

# **Amendment # 1**

## **Update to the Angelina & Neches River Authority Clean Rivers Program FY 2022/2023 QAPP**

*Prepared by the Angelina & Neches River Authority in Cooperation with the Texas Commission on Environmental Quality (TCEQ)*

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**Effective: Immediately upon approval by all parties**

Questions concerning this QAPP should be directed to:

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or

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## Justification

This document details the changes made to the basin-wide Quality Assurance Project Plan to update Appendix B for the remainder of 2022 and for fiscal year 2023. This document also updates personnel changes, and addresses any other changes made to the quality program since the last amendment.

## Summary of Changes

Section/Figure/Table	Page	Change	Justification
Section A1	2	Replaced Rebecca DuPont with Kyle Girten as Acting CRP Work Leader  Replaced Rebecca DuPont with Luis Medina as CRP Project Quality Assurance Specialist  Replaced Dana Squires with Jason Natho as Acting Lead CRP Quality Assurance Specialist	Personnel changes at TCEQ
Section A1	3	Replaced Carla Ethridge as CRP Manager with Rene Barelas as CRP Coordinator  Added Hannah Crawford as Lab Manager	Personnel and title changes at ANRA
Section A1	6	Updated Tracy Easley's title from Operations Manager to General Manager	Personnel changes at Pace Analytical
Section A3	9	Replaced Dana Squires with Jason Natho as Acting Lead CRP Quality Assurance Specialist	Personnel changes at TCEQ
Section A3	9	Replaced Carla Ethridge as CRP Manager with Rene Barelas as CRP Coordinator  Added Hannah Crawford as Lab Manager	Personnel and title changes at ANRA
Section A3	9	Updated Tracy Easley's title from Operations Manager to General Manager	Personnel changes at Pace Analytical
Section A4	11, 12	Replaced Sarah Kirkland with Scott Delgado as CRP Data Manager  Replaced Rebecca DuPont with Kyle Girten as Acting CRP Work Leader  Replaced Rebecca DuPont with Luis Medina as CRP Project Quality	Personnel changes at TCEQ

		Assurance Specialist  Replaced Dana Squires with Jason Natho as Acting Lead CRP Quality Assurance Specialist	
Section A4	12	Replaced Carla Ethridge with Rene Barelas as CRP Coordinator  Added Hannah Crawford as Lab Manager and split responsibilities previously assigned to Melissa Garcia between Melissa Garcia and Hannah Crawford.  Removed Casity King	Personnel changes at ANRA
Section A4	14	Updated Tracy Easley's title from Operations Manager to General Manager	Personnel changes at Pace Analytical
Figure A4.1	15	Replaced Sarah Kirkland with Scott Delgado as CRP Data Manager  Replaced Rebecca DuPont with Kyle Girtten as Acting CRP Work Leader  Replaced Rebecca DuPont with Luis Medina as CRP Project Quality Assurance Specialist  Replaced Dana Squires with Jason Natho as Acting Lead CRP Quality Assurance Specialist	Personnel changes at TCEQ
Figure A4.1	15	Replaced Carla Ethridge with Rene Barelas as CRP Coordinator  Added Hannah Crawford as Lab Manager	Personnel changes at ANRA
Figure A4.1	15	Updated Tracy Easley's title from Operations Manager to General Manager	Personnel changes at Pace Analytical
Section A6	17	Corrected spelling of "Specialist"	Spelling correction
Section A6, B2, B3, B4, B5, C1, C2, and D2	17,18, 25,27, 28, 31, 38, 40, 41, 42	Replaced ANRA Clean Rivers Program <b>Manager</b> with ANRA Clean Rivers Program <b>Coordinator</b>	Job title changes at ANRA
Appendix B	53	Updated sample design rationale for Remainder of FY2022 and FY 2023	Describes changes to monitoring design for FY2022-2023 based on the FY2022 Coordinated Monitoring Meetings
Appendix B	54-56	Updated Table B1.1	Describes changes to monitoring design for FY2023 based on the FY2022 Coordinated Monitoring Meetings
Appendix C	57-60	Updated maps of monitoring stations	Describes changes to monitoring design for FY2023 based on the FY2022 Coordinated Monitoring Meetings

## Detail of Changes

### A1 Approval Page

#### Texas Commission on Environmental Quality

#### *Water Quality Planning Division*

Electronically approved on 9/2/2022

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Kyle Girten, Acting Work Leader Clean Rivers Program	Date
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Electronically approved on 9/08/2022

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Luis Medina Project Quality Assurance Specialist Clean Rivers Program	Date
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Electronically approved on 9/08/2022

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Luis Medina, Project Manager Clean Rivers Program	Date
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Electronically approved on 8/24/2022

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Cathy Anderson, Team Leader Data Management and Analysis	Date
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#### *Monitoring Division*

