS Project Managers' data reviews. Provides training and guidance to NPS and Planning Agencies on technical data issues. Reviews QAPPs for valid stream monitoring stations. Checks validity of parameter codes, submitting entity code(s), collecting entity code(s), and monitoring type code(s). Develops and maintains data management-related standard operating procedures for NPS data management. Serves on planning team for NPS projects.

San Antonio River Authority**Patricia M. Carvajal****San Antonio River Authority Project Manager**

Responsible for ensuring tasks and other requirements in the contract are executed on time and are of acceptable quality. Monitors and assesses the quality of work. Coordinates attendance at conference calls, training, meetings, and related project activities with the TCEQ. Responsible for verifying the QAPP is followed and the project is producing data of known and acceptable quality. Ensures adequate training and supervision of all monitoring and data collection activities. Complies with corrective action requirements.

Jeanette Hernandez**San Antonio River Authority QAO**

Responsible for coordinating development and implementation of the QA program. Responsible for writing and maintaining the QAPP. Responsible for maintaining records of QAPP distribution, including appendices and amendments. Responsible for maintaining written records of sub-tier commitment to requirements specified in this QAPP. Responsible for identifying, receiving, and maintaining project quality assurance records. Responsible for coordinating with the TCEQ QAS to resolve QA-related issues. Notifies the San Antonio River Authority Project Manager and TCEQ Project Manager of particular circumstances which may adversely affect the quality of data. Responsible for validation and verification of all data collected according with Table 4 procedures and acquired data procedures after each task is performed. Coordinates the research and review of technical QA material and data related to water quality monitoring system design and analytical techniques. Conducts laboratory inspections. Develops, facilitates, and conducts monitoring systems audits.

Charles J. Lorea**Laboratory Manager**

Responsible for supervision of laboratory personnel involved in generating analytical data for this project. Responsible for ensuring that laboratory personnel involved in generating analytical data have adequate training and a thorough knowledge of the QAPP and all SOPs specific to the analyses or task performed and/or supervised. Responsible for oversight of all operations, ensuring that all QA/QC requirements are met, and documentation related to the analysis is completely and accurately reported. Enforces corrective action as required. Develops and facilitates monitoring systems audits.

Jeanette Hernandez**Laboratory QAO**

Monitors the implementation of the QAM and the QAPP within the laboratory to ensure complete compliance with QA objectives as defined by the contract and in the QAPP. Conducts internal audits to identify potential problems and ensure compliance with written SOPs. Responsible for supervising and verifying all aspects of the QA/QC in the laboratory. Performs validation and verification of data before the report is sent to the San Antonio River Authority. Insures that all QA reviews are conducted in a timely manner from real-time review at the bench during analysis to final pass-off of data to the QA officer.

Katherine Peché**San Antonio River Authority Data Manager**

Responsible for the acquisition, verification, and transfer of data to the TCEQ. Oversees data management for the study. Performs data quality assurances prior to transfer of data to TCEQ. Responsible for transferring data to the TCEQ in the Event/Result file format specified in the DMRG. Ensures data are submitted according to workplan specifications. Provides the point of contact for the TCEQ Data Manager to resolve issues related to the data.

Ernest Moran**San Antonio River Authority Field Supervisor**

Responsible for supervising all aspects of the sampling and measurement of surface waters and other parameters in the field. Responsible for the acquisition of water samples and field data measurements in a timely manner that meet the quality objectives specified in Section A7 (Table A.1), as well as the requirements of Sections B1 through B8. Responsible for field scheduling, staffing, and ensuring that staff is appropriately trained as specified in Sections A6 and A8.

LCRA ENVIRONMENTAL LABORATORY SERVICES

Note: LCRA Laboratory is a back-up laboratory

Alicia C. Gill LCRA Lab Manager

Responsible for overall performance, administration, and reporting of analyses performed by LCRA's Environmental Laboratory Services. Responsible for supervision of laboratory personnel involved in generating analytical data for the project. Ensures that laboratory personnel have adequate training and a thorough knowledge of the QAPP and related SOPs. Responsible for oversight of all laboratory operations ensuring that all QA/QC requirements are met, documentation is complete and adequately maintained, and results are reported accurately. Additionally, the lab director will review and verify all field and laboratory data for integrity and continuity, reasonableness and conformance to project requirements, and then validated against the data quality objectives listed in Table A7.1-A7.4.

Hollis Pantalion LCRA Quality Assurance Officer

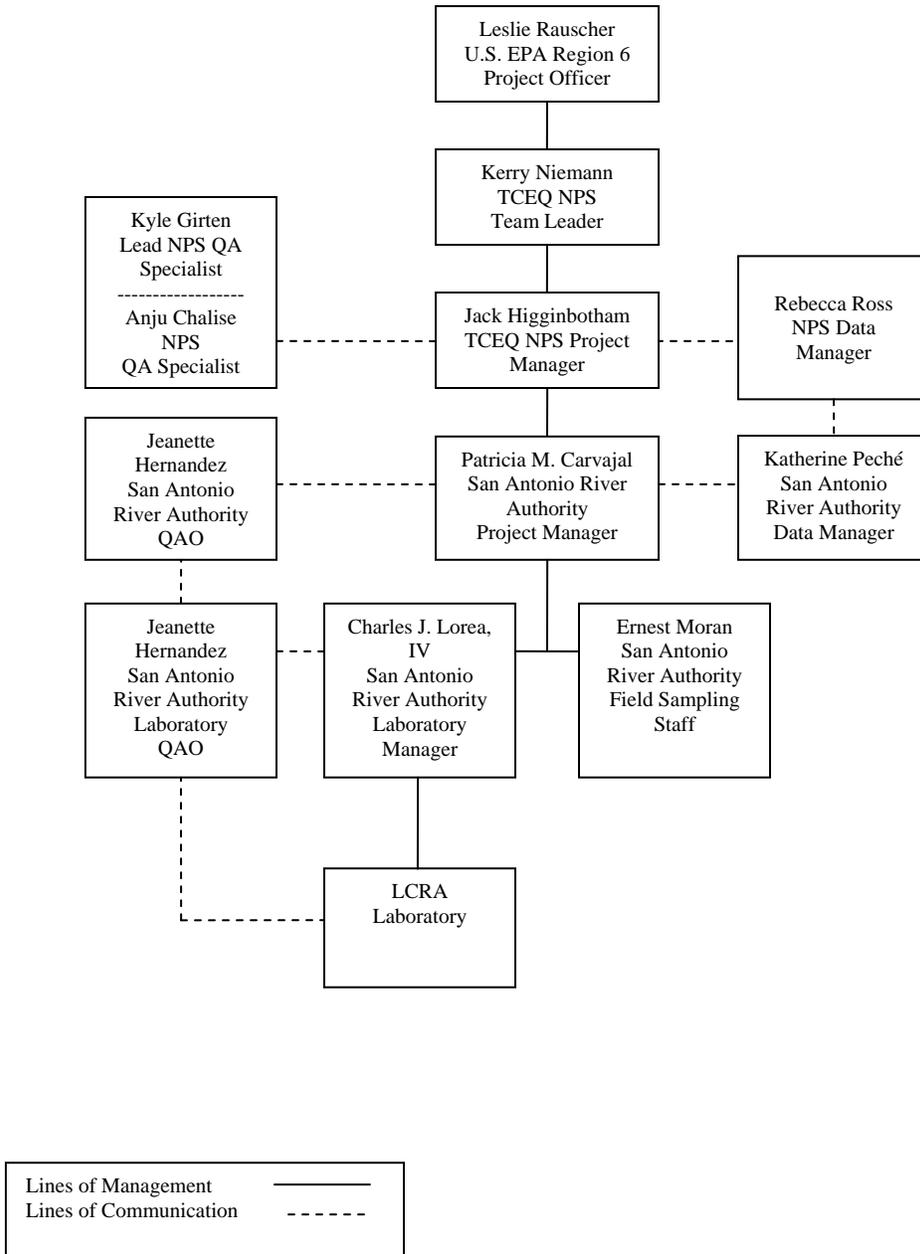
Maintains operating procedures that are in compliance with the QAPP, amendments and appendices. Responsible for the overall quality control and quality assurance of analyses performed by LCRA's Environmental Laboratory Services. Assists with monitoring systems audits for CRP projects.

U.S. EPA Region 6

Leslie Rauscher EPA Project Officer

Responsible for managing the CWA Section 319 funded grant on the behalf on EPA. Assists the TCEQ in approving projects that are consistent with the management goals designated under the State's NPS management plan and meet federal guidance. Coordinates the review of project workplans, draft deliverables, and works with the State in making these items approvable. Meets with the State at least semi-annually to evaluate the progress of each project and when conditions permit, participate in a site visit on the project. Fosters communication within EPA by updating management and others, both verbally and in writing, on the progress of the State's program and on other issues as they arise. Assists the regional NPS coordinator in tracking a State's annual progress in its management of the NPS program. Assists in grant close-out procedures ensuring all deliverables have been satisfied prior to closing a grant.

FIGURE A4.1. ORGANIZATION CHART - LINES OF COMMUNICATION



A5 PROBLEM DEFINITION/BACKGROUND

In 2000, the subject stream segments were identified by the Texas Commission on Environmental Quality (TCEQ) as impaired due to excessive levels of pathogenic indicator bacteria (fecal coliform and *E. coli*). As a result of this impairment, the TCEQ developed a Total Maximum Daily Load (TMDL) for each of the three segments. The TMDLs established the pollutant loading reductions necessary to bring the streams into compliance with state water quality standards. The TCEQ adopted these TMDLs on 25 July 2007, and the EPA approved the TMDLs on 25 September 2007, at which time they became part of the state's Water Quality Management Plan.

The San Antonio River Authority (SARA), in cooperation with local partners and the TCEQ, has developed a Watershed Protection Plan (WPP) for the urban portion of the Upper San Antonio River (above Loop 410). The WPP included additional sampling and recommendations for bacteria control measures. The plan was completed in December of 2006. This WPP is now being updated to assess the status of BMPs that were identified in the 2006 WPP and to identify new BMPs that can be implemented in the project area. Refer to Figure A1.1.

As a part of this project, additional water quality information will be collected to supplement the information that is currently available. Specifically, discrete stormwater data is needed for the Upper San Antonio River. The Monitoring schedule can be found in Section B1.

The QAPP is reviewed by the TCEQ to help ensure that data generated for the purposes described herein are scientifically valid and legally defensible. This review process will also help ensure that data submitted to the SWQMIS database have been collected and analyzed in a way that guarantees its reliability.

A6 PROJECT/TASK DESCRIPTION

The work to be performed and the products to be produced are described in detail in the project work plan (refer to Appendix B). The monitoring sites are identified in Section B1. The parameters of interest are also identified. Maps of the sample stations are located in Appendix A.

The monitoring activities included in this plan will be used to determine stormwater bacteria loads as well as nutrient and sediment loads for sub-watersheds in the Upper San Antonio River. The following sub-watersheds are planned to be monitored; Alazan Creek, Apache Creek and San Pedro Creek. The data may be used to determine which sub-watersheds should be focused on for future BMP implementation. If a sub-watershed is contributing a significantly higher load of bacteria and nutrients; future BMPs may be prioritized for those sub-basins where the higher loads are being found.

As part of this project site-specific and watershed specific BMPs are being identified for potential future implementation. The data that is generated from this project may be used to determine which sub-watersheds and which specific sites should be focused on in order to provide the greatest bacteria and nutrient load reductions. The BMPs being considered for potential implementation consist of structural BMPs. These structural BMPs consist of infiltration trenches, infiltration basins, wet ponds, constructed wetlands, bioretention systems, sand filters and manufactured wetlands (proprietary system).

Best Management Practices for run-off may be monitored as a component of this QAPP. Currently, there are plans to install best management practices at two SARA facilities located at 100 E. Gunther and 600 E. Euclid in San Antonio. If the construction of these BMPs is completed by January 2013 monitoring to determine the effectiveness of the BMPs will be attempted for acceptable rainfall events. If this occurs this QAPP will be amended to include this monitoring.

See Appendix B for the project-related work plan tasks related to data collection and schedule of deliverables for a description of work defined in this QAPP.

See Section B1 for monitoring to be conducted under this QAPP.

Revisions to the QAPP

Until the work described is completed, this QAPP shall be reissued annually on the anniversary date, or revised and reissued prior to any significant changes being made in activities, whichever is sooner. Reissuances and annual updates must be submitted to the TCEQ for approval at least 90 days before the last approved version has expired. If the QAPP expires, the QAPP is no longer in effect and the work covered by the QAPP must be halted. If the entire QAPP is current, valid, and accurately reflects the project goals and the organization's policy, the annual re-issuance may be done by a certification that the plan is current. This can be accomplished by submitting a cover letter stating the status of the QAPP and a copy of new, signed approval pages for the QAPP. If the QAPP needs to be updated to incorporate amendments made earlier in the

year or to incorporate new changes, a full annual update is required. This is accomplished by submitting a cover letter, a document detailing changes made, and a full copy of the updated QAPP (including signature pages).

Amendments

Amendments to the QAPP may be necessary to reflect changes in project organization, tasks, schedules, objectives, and methods; address deficiencies and nonconformances; improve operational efficiency; and/or accommodate unique or unanticipated circumstances. Requests for amendments are directed from the contractor Project Manager to the TCEQ Project Manager in writing using the QAPP Amendment shell. The changes are effective immediately upon approval by the TCEQ NPS Project Manager and Quality Assurance Specialist, or their designees, and the EPA Project Officer (if necessary).

Amendments to the QAPP and the reasons for the changes will be documented, and full copies of amendments will be forwarded to all persons on the QAPP distribution list by the Contractor QAO. Amendments shall be reviewed, approved, and incorporated into a revised QAPP during the annual revision process or within 120 days of the initial approval in cases of significant changes.

Amendments shall be reviewed, approved, and incorporated into a revised QAPP during the annual revision process or within 120 days of the initial approval in cases of significant changes.

A7 QUALITY OBJECTIVES AND CRITERIA

Only data collected that have a valid parameter code in Table A7.1-A7.4 will be stored in SWQMIS. Any parameters listed in Table A7.1-A7.4 that do not have a valid TCEQ parameter code assigned will not be stored in SWQMIS.

Quantitative and qualitative information regarding measurement data needed to measure pond efficiency and in-stream water quality improvements are provided below.

Storm event selection criteria are defined in Section B1. The storm event data will assist in future efforts to model storm event bacteria and nutrient loads coming from the Westside Creeks.

TABLE A7.1 MEASUREMENT PERFORMANCE SPECIFICATIONS FOR INSTREAM ROUTINE WATER MONITORING FIELD PARAMETERS										
Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (uS/CM @ 25C)	us/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G and TCEQ SOP, V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)	s.u	water	EPA 150.1 and TCEQ SOP, V1	00400	NA*	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)	cfs	Water	TCEQ SOP, V1	74069	NA*	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPL	NU	other	TCEQ SOP V1	89835	NA*	NA	NA	NA	NA	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER)	NU	other	NA	89966	NA	NA	NA	NA	NA	Field
WATER COLOR (1=BROWN, 2=REDDISH, 3=GREEN, 4=BLACK, 5=CLEAR, 6=OTHER)	NU	water	TCEQ SOP V1	89969	NA	NA	NA	NA	NA	Field
WATER ODOR (1=SEWAGE, 2=OILY/CHEMICAL, 3=H2S, 4=MUSKY, 5=FISHY, 6=NONE, 7=OTHER)	NU	water	TCEQ SOP V1	89971	NA	NA	NA	NA	NA	Field
PRIMARY CONTACT, OBSERVED ACTIVITY (# OF PEOPLE OBSERVED)****	NU	water	TCEQ SOP V1	89978	NA	NA	NA	NA	NA	Field
EVIDENCE OF PRIMARY CONTACT RECREATION (1 = OBSERVED, 0 = NOT OBSERVED)****	NU	water	TCEQ SOP V1	89979	NA	NA	NA	NA	NA	Field

TABLE A7.1 MEASUREMENT PERFORMANCE SPECIFICATIONS FOR INSTREAM ROUTINE WATER MONITORING FIELD PARAMETERS										
Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
* Reporting to be consistent with SWQM guidance and based on measurement capability. ** Chlorine residual to be collected downstream of chlorinated outfalls. *** To be routinely reported when collecting data from perennial pools. ****Recorded for Routine Monitoring Only										
References: United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020 American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.) TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2008 (RG-415). TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)										

TABLE A7.2 MEASUREMENT PERFORMANCE SPECIFICATIONS FOR SARA- REL FOR INSTREAM ROUTINE/STORMWATER/BMP MONITORING										
Conventional and Bacteriological Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540 D	00530	4	4.0	NA	NA	NA	SARA - REL
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM 4500-NH ₃ D	00610 ¹	0.1	0.1	70-130	20	80-120	SARA - REL
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610 ¹	0.1	0.1	70-130	20	80-120	SARA - REL
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.05	70-130	20	80-120	SARA - REL
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00615	0.1	0.05	70-130	20	80-120	SARA - REL
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2 Rev. 2 (1993)	00625	0.2	0.2	70-130	20	80-120	SARA - REL
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.3	00665	0.06	0.02	70-130	20	80-120	SARA - REL
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-B***	31699	1	1	NA	0.50**	NA	SARA - REL
E.COLI, COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	SARA - REL
¹ These methods are equivalent to one another. The availability of two methods allows for the analysis of samples within hold time if equipment problems develop. ** This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B5. *** E.coli samples analyzed by SM 9223-B should always be processed as soon as possible and within 8 hours. When transport conditions necessitate delays in delivery longer than 6 hours, the holding time may be extended and samples must be processed as soon as possible and within 48 hours.										
References: United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020 American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.) TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2008 (RG-415). TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)										

**TABLE A7.3 MEASUREMENT PERFORMANCE SPECIFICATIONS FOR INSTREAM STORM WATER MONITORING AND BMP MONITORING
FIELD PARAMETERS**

Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
RAINFALL (INCHES, GAUGE DATA) ¹	inches	other	Gauge	46529	NA*	NA*	NA*	NA*	NA*	Field
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (uS/CM @ 25C)	us/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G and TCEQ SOP, V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)	s.u	water	EPA 150.1 and TCEQ SOP, V1	00400	NA*	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)	cfs	Water	TCEQ SOP, V1	74069	NA*	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPL	NU	other	TCEQ SOP V1	89835	NA*	NA	NA	NA	NA	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER)	NU	other	NA	89966	NA	NA	NA	NA	NA	Field
WATER COLOR (1=BROWN, 2=REDDISH, 3=GREEN, 4=BLACK, 5=CLEAR, 6=OTHER)	NU	water	TCEQ SOP V1	89969	NA	NA	NA	NA	NA	Field
WATER ODOR (1=SEWAGE, 2=OILY/CHEMICAL, 3=H2S, 4=MUSKY, 5=FISHY, 6=NONE, 7=OTHER)	NU	water	TCEQ SOP V1	89971	NA	NA	NA	NA	NA	Field

¹Rain fall data may be obtained from either a USGS gauge or a unit installed temporarily at a sample location for each event. A rain gauge reading is typically considered accurate for ¾ mile radius surrounding the rain gauge. For this monitoring a rain gauge may be used if it is within 1.25 miles of the sample station. If multiple sample sites are within this range one rain gauge may be used for the sample sites.

* Reporting to be consistent with SWQM guidance and based on measurement capability.

** Chlorine residual to be collected downstream of chlorinated outfalls.

*** To be routinely reported when collecting data from perennial pools.

References:

- United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
- American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)
- TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2008 (RG-415).
- TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

**TABLE A7.4 MEASUREMENT PERFORMANCE SPECIFICATIONS FOR LCRA-ELS
FOR INSTREAM ROUTINE/STORMWATER/BMP MONITORING**

Conventional and Bacteriological Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610	0.1	0.1	70-130	20	80-120	LCRA-ELS
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.05	70-130	20	80-120	LCRA-ELS
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00615	0.05	0.05	70-130	20	80-120	LCRA-ELS
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2 Rev. 2 (1993)	00625	0.2	0.2	70-130	20	80-120	LCRA-ELS
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.4	00665	0.06	0.02	70-130	20	80-120	LCRA-ELS

*Hardness is not used for regulatory purposes but is used to assess metals in water at inland sites (estuarine sites do not require hardness analysis).
** This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B5.

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020 American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.) TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2008 (RG-415). TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

Precision

Precision is the degree to which a set of observations or measurements of the same property, obtained under similar conditions, conform to themselves. It is a measure of agreement among replicate measurements of the same property, under prescribed similar conditions, and is an indication of random error.

Field splits are used to assess the variability of sample handling, preservation, and storage, as well as the analytical process, and are prepared by splitting samples in the field. Control limits for field splits are defined in Section B5.

Laboratory precision is assessed by comparing replicate analyses of laboratory control samples in the sample matrix (e.g. deionized water, sand, commercially available tissue) or sample/duplicate pairs in the case of bacterial analysis. Precision results are compared against measurement performance specifications and used during evaluation of analytical performance. Program-defined measurement performance specifications for precision are defined in Table A7.1-A7.4.

Bias

Bias is a statistical measurement of correctness and includes multiple components of systematic error. A measurement is considered unbiased when the value reported does not differ from the true value. Bias is determined through the analysis of laboratory control samples and LOQ Check Standards prepared with verified and known amounts of all target analytes in the sample matrix (e.g. deionized water, sand, commercially available tissue) and by calculating percent recovery. Results are compared against measurement performance specifications and used during evaluation of analytical performance. Program-defined measurement performance specifications for bias are specified in Table A7.1-A7.4.

Representativeness

Site selection, the appropriate sampling regime, the sampling of all pertinent media according to TCEQ SOPs, and use of only approved analytical methods will assure that the measurement data represents the conditions at the site. Routine data collected for water quality assessment are considered to be spatially and temporally representative of routine water quality conditions.

It is anticipated that a minimum of three stormwater sample events will be sampled during the contract period. Each sampling event will consist of discrete samples collected along the hydrograph of the rain event. Refer to Section B1 and Appendix J for more information. The primary goal is to characterize bacteria and nutrient loads during varying types of rainfall events as well as to provide information on which areas are contributing the most to the bacteria and nutrient loads that have been identified in the Upper San Antonio River.

BMPs may also be monitored. In order to assess the effectiveness of the BMPs. Data will be collected for storms of varying size and intensity a minimum of once per fiscal quarter. The goal would be to determine the BMPs ability to reduce the amount of bacteria and nutrients reaching the river. If the BMPs are not installed by January 2013, monitoring may not be able to be performed under this project.

Completeness

The completeness of the data is basically a relationship of how much of the data is available for use compared to the total potential data. Ideally, 100% of the data should be available. However, the possibility of unavailable data due to accidents, insufficient sample volume, broken or lost samples, etc. is to be expected. Therefore, it will be a general goal of the project(s) that 90% data completion is achieved.

Comparability

Confidence in the comparability of routine data sets for this project and for water quality assessments is based on the commitment of project staff to use only approved sampling and analysis methods and QA/QC protocols in accordance with quality system requirements and as described in this QAPP and in TCEQ SOPs. Comparability is also guaranteed by reporting data in standard units, by using accepted rules for rounding figures, and by reporting data in a standard format as specified in Section B10.

Limit of Quantitation

AWRLs (Table A7.1- A7.4) are used in this project as the *limit of quantitation specification*, so data collected under this QAPP can be compared against the TSWQS. Laboratory *limits of quantitation* (Table A7.1-A7.4) must be at or below the AWRL for each applicable parameter.

Laboratory Measurement Quality Control Requirements and Acceptability Criteria are provided in Section B5

Analytical Quantitation

To demonstrate the ability to recover at the limit of quantitation, the laboratory will analyze an LOQ check standard for each batch of samples run.

Laboratory Measurement Quality Control Requirements and Acceptability Criteria are provided in Section B5

A8 SPECIAL TRAINING/CERTIFICATION

Field personnel will receive training in proper sampling and field analysis. Before actual sampling or field analysis occurs, they will demonstrate to the QA officer (in the field), their ability to properly operate the automatic samplers and retrieve the samples. The QA officer or a senior field biologist will document training and submit this documentation to the department training files.

Global Positioning System (GPS) equipment may be used as a component of the information required by the Station Location (SLOC) request process for creating the certified positional data that will ultimately be entered into the TCEQ's SWQMIS database. Any positional data obtained by Nonpoint Source Program grantees using a Global Positioning System will follow the TCEQ's OPP 8.11 and 8.12 policy regarding the collection and management of positional data.

Positional data entered into SWQMIS will be collected by a GPS certified individual with an agency approved GPS device to ensure that the agency receives reliable and accurate positional data. Certification can be obtained in any of three ways: completing a TCEQ training class, completing a suitable training class offered by an outside vendor, or by providing documentation of sufficient GPS expertise and experience. San Antonio River Authority must agree to adhere to relevant TCEQ policies when entering GPS-collected data.

In lieu of entering certified GPS Coordinates, positional data may be acquired with a GPS and verified with photo interpolation using a certified source, such as Google Earth or Google Map. The verified coordinates and map interface can then be used to develop a new SLOC.

A9 DOCUMENTS AND RECORDS

The documents and records that describe, specify, report, or certify activities are listed. The list below is limited to documents and records that may be requested for review during a monitoring systems audit. Add other types of project documents and records as appropriate.

TABLE A9.1 PROJECT DOCUMENTS AND RECORDS

Document/Record	Location	Retention (yrs)	Format
QAPPs, amendments and appendices	San Antonio River Authority, LCRA	5 years	Paper/Electronic
Field SOPs	San Antonio River Authority	5 years	Paper/Electronic
Laboratory Quality Manuals	San Antonio River Authority, LCRA	5 years	Paper/Electronic
Laboratory SOPs	San Antonio River Authority, LCRA	5 years	Paper/Electronic
QAPP distribution documentation	San Antonio River Authority	5 years	Paper/Electronic
Field staff training records	San Antonio River Authority	5 years	Paper/Electronic
Field equipment calibration/maintenance logs	San Antonio River Authority	5 years	Paper/Electronic
Field instrument printouts	San Antonio River Authority	5 years	Paper/Electronic
Field notebooks or data sheets	San Antonio River Authority	5 years	Paper/Electronic
Chain of custody records	San Antonio River Authority, LCRA	5 years	Paper/Electronic
Laboratory calibration records	San Antonio River Authority, LCRA	5 years	Paper/Electronic

Document/Record	Location	Retention (yrs)	Format
Laboratory instrument printouts	San Antonio River Authority, LCRA	5 years	Paper/Electronic
Laboratory data reports/results	San Antonio River Authority, LCRA	5 years	Paper/Electronic
Laboratory equipment maintenance logs	San Antonio River Authority, LCRA	5 years	Paper/Electronic
Corrective Action Documentation	San Antonio River Authority, LCRA	5 years	Paper/Electronic

Laboratory Test Reports

Test/data reports from the laboratory must document the test results clearly and accurately. Routine data reports should be consistent with the TNI Volume 1, Module 2, Section 5.10 and include the information necessary for the interpretation and validation of data. The requirements for reporting data and the procedures are provided.

The SARA generates Laboratory Test reports, these reports are sent to the SARA Project Manager in order to keep them informed as to the progress of the project. The data is entered into the LIMS by the ESD Laboratory personnel, and upon validation, electronic data will be submitted to the TCEQ on or before the deliverable due date. The data will be stored electronically for a minimum of 5 years.