Electronically approved on 9/08/2022

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Jason Natho Lead CRP Quality Assurance Specialist	Date
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**Angelina & Neches River Authority (ANRA)**

***Environmental Division – Clean Rivers Program***

Electronically approved on 8/24/2022

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Rene Barelás Date  
Clean Rivers Program Coordinator

Electronically approved on 8/24/2022

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Melissa Garcia Date  
Laboratory Services Director

Electronically approved on 8/24/2022

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Jeremiah Poling Date  
Information Resources Manager

***Environmental Division – ANRA Environmental Laboratory***

Electronically approved on 8/24/2022

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Melissa Garcia Date  
Laboratory Services Director

Electronically approved on 8/24/2022

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Hannah Crawford Date  
Laboratory Manager

**Lower Colorado River Authority (LCRA)**

***Environmental Laboratory Services (ELS)***

Electronically approved on 8/31/2022

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Dale Jurecka  
Director, Environmental Laboratory Services

Date

Electronically approved on 8/24/2022

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Angel Mata  
Regulatory Compliance and Safety Program Manager

Date

Electronically approved on 8/30/2022

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Jason Woods  
Supervisor - ELS Customer and Project Services

Date

**Ana-Lab Corporation (Kilgore)**

Electronically approved on 8/26/2022

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Bill Peery  
Vice President, Technical Services

Date

Electronically approved on 8/24/2022

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Tracey Varvel  
Quality Manager

Date

**Pace Analytical (NOLA)**

***Pace Environmental Sciences***

Electronically approved on 9/06/2022

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Tracy Easley  
General Manager

Date

Electronically approved on 8/31/2022

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Gabrielle Jones  
Quality Manager

Date

Electronically approved on 9/08/2022

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Karen Brown  
Project Manager

Date



## A3 Distribution List

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## A4 Project Task/Organization

### Description of Responsibilities

#### TCEQ

##### **Kyle Girten**

##### **Acting CRP Work Leader**

Responsible for Texas Commission on Environmental Quality (TCEQ) activities supporting the development and implementation of the Texas Clean Rivers Program (CRP). Responsible for verifying that the TCEQ Quality Management Plan (QMP) is followed by CRP staff. Supervises TCEQ CRP staff. Reviews and responds to any deficiencies, corrective actions, or findings related to the area of responsibility. Oversees the development of Quality Assurance (QA) guidance for the CRP. Reviews and approves all QA audits, corrective actions, reports, work plans, contracts, QAPPs, and TCEQ Quality Management Plan. Enforces corrective action, as required, where QA protocols are not met. Ensures CRP personnel are fully trained.

##### **Jason Natho Acting Lead CRP Quality Assurance Specialist**

Participates in the development, approval, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Assists program and project manager in developing and implementing quality system. Serves on planning team for CRP special projects. Coordinates the approval of CRP QAPPs. Prepares and distributes annual audit plans. Conducts monitoring systems audits of Planning Agencies. Conveys QA problems to appropriate management. Recommends that work be stopped in order to safeguard programmatic objectives, worker safety, public health, or environmental protection. Ensures maintenance of QAPP records and audit records for the CRP.

##### **Luis Medina**

##### **CRP Project Manager**

Responsible for the development, implementation, and maintenance of CRP contracts. Tracks, reviews, and approves deliverables. Participates in the development, approval, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Assists CRP Lead QA Specialist in conducting Basin Planning Agency audits. Verifies QAPPs are being followed by contractors and that projects are producing data of known quality. Coordinates project planning with the Basin Planning Agency Project Manager. Reviews and approves data and reports produced by contractors. Notifies QA Specialists of circumstances which may adversely affect the quality of data derived from the collection and analysis of samples. Develops, enforces, and monitors corrective action measures to ensure contractors meet deadlines and scheduled commitments.

##### **Cathy Anderson**

##### **Team Leader, Data Management and Analysis (DM&A) Team**

Participates in the development, approval, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Ensures DM&A staff perform data management-related tasks.

##### **Scott Delgado**

##### **CRP Data Manager, DM&A Team**

Responsible for coordination and tracking of CRP data sets from initial submittal through CRP Project Manager review and approval. Ensures that data are reported following instructions in the Data Management Reference Guide, July 2019 or most current version (DMRG). Runs automated data validation checks in the Surface Water Quality Management Information System (SWQMIS) and coordinates data verification and error correction with CRP Project Managers. Generates SWQMIS summary reports to assist CRP Project Managers' data review. Identifies data anomalies and inconsistencies. Provides training and guidance to CRP and Planning Agencies on technical data issues to ensure that data are submitted according to documented procedures. 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 SOPs for CRP data management. Coordinates and processes data correction

requests. Participates in the development, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP).

### **Luis Medina**

#### **CRP Project Quality Assurance Specialist**

Serves as liaison between CRP management and TCEQ QA management. Participates in the development, approval, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Serves on planning team for CRP special projects and reviews QAPPs in coordination with other CRP staff. Coordinates documentation and implementation of corrective action for the CRP.

## **ANRA**

### **Rene Barelvas**

#### **ANRA Clean Rivers Program Coordinator**

Responsible for writing and maintaining the QAPP and monitoring implementation of 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 implementing and monitoring CRP requirements in contracts, QAPPs, and QAPP amendments and appendices. Ensures that field staff is properly trained and that training records are maintained. Coordinates basin planning activities and work of basin partners. Ensures monitoring systems audits are conducted to ensure QAPPs are followed by ANRA participants and that projects are producing data of known quality. Ensures that subparticipants are qualified to perform contracted work. Ensures CRP project managers and/or QA Specialists are notified of deficiencies and corrective actions, and that issues are resolved. Responsible for validating that data collected are acceptable for reporting to the TCEQ.

### **Melissa Garcia**

#### **ANRA Laboratory Services Director**

Responsible for coordinating the implementation of the QA program. Responsible for identifying, receiving, and maintaining project QA records. Responsible for coordinating with the TCEQ QAS to resolve QA-related issues. Notifies ANRA Clean Rivers Program **Coordinator** of particular circumstances that may adversely affect the quality of data. Coordinates and monitors deficiencies and corrective action. Coordinates and maintains records of data verification and validation. Coordinates the research and review of technical QA material and data related to water quality monitoring system design and analytical techniques.

### **Hannah Crawford**

#### **ANRA Laboratory Manager**

Responsible for overall performance, administration, and reporting of analyses performed by ANRA's Environmental Laboratory. 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 this 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.

### **Jeremiah Poling**

#### **ANRA Information Resources Manager**

Responsible for ensuring that field data are properly reviewed and verified. Responsible for the transfer of basin quality-assured water quality data to the TCEQ in a format compatible with SWQMIS. Maintains quality-assured data on ANRA internet sites.

### **Kimberly Wagner**

#### **Communications Director**

Responsible for education and outreach regarding ANRA's Clean Rivers Program. Also responsible for coordinating and conducting CRP sample collection in accordance with the basin coordinated monitoring schedule and the QAPP.

## **LCRA ELS**

### **Dale Jurecka**

#### **Director, Environmental Laboratory Services**

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 this 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.

### **Angel Mata**

#### **Regulatory Compliance and Safety Program Manager**

Responsible for the overall quality control and quality assurance of analyses performed by LCRA's ELS. Monitors the implementation of the QM/QAPP within the laboratory to ensure complete compliance with QA data quality objectives, as defined by the contract and in this QAPP. Conducts in-house audits to ensure compliance with written SOPs and to identify potential problems. Responsible for supervising and verifying all aspects of the QA/QC in the laboratory.

### **Jason Woods**

#### **Supervisor – ELS Customer and Project Services**

Responsible for analyses performed by LCRA ELS for this project. Responsible for project setup in LIMS. Responsible for LCRA ELS laboratory and field staff corrective action communication with the LCRA ELS Quality Officer. Makes LCRA ELS data available to the ANRA Information Resources Manager. Notifies the LCRA ELS Quality Officer, ANRA Laboratory Services Director and ANRA Clean Rivers Program **Coordinator** of laboratory analysis issues that may invalidate data.

## **Ana-Lab**

### **Bill Peery**

#### **Vice President, Technical Services**

Responsible for overall performance, administration, and reporting of analyses performed by Ana-Lab. 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 this 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.

### **Tracey Varvel**

#### **Quality Manager**

Responsible for the overall quality control and quality assurance of analyses performed by Ana-Lab. Monitors the implementation of the QM/QAPP within the laboratory to ensure complete compliance with QA data quality objectives, as defined by the contract and in this QAPP. Conducts in-house audits to ensure compliance with written SOPs and to identify potential problems. Responsible for supervising and verifying all aspects of the QA/QC in the laboratory.

## **Pace (NOLA)**

### **Karen Brown**

#### **Project Manager**

Responsible for analyses performed by Pace (NOLA) for this project. Responsible for project setup in LIMS. Responsible for Pace (NOLA) laboratory and field staff corrective action communication with the Pace (NOLA) Quality Manager. Makes Pace (NOLA) data available to the ANRA Data Manager. Notifies the Pace (NOLA) Quality Manager, ANRA Laboratory Services Director, and ANRA Clean Rivers Program **Coordinator** of laboratory analysis issues that may invalidate data.

**Tracy Easley**

**General Manager**

Responsible for overall performance, administration, and reporting of analyses performed by Pace (NOLA). 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 this 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.