Analysis conducted by LCRA will be reported to the SARA –REL through an analytical report that complies with the NELAP requirements listed below. The results are then entered into the SARA LIMS system and identified as being analyzed by the appropriate laboratory.

In the event that an analytical test report is requested as part of a Quality Systems audit an analytical test report may be generated. Test/data reports from the laboratory document the test results clearly and accurately. Routine data reports are consistent with the NELAP standards (Section 5.5.10) and include the information necessary for the interpretation and validation of data. The information provided in an analytical test report whether hard copy or electronic includes the following:

- title
- name and address of the laboratory, and the phone number and name of a contact person;
- unique identification of the test report, date and time stamp at the bottom of the report, on each page and a pagination system that ensures that each page is recognized as part of the test report and a clear identification of the end of the report, such as 3 of 10;

- name and address of the client if applicable;
- identification of the test method used;
- unambiguous identification of the sample(s), including the client identification code;
- date of sample receipt when it is critical to the validity and application of the results, date and time of sample collection, dates the tests were performed, the time of sample preparation and analysis if the required holding time for either activity is less than or equal to 72 hours;
- test results with failures identified, units of measurement, an indication of whether results are calculated on a dry weight or wet weight basis.
- the name, function, and signature or an equivalent electronic identification of the person authorizing the test report, and the date of issue;
- statement to the effect that the results relate only to the samples;
- a statement that the report shall not be reproduced except in full without written approval of the laboratory;
- Certification that the results are in compliance with the NELAP Standards if accredited to be in compliance or provide reasons and/or justification if they do not comply.

Electronic Data

Data will be submitted to the TCEQ in the event/result format specified in the TCEQ Data Management Reference Guide (DMRG; January 2012 or most recent version) for upload to the Surface Water Quality Monitoring Information System (SWQMIS). The Data Review Checklist and Summary as contained in Appendix C of this document will be submitted with the data.

A submitting entity will submit a station location request (SLOC) directly to the TCEQ Data Manager through SWQMIS for each sampling site to obtain a station identification number. If submitting entity does not have access to the SWQMIS, TCEQ Project Manager will assist the submitting entity to get the access. TCEQ Project Manager should be copied on all the correspondence throughout the process. The TCEQ Project Manager will ensure that submitting entity actually requests SLOCS before submitting any data to the TCEQ.

All reported Events will have a unique TagID (see DMRG). A Tag Prefix must be requested from the TCEQ in accordance with the DMRG where the Submitting Entity does not already have one. TagIDs used in this project will be seven-character alphanumerics with the structure of the two-letter Tag prefix followed by a four digit number and ending with the character "N": for example - KI1234N, KI1235N, etc.

Submitting Entity, Collecting Entity, and Monitoring Type codes will reflect the project organization and monitoring type in accordance with the DMRG. The proper coding of Monitoring Type is essential to accurately capture any bias toward certain environmental condition (for example, high flow events). The Project Manager should be consulted to assure proper use of the Monitoring Type code.

TABLE A9.2 SAMPLE EVENT MONITORING CODES

Sample Description	Tag Prefix	Submitting Entity	Collecting Entity	Monitoring Type
San Antonio River Authority	<i>SA</i>	<i>SA</i>	<i>SA</i>	<i>BF</i>
San Antonio River Authority	<i>SA</i>	<i>SA</i>	<i>SA</i>	<i>RT</i>

B1 SAMPLING PROCESS DESIGN (EXPERIMENTAL DESIGN)

The TMDL for the Upper San Antonio River originally did not include the Westside Creeks (Alazan, Apache, San Pedro, and Martinez). The Upper San Antonio Watershed Protection Plan (December 2006) included the Westside Creeks. Some data has been collected for these tributaries; it is the desire of the river authority to further characterize the bacteria and nutrient loads that may be coming from these creeks into the Upper San Antonio River during stormwater events. The routine and stormwater data may be used to determine which subwatersheds to focus future BMP implementation. Two portions of this project (site-specific and watershed-specific) are examining the areas in these sub-watersheds in order to identify locations where BMPs may be implemented in the future. The data collected under this QAPP will assist future planning by determining which watersheds and facilities should be focused on for BMP implementation.

Routine Monitoring

Routine Monitoring will be conducted at one sample station under this QAPP; this will occur at station 21105. This station was created to fully capture the load coming in from the Westside Creeks. This station will capture all of the flow from the Westside creeks before it enters the Upper San Antonio River. Stations 18735, 12715, 17066, and 14256 are being monitored routinely under the Clean Rivers Program and the SARA Stream monitoring program. These stations are not included in the routine monitoring under this QAPP to prevent duplication of efforts.

Stormwater Monitoring

Stormwater monitoring will focus on runoff bacteria concentrations. Five sites have been selected for monitoring. These sites are listed in Tables B1.1 for the FY2013 monitoring year. The storm event data is designed to estimate bacterial loads in storm flows from suspected priority sources or source areas contributing to the impairments that exist in the Upper San Antonio River.

Qualifying storm events will produce ½ inch or greater of widespread precipitation. Localized, isolated events will not be sampled. False starts and terminated events are to be expected due to the unpredictable nature of storm events that may not meet data quality objectives of the organization. Specific criteria for selection of stormwater events is contained in Appendix J.

The following sites are included as routine monitoring under the SARA Clean Rivers Program and SARA Stream Monitoring Program (18735, 12715, 17066 and 14256). The routine data from these programs will be used in the development of the data report.

In order to distribute the samples along the hydrograph the flow for the USGS gauges that are available (SAR @ Mitchell and SAR @ Probandt) will be monitored to assist the field staff in determining the appropriate time to collect the samples. Refer to Section B2 Field Sampling Procedures.

TABLE B1.1 MONITORING FOR FY2013

Basin ID: 19 **Segment ID:** 1911 **TCEQ Region:** 13
Fiscal Year: 2013(September 1, 2012 to August 31, 2013)

Station ID	Long Description (lat/long)	Collecting Entity	Submitting Entity	Monitoring Type Code	Conv in Water	Bacteria	Flow	Field
18735	APACHE CREEK AT BRAZOS STREET APPROXIMATELY 0.7 KM UPSTREAM OF THE CONFLUENCE WITH ALAZAN CREEK	SA	SA	BF	4 ¹	4 ¹	4 ^{1,2}	4 ¹
12715	ALAZAN CREEK AT TAMPICO ST IN SAN ANTONIO	SA	SA	BF	4 ¹	4 ¹	4 ^{1,2}	4 ¹
17066	SAN ANTONIO RIVER AT 2ND CROSSING OF MISSION ROAD 3.2 KM DOWNSTREAM OF SAN ANTONIO RIVER/SAN PEDRO CREEK CONFLUENCE IN SAN ANTONIO TX	SA	SA	BF	4 ¹	4 ¹	4 ^{1,2}	4 ¹
14256	SAN ANTONIO RIVER AT W. MITCHELL STREET IN DOWNTOWN SAN ANTONIO	SA	SA	BF	4 ¹	4 ¹	4 ^{1,2}	4 ¹
21105	SAN PEDRO CREEK AT MITCHELL ST.	SA	SA	BF	4 ¹	4 ¹	4 ^{1,2}	4 ¹
21105	SAN PEDRO CREEK AT MITCHELL ST.	SA	SA	RT	10	10	10 ²	10

¹This indicates the number of individual stormwater events that are intended to be monitored during this fiscal year. Each event will consist of at least 7 grab samples

²Flow values reported may be instantaneous or estimated.

BMP Effectiveness Monitoring

(This monitoring may be performed if BMPs are installed within the contract period. If implemented, this monitoring will be specified in an amendment to this QAPP prior to the initiation of sampling.)

Stormwater BMPs are currently being developed for two SARA facilities; the Main Office at 100 E. Guenther and the SARA Environmental Center at 600 E. Euclid. These BMPs have yet to be determined. The BMPs may address sediment and/or bacteria runoff.

The sample sites for the BMP effectiveness monitoring will be determined once design and construction have been completed. Final determination on the type of monitoring and location of sample sites will not be determined until a final design has been approved. This QAPP will be amended to include specific BMP monitoring information prior to the start of monitoring.

B2 SAMPLING METHODS

Field Sampling Procedures

Routine and stormwater sample collection will follow the field sampling procedures for conventional and microbiological parameters documented in the TCEQ Surface Water Quality Monitoring Procedures Manual (October 2008 or most recent version). All samples collected under this QAPP will be manual grab samples collected in accordance with TCEQ procedures. In

order to distribute the samples along the hydrograph the flow for the USGS gauges that are available (SAR @ Mitchell and SAR @ Probandt) will be monitored during the rainfall events to assist the field staff in determining the appropriate time to collect the samples. The USGS gauges allow the field staff to monitor the stream stage height in real time in addition to taking stage height measurements from the bridge sample sites. Based upon these reading and the USGS gauges the field staff can verify that they are collecting samples at the appropriate time during the rain event to capture the samples along the hydrograph. Refer to Appendix J for additional information.

The sample volumes, container types, minimum sample volume, preservation requirements, and holding time requirements are specified in table B2.1.

Sample Volume, Container Types, Minimum Sample Volume, Preservation Requirements, and Holding Time Requirements

TABLE B2.1 SAMPLE PRESERVATION AND HOLDING TIME REQUIREMENTS

Parameter	Matrix	Container	Preservation	Sample Volume	Holding Time
TSS	Water	Cubitainer	Cool to 0 ≤ 6°C	1000 mL	7 days
E. coli, IDEXX Colilert	Water	Whirl-pack containing Sodium Thiosulfate	Cool to 0 ≤ 6°C	250 mL	8 hrs ¹
Ammonia-N, total	Water	Cubitainer	H ₂ SO ₄ to pH <2 Cool to 0 ≤ 6°C	500 mL	28 days
Nitrate-N, total	Water	Cubitainer	Cool to 0 ≤ 6°C	100 ² mL	48 hours
Total phosphorous	Water	Cubitainer	H ₂ SO ₄ to pH <2 Cool to 0 ≤ 6°C	100 mL	28 days
Nitrite-N	Water	Cubitainer	Cool to 0 ≤ 6°C	100 ² mL	48 hours
Total Kjeldahl Nitrogen	Water	Cubitainer	H ₂ SO ₄ to pH <2 Cool to 0 ≤ 6°C	500 mL	28 days

¹E.coli samples analyzed by SM 9223-B should always be processed as soon as possible and within 8 hours.

²Nitrate and Nitrite are analyzed together using Ion Chromatography; the volume required is a total of 100 mLs, not 100 mLs per parameter

Sample Containers

Sample containers (cubitainers) are purchased pre-cleaned for conventional parameters and are disposable. Sterile containers are used for bacteriological samples and contain 1% sodium thiosulfate tablets.

Processes to Prevent Contamination

The TCEQ *Surface Water Quality Monitoring Procedures Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment and Tissue (2008)*, or most current revision, outlines the necessary steps to prevent contamination of samples. These include: direct collection into sample containers, when possible; clean sampling techniques for metals; and certified containers for organics. Field QC samples as discussed in Section B5 are collected to verify that contamination has not occurred.

Documentation of Field Sampling Activities

Field sampling activities are documented on field data sheets as presented in Appendix C. Flow work sheets, multi-probe calibration records, and records of bacteria analyses (if applicable) are part of the field data record. For all visits, station ID, location, sampling time, sampling date, sampling depth, preservatives added to samples and sample collector's name/signature are recorded. Values for all measured field parameters are also recorded. Detailed observational data are recorded as well, including: water appearance, weather, biological activity, stream uses, watershed or instream activities, unusual odors, specific sample information, missing parameters, days since last significant rainfall, and flow severity.

Field sampling activities are documented on field data sheets as presented in Appendix C. The following will be recorded for all visits:

1. Station ID
2. Sampling Date
3. Location
4. Sampling depth (end depth)
5. Sampling time
6. Sample collector's name/signature
7. Values for all field parameters
8. Detailed observational data may include:
 - water appearance
 - weather
 - biological activity
 - unusual odors
 - pertinent observations related to water quality or stream uses (e.g., exceptionally poor water quality conditions/standards not met; stream uses such as swimming, boating, fishing, irrigation pumps, etc.)
 - watershed or instream activities (events impacting water quality, e.g., bridge construction, livestock watering upstream, etc.)
 - specific sample information (number of sediments grabs, type/number of fish in a tissue sample, etc.)
 - missing parameters (i.e., when a scheduled parameter or group of parameters is not collected)

Recording Data

For the purposes of this section and subsequent sections, all personnel follow the basic rules for recording information as documented below:

1. Legible writing in indelible, waterproof ink with no modifications, write-overs or cross-outs;
2. Changes should be made by crossing out original entries with a single line, entering the changes, and initialing and dating the corrections.
3. Close-outs on incomplete pages with an initialed and dated diagonal line.

Sampling Method Requirement or Sampling Process Design Deficiencies and Corrective Action

Examples of sampling method requirement or sample design deficiencies include but are not limited to such things as inadequate sample volume due to spillage or container leaks, failure to preserve samples appropriately, contamination of a sample bottle during collection, storage temperature and holding time exceedance, sampling at the wrong site, etc. Any deviations from the QAPP and appropriate sampling procedures may invalidate resulting data and may require corrective action. Corrective action may include for samples to be discarded and re-collected. It is the responsibility of the San Antonio River Authority Project Manager, in consultation with the San Antonio River Authority QAO, to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP. In addition, these actions and resolutions will be conveyed to the NPS Project Manager both verbally and in writing in the project progress reports and by completion of a Non-conformance Report (NCR). The River Authority has an electronic Non-conformance reporting system where laboratory analysts and field personnel are responsible for entering issues relates to possible deficiencies with sample collection or analytical procedures. These reports, once closed, will be provided to the TCEQ Project manager with the quarterly progress report.

The definition of and process for handling deficiencies and corrective actions are defined in Section C1.

Storm Water Flow Measurement Procedure

The stormwater criteria will follow the Watershed Monitoring SOP for Collecting Instream Stormwater Samples. See Appendix J.

B3 SAMPLE HANDLING AND CUSTODY

Sample Tracking

Proper sample handling and custody procedures ensure the custody and integrity of samples beginning at the time of sampling and continuing through transport, sample receipt, preparation, and analysis.

A sample is in custody if it is in actual physical possession or in a secured area that is restricted to authorized personnel. The Chain of Custody (COC) form is a record that documents the possession of the samples from the time of collection to receipt in the laboratory. The list of items below is included on the COC form (See Appendix D for sample form).

1. Date and time of sample collection, shipping and receiving
2. Site identification
3. Sample matrix
4. Number of containers
5. Preservative used

6. Was the sample filtered
7. Analyses required
8. Name of collector
9. Custody transfer signatures and dates and time of transfer
10. Bill of lading (*if applicable*)

Sample Labeling

Samples from the field are labeled on the container (*or on a label; please specify*) with an indelible marker. Label information includes:

1. Site identification
2. Date and time of collection
3. Preservative added, if applicable
4. Designation of 'field-filtered' (*for metals*) as applicable
5. Sample type (i.e., analysis(es)) to be performed

Sample Handling

Water quality samples (conventional and bacteriological parameters) are collected according to procedures identified in TCEQ's SOP, V1 - *TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2008* and V2 *Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2007* or most current revision. The field data sheet is filled out in the field when the sample is collected and the results of field parameters are posted on this sheet. This sheet also acts as the chain of custody for this sample and flow data collected.

Samples requiring analysis that require acid preservation are collected in containers prepared for acid preserved sample collection prior to departing for the days sample collection. These containers are prepared by dispensing 2 mL of acid in the container at the beginning of the day. A Chain – of – Custody (COC) seal displaying the collector's initials and date is affixed to the sample container and lid, the sample container is labeled with a permanent water proof marker directly on the container and placed in an ice chest where they are covered with crushed ice.

The samples are transported in a SARA vehicle to the laboratory. Upon arrival at the laboratory, all samples and paperwork are relinquished to the sample custodian. The sample custodian accepts the sample, checking for any abnormalities in the sample (i.e. leakers, missing or torn COC seals, etc.) and notes any abnormalities at log in. The sample custodian also checks and documents the temperature of the samples using an infrared thermometer, and that all acid preserved samples are below 2 S.U. pH. Paperwork is examined for completeness and the sample custodian accepts the sample and documentation by signing the chain of custody (field data sheet) and also posting the date and time of acceptance.

The sample custodian enters the sample information into the laboratory's information management system and prints out one set of labels. Each sample container brought in, gets a label with a unique identification number. The water quality samples are then either given

directly to an analyst, preparing to analyze the sample(s) immediately, or placed in a refrigerator in a secured (access is controlled through the use of programmed access cards) portion of the laboratory. The biological samples are returned to field staff for further processing, preservation and identification.

Laboratory staff run backlog reports to identify samples that need to be analyzed and identify when sample hold time elapses.

In the event that samples are outsourced to LCRA the SARA Laboratory Services Coordinator will prepare the samples to be sent to the appropriate laboratory. A COC will be prepared to document the chain-of-custody of the sample(s) and the analysis that is requested.

Sample Tracking Procedure Deficiencies and Corrective Action

All deficiencies associated with chain-of-custody procedures as described in this QAPP are immediately reported to the San Antonio River Authority Project Manager. These include such items as delays in transfer, resulting in holding time violations; violations of sample preservation requirements; incomplete documentation, including signatures; possible tampering of samples; broken or spilled samples, etc. The San Antonio River Authority Project Manager in consultation with the San Antonio River Authority QAO will determine if the procedural violation may have compromised the validity of the resulting data. Any failures that have reasonable potential to compromise data validity will invalidate data and the sampling event should be repeated. The resolution of the situation will be reported to the TCEQ NPS Project Manager in the project progress report. Non-conformance reports will be prepared by the San Antonio River Authority staff and submitted to TCEQ NPS Project Manager along with project progress report.

The definition of and process for handling deficiencies and deficiencies, nonconformances, and corrective action are defined in Section C1.

B4 ANALYTICAL METHODS

The analytical methods are listed in Tables A7.1-A7.4 of Section A7. Laboratories collecting data under this QAPP are compliant with the NELAP Standards.

Copies of laboratory SOPs are retained by the San Antonio River Authority or sub-contracting laboratory and are available for review by the TCEQ. Laboratory SOPs are consistent with EPA requirements as specified in the method.

Standards Traceability

All standards used in the field and laboratory are traceable to certified reference materials. Standards and reagent preparation is fully documented and maintained in a standards log book. Each documentation includes information concerning the standard or reagent identification, starting materials, including concentration, amount used and lot number; date prepared, expiration date and preparer's initials/signature. The bottle is labeled in a way that will trace the

standard or reagent back to preparation. Standards or reagents used are documented each day samples are prepared or analyzed.

Analytical Method Deficiencies and Corrective Actions

Deficiencies in field and laboratory measurement systems involve, but are not limited to such things as instrument malfunctions, failures in calibration, blank contamination, quality control samples outside QAPP defined limits, etc. In many cases, the field technician or lab analyst will be able to correct the problem. If the problem is resolvable by the field technician or lab analyst, then they will document the problem on the field data sheet or laboratory record and complete the analysis. If the problem is not resolvable, then it is conveyed to the San Antonio River Authority Laboratory Supervisor, who will make the determination and notify the San Antonio River Authority QAO. If the analytical system failure may compromise the sample results, the resulting data will not be reported to the TCEQ. The nature and disposition of the problem is reported on the data report which is sent to the San Antonio River Authority Manager. The San Antonio River Authority Project Manager will include this information in the NCR and submit with the Progress Report which is sent to the TCEQ NPS Project Manager.

The definition of and process for handling deficiencies and deficiencies, nonconformances, and corrective action are defined in Section C1.

The TCEQ has determined that analyses associated with the qualifier codes holding time exceedance, sample received unpreserved, estimated value, etc., may have unacceptable measurement uncertainty associated with them. This will immediately disqualify analyses from submittal to SWQMIS. Therefore, data with these types of problems should not be reported to the TCEQ. Additionally, any data collected or analyzed by means other than those stated in the QAPP, or data suspect for any reason should not be submitted for loading and storage in SWQMIS.

B5 QUALITY CONTROL

Sampling Quality Control Requirements and Acceptability Criteria

Field Split - A field split is a single sample subdivided by field staff immediately following collection and submitted to the laboratory as two separately identified samples according to procedures specified in the *SWQM Procedures*. Split samples are preserved, handled, shipped, and analyzed identically and are used to assess variability in all of these processes. Field splits apply to conventional samples only. Field Splits are required on a 10% basis, for every 10 routine water quality samples, a field split is collected for conventional parameters.

The precision of field split results is calculated by relative percent difference (RPD) using the following equation:

$$RPD = [(X_1 - X_2) / \{(X_1 + X_2) / 2\}] * 100$$

A 30% RPD criteria will be used to screen field split results as a possible indicator of excessive variability in the sample handling and analytical system. If it is determined that elevated quantities of analyte (i.e., > 5 times the LOQ) were measured and analytical variability can be eliminated as a factor, then variability in field split results will primarily be used as a trigger for discussion with field staff to ensure samples are being handled in the field correctly. Some individual sample results may be invalidated based on the examination of all extenuating information. The information derived from field splits is generally considered to be event specific and would not normally be used to determine the validity of an entire batch; however, some batches of samples may be invalidated depending on the situation. Professional judgment during data validation will be relied upon to interpret the results and take appropriate action. The qualification (i.e., invalidation) of data will be documented on the Data Review Checklist and Summary. Deficiencies will be addressed as specified in this section under Quality Control or Acceptability Requirement Deficiencies and Corrective Actions.

Batch – A batch is defined as environmental samples that are prepared and/or analyzed together with the same process and personnel, using the same lot(s) of reagents. A **preparation batch** is composed of one to 20 environmental samples of the same NELAP-defined matrix, meeting the above mentioned criteria and with a maximum time between the start of processing of the first and last sample in the batch to be 25 hours. An **analytical batch** is composed of prepared environmental samples (extract, digestates or concentrates) which are analyzed together as a group. An analytical batch can include prepared samples originating from various environmental matrices and can exceed 20 samples.

Method Specific QC requirements – QC samples, other than those specified later this section, are run (e.g., sample duplicates, surrogates, internal standards, continuing calibration samples, interference check samples, positive control, negative control, and media blank) as specified in the methods. The requirements for these samples, their acceptance criteria or instructions for establishing criteria, and corrective actions are method-specific.

Detailed laboratory QC requirements and corrective action procedures are contained within the individual laboratory quality manuals (QMs). The minimum requirements that all participants abide by are stated below.

Limit of Quantitation (LOQ) – The laboratory will analyze a calibration standard (if applicable) at the LOQ on each day calibrations are performed. In addition, an LOQ check standard will be analyzed with each analytical batch. Calibrations including the standard at the LOQ will meet the calibration requirements of the analytical method or corrective action will be implemented.

LOQ Check Standard – An LOQ check standard consists of a sample matrix (e.g., deionized water, sand, commercially available tissue) free from the analytes of interest spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes. It is used to establish intra-laboratory bias to assess the performance of the measurement system at the lower limits of analysis. The LOQ check standard is spiked into the sample matrix at a level less than or near the LOQ for each analyte for each analytical batch of samples run.

The LOQ check standard is carried through the complete preparation and analytical process. LOQ Check Standards are run at a rate of one per analytical batch.

The percent recovery of the LOQ check standard is calculated using the following equation in which %R is percent recovery, SR is the sample result, and SA is the reference concentration for the check standard:

$$\%R = SR/SA * 100$$

Measurement performance specifications are used to determine the acceptability of LOQ Check Standard analyses as specified in Table A7.1-A7.4.

Laboratory Control Sample (LCS) – An LCS consists of a sample matrix (e.g., deionized water, sand, commercially available tissue) free from the analytes of interest spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes. It is used to establish intra-laboratory bias to assess the performance of the measurement system. The LCS is spiked into the sample matrix at a level less than or near the mid-point of the calibration for each analyte. In cases of test methods with very long lists of analytes, LCSs are prepared with all the target analytes and not just a representative number, except in cases of organic analytes with multippeak responses.

The LCS is carried through the complete preparation and analytical process. LCSs are run at a rate of one per preparation batch.

Results of LCSs are calculated by percent recovery (%R), which is defined as 100 times the measured concentration, divided by the true concentration of the spiked sample.

The following formula is used to calculate percent recovery, where %R is percent recovery; SR is the measured result; and SA is the true result:

$$\%R = SR/SA * 100$$

Measurement performance specifications are used to determine the acceptability of LCS analyses as specified in Table A7.1-A7.4.

Laboratory Duplicates – A laboratory duplicate is prepared by taking aliquots of a sample from the same container under laboratory conditions and processed and analyzed independently. A laboratory control sample duplicate (LCSD) is prepared in the laboratory by splitting aliquots of an LCS. Both samples are carried through the entire preparation and analytical process. LCSDs are used to assess precision and are performed at a rate of one per preparation batch.

For most parameters, precision is calculated by the relative percent difference (RPD) of LCS duplicate results as defined by 100 times the difference (range) of each duplicate set, divided by the average value (mean) of the set. For duplicate results, X_1 and X_2 , the RPD is calculated from the following equation:

$$RPD = [(X_1 - X_2)/\{(X_1+X_2)/2\} * 100]$$

A bacteriological duplicate is considered to be a special type of laboratory duplicate and applies when bacteriological samples are run in the field as well as in the lab. Bacteriological duplicate analyses are performed on samples from the sample bottle on a 10% basis. Results of bacteriological duplicates are evaluated by calculating the logarithm of each result and determining the range of each pair.

Measurement performance specifications are used to determine the acceptability of duplicate analyses-as specified in Table A7.1-A7.4. The specifications for bacteriological duplicates in Table A7.1-A7.4 apply to samples with concentrations > 10 org./100mL.

Matrix spike (MS) – Matrix spikes are prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. Matrix spikes are used, for example, to determine the effect of the matrix on a method's recovery efficiency.

Percent recovery of the known concentration of added analyte is used to assess accuracy of the analytical process. The spiking occurs prior to sample preparation and analysis. Spiked samples are routinely prepared and analyzed at a rate of 10% of samples processed, or one per preparation batch whichever is greater. The information from these controls is sample/matrix specific and is not used to determine the validity of the entire batch. The MS is spiked at a level less than or equal to the midpoint of the calibration or analysis range for each analyte. Percent recovery (%R) is defined as 100 times the observed concentration, minus the sample concentration, divided by the true concentration of the spike.

The results from matrix spikes are primarily designed to assess the validity of analytical results in a given matrix and are expressed as percent recovery (%R). The laboratory shall document the calculation for %R. The percent recovery of the matrix spike is calculated using the following equation in which %R is percent recovery, SSR is the observed spiked sample concentration, SR is the sample result, and SA is the reference concentration of the spike added:

$$\%R = (SSR - SR)/SA * 100$$

Measurement performance specifications for matrix spikes are not specified in this document.

The results are compared to the acceptance criteria as published in the mandated test method. Where there are no established criteria, the laboratory shall determine the internal criteria and document the method used to establish the limits. For matrix spike results outside established criteria, corrective action shall be documented or the data reported with appropriate data qualifying codes.

Method blank – A method blank is a sample of matrix similar to the batch of associated samples (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as the samples through all steps of the analytical procedures, and in which no target analytes or interferences are present at concentrations that impact the

analytical results for sample analyses. The method blanks are performed at a rate of once per preparation batch. The method blank is used to document contamination from the analytical process. The analysis of method blanks should yield values less than the LOQ. For very high-level analyses, the blank value should be less than 5% of the lowest value of the batch, or corrective action will be implemented. Samples associated with a contaminated blank shall be evaluated as to the best corrective action for the samples (e.g. reprocessing or data qualifying codes). In all cases the corrective action must be documented.

The method blank shall be analyzed at a minimum of once per preparation batch. In those instances for which no separate preparation method is used (example: volatiles in water) the batch shall be defined as environmental samples that are analyzed together with the same method and personnel, using the same lots of reagents, not to exceed the analysis of 20 environmental samples.

Quality Control or Acceptability Requirement Deficiencies and Corrective Actions

Sampling QC excursions are evaluated by the San Antonio River Authority Project Manager, in consultation with the San Antonio River Authority QAO. In that differences in sample results are used to assess the entire sampling process, including environmental variability, the arbitrary rejection of results based on pre-determined limits is not practical. Therefore, the professional judgment of the San Antonio River Authority Project Manager and QAO will be relied upon in evaluating results. Rejecting sample results based on wide variability is a possibility. Notations of field split excursions and blank contamination are noted in the quarterly report and the final QC Report.

Laboratory measurement quality control failures are evaluated by the laboratory staff. The disposition of such failures and the nature and disposition of the problem is reported to the San Antonio River Authority Laboratory QAO. The Laboratory QAO will discuss with the San Antonio River Authority Project Manager. If applicable, the San Antonio River Authority Project Manager will include this information in the NCR and submit with the Progress Report which is sent to the TCEQ NPS Project Manager.

The definition of and process for handling deficiencies and deficiencies, nonconformances, and corrective action are defined in Section C1.

B6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION AND MAINTENANCE

All in-stream sampling equipment testing and maintenance requirements are detailed in the *TCEQ Surface Water Quality Monitoring Procedures, Volume 1, 2008 or most recent revision*. Equipment records are kept on all field equipment and a supply of critical spare parts is maintained by the San Antonio River Authority Field Watershed Monitoring Supervisor

All laboratory tools, gauges, instrument, and equipment testing and maintenance requirements are contained within laboratory QAM(s). Testing and maintenance records are maintained and are available for inspection by the TCEQ. Instruments requiring daily or in-use testing may include, but are not limited to, water baths, ovens, autoclaves, incubators, refrigerators, and

laboratory pure water. Critical spare parts for essential equipment are maintained to prevent downtime. Maintenance records are available for inspection by the TCEQ. SARA documents deficiencies through the use of an electronic notification system which automatically notifies pertinent SARA staff of the incident (Non-Conformance Reporting System). The SARA QAO then investigates and determines what type of action is needed in consultation with the San Antonio River Authority Project Manager. Non-conformance Reports will be submitted to the SARA Project Manager for inclusion with the progress report.

Status of Non-conformance Reports will be included with quarterly progress reports. In addition, significant conditions (i.e., situations which, if uncorrected, could have a serious effect on safety or on the validity or integrity of data) will be reported to the TCEQ immediately.

The San Antonio River Authority QAO is responsible for implementing and tracking corrective actions. Records of audit findings and corrective actions are maintained by the San Antonio River Authority QAO. Audit reports and corrective action documentation may be submitted to the TCEQ with the Progress Report.

B7 INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

In-stream field Equipment calibration requirements are contained in the TCEQ *Surface Water Quality Monitoring Procedures Manual Volume 1, 2008 or most recent revision*. Post calibration error limits and the disposition resulting from error are adhered to. Data not meeting post-error limit requirements invalidates associated data collected subsequent to the pre-calibration and are not submitted to the TCEQ.

Detailed laboratory calibrations are contained within the QAM(s).

B8 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

New batches of supplies are tested before use to verify that they function properly and are not contaminated. The laboratory QAM provides additional details on acceptance requirements for laboratory supplies and consumables.

B9 NON-DIRECT MEASUREMENTS

Only data collected directly under this QAPP will be submitted to the TCEQ for storage in SWQMIS. This project will not submit any acquired or non-direct measurement data to SWQMIS that has been or is going to be collected under another QAPP. All data collected under this QAPP and any acquired or non-direct measurements will comply with all requirements/guidance of the project.

The project data report will utilize routine monitoring data collected under the Clean Rivers Program and the SARA Stream Monitoring Program as well as associated USGS flow information as well as USGS rainfall data. Historical routine data may also be used in the evaluation of bacteria and nutrient loadings from the tributaries of the Upper San Antonio River.

TABLE B9.1 ACQUIRED DATA

Site	Parameters	Date Range	Frequency of Sampling
18735	TSS (00530) Nitrogen, ammonia (00610) Nitrite, nitrogen (00615) Nitrate, nitrogen (00620) Total Phosphorus (00665) E. coli (31699) Flow (00061) Dissolved Oxygen (00300)	September 1, 2010 through June 30, 2013	Every other month
12715	TSS (00530) Nitrogen, ammonia (00610) Nitrite, nitrogen (00615) Nitrate, nitrogen (00620) Total Phosphorus (00665) E. coli (31699) Flow (00061) Dissolved Oxygen (00300)	September 1, 2010 through June 30, 2013	Every other month
17066	TSS (00530) Nitrogen, ammonia (00610) Nitrite, nitrogen (00615) Nitrate, nitrogen (00620) Total Phosphorus (00665) E. coli (31699) Flow (00061) Dissolved Oxygen (00300)	September 1, 2010 through June 30, 2013	Conventionals – every other month Bacteria - weekly
14256	TSS (00530) Nitrogen, ammonia (00610) Nitrite, nitrogen (00615) Nitrate, nitrogen (00620) Total Phosphorus (00665) E. coli (31699) Flow (00061) Dissolved Oxygen (00300)	September 1, 2010 through June 30, 2013	Every other month
21105	TSS (00530) Nitrogen, ammonia (00610) Nitrite, nitrogen (00615) Nitrate, nitrogen (00620) Total Phosphorus (00665) E. coli (31699) Flow (00061) Dissolved Oxygen (00300)	September 1, 2010 through June 30, 2013	Monthly for FY2013

The acquired water quality data may be used in the development of spreadsheet based models to estimate the potential bacteria load reductions from future BMP implementation. These spreadsheet based models will be Load Duration Curves and will be developed as a part of the Watershed and Site-Specific BMP Reports.

Site Specific and Watershed Specific BMP reports will be developed as separate components of this project. These reports will utilize GIS spatial information obtained from various entities that have infrastructure in the project area. This information will be utilized by the consultant preparing the reports to identify parcels that are publicly owned that may be candidates for future BMP Implementation. The Watershed specific report will include spreadsheet based modeling to estimate the potential load reductions for potential BMPs. The data provided to the consultant is

listed below. The data will be used to develop the Site specific and watershed specific BMP reports.

1. Bexar County 2011 Aerial (Bexar County Aerials from end of 2010 – called as 2011 aerials since including QA/QC etc. The data processing and delivery took place in 2011 – similar scenario exists for the future years- aerials are flown at the end of the year and delivered in the upcoming year after QA/QC).
2. Drainage Network (Stream network data out of DFIRM and NHD etc.).
3. Land use and Cover (various feature classes from various entities – SARA, COSA and USGS specifically- on land use/cover).
4. Stormwater_Water_Wastewater (various feature classes from various entities – COSA, Bexar County, TWDB etc.) on stormwater, water, wastewater infrastructure in Bexar county and SARA jurisdiction counties.

B10 DATA MANAGEMENT

Personnel

Personnel responsible for data management at the San Antonio River Authority are

1. Water Quality Planner /Data Management (SARA ESD Data Manager)

Responsible for the acquisition, verification, and transfer of data to the TCEQ NPS Project Manager. Oversees data management for the project. Performs data quality assurances prior to transfer of data to TCEQ in the format specified in the SWQM Data Management Reference Guide, 2012 or most recent version. Ensures that the data review checklist is completed and data is submitted with appropriate codes. Provides the point of contact for the TCEQ Project Manager to resolve issues related to the data and assumes responsibility for the correction of any data errors. Responsible for maintaining the ESD water quality database and generation of data reports as requested. Responsible for quality control on data and specific quality control project related objectives.

2. Environmental Systems Information Specialist

Assist in maintaining the ESD water quality database. Reviews data management and quality control work performed by Data Manager for the project. Performs duties of the Data Manager in the absence of the Water Quality Planner I/Data Management.

Data Management Process

Samples are collected by field staff and transferred to the laboratory for analyses as described in Sections B1 and B2. Sampling information (e.g. site location, date, time, sampling depth, etc.) is used to generate a unique sampling event in an interim database built on an auto-generated alphanumeric key field. Measurement results from both the field data sheets and laboratory data sheets are manually entered (by field and laboratory staff, respectively) into the interim database for their corresponding event. Customized data entry forms facilitate accurate data entry.

Following data verification and validation, the data are exported from the interim database into the Event/Result format required for submission to TCEQ's SWQMIS (as described in the SWQM DMRG January 2012 or later version). Once TCEQ approval of the data is obtained, the data are loaded into SWQMIS by TCEQ data managers.

The Figure in Appendix F is a flow chart identifying the flow of the data at SARA from collection to sending the information to the TCEQ. Although the flow chart may not identify it, at any point in the review of data, the reviewer can send the data back up to the prior level for additional work, or documentation. Field measurements and data collections are performed according to SWQM Procedures Manual (RG-415).

Analytical data from back-up laboratories is entered in to the SARA LIMS and the laboratory that performed the analysis is identified on the analytical reports. Analytical results are reviewed prior to validation. Analytical reports from back-up laboratories are scanned and filed according to the schedule in Table A9.1.

Record-keeping and Data Storage

San Antonio River Authority record keeping and document control procedures are contained in the water quality sampling and laboratory standard operating procedures (SOPs) and this QAPP. Original field and laboratory data sheets are stored in the San Antonio River Authority offices in file cabinets or the lab library in accordance with the record-retention schedule in Section A9.

Archives/Data Retention

Complete original data sets are archived on paper and retained on-site by the San Antonio River Authority for a retention period specified in section A9.

Record Keeping and Data Storage

Data is filed in the ESD filing system and the data is retained according to the schedule in Table A9.1

Data Handling, Hardware, and Software Requirements

SARA laboratory data will be input into SARA's LIMS. This system is the PerkinElmer *LabWorks*™ Enterprise System.

The SARA LIMS relies heavily on Microsoft SQL databases and Excel spreadsheets.

The actual data is housed in a SQL server with an Access front end.

Once the data is ready to be submitted to TCEQ for upload in to SWQMIS the data is formatted according to the format specified in the *SWQM Data Management Reference Guide, 2012*, or most recent version. See Migration/Transfer/Conversion section for specifics on how data is formatted for TCEQ SWQMIS requirements.

Information Resource Management Requirements

The Data Manager is familiar with the TCEQ's data management reference guide, and follows the processes described in the document. The work of the Data Manager is reviewed by the SARA QAO, TCEQ Project Manager and is audited by the TCEQ as part of the field audit. The TCEQ uses the TCEQ CRP Program Data Review Checklist. If deficiencies or non-conformances are identified in the audit, the condition is addressed and a corrective action memo outlining the steps taken is sent to the SARA Project Manager for their approval.

Data will be managed in accordance with the *TCEQ Surface Water Quality Monitoring Data Management Reference Guide, 2012 or most current revision* and applicable San Antonio River Authority information resource management policies.

Global Positioning System (GPS) equipment may be used as a component of the information required by the Station Location (SLOC) request process for creating the certified positional data that will ultimately be entered into the TCEQ's SWQMIS database. Positional data obtained by the Clean Rivers Program grantees using a Global Positioning System will follow the TCEQ's OPP 8.11 and 8.12 policy regarding the collection and management of positional data. All positional data entered into SWQMIS will be collected by a GPS certified individual with an agency approved GPS device to ensure that the agency receives reliable and accurate positional data. Certification can be obtained in any of three ways: completing a TCEQ training class, completing a suitable training class offered by an outside vendor, or by providing documentation of sufficient GPS expertise and experience. Contractors must agree to adhere to relevant TCEQ policies when entering GPS-collected data.

In lieu of entering certified GPS coordinates, positional data may be acquired with a GPS and verified with photo interpolation using a certified source, such as Google Earth or Google Maps. The verified coordinates and map interface can then be used to develop a new station location.

Quality Assurance Quality Control – See Section D of this QAPP

Migration/Transfer/Conversion

Data collected under this QAPP is entered in the SARA Laboratory Information Management System (LIMS) and will be identified with a unique tag id.

SQL Server Integration Services scripts are run to capture required data from LIMS upon validation into historical tables. Any validated data scheduled to be sent to the TCEQ under an approved QAPP will be displayed on the SARA website with the status of "provisional". The definition of provisional data is as follows: **Provisional Data** - Surface water quality data that is collected at stations that are part of an approved Quality Assurance Project Plan, where the data has not been accepted by the Texas Commission on Environmental Quality (TCEQ) Surface Water Quality Monitoring Information System (SWQMIS).

Views have been created and will be run using Microsoft Access to acquire appropriate data sets for each deliverable. Automated data checks will be performed on the views using a SQL Server Integration Services script created by the Information Technology (IT) Department.

Data is exported, in the required pipe delimited format as detailed in the SWQM Data Management Reference Guide, 2012, or latest revision, using a Microsoft SQL Server Integration Services (SSIS) Package also created by the SARA IT Department. Upon acceptance of a data deliverable, by the TCEQ SWQMIS database system, the Assessments and Planning (A&P) staff or the IT Department will remove the “provisional” status from the accepted data.

Historical tables can be viewed and queried on by the A&P staff for internal and external use. Upon request, the related sections of the data dictionary will be sent with the data.

Backup/Disaster Recovery

Disaster Risks and Prevention

As important as having a disaster recovery plan is, taking measures to prevent a disaster or to mitigate its effects beforehand is even more important. This portion of the plan reviews the various threats that can lead to a disaster, where our vulnerabilities are, and steps we should take to minimize our risk. The threats covered here are both natural and human-created.

- Fire
- Flood
- Tornados and High Winds
- Earthquake
- Computer Crime
- Terroristic Actions and Sabotage

Fire:

The threat of fire in the Environmental Center Building, especially in the mechanical and computer rooms, is very real and poses the highest risk factor of all the causes of disaster mentioned here. The building is filled with electrical devices and connections that could overheat or short out and cause a fire. Not to be forgotten is hydrogen gas producing batteries in the Uninterruptible Power Supply in the Computer Room where a spark could ignite a fire and explosion.

The computers within the facility also pose a quick target for arson from anyone wishing to disrupt the River Authority's operations.

Preventive Measures

Fire Alarms

The Environmental Center Building is equipped with a monitored fire alarm system, with ceiling-mounted smoke and heat detectors scattered widely throughout the building. Smoke detectors are also placed beneath the raised floor of the computer room.

Fire Extinguishers

Hand-held fire extinguishers are required in visible locations throughout the building. Staff are trained in the use of fire extinguishers.

Building Construction

SARA is built primarily of non-combustible materials. The risk to fire can be reduced when new construction is done, or when office furnishings are purchased, to acquire flame resistant products.

Training and Documentation

Detailed instructions for dealing with fire are present in the San Antonio River Authority Chemical Hygiene Plan. Staff demonstrates proficiency in periodic, unscheduled fire drills.

Flood:

Flooding is also a possibility in the Environmental Center Building. Not only could there be potential disruption of power caused by the water, flood waters can bring in mud and silt that can destroy sensitive electrical connections. Of course, the presence of water in a room with high voltage electrical equipment can pose a threat of electrical shock to personnel within the mechanical room. The buildings' HVAC System controls the temperature of the air with chilled and heated water, any of which could burst at any time.

Preventive Measures

SARA staff should insure that the drainage grates in the building are free from debris and are functional. Information Technology staff have a water proof tarp to cover servers in the computer room in the event it is needed.

Tornados and High Wind:

A tornado has the potential for causing the most destructive disaster we face.

Preventive Measures

While a fire can be as destructive as a tornado, there are very few preventative measures that we can take for tornados. Building construction makes a big difference in the ability of a structure to withstand the forces of high winds. Strong winds are often accompanied by heavy rain, so a double threat of wind and water damage exists if the integrity of the roof is lost.

Earthquake:

The threat of an earthquake in the San Antonio area is low, but should not be ignored. Buildings in our area are not built to earthquake resistant standards like they are in quake-prone areas like California. So we could expect light to moderate damage from the predicted quake.

An earthquake has the potential for being the most disruptive for this disaster recovery plan. Restoration of computing and networking facilities following a bad earthquake could be very difficult and require an extended period of time due to the need to do wide scale building repairs.

Preventive Measures

The preventative measures for an earthquake can be similar to those of a tornado. Building construction makes all the difference in whether the facility will survive or not. Even if the building survives, earthquakes can interrupt power and other utilities for an extended period of time. Standby power generators could be purchased or leased to provide power while commercial utilities are restored. The Environmental Datacenter has full UPS and diesel generator backup capabilities in place and tested monthly. The diesel generator can maintain power to the majority of the building for an extended period of time – indefinitely with a supply of fuel.

Computer Crime:

Computer crime is becoming more of a threat as systems become more complex and access is more highly distributed. With the new networking technologies, more potential for improper access is present than ever before. Computer crime usually does not affect hardware in a destructive manner. It may be more insidious, and may often come from within. A disgruntled employee can build viruses or time bombs into applications and systems code or delete whole file systems. A well-intentioned employee can make coding errors that affect data integrity (not considered a crime, of course, unless the employee deliberately sabotaged programs and data).

Preventive Measures

All systems should have security products installed to protect against unauthorized entry. All systems should be protected by passwords, especially those permitting updates to data. All security systems should log invalid attempts to access data, and security administrators should review these logs on a regular basis.

All systems are backed up on a periodic basis. Those backups are stored in an area separate from the original data. Physical security of the data storage area for backups must be implemented. Standards have been established on the number of backup cycles to retain and the length of their retention. See Backups and Recovery Section.

Terroristic Action and Sabotage:

The San Antonio River Authority's computer systems are always potential targets for terroristic actions, such as a bomb. The threat of kidnapping of key personnel also exists.

Preventive Measures

Good physical security is extremely important. However, terroristic actions can often occur regardless of in-building security, and they can be very destructive.

Given the freedom that we enjoy within the United States at this time, almost no one will accept the wide-scale planning, restrictions, and costs that would be necessary to protect the Environmental Center Building from a bomb. Some commonsense measures can help, however.

The building should be adequately lit at night on all sides. Only those people with proper security clearances should be permitted into the computer room area. Suspicious parties should

be reported to the police (they may not be terrorists, but they may have theft of expensive computer equipment in mind).

Visitors are no longer allowed to enter the buildings without first signing in at the front desk. The visitor must wear a special visitor's badge while they are at SARA, (city of San Antonio and county employees must sign in at the front desk, but their agency's badge is worn, instead of the SARA visitor's badge). SARA staff is also required to wear a security badge identifying them as SARA employees. Only IT Staff is allowed in the IT area, anyone else must have IT Staff escort.

Backups and Recovery

- Incremental backups are done daily.
- Full backups are done weekly.

The San Antonio River Authority has now converted to a hard disk based data duplication backup system. There are now physical servers and virtual servers being backed up on a rotating basis with Symantec Backup Exec writing to a DataDomain storage system. This storage system then replicates the stored data to another one at the Guenther location where the offsite data is stored. We also have vRanger replicating virtual machines from the primary cluster of VMWare ESX hosts to an offline VMWare ESX cluster in the Guenther location. We are also in the process of creating a backup Symantec Exec server at the Guenther location. With all of this in place, we could lose the complete datacenter here at Euclid and be back up and running rather quickly on the Guenther location.

In the event that data recovery is needed an IT request is initiated describing the situation and the files that need to be recovered. The IT staff will then contact the individual requesting the recovery and restore the needed files from the back-up. In the event of a catastrophic systems failure a backup server will be used to process data until the primary server is repaired.

Archives/Data Retention – Complete original paperwork is archived and retained on-site by the San Antonio River Authority for a retention period specified in Table A9.1 Project Documents and Records.

Archived records are stored at the San Antonio River Authority Environmental Center. Files that are not actively needed are stored in a closet until disposed of. This room is secured with a key. The Senior Water Quality Planner is the designated individual that has the key. When it is necessary for an individual to access the Archive room the Senior Water quality Planner accompanies that individual to the archive room. Any entry into this room is documented on the log located inside the Archive Room. If files are removed from archive this action is documented in the log. Once the files are replaced the log is completed with the date that the files were returned to the archive room.

The original paperwork is available through Papervision[®], which is an electronic system which allows staff to access electronic scans of the documents. Each individual has a unique ID and password in order to access the system. These records cannot be manipulated. Only the Senior Water Quality Planner can document comments in the Papervision system.

Information Dissemination – Project updates will be provided to the Project Manager in progress reports and the information will be made available at stakeholder meetings. Environmental Data collected as part of the project described in this QAPP will be accessible to the general public from the TCEQ SWQMIS database once the data has undergone the QA/QC protocol described herein.

Data Verification/Validation

The control mechanisms for detecting and correcting errors and for preventing loss of data during data reduction, data reporting, and data entry are contained in Sections D1, D2, and D3.

Forms and Checklists

See Appendix F for the Field and Laboratory Data Sheets.
See Appendix C for the Data Review Checklist and Summary.

Data Dictionary

Terminology and field descriptions are included in the SWQM DMRG (2012 or most recent version). For the purposes of verifying which entity codes are included in this QAPP, a table outlining the entities that will be used when submitting data under this QAPP is included below.

TABLE B10.1 SUBMITTING ENTITY & MONITORING ENTITY CODES

Name of Monitoring Entity	Tag Prefix	Submitting Entity	Collecting Entity
San Antonio River Authority	SA	SA	SA

Refer to Appendix B Table B1.1 for monitoring codes

Quality Assurance/Control

See Section D of this QAPP

CIASSESSMENTS AND RESPONSE ACTIONS

The following table presents the types of assessments and response actions for data collection activities applicable to the QAPP.

TABLE C1.1 ASSESSMENTS AND RESPONSE REQUIREMENTS

Assessment Activity	Approximate Schedule	Responsible Party	Scope	Response Requirements
Status Monitoring Oversight, etc.	Continuous	San Antonio River Authority	Monitoring of the project status and records to ensure requirements are being fulfilled	Report to TCEQ in Quarterly Report
Monitoring Systems Audit of San Antonio River Authority	Dates to be determined by TCEQ NPS	TCEQ	The assessment will be tailored in accordance with objectives needed to assure compliance with the QAPP. Field sampling, handling and measurement; facility review; and data management as they relate to the NPS Project	30 days to respond in writing to the San Antonio River Authority QAO to address corrective actions
Laboratory Inspection	Dates to be determined by TCEQ	TCEQ Laboratory Inspector	Analytical and quality control procedures employed at the laboratory and the contract laboratory	30 days to respond in writing to the TCEQ to address corrective actions
Site Visit	Dates to be determined by TCEQ	TCEQ PM	Status of activities. Overall compliance with work plan and QAPP	As needed

Corrective Action Process for Deficiencies

Deficiencies are any deviation from the QAPP, SWQM Procedures Manual, SOPs, or Data Management Reference Guide. Deficiencies may invalidate resulting data and may require corrective action. Corrective action may include for samples to be discarded and re-collected. Deficiencies are documented in logbooks, field data sheets, etc. by field or laboratory staff. It is the responsibility of the San Antonio River Authority Project Manager, in consultation with the San Antonio River Authority QAO, to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP. In addition, these actions and resolutions will be conveyed to the NPS Project Manager both verbally and in writing in the project progress reports and by completion of a Non-Conformance Report

Corrective Action

CAPs should:

- Identify the problem, nonconformity, or undesirable situation
- Identify immediate remedial actions if possible
- Identify the underlying cause(s) of the problem
- Identify whether the problem is likely to recur, or occur in other areas
- Evaluate the need for Corrective Action
- Use problem-solving techniques to verify causes, determine solution, and develop an action plan
- Identify personnel responsible for action
- Establish timelines and provide a schedule
- Document the corrective action

To facilitate the process a flow chart has been developed (see figure C1.1: Corrective Action Process for Deficiencies). This will be used as a guide by the SARA QAO in addressing issues that may affect data quality. The San Antonio River Authority's ESD Non-conformance Reporting (NCR) System incorporates determination of the root cause of a non-conformance as well as how the incident is handled and how it can be prevented in the future. The ESD NCR system documents all of these steps including the follow-up monitoring performed by the SARA QAO. The NCR reports will be forwarded to the SARA Project Manager, as necessary.

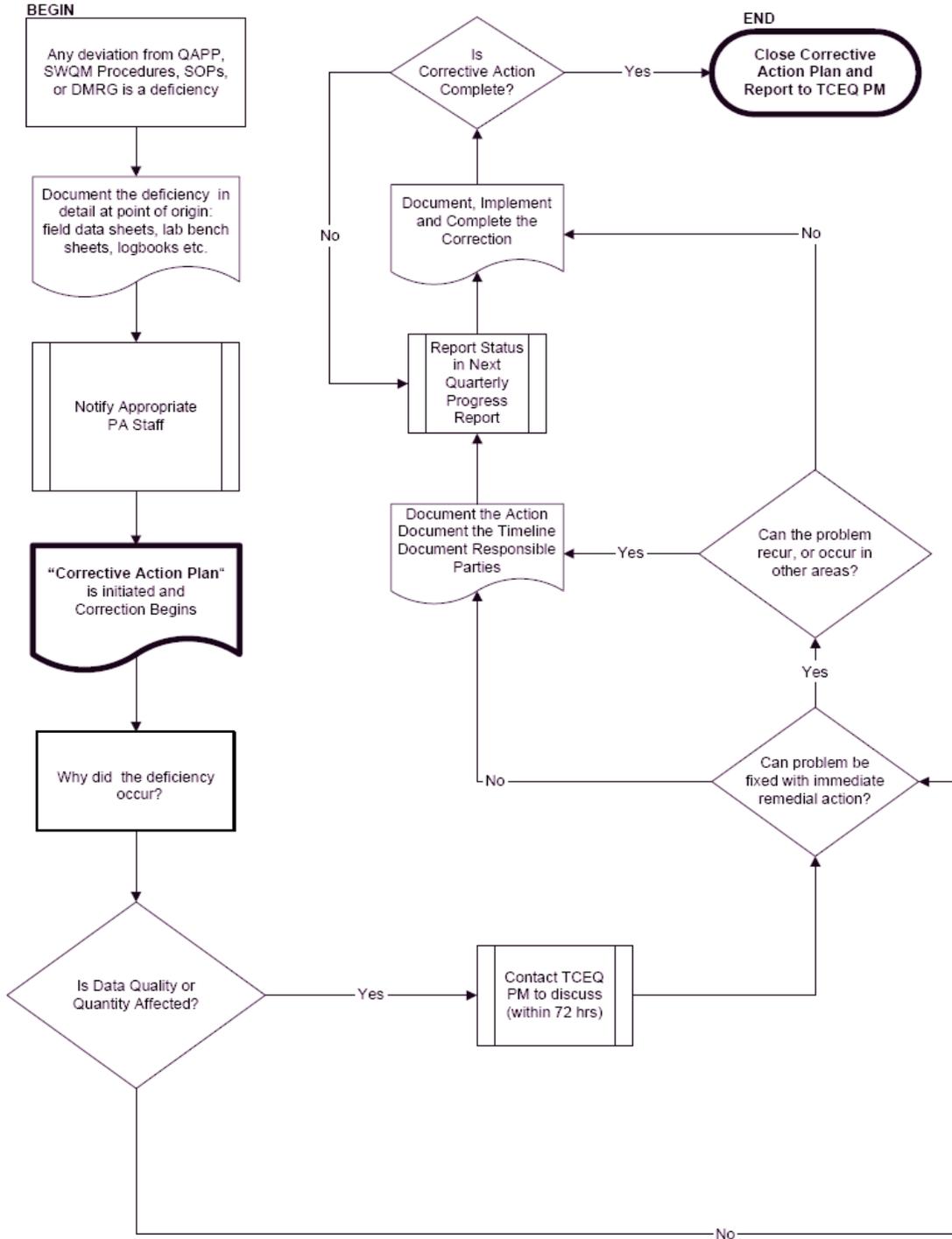
Status of NCRs will be documented on the Corrective Action Status Table (See Appendix L) and included with Quarterly Progress Reports. In addition, significant conditions (i.e., situations which, if uncorrected, could have a serious effect on safety or on the validity or integrity of data) will be reported to the TCEQ immediately.