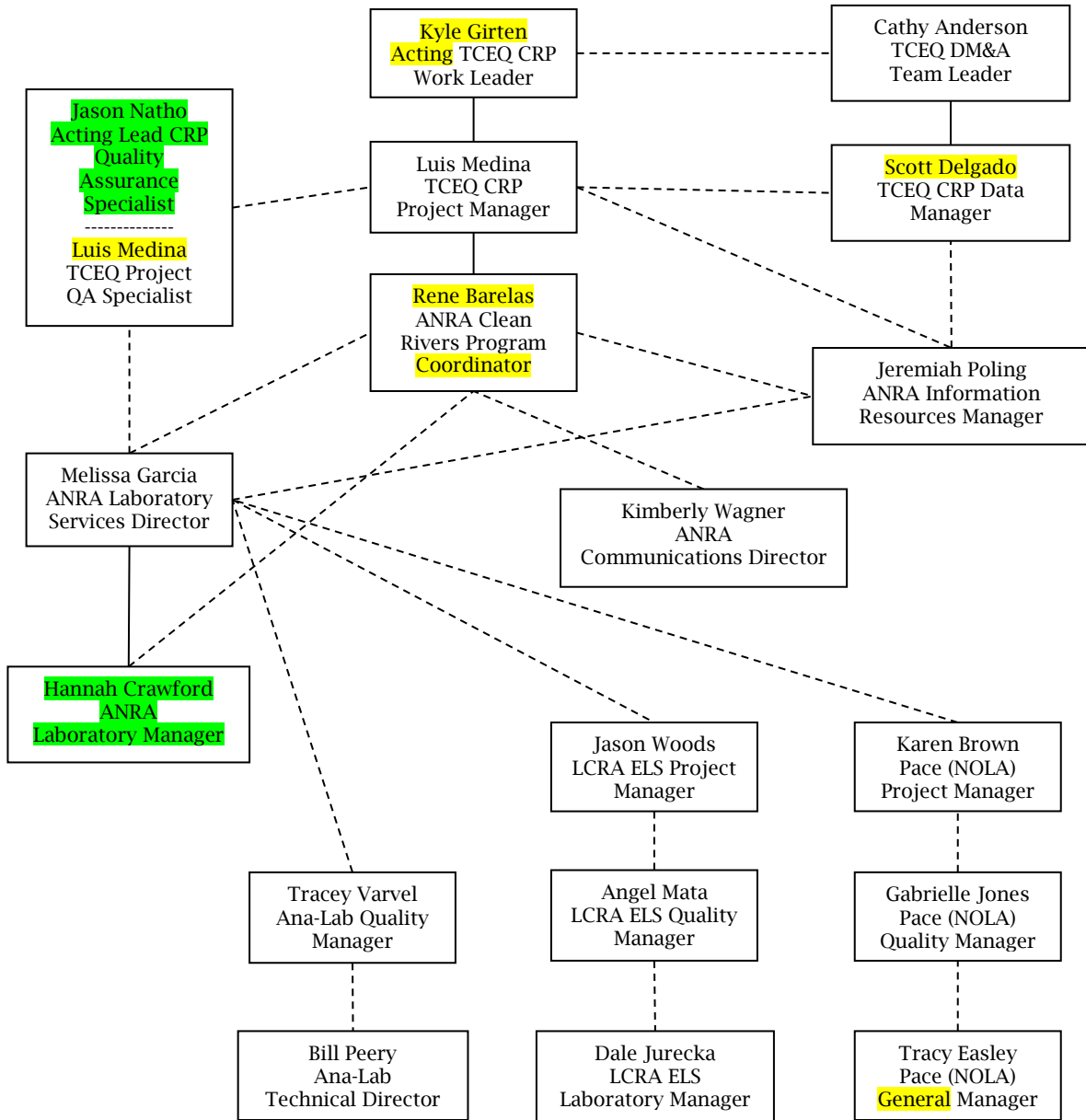
**Gabrielle Jones**

**Quality Manager**

Responsible for the overall quality control and quality assurance of analyses performed by Pace (NOLA). Monitors the implementation of the QM/QAPP within the laboratory to ensure complete compliance with QA data quality objectives, as defined by the contract and in this QAPP. Conducts in-house audits to ensure compliance with written SOPs and to identify potential problems. Responsible for supervising and verifying all aspects of the QA/QC in the laboratory.

# Project Organization Chart

Figure A4.1. Organization Chart - Lines of Communication



Lines of Management ———  
 Lines of Communication - - - - -

## **A6 Project/Task Description**

### **Amendments to the QAPP**

Revisions to the QAPP may be necessary to address incorrectly documented information or to reflect changes in project organization, tasks, schedules, objectives, and methods. The ANRA Clean Rivers Program **Coordinator** will direct requests for amendments to the CRP Project Manager electronically. ANRA will submit a completed QAPP Amendment document, including a justification of the amendment, a table of changes, and all pages, sections, and attachments affected by the amendment. Amendments are effective immediately upon approval by ANRA Clean Rivers Program **Coordinator**, ANRA Laboratory Services Director, CRP Project Manager, the CRP Lead QA Specialist, the CRP Project QA **Specialist**, and additional parties affected by the amendment. Amendments are not retroactive. No work shall be implemented without an approved QAPP or amendment prior to the start of work. Any activities under this contract that commence prior to the approval of the governing QA document, constitute a deficiency, and are subject to corrective action as described in section C1 of this QAPP. Any deviation or deficiency from this QAPP, which occurs after the execution of this QAPP, will be addressed through a Corrective Action Plan (CAP). An amendment may be a component of a CAP to prevent future recurrence of a deviation.