The San Antonio River Authority QAO is responsible for implementing and tracking corrective actions. Corrective action plans will be documented on the Corrective Action Plan Form (See Appendix M) and submitted, when complete, to the TCEQ Project Manager. Records of audit findings and corrective actions are maintained by both the TCEQ and the San Antonio River Authority QAO. Audit reports and corrective action documentation will be submitted to the TCEQ with the Quarterly Progress Report.

If audit findings and corrective actions cannot be resolved, then the authority and responsibility for terminating work are specified in the TCEQ QMP and in agreements in contracts between participating organizations.

FIGURE C1.1 CORRECTIVE ACTION PROCESS FOR DEFICIENCIES

Corrective Action Process for Deficiencies



C2 REPORTS TO MANAGEMENT

Reports to TCEQ Project Management

All reports detailed in this section are contract deliverables and are transferred to the TCEQ in accordance with contract requirements.

Monitoring Systems Audit Report and Response - Following any audit performed by the Basin Planning Agency, a report of findings, recommendations and response is sent to the TCEQ in the quarterly progress report.

Quarterly Progress Report - Summarizes the San Antonio River Authority's activities for each task; reports monitoring status, problems, delays, and corrective actions; and outlines the status of each task's deliverables.

Monitoring System Audit Response - The San Antonio River Authority will respond in writing to the TCEQ within 30 days upon receipt of a monitoring system audit report to address corrective actions.

San Antonio River Authority Evaluation - The San Antonio River Authority participates in a San Antonio River Authority Evaluation by the TCEQ annually for compliance with administrative and programmatic standards.

Site Specific BMP Assessment Report - A report that will describe the inventory of publicly-owned sites for potential BMP implementation.

Watershed Specific BMP Assessment Report – A report that will describe the conceptual layout of BMPs within the specific study watershed.

Revised Upper San Antonio River Watershed Protection Plan

Summary Report of BMPs - A summary report that identifies the suite of BMPs recommended for implementation in the planning area.

Final Project Report - Summarizes the San Antonio River Authority's activities for the entire project period including a description and documentation of major project activities; evaluation of the project results and environmental benefits; and a conclusion.

Reports to San Antonio River Authority Project Management

The reports listed in Table C2.1 are produced at the appropriate intervals to document activities towards completion of the project or to document quality control issues that result in the qualification or loss of data.

Table C2.1 Reports

Type of Report	Frequency (daily, weekly, monthly, quarterly, etc.)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation	Report Recipients
Non-Conformance report	As Needed	As Needed	Field Staff Laboratory staff	QA Staff and Laboratory Mgmt.
Project Progress Reports	Monthly	Not Applicable	SARA Project Manager	SARA Project Management Staff
Inventory of Implemented BMP's	NA	4/15/12	SARA PM	TCEQ
BMP Summary Report	NA	11/14/12	Contractor	TCEQ, BRWM Water Quality Focus Group
Site Specific BMP Report	NA	3/14/13	Contractor	TCEQ, BRWM Water Quality Focus Group
Watershed Specific BMP Report	NA	3/14/13	Contractor	TCEQ, BRWM Water Quality Focus Group
Revised Upper San Antonio River Watershed Protection Plan	NA	7/14/13	Contractor	TCEQ, BRWM Water Quality Focus Group
Final Project Report	NA	8/31/13	SARA PM	TCEQ

D1 DATA REVIEW, VERIFICATION, AND VALIDATION

For the purposes of this document, data verification is a systematic process for evaluating performance and compliance of a set of data to ascertain its completeness, correctness, and consistency using the methods and criteria defined in the QAPP. Validation means those processes taken independently of the data-generation processes to evaluate the technical usability of the verified data with respect to the planned objectives or intention of the project. Additionally, validation can provide a level of overall confidence in the reporting of the data based on the methods used.

All data obtained from field and laboratory measurements will be reviewed and verified for conformance to project requirements, and then validated against the data quality objectives which are listed in Section A7. Only those data which are supported by appropriate quality control data and meet the measurement performance specification defined for this project will be considered acceptable and submitted to the TCEQ for entry into SWQMIS.

The procedures for verification and validation of data are described in Section D2, below. The San Antonio River Authority Quality Staff and Watershed Monitoring Supervisor is responsible for ensuring that field data are properly reviewed and verified for integrity. The Laboratory Supervisor is responsible for ensuring that laboratory data are scientifically valid, defensible, of acceptable precision and bias, and reviewed for integrity. The San Antonio River Authority Data Manager will be responsible for ensuring that all data are properly reviewed and verified, and submitted in the required format to be loaded into SWQMIS. The San Antonio River Authority QAO is responsible for validating a minimum of 10% of the data produced in each task. Finally, the San Antonio River Authority Project Manager, with the concurrence of the San Antonio River Authority QAO, is responsible for validating that all data to be reported meet the objectives of the project and are suitable for reporting to TCEQ.

D2 VERIFICATION AND VALIDATION METHODS

All data will be verified to ensure they are representative of the samples analyzed and locations where measurements were made, and that the data and associated quality control data conform to project specifications. The staff and management of the respective field, laboratory, and data management tasks are responsible for the integrity, validation and verification of the data each task generates or handles throughout each process. The field and laboratory tasks ensure the verification of raw data, electronically generated data, and data on chain-of-custody forms and hard copy output from instruments.

Verification, validation and integrity review of data will be performed using self-assessments and peer review, as appropriate to the project task, followed by technical review by the manager of the task. The data to be verified (listed in table 2.1) are evaluated against project performance specifications (Section A7) and are checked for errors, especially errors in transcription, calculations, and data input. If a question arises or an error is identified, the manager of the task responsible for generating the data is contacted to resolve the issue. Issues which can be

corrected are corrected and documented electronically or by initialing and dating the associated paperwork. If an issue cannot be corrected, the task manager consults with the higher level project management to establish the appropriate course of action, or the data associated with the issue are rejected and not reported to the TCEQ for storage in SWQMIS. The performance of these tasks is documented by completion of the Data Review Checklist and Summary (Appendix C).

The San Antonio River Authority Project Manager and QAO are each responsible for validating that the verified data are scientifically valid, defensible, of known precision, bias, integrity, meet the data quality objectives of the project, and are reportable to TCEQ. One element of the validation process involves evaluating the data again for anomalies. Any suspected errors or anomalous data must be addressed by the manager of the task associated with the data, before data validation can be completed.

A second element of the validation process is consideration of any findings identified during the monitoring systems audit conducted by the TCEQ QAS assigned to the project. Any issues requiring corrective action must be addressed, and the potential impact of these issues on previously collected data will be assessed. Finally, the San Antonio River Authority Project Manager, with the concurrence of the QAO validates that the data meet the data quality objectives of the project and are suitable for reporting to TCEQ.

TABLE D2.1 DATA VERIFICATION PROCEDURES

Data to be Verified	Field Task	Laboratory Task	Lead Organization Data Manager Task
Sample documentation complete; samples labeled, sites identified	Y	Y	
Field QC samples collected for all analytes as prescribed in the TCEQ <i>SWQM Procedures Manual</i>	Y		
Standards and reagents traceable	Y	Y	
Chain of custody complete/acceptable	Y	Y	
Sample preservation and handling acceptable	Y	Y	
Holding times not exceeded	Y	Y	
Collection, preparation, and analysis consistent with SOPs and QAPP	Y	Y	Y
Field documentation (e.g., biological, stream habitat) complete	Y		
Instrument calibration data complete	Y	Y	
Bacteriological records complete	Y	Y	
QC samples analyzed at required frequency	Y	Y	
QC results meet performance and program specifications	Y	Y	
Analytical sensitivity (Minimum Analytical Levels/Ambient Water Reporting Limits) consistent with QAPP		Y	
Results, calculations, transcriptions checked	Y	Y	
Laboratory bench-level review performed		Y	
All laboratory samples analyzed for all parameters		Y	
Corollary data agree	Y	Y	Y
Nonconforming activities documented	Y	Y	Y
Outliers confirmed and documented; reasonableness check performed			Y
Dates formatted correctly			Y
Depth reported correctly			Y
TAG IDs correct			Y
TCEQ ID number assigned			Y
Valid parameter codes			Y
Codes for submitting entity(ies), collecting entity(ies), and monitoring type(s) used correctly			Y
Time based on 24-hour clock			Y
Absence of transcription error confirmed	Y	Y	Y
Absence of electronic errors confirmed	Y	Y	Y
Sampling and analytical data gaps checked (e.g., all sites for which data are reported are on the coordinated monitoring schedule)	Y	Y	Y
Field QC results attached to data review checklist			
Verified data log submitted			
10% of data manually reviewed			Y

D3 RECONCILIATION WITH USER REQUIREMENTS

Data collected from this project will be analyzed by the SARA Staff to report the NPS loadings of bacteria and nutrients for the sub-watershed sampling locations. This data will assist in determining which areas to focus on for future BMP implementation in an effort to have the stream meet the surface water quality standard for contact recreation. Ongoing progress will be based upon the evaluation of routine monitoring data conducted under the Clean Rivers Program.

Data collected from this project will be analyzed by SARA Staff to report the performance of the BMPs if completed during the time frame of this project. The percentage of pollutant removal achieved as of the BMP's performance will be one of several criteria examined by the staff. Neither BMP nor in-stream monitoring data that do not meet data quality objectives will be used in the project or submitted to SWQMIS. Routine water quality monitoring data will be assessed to determine whether the BMPs are having a positive impact on water quality.

APPENDIX A: AREA LOCATION MAP & SAMPLE LOCATION MAP

FIGURE A.1 PROJECT AREA MAP

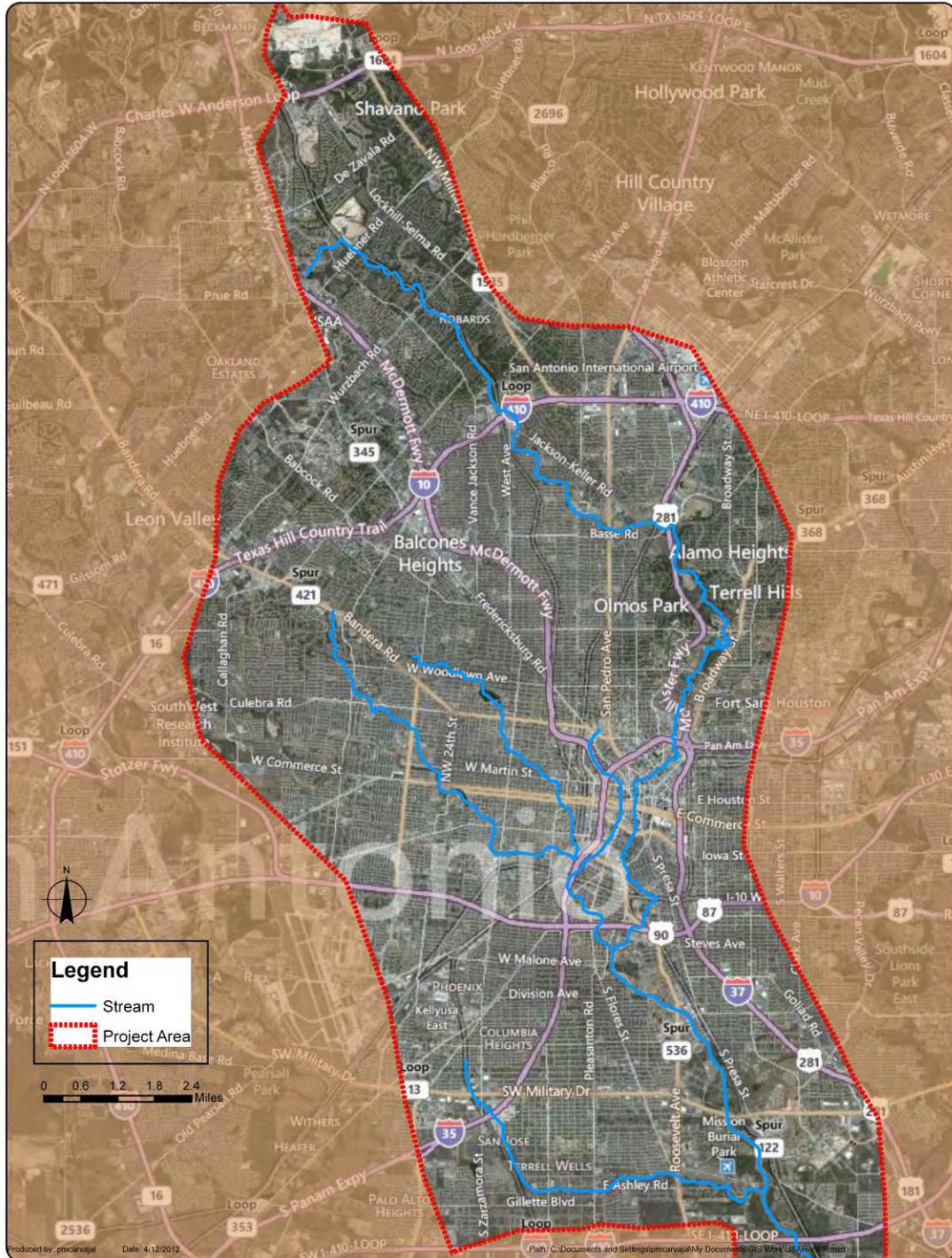


FIGURE A.2 ROUTINE SAMPLE STATIONS MAP

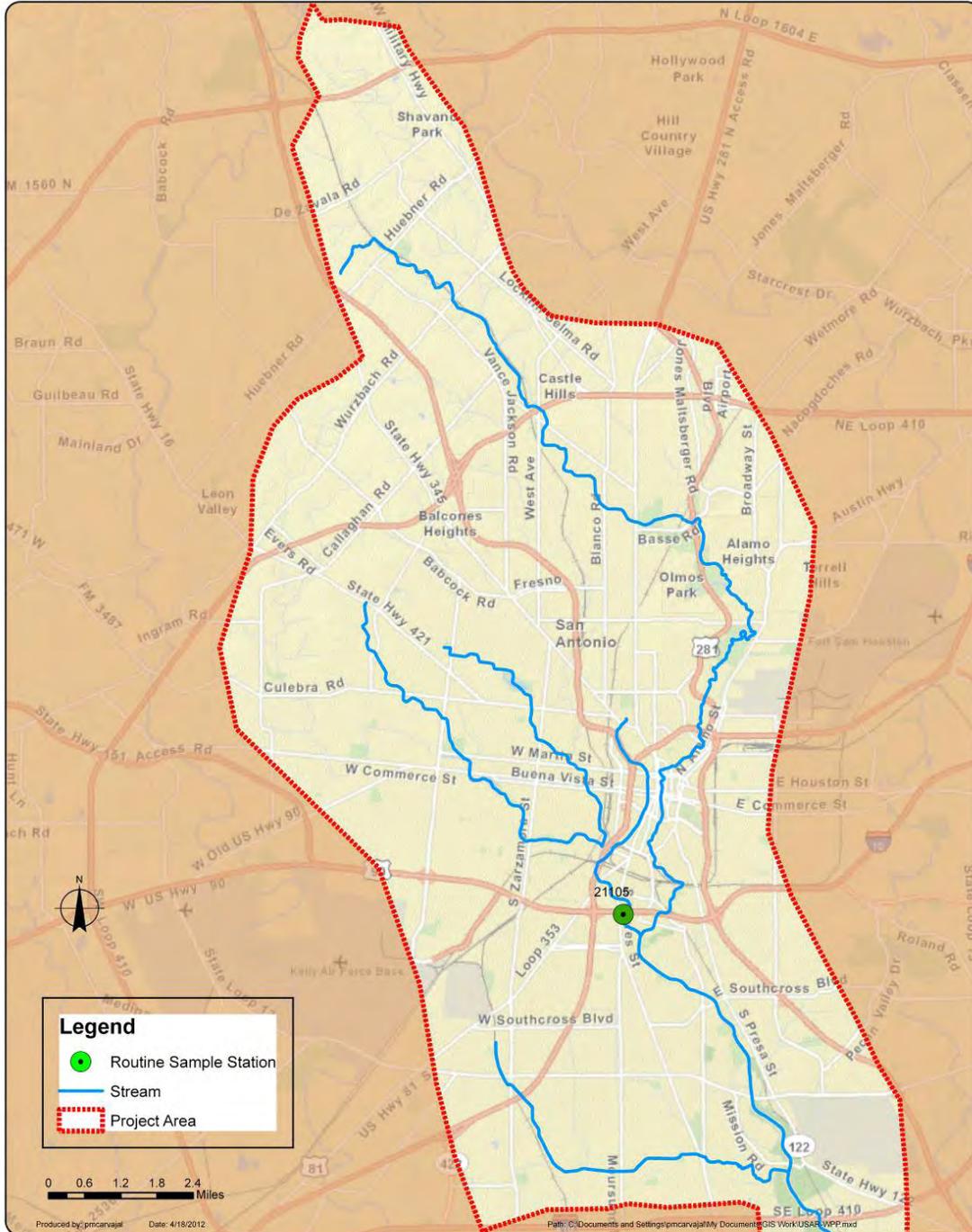
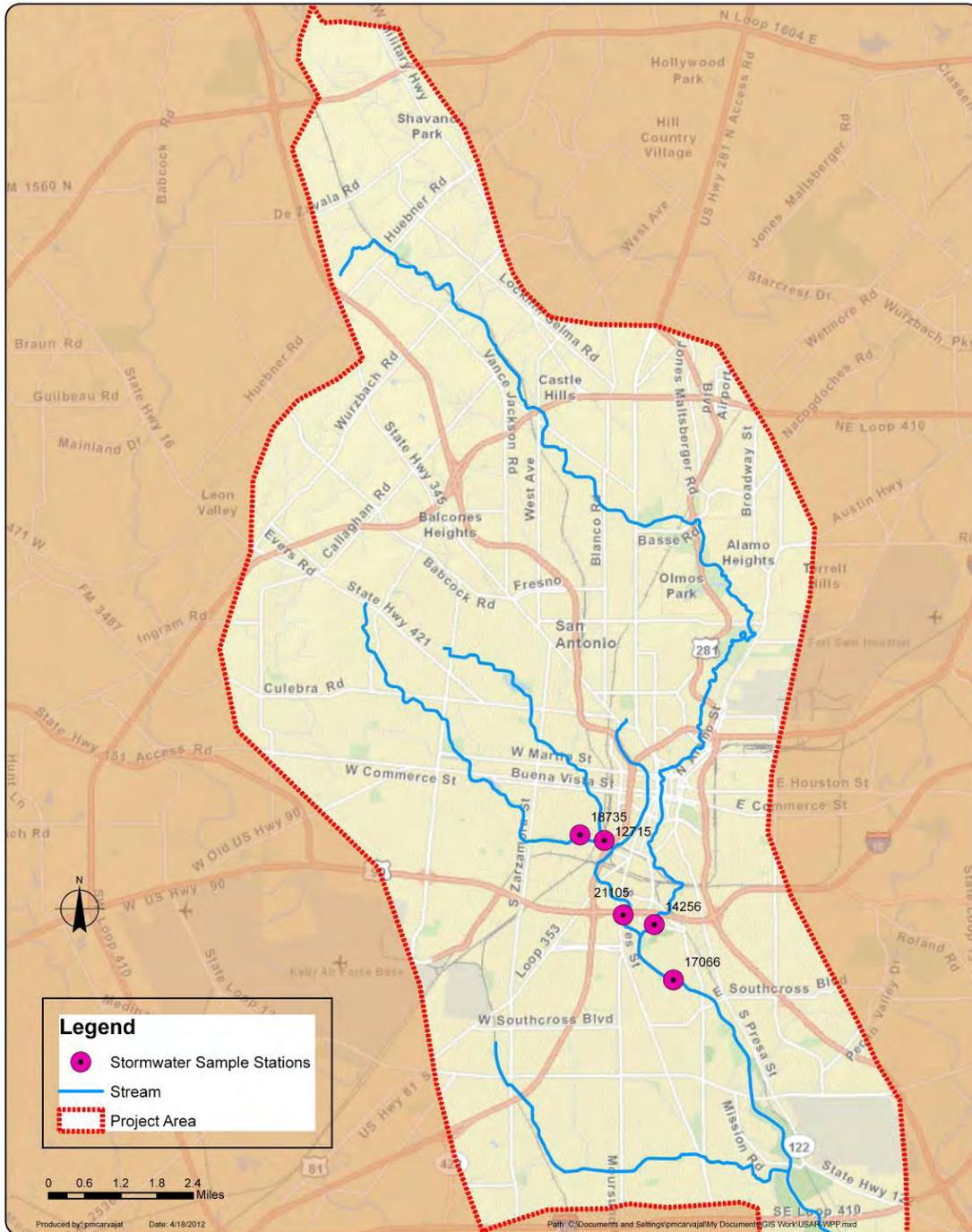


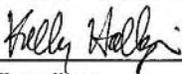
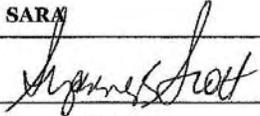
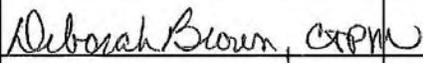
FIGURE A.3 STORMWATER SAMPLE STATIONS MAP



APPENDIX B: WORK PLAN

Texas Commission on Environmental Quality

**Clean Water Act (CWA) Section 319(h) Categorical Nonpoint Source (NPS) Grant Agreement
CONTRACT SIGNATURE PAGE**

Contract Name		Upper San Antonio River Watershed Protection Plan(WPP)
Contract Number		582-12-10083
Grantee		San Antonio River Authority (SARA)
Grantee Identification Number		17460113115005
Maximum TCEQ Obligation: \$92,509.86	Effective Date: Date of last signature	Expiration Date: 8/31/2013
<p>The Texas Commission on Environmental Quality (TCEQ), an agency of the State of Texas, and the named Grantee, a governmental body, agency, or political subdivision of: the United States, the State of Texas, or another State, enter this agreement (Contract) to cooperatively conduct authorized governmental functions and activities under the laws of the State of Texas, including, the Interagency Cooperation Act, the Interlocal Cooperation Act, and Texas Water Code §§ 5.124 and 5.229.</p> <p>The Parties agree: to be effective, the Contract must be signed by an authorized official of the TCEQ and the Grantee; as authorized by TCEQ, Grantee will conduct Grant Activities as part of its own authorized governmental functions and TCEQ will reimburse Allowable Costs subject to the Texas Uniform Grant Management Standards (UGMS) and this Contract; the Grantee is not a vendor of goods and services under Texas Government Code Chapter 2251, therefore, no interest is applicable; and the Contract may be terminated by TCEQ for its own convenience with 30 days written notice.</p>		
Grant Number: 905010	CFDA Number: 66.460	
Parties to the Contract:	TCEQ	SARA
By (Authorized Signature)		
Printed Name:	Kelly Holligan	Suzanne Scott
Title:	Division Director	General Manager
Date of Signature:	14 October 2011	9/28/11
Procurement and Contracts Representative		
Printed Name	Deborah Brown, CTPM, CTCM	
Date	10/12/11	

SARA

TCEQ Contract Number: 582-12-10083

Intergovernmental Cooperative Reimbursement Contract CONTRACT DOCUMENTS	
<p>The Agreement between TCEQ and Grantee is composed of the Contract Documents listed on this page and marked by an "X." Documents on this list include all amendments. The terms "Contract" and "Grant Agreement" include all the Contract Documents. In the event of a conflict of terms, the Contract Documents as amended control in the descending order of the list, subject to provisions in the Special Terms and Conditions, if any. All Contract provisions, however, are subject to control by the latest amendment and most specific provision and by the applicable state and federal laws, rules, and regulations.</p>	
X	Contract Signature Page
X	Special Terms and Conditions
X	Federal Section (Including Federal Conditions and Completed Forms)
	Documents Created during the Contract: Work Orders/Proposal for Grant Activities. For umbrella contracts/grants, the following order takes precedence, with the most important first; all of which are subject to control by the latest amendment:
<input type="checkbox"/>	Work Order / Proposal for Grant Activities
<input type="checkbox"/>	Notice to Proceed / Notice to Commence
<input type="checkbox"/>	TCEQ Approved Work Plan / Grant Activity Description
X	Grant Activities ("Scope of Work")
X	General Terms and Conditions
X	Contract Budget / Schedule of Fixed Cost for Reimbursement
X	Project Representatives and Records Location
X	Attachment A
X	Attachment B
X	Attachment C

SARA

TCEQ Contract Number: 582-12-10083

**Texas Commission on Environmental Quality
CWA §319(h) NPS Grant Program
FY 2011 Proposal 1.06**

NPS SUMMARY PAGE for the CWA §319(h) NPS Grant Program			
1. Title of Project:	1.06 Upper San Antonio River WPP		
2. Project Goals:	<p>In an effort to enhance the urban reaches of the Upper San Antonio River (segment 1911) and improve and protect water quality, SARA is proposing to update, revise, and implement the 2006 Upper San Antonio River WPP. The revised WPP will identify and propose water quality Best Management Practices (BMPs) that would serve to abate or control NPS pollution of bacteria, sediments and excess nutrients (nitrogen and phosphorous). The water quality goals of the project are to develop a plan for implementation of approved BMPs that would aid in reducing <i>E. coli</i> bacteria Nonpoint Source (NPS) loads to segment 1911 of the San Antonio River. The SARA and Bexar Regional Watershed Management (BRWM) partner's objective is to have the Upper San Antonio River compliant with State of Texas Surface Water Quality Standards (less than 126 organisms per 100 ml).</p> <p>SARA will compile an inventory of water quality BMPs developed as part of the 2006 WPP, and BMPs that were developed and implemented after the 2006 WPP was finalized. Where possible, SARA will conduct targeted post implementation water quality sampling events in order to determine the effectiveness of the implemented BMPs.</p> <p>SARA will identify the types of BMPs best suited to reducing NPS pollution along the 303(d) Listed reaches of the Upper San Antonio River and determine locations (including tributaries) where installation would be most effective, economical and complimentary to the ecosystem. Installation and implementation will be coordinated and phased with planned re-developments, flood control or parkway structures, features and amenities. Following the implementation of the new BMPs, SARA personnel will establish a long term water quality monitoring program, coordinated with existing Clean Rivers Program monitoring, to assess and evaluate the effectiveness of the BMPs.</p>		
3. Project Tasks:	<ul style="list-style-type: none"> (1) Project Administration (2) Water Quality and Implementation Tracking (3) General BMP Recommendations (4) Site-Specific Assessment and Selection of Appropriate BMPs to Achieve Effective Load Reductions (5) Watershed-Specific Assessment and Selection of Appropriate BMPs to Achieve Effective Load Reductions (6) Stakeholder and Public Outreach (7) Report Preparation 		
4. Measures of Success:	<p>Development of a QAPP and post implementation monitoring plan.</p> <p>Inventory of 2006 WPP implemented BMPs and estimated reductions where possible.</p> <p>Identification of new BMPs to reduce NPS bacterial loads and a projection of load reductions.</p> <p>Approval of the revised Upper San Antonio River WPP by the BRWM program.</p> <p>Acceptance of the revised Upper San Antonio River WPP by the TCEQ and the U.S. Environmental Protection Agency (EPA).</p>		
5. Project Type:	Implementation (); Education (X); Planning(X); Assessment(X); Groundwater ()		
6. Status of Water Body: 2008 Texas Water Quality Inventory and 303(d) List	Segment ID: 1911 Upper San Antonio River	Parameter: <i>E. coli</i>	Category: Impaired 4a
7. Project Location (Statewide or Watershed and County)	Upper San Antonio River Watershed (Segment 1911) upstream of South Loop 410 within the city limits of San Antonio, Texas.		
8. Key Project Activities:	Hire Staff (); Surface Water Quality Monitoring (X); Technical Assistance (X); Education (X); Implementation (); BMP Effectiveness Monitoring (X); Demonstration (X); Planning (X); Modeling (X); Bacterial Source Tracking (); Other ()		

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9. Texas NPS Management Program Elements:	<p>Element One (LTG Objectives 1, 2, & 6; STG Objectives 1c, and 2a)</p> <p>Element Two</p> <p>Element Four</p> <p>Element Six</p> <p>This project supports the Texas Nonpoint Source Management Program Long-Term Goal of protecting and restoring water quality from NPS pollution by: 1) focusing available resources in watersheds impacted by NPS pollution; and, 2) supporting the implementation of the state programs to reduce NPS pollution as defined in the TMDL Implementation Plan.</p> <p>The project also supports the Texas Nonpoint Source Management Program Short-Term Goal of data collection and assessment by: 1) conducting special studies to determine sources of NPS pollution and target TMDL activities and BMP implementation; and, 2) conducting monitoring to determine the effectiveness of TMDL activities and BMP implementation.</p> <p>This project supports EPA Performance Activity Measure WQ-14, by contributing to the estimated annual reduction in bacterial contributions from NPS to 303(d) Listed Planning Area streams.</p>					
10. Project Costs:	Federal: (TCEQ)	\$92,510.00	Non-Federal: (Match)	\$61,673.00	Total:	\$154,183.00
11. Project Management:	SARA					
12. Project Period:	Upon signature of both parties – August 31, 2013					

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Part I – Applicant Information

Applicant						
13. Project Lead		Patricia Carvajal				
14. Title		Project Representative				
15. Organization		SARA				
16. Federal ID No.		17460113115005				
17. E-mail Address		pmeavajal@sara-tx.org				
18. Street Address		100 E. Guenther St.				
City	San Antonio	County	Bexar	State	Tx	Zip Code 78283-9980
19. Telephone No.		(210)302-3672		Fax No.	(210) 858-0265	

Project Partners	
Names	Roles & Responsibilities
TCEQ	Provide state oversight and management of all project activities and ensure coordination of activities with related projects.
SARA	Provide project management, administrative and technical services; funding, in kind contributions and coordination with project partners, collaborators, stakeholders, and the public.
BRWM Program – BRWM, consists of the City of San Antonio (CoSA), Bexar County, SARA, 20 San Antonio area suburban cities) and technical staff from San Antonio Water System (SAWS), Edwards Aquifer Authority, San Antonio Metropolitan Health Dept.	Provide technical and programmatic input towards the revisions to the WPP. In some instances identified BRWM partners may fund or implement selected BMPs.

Part II – Project Information

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Project Type							
21. Surface Water	X	Groundwater					
22. Does the project implement recommendations made in a completed WPP or an adopted TMDL or Implementation Plan?				Yes	X	No	
23. If yes, identify the document and cite the page(s) on which the proposed implementation activities are cited.		Upper San Antonio River WPP (SARA 2006) http://www.sara-tx.org/site/water_quality/water_qual_mon/Projects_and_Studies.php#Anchor-WATERSHB-48985 Upper San Antonio River Segment 1911 TMDL Report (TCEQ 2007) http://www.tceq.state.tx.us/assets/public/implementation/water/tmdl/34lowers/34c-lsartmdl_adopted.pdf					
24. If yes, identify the agency/group that developed and/or approved the document.		- SARA and BRWM - TCEQ accepted	25. Year Developed	2006 2007			

26. Watershed Information				
Watershed Name(s)	Hydrologic Unit Code (8 Digit)	Segment ID	305 (b) Category	Size (Acres)
Upper San Antonio River	12100301	1911	4a impaired	524 sq mi

27. Water Quality Impairment			
Describe all known causes (pollutants of concern) of water quality impairments from any of the following sources: 2008 Texas Water Quality Inventory and 303(d) List, Clean Rivers Program Basin Summary, Basin Highlights Reports or Other Documented Sources.			
2008 Texas Index of Water Quality Impairments			
Area	Category	Year Listed	
1911_02	Bacteria Geomean	4a	1996
1911_03	Bacteria Geomean	4a	1996
1911_06	Bacteria Geomean	4a	1996
1911_08	Bacteria Geomean	4a	1996
1911_09	Bacteria Geomean	4a	1996
	Impaired fish community	5c	2006
1911_10	Bacteria Geomean	4a	1996
1911_11	Bacteria Geomean	4a	1996
	Bacteria Single Sample		
2008 Texas Water Quality Inventory			
Water Bodies with Concerns for use Attainment and Screening Levels			
Area	Parameter of Concern	Level of Concern	
1911_01	Nitrate	CS	
	Total phosphorus	CS	
1911_02	Nitrate	CS	
	Total phosphorus	CS	
1911_03	Nitrate	CS	
1911_04	Nitrate	CS	
	Total phosphorus	CS	
	Orthophosphorus	CS	
1911_05	Nitrate	CS	
	Total phosphorus	CS	

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1911_06	Orthophosphorus	CS
	Nitrate	CS
	Total phosphorus	CS
1911_07	Orthophosphorus	CS
	Nitrate	CS
	Total phosphorus	CS
1911_10	Orthophosphorus	CS
	Nitrate	CS
	bacteria	CN
1911_11	Impaired fish community	CN
	nitrate	CS

CN= Concern for near-nonattainment of the water quality standards
CS=Concern for water quality based on screening levels

Project Narrative	
28. Problem/Need Statement	
<u>Characteristics of Segment 1911 in terms of its 303(d) Listing</u>	
<p>The 2004 303(d) List identifies the Upper San Antonio River (Segment 1911) as exceeding the contact recreation criterion for fecal coliform bacteria. The 2008 list does not list Segment 1911 as having bacterial issues. However, the actual status of the whole segment has not changed; the removal from the 303(d) List was due to the adoption of the Total Maximum Daily Load (TMDL) for Segment 1911. The ultimate water quality goal for this segment is to reduce bacterial concentrations to within acceptable risk levels for contact recreation.</p> <p>The origins of the NPS and their relative contributions have been investigated under the TCEQ TMDL program, with the finding that "urban runoff is the major source of bacterial runoff in the area. These runoff bacteria loads are not continuous; instead they occur only when precipitation events produce runoff." (WPP p. 82) The "Summary Table for Nine Key Elements of Proposed Control Measures for the WPP" for this area identifies "general urban runoff sources" as one of the major causes of bacterial impairment in the upper reaches of the San Antonio River. This is the issue addressed in this project.</p> <p><u>Other projects that have addressed the same water quality issues in the same water body</u> The TMDL project for the Upper San Antonio River has been completed. A WPP is in place (2006), and an Implementation Plan is in progress. The Summary Table for Nine Key Elements of the 2006 WPP calls for "new structural stormwater BMPs" along with "education for contractors and property managers on BMP construction and maintenance." This project will contribute to this goal.</p> <p>Several of the Management Measures identified in the 2006 WPP or afterwards, have been completed:</p> <ul style="list-style-type: none"> o The San Antonio Zoo has relocated its hippopotami to an aquarium-style exhibit that filters the water and drains the waste into a sanitary line after being treated with ultraviolet light and has changed the way staff clean the exhibits to minimize the flow of feces reaching the San Antonio River; design of disinfection improvements for zoo effluent is underway o The City has implemented a Pooper Scooper Program to encourage residents to pick up after their dogs o The River Walk Implementation Project educates the public and works with stakeholders along the River Walk loop to change behaviors and practices to diminish the deposit of nutrients and bacteria into the river o The Houston Street Bridge has been modified to prevent bat colonies, which eliminated that source of bacteria in the River Loop o Some bird nests are regularly removed along the River Walk o Falconers are being periodically employed to discourage large colonies of birds from nesting in trees overhanging the river along the River Walk o The City's Animal Control facilities have been moved away from the river o The San Antonio Water System has connected 117 residences with failing septic systems in Espada Community to a Sanitary Sewer o De-silting of the River Loop, and extension, was initiated in January 2010 o To alleviate low flow at the Henry B. Convention Center on the River Walk, the San Antonio Water System has introduced 0.65 MGD of reuse water to the outfall. <p><u>Needs for this Project</u> Stormwater runoff and the associated bacterial load will increase with development and re-development without the implementation of techniques that capture or slow down runoff and allow time for its infiltration into the ground.</p>	

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The revised WPP will serve as a guide to specifically address NPS pollution and focus on the identification, development and implementation of NPS- specific BMPs. The overall water quality goal of the revised WPP is to provide for an additional reduction in bacteria levels so that the Upper San Antonio River is compliant with State Water Quality Stream Standards. The development of a revised WPP will compliment the 2007 TCEQ TMDL and build upon the 2006 WPP by expanding the framework needed for implementation through collaboration with partners and stakeholders as well as public outreach, awareness, and input.

Project Narrative

29. General Project Description (Include Project Location Map)

As the lead water resource planning agency for the San Antonio River Basin, the SARA worked in conjunction with the CoSA, Bexar County, the SAWS, and other partners to develop a WPP for the Upper San Antonio River watershed (Segment 1911) upstream of South Loop 410 in Bexar County, Texas (2006). The 2006 WPP development focused on the upper third (approximately) of segment 1911, with an emphasis on the reach (Planning Area) identified on the 2004 EPA 303(d) List. The Planning Area is an urbanized sub-watershed of the San Antonio River basin, wholly within the CoSA. The 2008 EPA 303(d) List prepared by TCEQ identifies the Upper San Antonio River as occasionally exceeding the contact recreation criterion for *E. coli* bacteria. There are several known point source discharges in the watershed which have been or are being corrected to minimize bacterial load contributions, but NPSs are suspected to contribute a significant portion of the bacterial load causing the impairment. The heavily urbanized corridor along the Upper San Antonio River has provided habitat for an unbalanced variety of domestic, feral and wild mammals, and dense roosting colonies of opportunistic and invasive bird species. Data and information to estimate relative contribution of bacteria from animal sources and other NPS was developed under a TMDL study conducted by the TCEQ in 2007. However, the origins of the NPSs and their relative contributions have been determined only to a limited extent.

The SAWS continues its programs to improve sewage management, collection and treatment to reduce contributions of bacterial contamination. Additionally, SAWS in partnership with the CoSA have augmented base flow to the San Antonio River by introducing re-use water. The addition of re-use water has assisted with re-aeration, sediment transport and clarity.

In order to move forward and continue to enhance the Upper San Antonio River watershed and improve and protect water quality throughout the Planning Reach, the 2006 WPP will be updated, revised and enhanced. The revised WPP will serve as a guide to specifically address NPS pollution and focus on the identification, development and implementation of NPS specific BMPs. The overall water quality goal of the revised WPP is to provide for an additional reduction in bacteria levels so that the Upper San Antonio River is compliant with State Surface Water Quality Standards. The development of a revised WPP will compliment the 2007 TCEQ TMDL and build upon the 2006 WPP by expanding the framework needed for implementation through collaboration with partners and stakeholders as well as public outreach, awareness, and input. SARA, Bexar County, and the CoSA are working together under an inter-local agreement to create an integrated management system to most effectively address stormwater, flood control, and water quality issues in the watersheds in Bexar County and between multiple local government jurisdictions. Coordinated management of flood control and stormwater issues in Bexar County promotes a better understanding of the pollutant contributions from the watershed to the streams, creeks and rivers during rain events. This multi-government effort is known as the BRWM program. Revising the WPP and implementation of new BMPs will also include coordination and input from the BRWM.

During the WPP revision, SARA will update existing Planning Area data and information into the SARA enterprise Geographic Information System (GIS) system to serve as an aid to identify, locate and design the types of BMPs best suited to reduce NPS pollution. This will help in determining locations where installation and / or implementation would be most effective and economical, and to help integrate data from the Upper San Antonio River watershed into BMP evaluations. Installation and implementation will be coordinated and phased with other Planning Area development projects, structures, features and amenities planned for the future.

The finalized WPP will provide substantial input to the specification of control measures for the NPS pollution abatement components of future development, flood control or parkway structures, features and amenities. SARA and BRWM partners are intending to leverage available resources with 319 Grant funds in order to implement future BMPs in the Planning Area.

As an attempt to document water quality improvements and BMP effectiveness, SARA personnel will initiate a Planning Area post implementation water quality monitoring program to collect data and information from BMPs to be implemented under the existing and updated WPP. The monitoring program will be coordinated with BRWM partners and conducted under a TCEQ approved Quality Assurance Project Plan (QAPP) to be developed at the onset of the project. Monitoring will commence when the QAPP is approved and in coordination with the San Antonio Basin Clean Rivers Program. The monitoring program will serve to verify assumptions regarding existing bacterial concentrations, collect additional data to assist in the identification of bacterial sources, and ultimately determine the effectiveness of implemented BMPs.

SARA will develop and implement a series of collaborative workshops where CoSA, Bexar County, SAWS, and SARA staff will work with Planning Area stakeholders represented by the SARA Environmental Advisory Committee and BRWM to identify problem areas, and recommend solutions utilizing existing public awareness and education campaigns. The public awareness / education campaign with basin residents, businesses and land owners will educate them on how some of their activities degrade water quality and how some operational or behavioral changes can improve water quality.

Schedule of project activities:

Task 1, 2 – Project Administration – will be ongoing

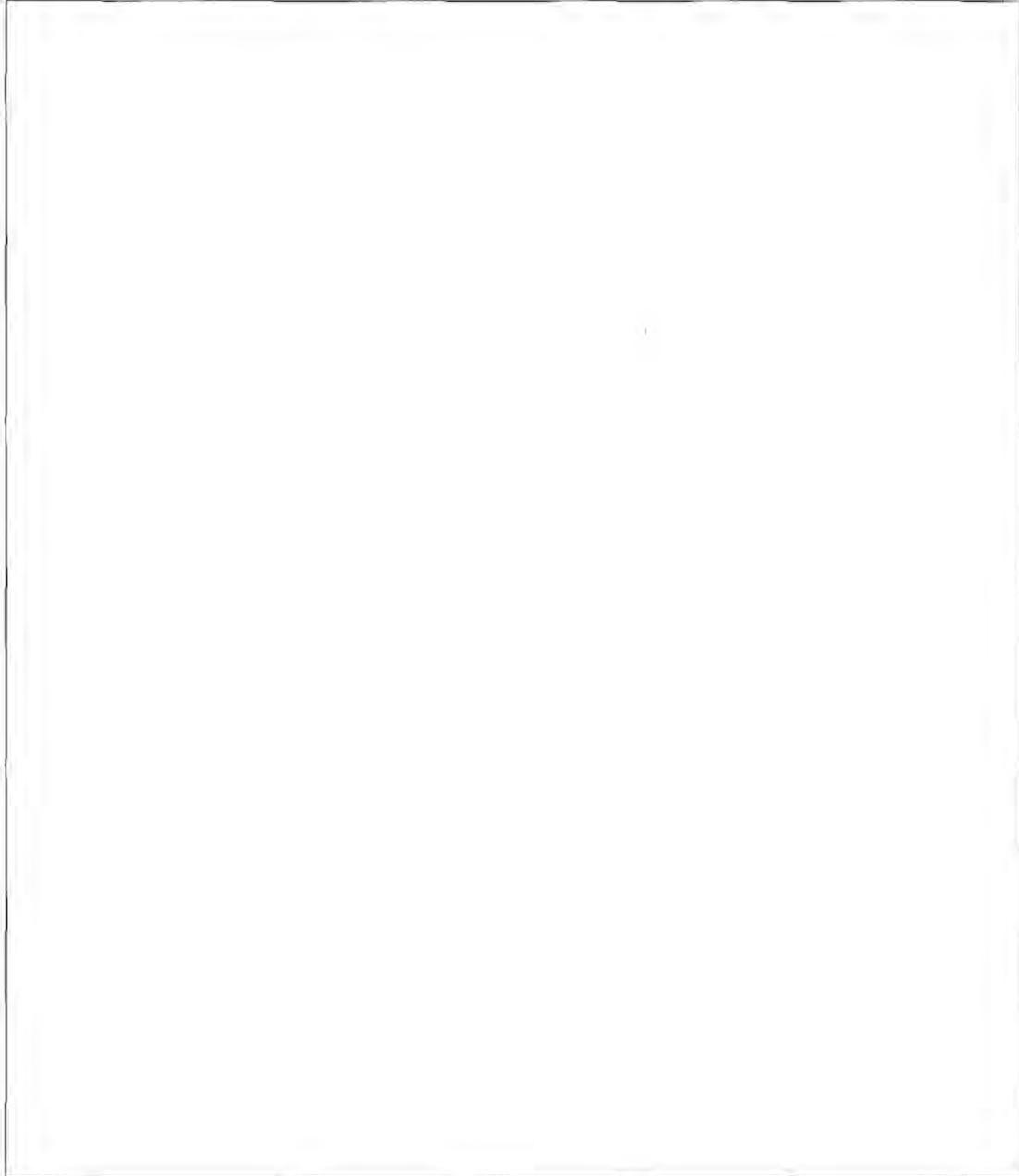
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- Task 2 - Quality Assurance, and Monitoring – will be ongoing
- Task 3 – Summary report of BMPs recommended in Planning Area -- seventeen months
- Task 4 – Site-Specific BMP Assessment Report of publicly-owned sites for potential BMP implementation – seventeen months
- Task 5 – Watershed-Specific BMP Assessment Report to describe conceptual layout of BMPs within a specific study watershed - Revised WPP Document -- seventeen months
- Task 6 - Stakeholder and public outreach / input – ongoing
- Task 7 – Revised WPP Document – twenty-two months

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30. Tasks, Objectives and Subtasks	
Task 1:	Project Administration
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:	Project Oversight – The SARA Project Manager will provide technical and fiscal oversight of the staff and/or contractor(s) to ensure Tasks and Deliverables are acceptable and completed as scheduled and within budget. With the TCEQ Project Manager authorization, SARA may secure the services of contractors as necessary for technical support, stakeholder / public outreach, spreadsheet-based modeling and training. Project oversight status will be provided to the TCEQ with the Quarterly Progress Reports (QPRs).
Subtask 1.2:	QPRs – Progress will be reported to the TCEQ by the 15 th of the month following each state fiscal quarter for incorporation into the Grant Reporting and Tracking System (GRTS). The Reports are to include the following: <ul style="list-style-type: none"> • Status of deliverables for each task • Narrative description in Progress Report format
Subtask 1.3:	Reimbursement Forms – Reimbursement forms will be submitted to the TCEQ by the last day of the month following each state fiscal quarter. For the last reporting period of the project, Reimbursement Forms will be required on a monthly basis.
Subtask 1.4:	Post-Award Conference – SARA will schedule and participate in a post-award orientation meeting with TCEQ within 30 days of contract execution, and submit minutes of the meeting within 30 days of the meeting.
Subtask 1.5:	Contract Communication – SARA will maintain regular telephone and/or email communication with the TCEQ Project Manager regarding the status and progress of the project in regard to any matters that require attention between QPRs. This will include a call or meeting each January, April, July, and October. Minutes recording the important items discussed and decisions made during each call will be attached to each QPR. Matters that must be communicated to the TCEQ Project Manager in the interim between QPRs may include: <ul style="list-style-type: none"> • Requests for prior approval of activities or expenditures for which the contract requires advance approval or that are not specifically included in the scope of work • Notification in advance when SARA has scheduled public meetings or events, initiation of construction, or other major task activities under this contract Information regarding events or circumstances that may require changes to the budget, scope of work, or schedule of deliverables; these events or circumstances must be reported within 48 hours of discovery
Subtask 1.6:	Annual Report Article – SARA will provide an article for the Nonpoint Source Annual Report upon request by the TCEQ. This report is produced annually in accordance with Section 319(h) of the CWA, and it is used to report Texas' progress toward meeting the CWA Section 319 goals and objectives and toward implementing its strategies as defined in the Texas Nonpoint Source Management Program. The article will include a brief summary of the project and describe the activities of the past fiscal year.
Deliverables	<ul style="list-style-type: none"> • QPRs • Reimbursement Forms • Post-Award Orientation Meeting Minutes • Quarterly Conference Call Meeting Minutes • Annual Report Article (as requested by TCEQ)

31. Tasks, Objectives and Subtasks	
Task 2:	Water Quality and Implementation Monitoring
Objective:	Develop a monitoring program for water quality tracking that will focus on stormwater runoff sampling in order to provide baseline data.
Subtask 2.1:	Monitoring program for water quality – Design and implement a monitoring program that will focus upon stormwater runoff bacteria concentrations. Sampling will be conducted at specific candidate sites (e.g., SARA parking lot) and from specific study watersheds (e.g., Westside creeks). Monitoring may also be conducted at selected existing BMP installations that are suitable for monitoring. At least 5 candidate sites will be monitored for storm event pollutant loads for at least 4 storm events each, and 1 or 2 existing BMP sites will be sampled depending upon availability. At least 4 sub-watersheds will be monitored at existing and new stations (not currently active) with routine monthly sampling over at least a 15 month period. All samples will be analyzed for <i>E. coli</i> , Total Suspended Solids (TSS), Total Nitrogen (N) (Total Kjeldahl Nitrogen (TKN), Nitrate, Nitrite), Total Phosphorus (P), with associated sample event flow data. The storm event data collection will be designed to estimate bacterial loads in storm flows from suspected priority sources or source areas contributing to the impairment.
Subtask 2.2:	QAPP Planning Meeting – Once the project has been approved, SARA will meet with the TCEQ Project Manager to review the monitoring plan and information needed for QAPP development based on the elements of

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	the TCEQ NPS QAPP Shell.
Subtask 2.3:	QAPP – SARA will develop and submit to the TCEQ a QAPP with project-specific Data Quality Objectives (DQOs) consistent with EPA Requirements for Quality Assurance Project Plans (QA/R5) format and the TCEQ NPS QAPP Shell 120 days prior to the initiation of any data collection. All of the monitoring procedures and methods prescribed in the QAPP will be consistent with the guidelines detailed in the TCEQ Surface Water Quality Monitoring Procedures, Volume 1 and 2. SARA will develop the QAPP with technical assistance from the TCEQ Project Manager, Quality Assurance (QA) and technical staff, management, and contractors. The QAPP must be approved by the TCEQ before data collection begins. Activities covered under this QAPP: Data collection Tasks/Subtasks covered under this QAPP: Subtasks 2.1, 2.4, 2.5, 2.6, 4.1, and 5.1. A QAPP planning meeting will be held with TCEQ staff and minutes of the meeting prepared. A draft and final QAPP for water quality data collection will be prepared and submitted for approval.
Subtask 2.4:	QAPP Annual Revisions and Amendments – SARA will provide input to TCEQ 60 days prior to the end of the effective period of the QAPP and will develop annual QAPP revisions no less than 45 days prior to the end of the effective period of the existing QAPP. Between annual revisions, amendments to the QAPP and the reasons for any needed changes will be submitted to TCEQ using appropriate procedures as outlined in the QAPP.
Subtask 2.5:	Data Assessment and Submission – Assessment data collected from water quality monitoring will be compiled, analyzed, evaluated, and submitted twice per year. The results will be assessed to determine if any modifications to the sampling program are warranted, to guide the conditions of future sampling surveys, and determine the utility of data collected to date.
Subtask 2.6:	Final Data Report – Results of the sampling program will be assessed at the conclusion of the project. Results will be presented in a brief report. Draft and final versions of the report will be prepared.
Deliverables	<ul style="list-style-type: none"> • Minutes of QAPP Planning Meeting • Draft QAPP • Final QAPP • Draft and Final QAPP Annual Updates • QAPP Amendments as needed • QAPP non-conformances reported to the TCEQ Project Manager and included in the QPR • Data submitted semi-annually • Final data report

Tasks, Objectives and Schedules	
Task 3:	General BMP Recommendations
Objective:	To develop a suite of BMPs that are recommended for implementation in the Planning Area. A consultant will assist SARA staff in identifying candidate BMPs and assist in the writing of the Summary Report.
Subtask 3.1:	Candidate BMPs – SARA will conduct activities as needed to develop a suite of BMPs that are recommended for general implementation in the Planning Area for control of bacteria contributions from NPSs. This work will build upon information developed for the WPP for the Upper San Antonio River and may include information from the Implementation Plan being written by TCEQ. The list of recommended BMPs must encompass BMPs that are suitable for redevelopment or new construction areas. SARA will provide a focal point for coordination with other entities, such as the BRWM partners, with interest in the Planning Area. This coordination will expand to any other implementation activities that other entities may put in place.
Subtask 3.2:	Inventory of Implemented BMPs – SARA will develop a list of BMPs implemented under the 2006 Upper San Antonio River WPP.
Subtask 3.3:	Summary Report – SARA will develop a summary report that identifies the suite of BMPs recommended for implementation in the Planning Area. The report will be a concise version of the information presented in the original WPP report produced in 2006. This summary report will be circulated and reviewed by other key stakeholders in the watershed, including CoSA, Bexar County, SAWS, and TxDOT.
Deliverables	<ul style="list-style-type: none"> • List of recommended BMPs • Inventory of BMPs Already Implemented • Draft summary report on BMPs • Final summary report on BMPs

Tasks, Objectives and Schedules	
Task 4:	Site-Specific Assessment and Selection of Appropriate BMPs to Achieve Effective Load Reductions