The ANRA Clean Rivers Program **Coordinator** will incorporate amendments into the QAPP by way of attachment, and distribute to personnel on the distribution list. If adherence letters are required, ANRA will secure an adherence letter from each sub-tier project participant (e.g., subcontractors, sub-participant, or other units of government) affected by the amendment stating the organization's awareness of and commitment to requirements contained in each amendment to the QAPP. ANRA will maintain this documentation as part of the project's QA records, and ensure that the documentation is available for review.

### **Special Project Appendices**

Projects requiring QAPP appendices will be planned in consultation with ANRA and the TCEQ Project Manager and TCEQ technical staff. Appendices will be written in an abbreviated format and will reference the Basin QAPP where appropriate. Appendices will be approved by ANRA Clean Rivers Program **Coordinator**, ANRA Laboratory Services Director, the CRP Project manager, the CRP Project QA Specialist, the CRP Lead QA Specialist and additional parties affected by the Appendix, as appropriate. Copies of approved QAPP appendices will be distributed by ANRA to project participants before data collection activities commence. ANRA will secure written documentation from each sub-tier project participant (e.g., subcontractors, subparticipants, other units of government) stating the organization's awareness of and commitment to requirements contained in each special project appendix to the QAPP. ANRA will maintain this documentation as part of the project's QA records, and ensure that the documentation is available for review.

## **B2 Sampling Methods**

### **Sampling Method Requirements or Sampling Process Design Deficiencies, and Corrective Action**

Examples of sampling method requirements 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, SWQM Procedures, or appropriate sampling procedures may invalidate data, and require documented corrective action. Corrective action may include for samples to be discarded and re-collected. It is the responsibility of the ANRA Clean Rivers Program **Coordinator**, in consultation with the ANRA Laboratory Services Director, 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 TCEQ CRP Project Manager both verbally and in writing in the project progress reports, and by completion of a CAP.

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

## **B3 Sample Handling and Custody**

### **Sample Tracking Procedure Deficiencies and Corrective Action**

All deficiencies associated with COC procedures, as described in this QAPP, are immediately reported to ANRA Clean Rivers Program **Coordinator**. 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. ANRA Clean Rivers Program **Coordinator** in consultation with ANRA Laboratory Services Director 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 CRP Project Manager in the project progress report. CAPs will be prepared by ANRA's Laboratory Services Director and submitted to TCEQ CRP Project Manager along with project progress report. The definition of and process for handling deficiencies and corrective action are defined in Section C1.

## **B4 Analytical Methods**

### **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 applicable Laboratory Supervisor, who will make the determination if the problem compromises sample results. 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 ANRA Clean Rivers Program **Coordinator**. The ANRA Clean Rivers Program **Coordinator** will include this information in a CAP and submit with the Progress Report, which is sent to the TCEQ CRP Project Manager.



## B5 Quality Control

**Matrix spike (MS)** – Matrix spikes are prepared by adding a known quantity of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

Matrix spikes indicate the effect of the sample on the precision and accuracy of the results generated using the selected method. Matrix-specific QC samples indicate the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. The information from these controls is sample/matrix specific and would not normally be used to determine the validity of the entire batch. The frequency of matrix spikes is specified by the analytical method, or a minimum of one per preparation batch, whichever is greater. To the extent possible, matrix spikes prepared and analyzed over the course of the project should be performed on samples from different sites.

The components to be spiked shall be as specified by the mandated analytical method. 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 percent recovery of the matrix spike is calculated using the following equation, where %R is percent recovery,  $S_{SR}$  is the concentration measured in the matrix spike,  $S_R$  is the concentration in the parent sample, and  $S_A$  is the concentration of analyte that was added:

$$\%R = \frac{S_{SR} - S_R}{S_A} \times 100$$

Matrix spike recoveries are compared to the same acceptance criteria established for the associated LCS recoveries, rather than the matrix spike recoveries published in the mandated test method. The EPA 1993 methods (i.e. ammonia-nitrogen, ion chromatography, TKN) that establish matrix spike recovery acceptance criteria are based on recoveries from drinking water that has very low interferences and variability and do not represent the matrices sampled in the CRP. If the matrix spike results are outside laboratory-established criteria, there will be a review of all other associated quality control data in that batch. If all of quality control data in the associated batch passes, it will be the decision of the Laboratory Services Director or ANRA Clean Rivers Program **Coordinator** to report the data for the analyte that failed in the parent sample to TCEQ or to determine that the result from the parent sample associated with that failed matrix spike is considered to have excessive analytical variability and does not meet project QC requirements. Depending on the similarities in composition of the samples in the batch, ANRA may consider excluding all of the results in the batch related to the analyte that failed recovery.