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Objective:	To develop options for management measures and implementation strategies to accomplish needed reductions on a site-specific basis. In this task, site-specific means the identification of specific sites where BMPs may be located. The overall goal of this task is to identify, select, geo-locate, and develop appropriate BMPs and plan for their implementation and monitoring. For this task, site-specific locations will be restricted to publicly-owned locations. SARA will identify specific sites and provide information (land use maps, aerial photograph etc.) to the consultant. The consultant will generate conceptual level strategies for BMP implementation at each site. The consultant will also write the Site-Specific BMP Assessment Report.
Subtask 4.1:	Site Identification – A plausible strategy for BMP implementation is to focus upon urban renewal/redevelopment opportunities as they become available over an extended time frame in the urban core. This task will inventory publicly-owned locations where BMP implementation could be scheduled for future activities. For example, sites owned by SARA include two office complexes. These SARA sites will be examined at a conceptual level to determine the feasibility of implementing BMPs in a retrofit activity. A similar inventory will be prepared for potential CoSA, Bexar County, and SAWS sites. The conceptual level effort will include an assessment of the general location and potential size of BMPs on a site, but will stop short of a detailed layout or design drawing. The number of potential sites evaluated will be restricted to no more than 12 sites. In this manner, potential site-specific locations for BMP implementation will be developed over time. Spreadsheet-based modeling will be applied for estimation of potential bacteria load reductions.
Subtask 4.2:	Site-Specific BMP Assessment Report – A site-specific BMP assessment report will be prepared to describe the inventory of publicly-owned sites for potential BMP implementation. The report will provide initial identification of appropriate management measures to achieve desired reductions in pollutant loads. Draft and final reports will be prepared and submitted to TCEQ.
Deliverables	<ul style="list-style-type: none"> • List of candidate sites for implementation • Draft site-specific BMP assessment report • Final site-specific BMP assessment report

Tasks, Objectives and Schedules	
Task 5:	Watershed-Specific Assessment and Selection of Appropriate BMPs to Achieve Effective Load Reductions
Objective:	To develop options for management measures and implementation strategies to accomplish needed load reductions on a watershed-specific basis. In this task, watershed-specific means the development of a BMP approach on a watershed basis, selecting key sub-watershed(s) located within the Upper San Antonio River (Planning Area) The selected watershed(s) will be from what is colloquially known as the "Westside Creeks" watersheds, namely Alazan, Apache, Martinez, and San Pedro Creeks; the candidate sub-watershed will be selected in conjunction with WPP stakeholders. Previous studies have documented significant bacterial concentrations in these fully urbanized reaches. The overall goal of this task is to identify, select, geo-locate, and develop appropriate BMPs and plan for their implementation and monitoring. SARA will assist the consultant in this task by providing information (land use maps, aerial photograph etc.).
Subtask 5.1:	Watershed Site Identification – A plausible strategy for BMP implementation is to focus upon urban renewal/redevelopment opportunities as they become available over an extended time frame in the urban core. This task will review aerial photography, land use mapping, drainage network mapping, and property records for the subject watershed. The objective will be to inventory both publicly-owned locations and privately-owned locations where BMP implementation could be scheduled for future activities. For example, sites owned by SARA, CoSA, Bexar County, and SAWS were inventoried in an earlier task, and some of these sites may be located in the western watersheds. As part of this task, nonpublic sites will also be inventoried that are positioned at advantageous locations for potential BMP implementation. Identification of these sites will not mean that the properties will be actively pursued, but some of them may become available in the future as redevelopment occurs. In this manner, potential site-specific locations for BMP implementation will be developed. Spreadsheet-based modeling will be applied for estimation of potential bacteria load reductions.
Subtask 5.2:	Watershed-Specific BMP Assessment Report – A watershed-specific BMP assessment report will be prepared to describe the conceptual layout of BMPs within the specific study watershed. The report will provide conceptual level identification of appropriate management measures to achieve desired reductions in pollutant loads. Draft and final reports will be prepared and submitted to TCEQ.
Deliverables	<ul style="list-style-type: none"> • List of watershed sites advantageous for BMP development • Draft watershed-specific BMP assessment report • Draft watershed-specific BMP assessment report

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Tasks, Objectives and Schedules	
Task 6:	Stakeholder / public involvement process
Objective:	Use existing communication programs that inform the public, and facilitate coordination towards the development of the WPP. The program will be used to enhance partner, stakeholder and public understanding of the WPP and encourage their participation in developing and implementing appropriate BMPs. The program will also help the public achieve a better understanding of land use activities and their impact on water quality. This task is primarily the responsibility of SARA. The consultant will provide assistance and make presentations as needed.
Subtask 6.1:	Stakeholder Participation – Stakeholder participation will be engaged via monthly meetings or workshops of the BRWM Water Quality Focus Group. These public meetings/workshops will provide the opportunity to transmit study goals, activities, and results to the stakeholders in the Planning Area. An additional activity will be quarterly conference calls with TCEQ for a project update and status.
Subtask 6.2:	Public Outreach – Updates will be provided for inclusion on the SARA and BRWM web site. Periodic newspaper articles may be published. The SARA newsletter will also be used to periodically release updates.
Subtask 6.3:	Agency Coordination – Coordinate with the BRWM program, apprise the various BRWM management committees of the WPP development and solicit their input: <ul style="list-style-type: none"> • Participate in the Committee of Seven (BRWM elected officials) public meetings, providing information and soliciting input on WPP development • Participate in the BRWM Watershed Improvement and Advisory Committee (WIAC) public meetings, providing information and soliciting input on WPP development • Participate in the BRWM Management Committee Meetings (SARA, Bexar County and CoSA top executives), providing information and soliciting input on WPP development
Subtask 6.4:	Program Coordination – Coordinate with the ongoing outreach programs (i.e., San Antonio River Improvements Project – Oversight Committee, TMDL Stakeholders, SARA Environmental Advisory Committee/ CRP Steering Committee) to inform and educate the public and solicit their input on the WPP and BMP development.
Deliverables	<ul style="list-style-type: none"> ▪ List / database of identified stakeholders – with progress report ▪ Updates to stakeholder list / database – with progress reports ▪ SARA and BRWM web site update ▪ SARA newsletter articles ▪ Clean Rivers Program Highlight Report article ▪ Meeting agendas, handouts, materials and attendee list

Tasks, Objectives and Schedules	
Task 7:	Report Preparation
Objective:	To develop, prepare and deliver a revised WPP. The revised WPP will summarize implemented and proposed BMPs with estimated load reductions in the Management Measures for Nonpoint and Runoff Sources section (and other applicable sections) and present a strategy for selecting and implementing specific types of measures to address priority source areas. The revision will add findings and analysis of the new monitoring data collected under this project to the Water Quality Data Review section, and elaborate on a continuing monitoring strategy to address Element I, the monitoring component of the plan. It will also address comments submitted by TCEQ regarding the nine key elements required for watershed plans. This task is primarily the responsibility of the consultant. SARA will assist with the report preparation.
Subtask 7.1:	Develop and submit a draft revised WPP
Subtask 7.2:	Develop and submit a final revised WPP
Deliverables	<ul style="list-style-type: none"> • Draft revised Upper San Antonio River WPP • Final revised Upper San Antonio River WPP

3a. Project Goals (Expand from NPS Summary Page)

The goal of this project is to revise/update the existing WPP for the Upper San Antonio River (approximately upper third of segment 1911 - Planning Area). The WPP will use a locally-driven stakeholder process which will provide stakeholders and agencies with information to address bacterial impairments in the Planning Area. The revised/updated WPP will focus on the control of bacteria from NPSs and determine appropriate control measures:

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- Develop a suite of BMPs that are recommended for implementation in the Planning Area
- Develop options for management measures and implementation strategies to accomplish needed load reductions on a site-specific basis (the identification of specific sites where BMPs may be located)
- Develop options for management measures and implementation strategies to accomplish needed load reductions on a watershed-specific basis
- Develop a monitoring program for water quality tracking that will focus on stormwater runoff sampling in order to provide baseline data
- Develop an information and communication program that informs the public, and facilitates coordination towards the development of the revised WPP

3a. Measures of Success (Expand from NPS Summary Page)

- Adherence to all TCEQ administrative requirements
- Development of an inventory of site-specific locations where BMPs could be deployed
- Development of a watershed-specific assessment wherein potential BMPs deployment is developed on a conceptual level
- Success will be measured by collection of water quality data that provides baseline bacterial concentrations under runoff conditions
- Success will be measured by stakeholder/public participation as indicated by the attendance rosters at public meetings

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**SARA Upper San Antonio River Watershed Protection Plan Project
Schedule of Deliverables**

Schedule of Deliverables Based on Anticipated Project Funding/Initiation Date

Task No.	Deliverable	Due Date
1.1	Project oversight status	With QPR's
1.2	Quarterly Progress Reports	The 15 th of the month following each state fiscal quarter
1.3	Quarterly Reimbursement Request Forms	The last day of the month following each state fiscal quarter, for the last reporting period of the project, reimbursement forms are required on a monthly basis
1.4	Post Award Meeting	Within 30 days of contract execution
1.4	Post Award Meeting Minutes	Within 30 days of Post Award Meeting
1.4	Quarterly conference call or meeting with the TCEQ Project Manager & Minutes	The second month of each state fiscal quarter
1.7	Project Annual Report Article	Upon TCEQ Request
2.1	Monitoring program for water quality	Within 20 months of Contract execution
2.2	QAPP Planning Meeting minutes	Within 3 months of Contract execution
2.4	Data Submittals	Within 22 months of contract execution
2.5	Data Report	Within 23 months of contract execution
3.1	Develop BMPs	Within 13 months of Contract execution
3.2	Inventory of Implemented BMPs	Within 5 months of Contract execution
3.3	Summary Report that Identifies BMPs recommended for implementation in the Planning Area	Within 17 months of Contract execution
4.1	Site Identification	Within 13 months of Contract execution
4.2	Site-Specific BMP Assessment Report	Within 17 months of Contract execution
5.1	Watershed Site Identification	Within 13 months of Contract execution
5.2	Watershed-Specific BMP Assessment Report	Within 17 months of Contract execution
6.1	Stakeholder Participation – Stakeholder participation will be engaged via monthly meetings or workshops of the BRWM Water Quality Focus Group	Within 22 months of Contract execution
6.2	Public Outreach – Updates will be provided for inclusion on the SARA and BRWM web site. Periodic newspaper articles may be published.	Within 24 months of Contract execution
6.3	Agency Coordination – Coordinate with the BRWM program and apprise the various BRWM management committees of the WPP development and solicit their input:	Within 18 months of Contract execution
6.4	Program Coordination – Coordinate with the ongoing outreach programs (i.e., San Antonio River Improvements Project - Oversight Committee, TMDL Stakeholders, SARA Environmental Advisory Committee/ CRP Steering Committee) to inform and educate the public and solicit their input on the WPP and BMP development.	Within 18 months of contract execution
7.1	Draft -WPP	Within 21 months of contract execution

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7.2	Final WPP	Within 23 months of contract execution
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SPECIAL TERMS AND CONDITIONS FOR 319(h) GRANT AGREEMENTS

The provisions of these Special Terms and Conditions add to, or in the case of conflicts, supersede and take precedence over the provisions of the General Terms and Conditions and other specified Contract Documents.

1. COST SHARING/ MATCHING FUNDS

- 1.1 The Grantee agrees to share the costs of the activities described in this Contract. Grantee shall pay at least Forty percent (40%) of all the Grant Activity Allowable Costs incurred. TCEQ payments to the Grantee shall not exceed Sixty percent (60%) of all the Grant Activity Allowable Costs incurred.
- 1.2 The U.S. Government has provided funds which are included in this Contract. Therefore, additional requirements apply to this Contract that is contained in the Contract Document titled, *Federal Conditions*. The Grantee must comply with all applicable Federal Conditions.
- 1.3 The Grantee's cost share or matching contribution must not be paid from other Federal funds under another award, except where authorized by Federal statute. Grantee's cost share or matching contribution must not be included as a cost share or match for any other federally-assisted project or program.
- 1.4 *Invoice Submittal:* Each request for reimbursement must demonstrate that the Grantee is contributing a minimum of Forty percent (40%) of the Grant Activity Allowable Costs for the period specified on the invoice. A request for reimbursement will not be approved unless the Forty percent (40%) contribution is demonstrated on the Financial Status Report accompanying the reimbursement request.

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GENERAL TERMS AND CONDITIONS FOR 319(h) GRANT AGREEMENTS

1. CONTRACT PERIOD

- 1.1 **Contract Period.** The Contract begins on the Effective Date and ends on the Expiration Date as provided on the Signature Page of this Contract (Contract Period). If no Effective Date is provided, the Effective Date of the Contract is the date of last signature. If no Expiration Date is provided, the Expiration Date is August 31 of the same Fiscal Year in which the Contract is signed.
- 1.2 **Extension Period.** This Contract may be extended by notice of the TCEQ for ninety (90) days beyond expiration of a Contract Period during which the Parties may agree on a written amendment to extend the Contract for a longer period. Extensions do not extend any other deadlines or due dates other than the expiration of the Contract Period.
- 1.2.1 This Contract is not subject to competitive procurement requirements and may be amended as needed.
- 1.3 The reporting requirements shall survive the expiration or termination of this Contract.

2. AUTHORIZATION

A Notice to Proceed is not required to begin the Grant Activities. The Grantee is authorized to begin work upon the effective date of the contract. Any performance of grant activities prior to the effective date of the contract is not reimbursable.

3. FUNDS

- 3.1 **Availability of Funds.** This Contract and all claims, suits or obligations arising under or related to this Contract are subject to the receipt and availability of funds appropriated by the Texas Legislature and the U.S. Government for the purposes of this Contract or the respective claim, suit or obligation, as applicable.
- 3.1.1 Grantee will ensure that Paragraph 3.1 is included in any subcontract it awards.
- 3.2 **Amount Limits on Funds.** The total amount of funds provided by TCEQ shall not exceed the amount of the Maximum TCEQ Obligation as shown on the Contract Signature Page unless the amount is amended by a written agreement of the Parties.
- 3.3 **Grants.** If this Contract was entered under the TCEQ authority to award grants, TCEQ is providing financial assistance to the recipient to undertake its own project.

4. ALLOWABLE COSTS

- 4.1 **Conforming Activities.** Subject to any requirements for cost sharing / matching funds which may be specified in the Special Conditions, TCEQ will reimburse the Grantee for Grant Activity Allowable Costs. Grant Activity Allowable Costs are reasonable and necessary costs that are actually incurred and paid by the Grantee in performance of conforming Grant Activities. Allowable Costs must be authorized by this Contract to be eligible for reimbursement.
- 4.2 Allowable Costs are restricted to costs that comply with the requirements of this Contract and the following:
- 4.2.1 For contracts with federal funds, those requirements contained in the federal Office of Management and Budget(OMB) Circular A-133, 2 Code of Federal Regulations (CFR) Parts 215, 220, 225, 230, and 1523; and 40 CFR Parts 30, 31, and 33 through 36 (including appendices, supplements, changes and updates in existence when the cost was incurred).
- 4.2.2 For contracts with state funds alone, the requirements contained in the Texas Uniform Grant Management Standards (UGMS). The text of UGMS is available online at the Governor's Website. (The link as of May 5, 2011 is <http://www.governor.state.tx.us/files/state-grants/UGMS062004.doc>.) The Parties agree that all the requirements of the UGMS apply to this Contract, including the criteria for Allowable Costs.

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5. REIMBURSEMENT

- 5.1 **Reimbursement Request Deadline.** Grantee shall submit all requests for payment to TCEQ prior to July 15 of the second fiscal year following the fiscal year for which the appropriation is made.
- 5.2 **Reimbursement Requests.** Grantee shall invoice TCEQ to request reimbursement for its Allowable Costs for performing the Grant Activities. Grantee's invoice shall conform to TCEQ's reimbursement requirements.
- 5.3 **Travel, Other Costs.** Travel costs must be specifically authorized in advance of the travel. Travel costs, including per diem, will be reimbursed only in the amount of actual costs, up to the maximum allowed by law for employees of the State of Texas at the time the cost is incurred.
- 5.4 **Supporting Records.** Grantee shall submit records and documentation to TCEQ as appropriate for the review and approval of reimbursing costs. At a minimum, Grantee shall submit supporting records with its invoices. TCEQ may reject invoices without appropriate supporting documentation. TCEQ has the right to request additional documentation. Grantee shall maintain records subject to the terms of this Contract.
- 5.5 **Conditional Payments.** Reimbursements are conditioned on the Grant Activities being performed in compliance with the Contract. Grantee shall return payment to TCEQ for either overpayment or activities undertaken that are not compliant with the Grant Activities. This does not limit or waive any other TCEQ remedy.
- 5.6 **Availability of Funds.** Availability of federal funds for payment is subject to federal grant requirements which may vary from grant to grant. Under Government Code 403, State funds are not available for payment requests which have not been fully approved by TCEQ prior to the end of the second fiscal year following the fiscal year for which they were appropriated. These restrictions are noted here for Grantee's information; TCEQ is under no obligation to offer deadline extensions which extend to the maximum availability of its funds.

6. FINANCIAL RECORDS, ACCESS AND AUDITS

- 6.1 **Audit of Funds.** The Grantee understands that acceptance of funds under this Contract acts as acceptance of the authority of the State Auditor's Office, or any successor agency, to conduct an audit or investigation in connection with those funds. Grantee further agrees to fully cooperate with the State Auditor's Office or its successor in the conduct of the audit or investigation, including providing all records requested. Grantee shall ensure that this clause concerning the authority to audit funds received indirectly by subcontractors through Contractor and the requirement to cooperate is included in any subcontract it awards.
- 6.2 **Financial Records.** Grantee shall establish and maintain financial records including records of costs of the Grant Activities in accordance with generally accepted accounting practices. Upon request Grantee shall submit records in support of reimbursement requests. Grantee shall allow access during business hours to its financial records by TCEQ and other state agencies for the purpose of inspection and audit. Records shall be maintained for a minimum of three years beyond the expiration or earlier termination of this Contract, and three years after the end of any litigation or claims process, including appeals.

7. INDIRECT COST RATE

- 7.1 The indirect cost rate may be
- 7.1.1. A rate that has been determined by a federal cognizant agency or by a state coordinating agency;
 - 7.1.2. A rate negotiated and agreed on by the Parties; or
 - 7.1.3. A default amount equal to 10 percent of personnel salaries and wages.
- 7.2. **Indirect Cost Rate determined by Federal and State agencies.** The Parties agree the requirements applicable to cost rates determined by federal and state agencies are:

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- 7.2.1. For contracts with federal funds, those requirements contained in the federal OMB Circular A-133, 2 CFR Parts 215, 220, 225, 230, and 1523; and 40 CFR Parts 30, 31, and 33 through 36 (including appendices, supplements, changes and updates in existence when the cost was incurred); and
- 7.2.2. For contracts with state funds alone, the requirements contained in the UGMS. The text of UGMS is available online at the Governor's Website. (The link as of May 5, 2011 is <http://www.governor.state.tx.us/files/state-grants/UGMS062004.doc>.)
- 7.2.3. Upon request of the TCEQ, Grantee shall provide documentation of a federal or state agency cost rate determination.
- 7.3. **Negotiated Predetermined Final Rate.** TCEQ and the Grantee may negotiate a predetermined final indirect cost rate for the term of the contract based on the cost experience and other pertinent facts that are sufficient to enable the Parties to reach an informed judgment (1) as to the probable level of indirect costs in the Grantee's programs during the term of the Contract, covered by the negotiated rate, and (2) the amount allowable under that predetermined rate would not exceed the indirect costs rate determined by a federal or state agency.
- 7.4. If the negotiated predetermined final rate is less than the federal or state agency determined rate, the Grantee may claim the difference in the resulting amount as a matching contribution.
- 7.5. Because TCEQ may have fully obligated or expended its appropriation, TCEQ shall be under no obligation to make adjustments to the actual amounts paid by TCEQ because of a difference between the negotiated predetermined final rate and the federal or state agency determined rate. The indirect cost rate shown in the Budget of this Contract is final and is not subject to change during for the Contract term, including renewals and extensions. The Parties agree they waive and will not seek additional indirect costs after the Contract has expired.

8. AMENDMENTS

Changes to the Contract are only effective when made by a formal written contract amendment, signed and agreed to with the authorized signatures of the Parties, except for minor changes as described in Article 9, Contract Interpretation.

9. CONTRACT INTERPRETATION

- 9.1 **Interpretation of Time.** All days are calendar days, unless stated otherwise. Days are counted to exclude the first and include the last day of a period. If the last day of the period is a Saturday or Sunday, or a state or federal holiday, it is omitted from the computation.
- 9.2 **State, Federal Law.** This Contract is governed by, and interpreted under the laws of the State of Texas, as well as applicable federal law.
- 9.3 **Severability.** If any provision of this Contract is found by any court, tribunal or administrative body of competent jurisdiction to be wholly or partly illegal, invalid, void or unenforceable, it shall be deemed severable (to the extent of such illegality, invalidity or unenforceability) and the remaining part of the provision and the rest of the provisions of this Contract shall continue in full force and effect. If possible, the severed provision shall be deemed to have been replaced by a valid provision having as near an effect to that intended by the severed provision as will be legal and enforceable.
- 9.4 **Definitions.** *Include* The word *include* and all forms such as *including* mean *including but not limited to* in the Contract Documents and other documents issued in accordance with the contract, such as Task Orders, Work Orders and Proposals for Grant Activities.
- 9.5 **Contract Manager authority for making interpretations and agreeing to minor changes:**
- 9.5.1 The TCEQ Contract Manager has the authority, without a formal amendment, to make written contract interpretations and agree in writing to minor, non-material changes to requirements in the following specific contract documents: the Grant Activities, and the Budget for Actual Cost Reimbursement (Budget) including:

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- Changes to the schedule in the Grant Activities including an extension of a deliverable due date;
 - Changes to the individual tasks in the Grant Activities that do not substantially change the obligations of the Parties relative to those tasks; and
 - Transfers between the authorized amounts of expenditures in the Budget categories which do not exceed 10% of the total Budget.
- 9.5.2. To be effective, the Contract changes agreed to by the TCEQ Contract Manager must be in writing and must also be agreed to by an authorized Representative of the Grantee. A copy of the agreed change must be retained in the appropriate file of both the Grantee and the TCEQ.
- 9.5.3. The TCEQ Contract Manager is prohibited from agreeing on behalf of TCEQ to changes to the substantive obligations of the Grantee or the TCEQ, including the following:
- Changes in the total amount of funds in the Budget or the Contract;
 - Contract amendments;
 - Changes to the Grant Activities that affect TCEQ obligations in this contract and in other agreements with the funding source such as the EPA, and obligations to another state or federal agency or the Texas Legislature; and
 - Changes that affect the material obligations of the Grantee in this Contract.
- 9.5.4. It is the responsibility of the Grantee to request extensions to the deliverable schedule and other changes that are within the authority of the TCEQ Contract Manager.

10. GRANTEE'S RESPONSIBILITIES

- 10.1 **Grantee's Responsibility for the Grant Activities.** Grantee undertakes performance of the Grant Activities as its own project and does not act in any capacity on behalf of the TCEQ nor as a TCEQ agent, employee or vendor of goods or services. Grantee agrees that the Grant Activities are furnished and performed at Grantee's sole risk as to the means, methods, design, processes, procedures and performance of the Grant Activities.
- 10.2 **Independent Contractor.** Nothing in this Contract shall create an employee-employer relationship between Grantee and TCEQ. Nothing in this Contract shall create a joint venture between TCEQ and the Grantee. The Parties agree that the Grantee is an independent contractor.
- 10.3 **Grantee's Responsibility for Subcontractors.** All acts and omissions of Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Grant Activities under a direct or indirect contract with Grantee shall be considered to be the acts and omissions of Grantee.
- 10.4 **No Third Party Beneficiary.** TCEQ does not assume any duty to exercise any of its rights and powers under the Contract for the benefit of third parties. Nothing in this Contract shall create a contractual relationship between TCEQ and any of Grantee's subcontractors, suppliers or other persons or organizations with a contractual relationship with the Grantee.
- 10.5 **Quality Assurance.** All work funded by the Contract that involves the acquisition of environmental data generated from direct measurement activities, collected from other sources, or compiled from computerized data bases and information systems shall be planned in consultation with the TCEQ and be documented in a fully-approved TCEQ QAPP before data collection can be implemented. No work covered by this requirement shall be implemented prior to receipt of written approval from the TCEQ. Because this Contract is funded by a grant from the EPA, additional approval may need to be obtained from the EPA Project Officer. Any cost for environmental data acquisition incurred prior to approval of a QAPP by the TCEQ and, as necessary, the EPA, will be ineligible for reimbursement. Failure to meet the terms of the QAPP may result in the suspension of associated activities and reimbursement of expenses related to the associated activities.
- 10.6 **Lab Accreditation.** The Grantee must obtain laboratory analysis and data from laboratories and subcontract laboratories that are National Environmental Laboratory Accreditation Conference (NELAC) accredited according to Texas Water Code Chapter 5, Subchapter R (TWC §

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5.801, et seq) as well as accredited by TCEQ according to Title 30 Texas Administrative Code Chapter 25, Subchapters A and B.

11. GRANTEE PERFORMANCE EVALUATION

Performance evaluations are a part of the TCEQ review of Grantee and may be a factor in the selection of future contracts. TCEQ may provide this information to state agencies and, upon request, to others. Grantee consents to the disclosure of any information or opinion contained in the evaluations.

12. CONFLICT OF INTEREST

The Grantee shall timely notify TCEQ in writing of any actual, apparent, or potential conflict of interest regarding the Grantee or any related entity or individual. No entity or individual with a significant actual, apparent, or potential conflict of interest shall take part in the performance of any portion of the Grant Activities, nor have access to information regarding any portion of the Grant Activities. Grantee agrees that TCEQ has sole discretion to determine whether a significant conflict exists, and that a conflict of interest is grounds for termination for cause.

13. INTELLECTUAL PROPERTY

13.1 Third Party Intellectual Property. Unless specifically waived, Grantee must obtain all Intellectual Property licenses expressly required in the Scope of Work, or incident to the use or possession of the intellectual property. Grantee shall obtain and furnish to TCEQ: documentation on the use of such Intellectual Property, and a perpetual, irrevocable, enterprise-wide license to reproduce, publish, otherwise use, or modify such Intellectual Property and associated user documentation, and to authorize others to reproduce, publish, otherwise use, or modify such Intellectual Property for TCEQ non-commercial purposes, and other purposes of the State of Texas.

13.2 Grant of License. Grantee grants to TCEQ a nonexclusive, perpetual, irrevocable, enterprise-wide license to reproduce, publish, modify or otherwise use for any non-commercial TCEQ purpose any preexisting intellectual property belonging to the Grantee that is incorporated into the Grant Activities, intellectual property created under this Contract, and associated user documentation.

14. TIME DELAYS

14.1 Time is of the Essence. Grantee's timely performance is a material term of this Contract.

14.2 Delays. Where Grantee's performance is delayed without an agreed change in the due date, except by Force Majeure or act of the TCEQ, TCEQ may withhold or suspend reimbursement, terminate the Contract, or enforce any of its other rights.

15. TERMINATION

15.1 Termination for Cause. TCEQ may, upon 30 days written notice and the opportunity to cure, terminate this Contract for cause if Grantee materially fails to comply with the Contract including any one or more of the following acts or omissions: nonconforming Grant Activities, existence of a conflict of interest, failure to provide evidence of required insurance coverage and failure to comply with Historically Underutilized Business (HUB) requirements in law or this Contract. Termination for cause does not prejudice TCEQ's other remedies authorized by this Contract or by law.

15.2 Termination for Convenience. TCEQ may, upon 30 days written notice, terminate this Contract for convenience. Termination shall not prejudice any other right or remedy of TCEQ or the Grantee. Grantee may request reimbursement for: conforming Grant Activities and timely, reasonable costs directly attributable to termination. Grantee shall not be paid for: work not performed, loss of anticipated profits or revenue, consequential damages or other economic loss arising out of or resulting from the termination.

15.3 If, after termination for cause by TCEQ, it is determined that the Grantee had not materially failed to comply with the Contract, the termination shall be deemed to have been for the convenience of the TCEQ.

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16. INSURANCE AND INDEMNIFICATION

16.1 **Insurance.** Unless prohibited by law, the Grantee shall require its contractors and suppliers to obtain and maintain during the Contract Period adequate insurance coverage sufficient to protect the Grantee and the TCEQ from all claims and liability for injury to persons and for damage to property arising from the Contract. Unless specifically waived by the TCEQ, sufficient coverage shall include Workers Compensation and Employer's Liability Insurance, Commercial Automobile Liability Insurance, and Commercial General Liability Insurance.

16.2 **Indemnification.** TO THE EXTENT AUTHORIZED BY LAW, THE GRANTEE SHALL REQUIRE ALL CONTRACTORS PERFORMING GRANT ACTIVITIES ON BEHALF OF GRANTEE TO INDEMNIFY, DEFEND, AND HOLD HARMLESS THE TCEQ AND GRANTEE AND THEIR OFFICERS, EMPLOYEES AND REPRESENTATIVES FROM AND AGAINST ALL LOSSES, LIABILITIES, DAMAGES, AND OTHER CLAIMS OF ANY TYPE ARISING FROM THE PERFORMANCE OF GRANT ACTIVITIES BY THE CONTRACTOR OR ITS CONTRACTORS, SUPPLIERS AND AGENTS, INCLUDING THOSE ARISING FROM A DEFECT IN DESIGN, WORKMANSHIP, MATERIALS, OR FROM INFRINGEMENT OF ANY PATENT, TRADEMARK OR COPYRIGHT; OR FROM A BREACH OF APPLICABLE LAWS, REGULATIONS, SAFETY STANDARDS OR DIRECTIVES. THE DEFENSE OF THE TCEQ SHALL BE SUBJECT TO THE AUTHORITY OF THE OFFICE OF THE ATTORNEY GENERAL OF TEXAS TO REPRESENT THE TCEQ. THIS COVENANT SURVIVES THE TERMINATION OF THE CONTRACT.

17. DISPUTES, CLAIMS AND REMEDIES

17.1 **Payment not a Release.** Neither payment by TCEQ nor any other act or omission other than an explicit written release constitutes a release of Grantee from liability under this Contract.

17.2 **Schedule of Remedies available to the TCEQ.** In accordance with Texas Government Code Chapter 2261 the following Schedule of Remedies applies to this contract. In the event of Grantee's nonconformance, TCEQ may do any combination of the following:

- 17.2.1 Issue notice of nonconforming performance;
- 17.2.2 Reject nonconforming performance and request corrections without charge to the TCEQ;
- 17.2.3 Reject a reimbursement request or suspend further payments, or both, pending accepted revision of the nonconformity;
- 17.2.4 Suspend all or part of the Grant Activities or payments, or both, pending accepted revision of the nonconformity;
- 17.2.5 Demand restitution and recover previous payments where performance is subsequently determined nonconforming;
- 17.2.6 Terminate the contract without further obligation for pending or further payment by the TCEQ and receive restitution of previous payments.

17.3 **Opportunity to Cure.** The Grantee will have a reasonable opportunity to cure its nonconforming performance, if possible under the circumstances.

17.4 **Cumulative Remedies.** Rights and remedies in this Contract are in addition to, and are not in any way a limitation of, any rights and remedies available under state and federal rules, regulations, and laws and at common law.

18. SOVEREIGN IMMUNITY

The Parties agree that this Contract does not waive sovereign immunity relating to suit, liability, or payment of damages.

19. MISCELLANEOUS

19.1 **Assignment.** No delegation of the obligations, rights, or interests in the Contract, and no assignment of payments by Grantee will be binding on TCEQ without its written consent, except as restricted by law. No assignment will release or discharge the Grantee from any duty or responsibility under the Contract.

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- 19.2 **Venue.** Grantee agrees that the Contract is being performed in Bexar County, Texas, because this Contract has been performed or administered, or both, in Bexar County, Texas. The Grantee agrees that any cause of action involving this Contract arises solely in Bexar County, Texas.
- 19.3 **Publication.** Grantee agrees to notify TCEQ five days prior to the publication or advertisement of information related this Contract. Grantee agrees not to use the TCEQ logo or a TCEQ graphic as an advertisement or endorsement without written permission signed by the appropriate TCEQ authority.
- 19.4 **Waiver.** With the exception of an express, written document signed with authority by TCEQ, no act or omission will constitute a waiver or release of Grantee's obligation to perform conforming Grant Activities. No waiver on one occasion, whether expressed or implied, shall be construed as a waiver on any other occasion.
- 19.5 **Legal Requirements.** TCEQ relies on Grantee to perform all Grant Activities in conformity with all applicable laws, regulations, and rules and obtain all necessary permits and licenses.
- 19.6 **Survival of Obligations.** Except where a different period is specified in this Contract or applicable law, all representations, indemnifications, and warranties made in, required by or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, survive for four years beyond the termination or completion of the Contract, or after the end of a proceeding which was brought under the Contract, or if TCEQ has notified Grantee of an on-going proceeding. A proceeding includes any litigation, legal proceeding, permit application, State Office of Administrative Hearings proceeding, or similar activity listed in a TCEQ notice to the Grantee.
- 19.7 **Headings.** The headings of the sections contained in this Contract are for convenience only and do not control or affect the meaning or construction of any provision of this Contract.
- 19.8 **Release of Claims.** As a condition to final payment or settlement, or both, the Grantee shall execute and deliver to the TCEQ a release of all claims against the TCEQ for payment under this Contract.
- 19.9 **Counterparts.** This Contract may be signed in any number of copies. Each copy when signed is deemed an original and each copy constitutes one and the same Contract.

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PROJECT REPRESENTATIVES AND RECORDS LOCATION

20.1 **TCEQ Project Representative (Project Manager).** The individual named below is the TCEQ Project Representative who is authorized to give and receive communications and directions on behalf of TCEQ, and to authorize changes to the schedule in the Grant Activities including an extension of a deliverable due date, not to exceed the expiration date of the agreement.

Bill Carter Telephone No.: (512) 239-6771
Project Manager 203 Facsimile No.: (512) 239-1414
(Title) (Mail Code) E-Mail: bill.carter@tceq.texas.gov
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

20.2 **TCEQ Contract Manager.** The individual named below is the TCEQ Contract Manager who is authorized to give and receive communications regarding the terms of the Contract, invoices, and reimbursements. In addition, the Contract Manager is authorized to approve changes to the individual tasks in the Grant Activities that do not substantially change the obligations of the Parties relative to those tasks, and transfers between the authorized amounts of expenditures in the Budget Categories.

Mary Beth Leihardt Telephone No.: (512) 239-5637
Contract Specialist 141 Facsimile No.: (512) 239-6672
(Title) (Mail Code) E-Mail: mary.leihardt@tceq.texas.gov
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

20.3 **Grantee Project Representative.** The individual named below is the Grantee Project Representative, who is authorized to give and receive communications and directions on behalf of the Grantee. All communications to the Grantee will be addressed to the Grantee Project Representative or his or her designee.

For Technical Matters:

Patricia Carvajal Telephone No.: (210) 302-3672
(Name) Facsimile No.: (210) 858-0265
Project Manager E-mail: pmcarvajal@sara-tx.org
(Title)
600 E. Euclid
(Mailing Address) San Antonio Texas 78283
(City) (State) (Zip Code)

For Contractual Matters:

Patricia Carvajal Telephone No.: (210) 302-3672
(Name) Facsimile No.: (210) 858-0265
Project Manager E-mail: pmcarvajal@sara-tx.org
(Title)
600 E. Euclid
(Mailing Address) San Antonio Texas 78283
(City) (State) (Zip Code)

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- 20.3 **Submittal of Payment Requests.** Payment requests must be submitted to the TCEQ Contract Manager.
- 20.4 **Designated Location for Records Access and Review.** The Grantee designates the physical location indicated below for record access and review pursuant to any applicable provision of this contract:

Patricia Carvajal _____
(Name)
Project Manager _____
(Title)
600 E. Euclid _____
(Mailing Address)
San Antonio Texas 78283
(City) (State) (Zip Code)

Telephone No.: (210) 302-3672
Facsimile No.: (210) 858-0265
E-mail: pmcarvajal@sara-tx.org

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CONTRACT BUDGET FOR ACTUAL COST REIMBURSEMENT

21. CONTRACT BUDGET

21.1 **Budget.** Authorized budgeted actual expenditures for Work Performed are as follows:

Budget Item	TCEQ Reimbursement Amount	Grantee Match	Total Cost for Grant Activities
Personnel / Salary	\$24,433.00	\$16,289.00	\$40,722.00
Fringe Benefits	\$8,552.00	\$5,701.00	\$14,253.00
Travel	\$180.00	\$120.00	\$300.00
Supplies	\$600.00	\$400.00	\$1,000.00
Equipment	\$0.00	\$0.00	\$0.00
Contractual	\$55,080.00	\$36,720.00	\$91,800.00
Construction	\$0.00	\$0.00	\$0.00
Other	\$0.00	\$0.00	\$0.00
Total Direct Costs	\$88,845.00	\$59,230.00	\$148,075.00
Indirect Costs	\$3,665.00	\$2,443.00	\$6,108.00
Total Grantee Costs	\$92,510.00	\$61,673.00	\$154,183.00
Other in Kind/Third Party	\$0.00	\$0.00	\$0.00
TOTAL	\$92,510.00	\$61,673.00	\$154,183.00

The Fringe Benefits rate will be no more than 35% of the Personnel costs.

21.2 **Indirect Cost Rate.**

21.2.1. The indirect cost rate may be a rate that has been determined by a federal cognizant agency or by a state coordinating agency or may be a rate negotiated and agreed on by the Parties.

21.2.2. Federal and State Agency Rate. The requirements applicable to federal agency rates and state agency rates under this contract, by agreement of the Parties, are: 1) for contracts with federal funds, those contained in the federal OMB Circular A-133, 2 CFR Parts 215, 220, 225, 230, and 1523; and 40 CFR Parts 30, 31, and 33 through 36 (including appendices, supplements, changes and updates in existence when the cost was incurred) and 2) for contracts with only state funds, the Texas UGMS. Grantee shall provide TCEQ with documentation of the federal or state agency determination.

21.2.3. Negotiated Predetermined Final Rate. TCEQ and the Grantee may negotiate a predetermined final indirect cost rate for the term of the contract based on the cost experience and other pertinent facts that are sufficient to enable the Parties to reach an informed judgment (1) as to the probable level of indirect costs in the Grantee's programs during the term of the Contract, covered by the negotiated rate, and (2) the amount allowable under that predetermined rate would not exceed the indirect costs as determined under the federal or state agency rate. The negotiated predetermined indirect cost rate for the term of this contract, including renewals and extensions is final and is not subject to change in the rate or the amount except as agreed by the Parties in written contract amendment. If the negotiated predetermined final rate is less than the federal or state agency determined rate, the Grantee may claim the difference in the resulting amount as a matching contribution.

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22.2.4. The indirect rate of the Grantee for this contract is 15% of Personnel Costs.

- 21.3 **Budget Control and Transfers.** Cumulative transfers among the budgeted direct cost categories must not exceed ten percent (10%) of the current Total Budgeted amount.
- 21.4 **Submittal of Payment Requests.** The Grantee shall submit the reimbursement request documents within thirty (30) days after the close of each quarter. The reporting periods shall correspond to the State of Texas fiscal year (September- November, December-February, March-May, and June-August).
 - 21.4.1. For the last reporting period of the Contract (June, July, and August), reimbursement requests are required on a monthly basis. The Grantee shall submit the monthly reimbursement request documents within fifteen (15) days after the close of each month.
- 21.5 In order to be reimbursable, costs must be allowable under the conditions stated in this Contract and be authorized by the Budget.

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Texas Commission on Environmental Quality Attachment A
FINANCIAL STATUS REPORT

1. STATE AGENCY TO WHICH REPORT IS SUBMITTED:		Texas Commission on Environmental Quality			
2. GRANT/AGREEMENT TITLE:					
3. PAYEE IDENTIFICATION NUMBER:			4. RECIPIENT ORGANIZATION (NAME AND COMPLETE ADDRESS, INCLUDING ZIP CODE):		
5. TCEQ AGREEMENT NUMBER: 582-10-					
6. FINAL REPORT: G YES G NO					
7. ACCOUNTING BASIS: G CASH G ACCRUAL					
8. TOTAL PROJECT/GRANT PERIOD:			9. PERIOD COVERED BY THIS REPORT:		
FROM TO			FROM TO		
10. BUDGET CATEGORIES:		Approved Budget	Project Cost This Report	Cumulative Project Cost	Balance **
a. Personnel/Salary					
b. Fringe Benefits (%)					
c. Travel					
d. Supplies					
e. Equipment					
f. Contractual					
g. Construction					
h. Other					
i. Total Direct Costs (Sum a -- h)					
j. Indirect Costs (% x \$ Base)					
k. Total Grantee Costs (Sum of i & j)					
l. Other - In-kind or third party contributions ***					
m. Total Project Costs (Sum of k & l)					
n. Recipient Cost Share (40%)					
o. Total Reimbursable Costs (m minus n)					
<p>* List (Itemize) on the appropriate supplemental form all component expenses comprising the total for each of these categories. Please attach receipts, as required, in accordance with the Cost and Payment terms of the Agreement.</p> <p>** Negative balances in any of the budget categories should be explained in a brief accompanying narrative.</p> <p>*** The value of third party in-kind contributions (e.g. volunteer hours) must be pre-approved and cannot exceed the recipient's cost share.</p>					
<p>11. CERTIFICATION I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays and unliquidated obligations are for the purposes set forth in the award document.</p> <p>Signature of Authorized Certifying Official _____</p> <p>Typed or Printed Name and Title _____</p> <p>Telephone (Area code, number and ext.) _____ Date Submitted _____</p>					

TCEQ Form 20248 (rev. 7/7/06)

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TCEQ Contract Number: 582-12-10083

Attachment A (contd.)

ITEMIZATION OF PERSONNEL/SALARY AND TRAVEL COSTS

PERSONNEL/SALARY EXPENDITURES (during this report period)

EMPLOYEE NAME	TITLE/POSITION	SALARY (THIS PERIOD)	TASKS
A. PERSONNEL/SALARY			
All Employees listed on current PEL? <input type="checkbox"/> Yes <input type="checkbox"/> No			
B. FRINGE Rate = ____% Total for the reporting period = (Do not include fringe in total at right)			
TOTAL PERSONNEL/SALARY EXPENDITURES (must agree with line 10a on Form 20248)			

TRAVEL EXPENDITURES (during this report period)

EMPLOYEE(S)	DATE(S) OF TRAVEL	DESTINATION & PURPOSE OF TRAVEL	MEALS	LODGING	TRANSPORTATION (Miles X Rate)	TASKS
TOTAL TRAVEL EXPENDITURES (must agree with line 10c on Form 20248)						\$

* SUPPLEMENTAL DOCUMENTATION (time sheets, travel receipts, etc.) IS NOT REQUIRED TO BE ATTACHED TO THIS FORM; however each traveler=s costs must be itemized to show costs for meals, lodging and transportation (itemization may be attached).

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TCEQ Contract Number: 582-12-10083

ITEMIZATION OF SUPPLY AND OTHER COSTS

Attachment A (contd.)

SUPPLIES PURCHASED (during this report period)

NUMBER PURCHASED	ITEM DESCRIPTION (Should match description provided for approval)	UNIT COST	TOTAL COST	TASKS
TOTAL SUPPLIES PURCHASED (must agree with line 10h on Form 20248)				

OTHER EXPENDITURES (during this report period)

NUMBER PURCHASED	DESCRIPTION	UNIT COST	TOTAL COST	TASKS
TOTAL OTHER EXPENDITURES (must agree with line 10h on Form 20248)				

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TCEQ Contract Number: 582-12-10083

ITEMIZATION OF EQUIPMENT & CONTRACTUAL EXPENDITURES Attachment A(contd.)

EQUIPMENT PURCHASES (during this report period)

NUMBER PURCHASED	ITEM DESCRIPTION (Should match description provided for approval)	UNIT COST	TOTAL COST	TASKS
TOTAL EQUIPMENT EXPENDITURES (must agree with line 10e on Form 20248)				

CONTRACTUAL EXPENDITURES (during this report period)

SUBCONTRACTOR (NAME)	FOR	COST (THIS PERIOD)	TASKS
TOTAL CONTRACTUAL EXPENDITURES (must agree with line 10f on Form 20248)			

* LEGIBLE RECEIPTS MUST BE ATTACHED TO THIS FORM FOR EACH LISTED ITEM OR EXPENDITURE.

TCEQ Supplemental Form 20248-3

ITEMIZATION OF CONSTRUCTION COSTS and COST SHARE Attachment A (contd.)
 CONSTRUCTION COSTS (during this report period)

DESCRIPTION	PURPOSE	COST (THIS PERIOD)	TASKS
TOTAL CONSTRUCTION EXPENDITURES (must agree with line 10g on Form 20248)		\$	

* LEGIBLE RECEIPTS MUST BE ATTACHED FOR ALL LISTED EXPENDITURES

OTHER IN-KIND or THIRD PARTY CONTRIBUTIONS (costs during this report period)

DESCRIPTION	PURPOSE	COST (THIS PERIOD)	TASKS
TOTAL IN-KIND CONTRIBUTIONS (must agree with line 10f on Form 20248)		\$	

* DOCUMENTATION MUST BE ATTACHED FOR IN-KIND CONTRIBUTIONS - In-kind Contributions in excess of Required Cost Share CANNOT be reimbursed.

COST SHARE (Matching costs during this report period)

DESCRIPTION	CALCULATION OF MATCH REQUIRED	MATCH (THIS PERIOD)	TASKS
	\$__ x 40%		All
TOTAL COSTS SHARED by Recipient (must agree with line 10n on Form 20248)		\$	

TCEQ Supplemental Form 20248-4

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TCEQ Contract Number: 582-12-10083

GRANTEE PERFORMANCE EVALUATION REPORT

Attachment B

Final Report (Check only if the Agreement has ended and this is the last Performance Report)

Today's Date: _____

Report No. _____ of _____

Evaluation Period: From _____ to _____

Grantee: _____

Contract No./ Purchase Order No. _____

Project Name (if applicable) _____

Phase (if applicable) _____

Date of Last Report: _____

Date of Program's Last Site Visit: _____
(if applicable)

Brief Description of Work / Services (optional): _____

Performance Category	Ratings				Comments
	Exceeds Expectations Score=3	Satisfactory Performance Score=2	Marginal Performance Score=1	Unsatisfactory Performance Score=0	
Quality & Accuracy					Please provide a narrative description for ratings of one or below (attachments are acceptable.)
Timeliness					
Reports					
HUB (for Quarterly Reporting, complete this portion only and return)					
Communication					
Cost Control					
Technology					
Other (describe)					
XXX					

Evaluator's Name _____
(Printed or Typed)

Signature _____

Division _____

Section: _____

XXX Requires an attachment describing category and rating description which corresponds.

Note: Please see reverse side for specific definitions for each performance category and an explanation for each score.

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TCEQ Contract Number: 582-12-10083

Attachment B (contd.)

GRANTEE'S PERFORMANCE EVALUATION REPORT - Category Descriptions

PERFORMANCE CATEGORY	EXCEEDS EXPECTATIONS (Score = 3)	SATISFACTORY PERFORMANCE (Score = 2)	MARGINAL PERFORMANCE (Score = 1)	UNSATISFACTORY PERFORMANCE (Score = 0)
1. Quality and Accuracy Quality, sufficiency, and accuracy of contract-required work, including work or tasks performed by subcontractors	Work product always, with rare exceptions, of excellent quality. Revisions rarely or never required.	Work product of satisfactory quality with only typical errors and omissions, which were corrected upon request.	Work product is acceptable, although many errors and/or omissions had to be corrected prior to product being acceptable.	Work product not acceptable or of very low quality, with many errors and omissions noted. Not all errors and omissions corrected.
2. Timeliness Timeliness with respect to completing contract-required work and/or work-related tasks, including work performed by subcontractors	All tasks and contract deliverables on time or ahead of schedule. Quality of work did not suffer as a result of the time line.	Some intermediate task delays, not expected to cause major deadlines to be missed or to require contract extension. Prior approval granted for any other delays.	Some major work performance delays caused (or expected to cause) delivery schedules to be missed.	Required work product not completed on time, due to factors that should have been under contractor's control.
3. Reports Accuracy, adequacy, and timeliness of contract-required activity/progress reports, notifications, financial reports, invoices, pay requests and other required documents, excluding HUB reports	All reports accurate and complete, as well as on time. No rewrites or additional information required.	Reports satisfactory with respect to both quality and timeliness. Contractor responded quickly and appropriately to questions or comments raised.	Numerous errors and/or omissions corrected prior to reports being acceptable (or reminders of reports due were required to be sent). Reports not later than 5 working days.	Reports consistently of poor quality and/or late. Contents inadequate to permit interpretation or analysis. Reports more than 5 working days late.
FOR HUB PROGRAM USE ONLY: 4. HUB and/or DBE/MBE/WBE* Contractor's achievement of (or continued responsiveness toward) contract-contained HUB Subcontracting Plan (HSP) and/or Good Faith Effort (GFE) requirements, including timely and accurate submittal of contract-required HUB related reports. *When the term HUB is used, include evaluation of Contractor's performance of DBE/MBE/WBE requirements.	Contractor consistently meets or exceeds the HSP and/or GFE requirements. All reports accurate and complete, as well as on time. No rewrites or additional information required.	Contractor satisfactorily meets the HSP and/or GFE requirements. Reports satisfactory with respect to both quality and timeliness. Contractor responded quickly and appropriately to questions or comments raised.	Contractor marginally meets the HSP and/or GFE requirements. Numerous errors and/or omissions corrected prior to reports being acceptable (or reminders of reports due were required to be sent). Reports frequently late.	Contractor did not adequately meet the HSP and/or GFE requirements. Reports consistently of poor quality and/or late. Contents inadequate to permit interpretation or analysis. Reports habitually late.

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Attachment B (contd.)

<p>5. Communication Contractor's accessibility, responsiveness, and cooperativeness with respect to any contract-related concerns communicated by the Contract Manager; plus contractor's demonstrated relationship with subcontractors.</p>	<p>Contractor consistently maintains excellent standing with subcontractors, including timely payments. Works as a team member and is flexible and responsive to changes in circumstances or scope of work.</p>	<p>Contractor is usually flexible and responsive to changes in circumstances or scope of work. Generally maintains good standing with subs, and ensures that they are paid promptly.</p>	<p>Contractor is only intermittently responsive to changes in contract scope or other circumstances. Marginal team player. Failed to make timely payments to subs on one or two occasions.</p>	<p>Not flexible to changes in scope or other circumstances. Not cooperative or accessible. Failed to maintain good standing with subs and failed to make payments on more than two occasions.</p>
<p>6. Cost Control* Contractor's ability to observe current cost levels; compare them with Contract or Work Order budget, as applicable; and institute corrective action to keep cost within budget. *Do not include consideration of Contract or Work Order budget amount changes requested or caused by TCEQ.</p>	<p>Contractor took strong initiative to observe current cost levels; compare them with Contract or Work Order budget, as applicable; and institute corrective action to keep cost within budget.</p>	<p>Contractor observed current cost levels; compared them with Contract or Work Order budget, as applicable; and instituted corrective action to keep cost within budget.</p>	<p>Contractor sometimes failed to observe current cost levels; compare them with Contract or Work Order budget, as applicable; and institute corrective action to keep cost within budget.</p>	<p>Contractor failed to observe current cost levels; compare them with Contract or Work Order budget, as applicable; and institute corrective action to keep cost within budget.</p>
<p>7. Technology Contractor's demonstrated technical competence and/or expertise (including competence and expertise of subcontractors); plus contractor's innovativeness and willingness to apply, within the limitations of the contract, new techniques or technologies</p>	<p>Contractor is comfortable with and applies current proven technology. But is familiar with, and willing to use, latest techniques and solutions where such are appropriate.</p>	<p>Contractor is capable of applying current proven technology. Is aware of, but not experienced in the use of latest techniques and solutions.</p>	<p>Contractor usually uses more basic technology to solve contract problems. Is aware of, but has little or no experience in the use of more current proven techniques and solutions.</p>	<p>Contractor can only apply basic technology to tasks. Requires direction concerning appropriate technology and solutions.</p>
<p>8. Other DESCRIBE</p>	<p>DESCRIBE</p>	<p>DESCRIBE</p>	<p>DESCRIBE</p>	<p>DESCRIBE</p>

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TCEQ Contract Number: 582-12-10083

Attachment C

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Release of Claims

_____ hereby releases the Texas Commission on Environmental Quality (TCEQ), its officers, agents, and employees from any and all future claims arising under or by virtue of TCEQ Contract Number _____.

Further certifies that all subcontractors, suppliers, employees and any party which has performed or provided service for this contract has been paid in full and satisfied.

All services and tasks required to be completed under the referenced contract have been completed.

Prompt payment, therefore, of any and all funds which may have been "retained" by TCEQ in accordance with said contract is requested.

Executed on this _____ day of _____, 20__.

By: _____
(signature)

(name, typed or printed)

(title)

APPENDIX C: DATA REVIEW CHECKLIST AND SUMMARY

NPS DATA REVIEW CHECKLIST AND SUMMARY

A completed checklist must accompany all data sets submitted to the TCEQ by the San Antonio River Authority.