## C1 Assessments and Response Actions

### Corrective Action Process for Deficiencies

Deficiencies are any deviation from the QAPP, SWQM Procedures, or other applicable guidance. Deficiencies may invalidate resulting data and require corrective action. Repeated deficiencies should initiate a CAP. Corrective action for deficiencies may include for samples to be discarded and re-collected. Deficiencies are documented in logbooks, field data sheets, etc. by field or laboratory staff, are communicated to the ANRA Clean Rivers Program **Coordinator** (or other appropriate staff) and should be subject to periodic review so their responses can be uniform, and their frequency tracked. It is the responsibility of the ANRA Clean Rivers Program **Coordinator**, in consultation with the ANRA Laboratory Services Director, 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 CRP Project Manager both verbally and in writing in quarterly progress reports and by completion of a CAP.

## C2 Reports to Management

### Reports to ANRA Project Management

ANRA Clean Rivers Program **Coordinator** is charged with the responsibility to report the status of implementation and application of the quality assurance procedures described in this QAPP and thereby the status of data quality. It is imperative that ANRA Clean Rivers Program **Coordinator** is properly informed of any quality assurance problems encountered and assists in the development and implementation of corrective actions. This information will be provided to ANRA Clean Rivers Program **Coordinator** by ANRA Laboratory Services Director, Information Resources Manager, Field Personnel and/or any performance auditor through the completion of reports. These reports may include but are not limited to the following: analytical and QC summary reports from the laboratory, field QC results and calibration records, and a data summary and data review checklist. These reports will be provided to ANRA Clean Rivers Program **Coordinator** as requested. The data summary and data review checklist are submitted to ANRA Clean Rivers Program **Coordinator** before each database transfer to the TCEQ. Other reports may include any corrective action forms, correspondence, etc. describing corrective actions or implementation of new processes to ensure that quality assured data are produced.

## D2 Verification and Validation Methods

All field and laboratory data will be reviewed, verified and validated to ensure they conform to project specifications.

Data review, verification, and validation will be performed using self-assessments as well as peer and management review as appropriate to the project task. The data review tasks to be performed by field and laboratory staff are listed in the first two columns of Table D2.1, respectively. Potential errors are identified by examination of documentation and by manual examination of corollary or unreasonable data; this analysis may be computer-assisted. 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 that can be corrected are corrected and documented. 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. Field and laboratory reviews, verifications, and validations are documented.

After the field and laboratory data are reviewed, another level of review is performed once the data are combined into a data set. This review step as specified in Table D2.1 is performed by the ANRA Information Resources Manager and Laboratory Services Director. Data review, verification, and validation tasks to be performed on the data set include, but are not limited to, the confirmation of laboratory and field data review, evaluation of field QC results, additional evaluation of anomalies and outliers, analysis of sampling and analytical gaps, and confirmation that all parameters and sampling sites are included in the QAPP.

The Data Review Checklist (see Appendix F) covers three main types of review: data format and structure, data quality review, and documentation review. The Data Review Checklist is transferred with the water quality data submitted to the TCEQ to ensure that the review process is being performed.

Another element of the data validation process is consideration of any findings identified during the monitoring systems audit conducted by the TCEQ CRP Lead Quality Assurance Specialist. Any issues requiring corrective action must be addressed, and the potential impact of these issues on previously collected data will be assessed. After the data are reviewed and documented, the ANRA Clean Rivers Program **Coordinator** validates that the data meet the data quality objectives of the project and are suitable for reporting to TCEQ.

If any requirements or specifications of the CRP are not met, based on any part of the data review, Angelina & Neches River Authority Amendment #1  
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the responsible party should document the nonconforming activities and submit the information to the ANRA Information Resources Manager with the data in the Data Summary (See Appendix F). All failed QC checks, missing samples, missing analytes, missing parameters, and suspect results should be discussed in the Data Summary.

## Appendix B Sampling Process Design and Monitoring Schedule (plan)

### *Sample Design Rationale FY 2022 & FY 2023*

The sample design is based on the legislative intent of CRP. Under the legislation, the Basin Planning Agencies have been tasked with providing data to characterize water quality conditions in support of the Texas Water Quality Integrated Report, and to identify significant long-term water quality trends. Based on Steering Committee input, achievable water quality objectives and priorities and the identification of water quality issues are used to develop work plans which are in accord with available resources. As part of the Steering Committee process, the Angelina & Neches River Authority coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed. For this amendment, a single 24 hour Dissolved Oxygen monitoring site on segment 0615 is being added. This site had been monitored for 2 years during the previous biennium, but due to low flow conditions some of the samples collected were not suitable for assessment. The site is being put back on the schedule to collect the additional data needed for assessment. No other changes are planned or anticipated for FY 2023 at this time.

**Monitoring Sites for FY 2022 & 2023**

The sample design for SWQM is shown in Table B1.1 below.

**Table B1.1 Sample Design and Schedule, FY 2022 & 2023**

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conventional	Bacteria	Flow	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments	
NECHES RIVER AT US 69 1.01 KM NORTH OF FM 1014/US 69 INTERSECTION 1.8 KM NORTHWEST OF ROCKLAND IN TYLER COUNTY	10585	0604	6	10	AN	AN	RT	4	4	4	4													
CEDAR CREEK AT ELLIS AVE IN LUFKIN	21434	0604A	6	10	AN	AN	RT	4	4	4	4													
CEDAR CREEK AT FM 1336 1.29 KM WEST-SOUTHWEST OF FM 324/FM 1336 INTERSECTION IN SOUTHWEST LUFKIN	13528	0604A	6	10	AN	AN	RT	4	4	4	4													
CEDAR CREEK AT FM 2497 5.55 KM NORTHWEST OF FM 2497/US 59 INTERSECTION 7.45 KM NORTH NORTHWEST OF CITY OF DIBOLL	10478	0604A	6	10	AN	AN	RT	4	4	4	4													
CEDAR CREEK AT ST LOOP 287 IN LUFKIN	10479	0604A	6	10	AN	AN	RT	4	4	4	4													
CEDAR CREEK AT ST LOOP 287 IN LUFKIN	10479	0604A	6	10	AN	AN	BS					5												
HURRICANE CREEK 38 METERS DOWNSTREAM OF KIWANIS PARK DRIVE AND DIRECTLY DOWNSTREAM OF CONFLUENCE WITH UNNAMED TRIBUTARY IN LUFKIN	21433	0604B	6	10	AN	AN	RT	4	4	4	4													
HURRICANE CREEK AT FM 324 6.74 KM SOUTH SOUTHWEST OF LUFKIN	13529	0604B	6	10	AN	AN	RT	4	4	4	4													
HURRICANE CREEK AT ST LOOP 287 IN SOUTH LUFKIN	10487	0604B	6	10	AN	AN	RT	4	4	4	4													
JACK CREEK AT FM 2497 5 KM SOUTHEAST OF SH 94/FM 2497 INTERSECTION 13.3 KM SOUTHWEST OF LUFKIN	10492	0604C	6	10	AN	AN	RT	4	4	4	4													
JACK CREEK AT FM 3150 7 KM WEST OF LUFKIN	10494	0604C	6	10	AN	AN	RT	4	4	4	4													
PINEY CREEK AT FM 358 2.4 KM EAST OF FM 3154/FM 358 INTERSECTION 10 KM EAST OF CITY OF PENNINGTON	16096	0604D	6	10	AN	AN	RT	4	4	4	4													
BILOXI CREEK AT ANGELINA CR216 8 KM SOUTHEAST OF LUFKIN 2.4 KM DOWNSTREAM OF US69	10499	0604M	6	10	AN	AN	RT	4	4	4	4													
BILOXI CREEK AT FM 1818 2.5 KM EAST OF FM 1818/ FM 58 INTERSECTION 13.8 KM EAST OF DIBOLL	16097	0604M	6	10	AN	AN	RT	4	4	4	4													