QAPP Title: _____

Effective Date of QAPP: _____

Data Format and Structure	Y, N, or N/A
A. Are there any duplicate <i>Tag Id</i> numbers in the Events file?	
B. Do the <i>Tag</i> prefixes correctly represent the entity providing the data?	
C. Have any <i>Tag Id</i> numbers been used in previous data submissions?	
D. Are TCEQ station location (SLOC) numbers assigned?	
E. Are sampling <i>Dates</i> in the correct format, MM/DD/YYYY with leading zeros?	
F. Are the sampling <i>Times</i> based on the 24 hour clock (e.g. 13:04) with leading zeros?	
G. Is the <i>Comment</i> field filled in where appropriate (e.g. unusual occurrence, sampling problems, unrepresentative of ambient water quality)?	
H. <i>Submitting Entity, Collecting Entity, and Monitoring Type</i> codes used correctly?	
I. Are the sampling dates in the <i>Results</i> file the same as the one in the <i>Events</i> file for each <i>Tag Id</i> ?	
J. Are values represented by a valid parameter code with the correct units?	
K. Are there any duplicate parameter codes for the same <i>Tag Id</i> ?	
L. Are there any invalid symbols in the <i>Greater Than/Less Than (GT/LT)</i> field?	
M. Are there any <i>Tag Ids</i> in the <i>Results</i> file that are not in the <i>Events</i> file or vice versa?	
Data Quality Review	Y, N, or N/A
A. Are all the “less-than” values reported at the LOQ? If no, explain on next page.	
B. Have the outliers been verified and a "1" placed in the <i>Verify_flg</i> field?	
C. Have checks on correctness of analysis or data reasonableness been performed? e.g.: Is ortho-phosphorus less than total phosphorus? Are dissolved metal concentrations less than or equal to total metals?	
D. Have at least 10% of the data in the data set been reviewed against the field and laboratory data sheets?	
E. Are all parameter codes in the data set listed in the QAPP?	
F. Are all stations in the data set listed in the QAPP?	
Documentation Review	Y, N, or N/A
A. Are blank results acceptable as specified in the QAPP?	
B. Were control charts used to determine the acceptability of field duplicates?	
C. Was documentation of any unusual occurrences that may affect water quality included in the <i>Event</i> table’s <i>Comments</i> field?	
D. Were there any failures in sampling methods and/or deviations from sample design requirements that resulted in unreportable data? If yes, explain on next page.	
E. Were there any failures in field and/or laboratory measurement systems that were not resolvable and resulted in unreportable data? If yes, explain on next page.	
F. Was the laboratory’s NELAP Accreditation current for analysis conducted?	

Data Set Information

Data Source:

Date Submitted:

Tag_ID Range:

Date Range:

Comments:

Please explain in the space below any data discrepancies discovered during data review including:

- Inconsistencies with AWRL specifications or LOQs
- Failures in sampling methods and/or laboratory procedures that resulted in data that could not be reported to the TCEQ
- Include completed Corrective Action Reports with the applicable Progress Report

- I certify that all data in this data set meets the requirements specified in Texas Water Code Chapter 5, Subchapter R (TWC §5.801 et seq) and Title 30 Texas Administrative Code Chapter 25, Subchapters A & B.
- This data set has been reviewed using the Data Review Checklist.

San Antonio River Authority Data Manager:

Date:

APPENDIX D: FIELD DATA REPORTING FORM

(or current revision)

SAN ANTONIO RIVER AUTHORITY
Stream Monitoring Field Data Sheet

Check for Review by Field Staff
(Initial/Date)

Sample No.(s): _____ Tag Id: _____ Matrix: NPW QC Sediment

Station Id: _____ - _____ Station Location: _____

Program Code: CRP SARA_SM TXDOT_Storm PC SAR_Loop NPS_Project Storm

Special Request (Specify Requestor in Comments) (Please Specify) _____

Sample Type: RT BS BF AS BE Pollution Complaint SR SS (Specify in Comments) _____

Collection Method: Grab Sampling Effort: Intensive Adaptive Instrument #: _____

Collection Date: _____ Collection Time: _____ End Depth: _____

Collector(s) Signature(s): _____

# of Containers/Container Type	Type of Field Preservation	Requested Analysis	pH <2 (Y or N) ²
____ GC - Gallon Cubitainer	<input type="checkbox"/> Ice <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> HNO ₃ <input type="checkbox"/> Filtered		
____ QC - Quart Cubitainer	<input type="checkbox"/> Ice <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> HNO ₃ <input type="checkbox"/> Filtered		
____ AB - Amber Glass Bottle	<input type="checkbox"/> Ice <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> HNO ₃ <input type="checkbox"/> Filtered		
____ CB - Clear Glass Bottle	<input type="checkbox"/> Ice <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> HNO ₃ <input type="checkbox"/> Filtered		
____ LW - Large Whirlpak	<input type="checkbox"/> Ice <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> HNO ₃ <input type="checkbox"/> Filtered		
____ PB - Plastic Bottle	<input type="checkbox"/> Ice <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> HNO ₃ <input type="checkbox"/> Filtered		
____ Other (Specify)	<input type="checkbox"/> Ice <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> HNO ₃ <input type="checkbox"/> Filtered		
____ Other (Specify)	<input type="checkbox"/> Ice <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> HNO ₃ <input type="checkbox"/> Filtered		

¹Observed/corrected temperature (ID: C01-15) ²pH Paper R006-63-6 Field Parameters Flow Sample Temperature (°C)¹: ____ / ____

Associated Required Data: Nekton Benthic Habitat 24Hr DO Metals Other (Specify in Comments)

FIELD PARAMETERS Meter: 600 XLM 6920V2-2M

Parameter	Code	Value
Dissolved Oxygen	00300	mg/L
Temperature	00010	°C
pH	00400	S.U.
CL ₂	50060	mg/L
*Conductivity (temperature compensated value to 25 °C)	00094	µS/cm
Secchi Depth	00078	m
Days Since Last Precipitation Event	72053	days

FIELD OBSERVATIONS

Parameter	Code	mmHg (first sample location of day):
Flow Severity	01351	<input type="checkbox"/> 1 - No Flow <input type="checkbox"/> 3 - Normal <input type="checkbox"/> 5 - High <input type="checkbox"/> 2 - Low <input type="checkbox"/> 4 - Flood <input type="checkbox"/> 6 - Dry
Water Color	89969	<input type="checkbox"/> 1 - Brown <input type="checkbox"/> 3 - Green <input type="checkbox"/> 5 - Clear <input type="checkbox"/> 2 - Reddish <input type="checkbox"/> 4 - Black <input type="checkbox"/> 6 - Other (Specify in Comments)
Water Odor	89971	<input type="checkbox"/> 1 - Sewage <input type="checkbox"/> 3 - H ₂ S <input type="checkbox"/> 5 - Fishy <input type="checkbox"/> 7 - Other (Specify in Comments) <input type="checkbox"/> 2 - Oily / Chemical <input type="checkbox"/> 4 - Musky <input type="checkbox"/> 6 - None
Present Weather	89966	<input type="checkbox"/> 1 - Clear <input type="checkbox"/> 3 - Cloudy <input type="checkbox"/> 2 - Partly Cloudy <input type="checkbox"/> 4 - Rain
Field Comments:		

CHAIN OF CUSTODY

Relinquished By: _____ Date: _____ Time: _____

Received By: _____ Date: _____ Time: _____

Relinquished By: _____ Date: _____ Time: _____

Received By: _____ Date: _____ Time: _____

Sample Comments:

Fill for Pollution Complaints Only

PC Id (PCAA####): _____

Latitude & Longitude in Decimal Degrees

Event: Major Minor Follow-up

Latitude: _____

Datum: WGS84 NAD83 Other: _____

Longitude: _____

GPS Unit Map Other: _____

For Special Sample Collections that are not a TCEQ Station

Latitude & Longitude in Decimal Degrees

Latitude: _____

Longitude: _____

GPS Unit Map Other: _____

Datum: WGS84 NAD83 Other: _____

GPS signal obtained at sample location: Yes No

GPS signal comment: _____

Stream Discharge Measurement

Measurement Method [89835]: 1 - Gage 2 - Elec 3 - Mech
 4 - Weir/Flume 5 - Doppler

Total Discharge (ΣQ) cfs [00061]:

Estimated Flow [74069]:

LABELS

\$Field, \$Flow

Additional Label if applicable

APPENDIX E: CHAIN-OF-CUSTODY FORM

(or current revision)

Print Form



Regional Environmental Laboratory
CHAIN OF CUSTODY



600 E. Euclid
 San Antonio, TX 78212
 Phone: (210) 302-3649
 FAX (210) 302-3694

Report To: _____ Phone #: _____ Collector's Name: _____
 Address: _____ Fax #: _____ Field Comments: _____
 City, State, ZIP: _____ E-mail: _____

Rush Analysis (Additional Fees Apply) 0-3 days 4-6 days

1.	2.	3.	4.	5.	6.
Sample # Lab Use Only	Client Sample Location	Collection Method	Sample Type	Matrix	Composite Start Date/Time
				Collection Date/Time	Container Type
					Type of Preservation
					Requested Analyses
					Therm: ID: C01-15 Receipt Temp: (°C) Observed/Corrected
					pH <2 Y or N pH Paper: R006-63-6
					Lab Use ONLY

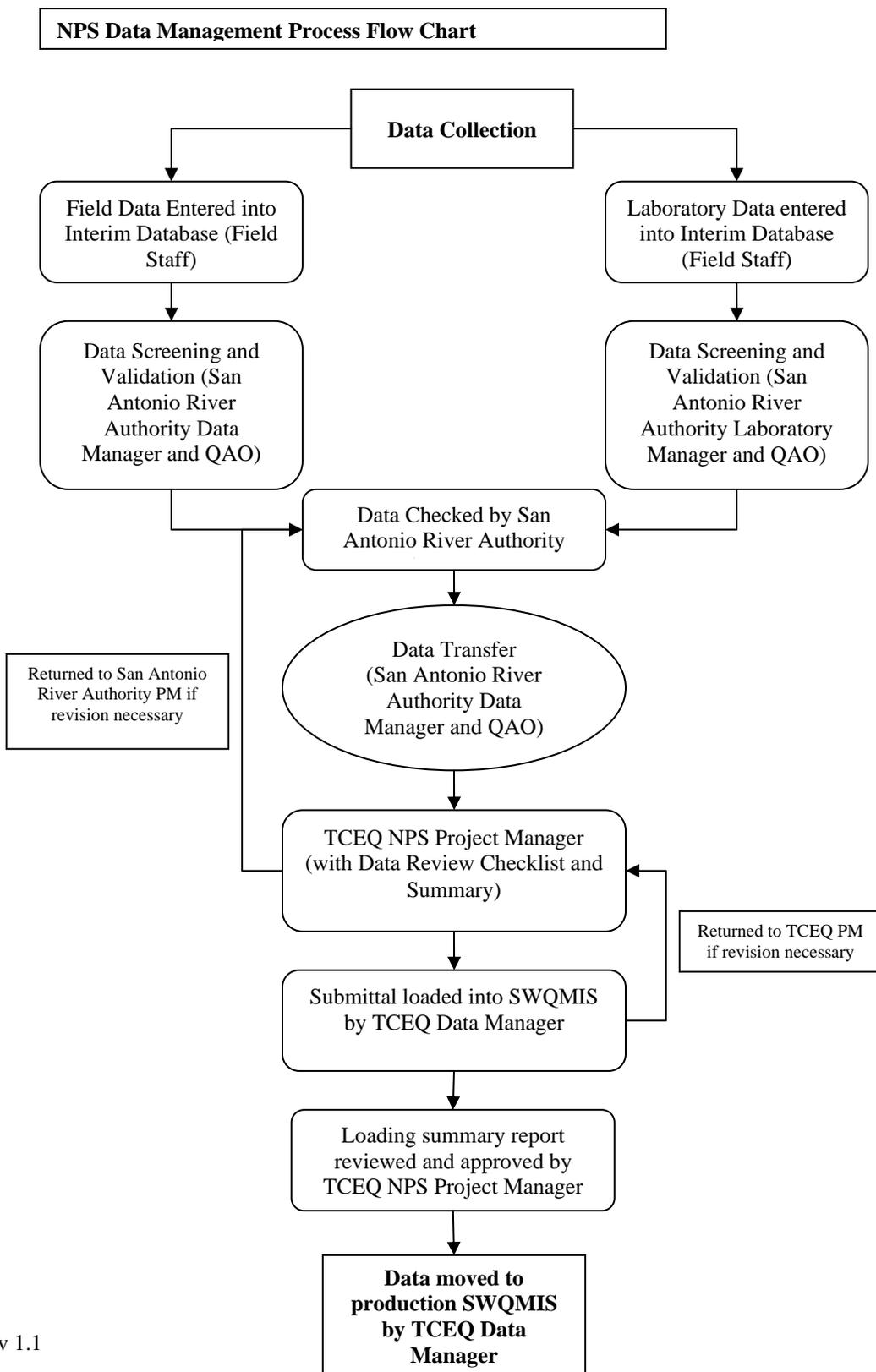
Method of Shipment: Hand Delivered Mailed Ice

Relinquished by: _____ Date/Time: _____ Received by: _____ Date/Time: _____
 Relinquished by: _____ Date/Time: _____ Received by: _____ Date/Time: _____
 Relinquished by: _____ Date/Time: _____ Received by: _____ Date/Time: _____
 Relinquished by: _____ Date/Time: _____ Received by: _____ Date/Time: _____

Lab Comments: _____
 NA - Not Applicable

1. Collection Method: G - Grab; C - Composite
 2. Sample Type: EF - Effluent; IF - Influent; BW - Bottled Water; SW - Surfacewater; ST - Stormwater; PW - Private Well; O - Other (Specify in Comments)
 3. Matrix: DW - Drinking Water; NFW - Non-Potable Water; SE - Sediment; SO - Soil; O - Other (Specify in Comments)
 4. Composite Samples require Composite Start Date/Time and Collection Date/Time
 Container Type: GC - Gallon Outliner; CC - Quart Outliner; AB - Amber Glass Bottle; OB - Clear Glass Bottle; DS - Drinking Water Srewtop;
 PB - Plastic Bottle; AP - Amber Plastic; MP - Mini-Link
 5. Type: CP - Chemical Preservation; S - Sulfuric Acid; H - Hydrochloric Acid; N - Nitric Acid; P - Phosphoric Acid; O - Other (Specify in Comments)

APPENDIX F: DATA MANAGEMENT FLOW CHART



APPENDIX G: CORRECTIVE ACTION STATUS TABLE

APPENDIX H: CORRECTIVE ACTION PLAN FORM

Example Non-Conformance Report Form

SARAnet	Page 1 of 1		
Non-Conformance Report Detail			
Report ID:	724		
ESD Section:	Lab		
Reporter:	Maru Garayar		
Date of Occurance:	June 10, 2009		
Date Submitted:	June 11, 2009		
Description:	Upon taking out Colliert-18 set on 6/10/09(batches 17483 and 17482) from client Le Snyder it was found the three of the samples had exceeded the hold time.		
Action Taken:	Submitted NCR and awaiting response.		
Parameter(s):	Coliform, Total		
Sample(s) Affected:	AA46856, AA46857, AA46858		
Project(s) Affected:	NA		
Severity Level:	Results not being reported		
Non-Conformance Report			
Assigned to: Maru Garayar			
Quality Manager/Deputy Quality Manager Comments			
Date	Submitter	Comments	
No comments have been submitted.			
Corrective Action Report			
Date	Submitter	Comments	Accepted
July 6, 2009	Maru Garayar	Root Cause Investigation Upon removing samples from incubator on 6/10/09 it was found that analyst did not analyze colliert-18 bottles within the specified hold time.	Accepted By: Gregory Mateo
July 6, 2009	Maru Garayar	Corrective Action to Address a Finding Client was notified and data for three samples was not used. Client resubmitted samples. Situation was also discussed at lab staff meeting.	Accepted By: Gregory Mateo
July 6, 2009	Maru Garayar	Corrective Action to Prevent a Re-occurrence It was recommended to check to-do lists regularly. Also for anyone logging in to notify analyst if sample has a shorter hold time then usual.	Accepted By: Gregory Mateo
The corrective actions have been accepted by Patricia Carvajal on August 4, 2009.			
30 Day Follow-up Report			
Date	Submitter	Comments	
September 9, 2009	Patricia Carvajal	I asked the analyst how she determined if a sample has exceeded the hold time. The primary method is for the sample receiver to document the date on the board in the event the sample was collected the previous day.	
Reviews and Sign-offs			
QM Accepted on September 18, 2009 by Patricia Carvajal			
Supervisor Accepted on September 18, 2009 by Gregory Mateo			
This report was closed by Patricia Carvajal on September 18, 2009.			
http://saranet.sara-tx.org/technical_services/qc_failure_detail_print.php?report_id=724 4/17/2012			

Appendix I: Example Letter to Document Adherence to the QAPP

TO: Hollis Pantalion
Lower Colorado River Authority – ELS
3505 Montopolis Drive
Austin, Texas 78744

FROM: Patricia M. Carvajal
Senior Water Quality Planner / QAO
San Antonio River Authority
P.O. Box 839980
San Antonio, Texas 78283-9980

RE: Upper San Antonio River Watershed Protection Plan Revision #1 Quality Assurance Project Plan

Please sign and return this form by (date) to:

Patricia M. Carvajal
Senior Water Quality Planner/QAO
San Antonio River Authority
P.O. Box 839980
San Antonio, Texas 78283-9980

I acknowledge receipt of the “Upper San Antonio River Watershed Protection Plan Revision #1 Quality Assurance Project Plan”. I understand the document(s) describe quality assurance, quality control, data management and reporting, and other technical activities that must be implemented to ensure the results of work performed will satisfy stated performance criteria. My signature on this document signifies that I have read and approved the document contents pertaining to my program. Furthermore, I will ensure that all staff members participating in Clean Rivers Program activities will be required to familiarize themselves with the document contents and adhere to them as well.

Signature

Date

Copies of the signed forms should be sent by the San Antonio River Authority to the TCEQ NPS Project Manager within 60 days of TCEQ approval of the QAPP.

APPENDIX J: STORM WATER SAMPLING SOP

(or current revision)

Uncontrolled Document

San Antonio River Authority Watershed Monitoring

Environmental Sciences Department

Standard Operating Procedure

For

Collecting Instream Stormwater Samples

SOP ID: WM002_Rev01

Effective Date: 6/11/2012

Prepared By:



Patricia M. Carvajal, Quality Manager

6/7/12

Date

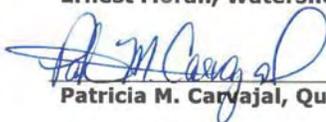
Approval Signatures:



Ernest Moran, Watershed Monitoring Supervisor

6/6/12

Date



Patricia M. Carvajal, Quality Manager

6/7/12

Date

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1. Summary

This procedure will be used to guide the collection of stormwater samples at instream sample locations within the San Antonio River Basin. Storm water samples may be discrete grab samples along the hydrograph or a combination of an initial discrete sample and composite sample.

2. Definitions and Acronyms

- a. Composite Sample – a mixed or combined sample that is formed by combining a series of individual samples of specific volumes at specific intervals. This interval may be time-weighted or flow-weighted.
- b. Grab Sample – a discrete sample taken within a short period of time, usually less than 15 minutes.
- c. QAPP – Quality Assurance Project Plan

3. Storm Event Selection Criteria

An approaching storm will be monitored by radar to determine its suitability to the project and determine preparedness for a sampling event. Qualifying storm events will produce ½ inch or greater of widespread precipitation. Localized, isolated events will not be sampled. False starts and terminated events are to be expected due to the unpredictable nature of storm events that may not meet the data quality objectives of the project or effort.

a. Minimum Antecedent Dry Period Requirements for sample locations

The following guidance is applied on a site by site basis. Some watersheds will return to 'normal' flow conditions sooner than others and will be eligible for an additional stormwater sampling event earlier than others.

- i. One (1) day if the previous rain event was limited to light rain/drizzle producing only a surface wetting and no run-off.
 - ii. Three (3) days if the previous rain event did not produce enough rainfall to result in a measurable increase in discharge at the sample location(s).
 - iii. Minimum of 5 days if preceded by a rain fall of at least ½ inch at a sample location. The antecedent dry period may be longer if the sample location(s) are still being impacted by runoff from a previous rain event.
- b. A Storm event may be deemed unsafe for manual collection due to excessive lightning, hail, high winds or flooding. If any of these conditions are present a sampling event will be cancelled and or terminated once these conditions develop.

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4. Discrete Grab Samples along the Hydrograph

A grab sample is a discrete, individual sample taken within a short period of time (usually less than 15 minutes). Analysis of grab samples characterizes the quality of stormwater discharge at a given time of the discharge.

a. Baseline Storm Water Sample Collection Procedure

In an effort to characterize water quality conditions of a stream prior to a storm event, a baseline water quality sample must be collected prior to the onset of runoff conditions from an approaching storm. The following is the procedure that will be implemented by ESD field personnel in collecting a storm water baseline sample.

ESD field personnel will monitor local Doppler weather radars to determine if approaching storms meet the requirements of applicable storm water projects.

If approaching storms DO NOT meet project requirements no action is taken.

If approaching storms DO meet project requirements, field personnel will monitor local Doppler radars to estimate time of arrival.

ESD field personnel then notify ESD laboratory personnel of the approaching storm and possible storm water sampling activities.

Baseline samples are then collected as closely as possible prior to the storm water sampling event in order to prevent exceeding baseline sample hold times (i.e., *E.coli*-8 hr. hold time). Because of the unpredictability of storm events, the time between baseline sample collection and the storm water sample collection will vary with each storm event.

If the storm event is delayed for more than 2 hours following the collection of the first baseline sample, the first baseline sample will be discarded and another baseline sample will be collected. If the storm event is delayed another two hours, the second baseline sample will be discarded and so on until the storm event occurs or until the event has been terminated.

b. Minimum sampling requirements for Discrete Grab Samples along the Hydrograph

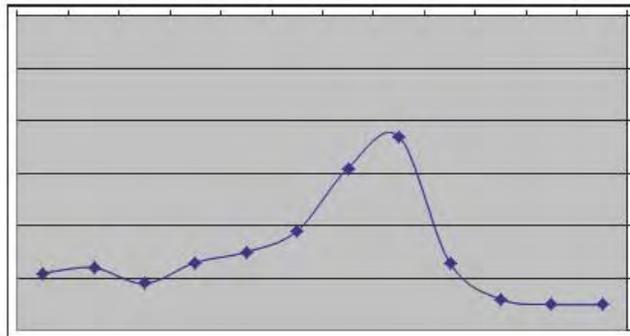
- i. Potential Events: Produce ½ inch of widespread rainfall
- ii. Minimum # of samples on increasing flow
 1. One prior to rain event (refer to baseline stormwater procedure)
 2. Minimum of two on the rise

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3. One additional sample at or near the peak flow of the event
- iii. Minimum # of samples on the decreasing flow
 1. Minimum of two samples on the decrease in flow
 2. One additional, sample as the stream returns to baseline flow
- iv. Minimum # of grab samples per storm event → 7 per sample location

Example:



c. Method of Collecting Grab Samples

Discrete grab samples may be collected manually or with an automatic sampler. Refer to WM001 - Automatic Sampler SOP. Analysis hold times must be adhered to, Refer to Section 6.

5. Combination Initial Discrete (First Flush) and Composite Samples

A composite sample is a mixed or combined sample that is formed by combining a series of individual and discrete samples of specific volumes at specific intervals. These intervals can be time-weighted or flow-weighted composite samples. A flow weighted composite means that discrete aliquots, or samples, are collected and combined in proportion to flow. Composite samples characterize the quality of storm water discharge over a longer period of time, such as the duration of the storm event.

Composite Samples may be collected manually or with an automatic sampler. Refer to the [NPDES Storm Water Sampling Guidance Document](#) for methods of compositing a manually collected composite sample. Refer to WM001 - Automatic Sampler SOP for using an automatic sampler to collect a composite sample.

a. Initial Discrete Sample (First Flush)

The initial Discrete sample must be collected within the **first 30 minutes of discharge**. These samples are intended to characterize the maximum

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concentration of a pollutant that may occur in the discharge and/or may indicate intermingling of non-storm water discharges.

b. Composite Sample

Composite samples are collected during the first 3 hours of discharge or the entire discharge, if less than 3 hours.

Composite Samples may be collected manually or with an automatic sampler. Refer to the [NPDES Storm Water Sampling Guidance Document](#) for methods of compositing a manually collected composite sample. Refer to WM001 – Automatic Sampler SOP for using an automatic sampler to collect a composite sample.

6. Flow Determinations

Two possible methods of determining instantaneous flow or estimated flow are identified below. Other methods of estimated flow may be found in the *NPDES Storm Water Sampling Guidance*. If a sampling program has a QAPP; please refer to that document for additional information.

a. Instantaneous flow measurements

During storm events the use of the *Flow Tracker*[®] or *RiverCat*[®] is not practical. If a stormwater sampling location has a USGS gauge, flow measurements from the gauge may be used to document the total discharge at the time that the samples are collected.

If a sample station does not have a USGS gauge a Discharge Rating Curve will need to be developed to estimate the discharge in relation to stage height. The development of a Discharge Rating Curve will need to be developed by Watershed Engineering Staff. These curves must be developed well in advance of sampling.

b. Discharge Rating Curves

i. Stage Discharge Rating Curve Development

The Digital Flood Insurance Maps (DFIRM) Hydrologic Engineering Center River Analysis System (HEC_RAS) hydraulic model will be used to develop a stage-discharge rating curve for each monitoring site. The stage-discharge rating curve developed at the monitoring site can then be used to calculate an estimated flow based on the water surface elevation or stage height values collected at that site. These curves will be incorporated into an Excel spreadsheet that will allow the user to enter the stage height to calculate the estimated flow. Each discharge rating curve is unique to the site from which the data was collected to develop the curve and cannot be used to estimate flows at other monitoring sites. These curves will be developed for sites that do not have a USGS gauging station available.

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ii. Stage Height Measurements to estimate flow

The stage height will be measured at a pre-determined location prior to the initiation of sampling (permanent mark on the upstream side of the bridge deck at the center of stream) using a weighted measuring tape. This will help define the initial baseline conditions of the stream prior to the precipitation event. Once the precipitation event begins, and runoff conditions are imminent, the stage height will be measured at the pre-determined location. A minimum of 7 succeeding stage height measurements will be collected at a frequency aimed at defining the rise, peak and fall of the hydrograph and will continue until the stage height returns to within 10% of the baseline measurement. Frequency of measurements will vary based on the intensity and duration of the precipitation event. If the hydrograph does not return to the baseline level within 24 hours, succeeding stage height measurements and samples will be collected once each day until the stream has returned to within 10% of the initial stage. If the receding hydrograph is interrupted by a subsequent rain event before it reaches the 10% baseline threshold, the event will be terminated. Each stage height measurement will be accompanied by water quality samples.

7. Sample Analyses

a. Preservation

- i. Analyses that are performed must be preserved in accordance with method requirements and within specified time frames.
- ii. When using an automatic sampler the unit should have the capability to refrigerate the sample(s). Refrigeration may be required by a project QAPP.

b. Hold time

i. Manually Collected Grab Samples

1. Bacteria hold time for stormwater samples is 8 hours from the time of collection to the time of incubation. Samples must be delivered to the laboratory with adequate time for the laboratory scientists to prepare the samples and place the samples in the incubator within this time. A Project QAPP may specify extended holding times under specific conditions. Refer to appropriate QAPP as necessary.
2. Chemistry samples must be analyzed within specified holding times. Refer to method or appropriate QAPP.

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ii. Samples collected with an Automatic Sampler

1. Bacteria samples (individual grabs and first flush)
The hold time for bacteria samples collected with an automatic sampler begins with the time that each particular grab was drawn.
2. Chemistry analysis (individual grabs)
The hold time for chemistry analyses begins with the time that the sample was drawn.
3. Chemistry analysis (composite)
For composite samples the hold time begins at the time that the last aliquot (grab) was drawn. A project QAPP may specify the method of determining the hold time for analysis collected with an automatic sampler. Please refer to the project QAPP as necessary.

Note: QAPP requirements may specify the hold time for analyses collected under a particular project.

8. References

- a. NPDES Storm Water Sampling Guidance Document, Environmental Protection Agency, EPA 833-B-92-001, 1992
- b. WM001 Automatic Sampler SOP, Latest revision
- c. Code of Federal Regulations Part 136