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conventional	Bacteria	Flow	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
BUCK CREEK AT FM 1818 4.72 KM WEST OF FM 844/ FM 1818 17.94 KM EAST OF DIBOLL	16098	0604N	6	10	AN	AN	RT	4	4	4	4												
LAKE RATCLIFF WHERE NORTHWEST ARM OF LAKE JOINS MAIN BODY 350 M NORTHWEST OF THE SOUTHWEST CORNER OF DAM1.48 KM WEST OF RATCLIFF	17339	0604T	6	10	AN	AN	RT	4	4	4													
BAYOU CARRIZO AT SH 21 NEAR NACOGDOCHES	21432	0610P	6	10	AN	AN	RT	4	4	4	4												
SAM RAYBURM RESERVOIR NEAR SHIRLEY CREEK IN THE ANGELINA RIVER CHANNEL 5.13 KM NE OF FM 2109/ FM 2801 INTERSECTION	15524	0610	6	10	AN	AN	RT	4	4	4													
SAM RAYBURN RESERVOIR ADJACENT TO ALLIGATOR COVE IN THE ATTOYAC RIVER CHANNEL 3.94 KM NORTHWEST OF FM 3185/ SH 147 INTERSECTION	15523	0610	6	10	AN	AN	RT	4	4	4													
AYISH BAYOU AT SH 103 0.8 KM EAST OF FM 705	15361	0610A	6	10	AN	AN	RT	4	4	4	4												
AYISH BAYOU AT WEST COLUMBIA STREET IN CITY OF SAN AUGUSTINE	21431	0610A	6	10	AN	AN	RT	4	4	4	4												
ANGELINA RIVER 340 METERS UPSTREAM OF SH 204 9.93 KM WEST OF CUSHING	10633	0611	6	5	AN	AN	RT	4	4	4	4												
ANGELINA RIVER AT SH 21 11.17 KM EAST NORTHEAST OF ALTO	10630	0611	6	10	AN	AN	RT	4	4	4	4												
ANGELINA RIVER UPSTREAM SAM RAYBURN RESERVOIR AT FM 1798 5.5 KM WEST OF LANEVILLE	10635	0611	6	5	AN	AN	RT	4	4	4	4												
LA NANA BAYOU AT LOOP 224 NORTH IN THE CITY OF NACOGDOCHES 1.2 KM EAST OF THE INTERSECTION OF US BUS 59F/ST LOOP 224 NORTH	16301	0611B	6	10	AN	AN	RT	4	4	4	4												
LA NANA BAYOU AT NACOGDOCHES CR 526 6.9 MI SOUTH OF NACOGDOCHES BETWEEN FM 2863 AND FM 3228	10474	0611B	6	10	AN	AN	RT	4	4	4	4												
LA NANA BAYOU IMMEDIATELY UPSTREAM OF EAST MAIN STREET/STATE HIGHWAY 7/ STATE HIGHWAY 21 IN NACOGDOCHES	20792	0611B	6	10	AN	AN	RT	4	4	4	4												
MUD CREEK AT US 79 9.8 KM EAST OF JACKSONVILLE AND 5.9 KM WEST OF NEW SUMMERFIELD	14477	0611C	6	5	AN	AN	RT	4	4	4	4												
MUD CREEK AT US 84 0.87 KM SOUTHWEST OF REKLAW	10532	0611C	6	5	AN	AN	RT	4	4	4	4												

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conventional	Bacteria	Flow	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
LAKE NACOGDOCHES IN MAIN POOL NEAR DAM 375 M EAST OF WESTERN EDGE OF DAM 126 M NORTH OF DAM 10 MI WEST OF NACOGDOCHES	15801	0611Q	6	10	AN	AN	RT	4	4	4													
LAKE NACOGDOCHES NEAR ISLAND IN UPPER LAKE EQUIDISTANT BETWEEN ISLAND AND BOAT RAMP AT THE END OF HARBOR DRIVE AND 3.37 KM SOUTH OF SH 21	21021	0611Q	6	10	AN	AN	RT	4	4	4													
LAKE STRIKER NEAR DAM APPROX 0.8 MILES SOUTHEAST OF POWERPLANT 138 M NORTHWEST OF SPILLWAY AND 7.5 MILES SOUTHEAST OF NEW SUMMERFIELD	17824	0611R	6	5	AN	AN	RT	4	4	4													
LAKE STRIKER UPPER LAKE EQUIDISTANT BETWEEN SHORELINES 2.28KM SOUTHEAST OF INTERSECTION OF FM2274/FM32889.4 KM E. OF NEW SUMMERFIELD	17822	0611R	6	5	AN	AN	RT	4	4	4													
ATTOYAC BAYOU AT SH 21 0.71 KM WEST OF INTERSECTION OF SH 21/ FM 1196 4.77 KM EAST OF CHIRENO	10636	0612	6	10	AN	AN	RT	4	4	4	4												
ATTOYAC BAYOU AT SH 7 1.75 KM NORTHEAST OF MARTINSVILLE	15253	0612	6	10	AN	AN	RT	4	4	4	4												
ATTOYAC BAYOU AT US 59 4.12 KM NORTHEAST OF GARRISON	16076	0612	6	10	AN	AN	RT	4	4	4	4												
NACONICHE LAKE NEAR THE DAM 226 METERS NORTH AND 715 METERS WEST OF INTERSECTION OF FM 2435 AND US 59 NORTHEAST OF CITY OF NACOGDOCHES	21435	0612G	6	10	AN	AN	RT	4	4	4													
WEST CREEK AT FM 2913 2.57 KM N OF INTERSECTION WITH SH 7	20845	0612F	6	10	AN	AN	RT	4	4	4	4												
ANGELINA RIVER/SAM RAYBURN RESERVOIR 0.2 KM DOWNSTREAM FROM PAPER MILL CREEK CONFLUENCE NW CORNER OF SAM RAYBURN RESERVOIR*	10622	0615	6	10	AN	AN	BS				5												

\* Site 10622 on segment 0615 will be monitored at least once in FY 2022 contingent on QAPP amendment approval.

# Appendix C: Station Location Maps

## Station Location Maps

Maps of stations monitored by the Angelina & Neches River Authority are provided below. The maps were generated by the Angelina & Neches River Authority. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact ANRA at 936-632-7795.

