

Red River Authority of Texas FY 2026–2027 Clean Rivers Program Quality Assurance Project Plan

***P.O. Box 240
Wichita Falls, Texas 76307-0240***

**Clean Rivers Program
Water Quality Planning Division
Texas Commission on Environmental Quality
P.O. Box 13087, MC 234
Austin, Texas 78711-3087
Effective Period: FY 2026 to FY 2027**

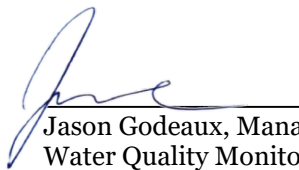
Questions concerning this QAPP should be directed to:

**Dan Medenwaldt
Clean Rivers Program Supervisor
3000 Hammon Road
P.O. Box 240
Wichita Falls, Texas 76307-0240
(940) 723-8697
daniel.medenwaldt@rra.texas.gov**

A2 Approval Page

Texas Commission on Environmental Quality

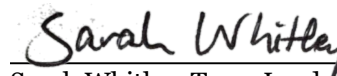
Water Quality Planning Division



Jason Godeaux, Manager
Water Quality Monitoring and Assessment
Section

8/29/2025

Date



Sarah Whitley, Team Leader
Water Quality Standards and Clean Rivers Program

8/29/2025

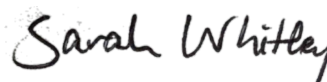
Date



Sunshyne Hendrix
Project Quality Assurance Specialist
Clean Rivers Program

8/29/2025

Date



on behalf of Kiran Freeman
Kiran Freeman, Project Manager
Clean Rivers Program

8/29/2025

Date

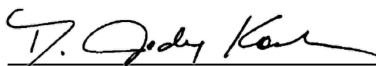


on behalf of Cathy Anderson
Cathy Anderson, Team Leader
Data Management and Analysis

8/29/2025

Date

Air Monitoring Division



D. Jody Koehler,
TCEQ Quality Assurance Manager
Laboratory and Quality Assurance Section

09/02/2025

Date



Loren Walker,
Lead CRP Quality Assurance Specialist
Quality Assurance Team

09/02/2025

Date

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List of Acronyms

AWRL	Ambient Water Reporting Limit
BMP	Best Management Practices
CAP	Corrective Action Plan
CE	Collecting Entity
CFR	Code of Federal Regulations
COC	Chain of Custody
CRP	Clean Rivers Program
DMRG	Surface Water Quality Monitoring Data Management Reference Guide
DM&A	Data Management and Analysis
EPA	United States Environmental Protection Agency
ELS	Environmental Laboratory Services
FY	Fiscal Year
GPS	Global Positioning System
IBWC	International Boundary and Water Commission
LCS	Laboratory Control Sample
LCS D	Laboratory Control Sample Duplicate
LOQ	Limit of Quantitation
LC	Lower Colorado River Authority
LCRA	Lower Colorado River Authority
MT	Monitoring Type
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NELAC	National Environmental Laboratories Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program
NM	North Texas Municipal Water District
NTMWD	North Texas Municipal Water District
PM	Project Manager
QA	Quality Assurance
QAM	Quality Assurance Manager
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QAS	Quality Assurance Specialist
QC	Quality Control
QM	Quality Manual
QMP	Quality Management Plan
RPD	Relative Percent Difference
RR	Red River Authority
RRA	Red River Authority
RT	Routine Monitoring
SE	Submitting Entity
SH	Sherman, City of
SLOC	Station Location
SOP	Standard Operating Procedure
SWQM	Surface Water Quality Monitoring
SWQMIS	Surface Water Quality Monitoring Information System
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TNI	The NELAC Institute
TOC	Total Organic Carbon
TSS	Total Suspended Solids

TSWQS	Texas Surface Water Quality Standards
TWDB	Texas Water Development Board
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
VOA	Volatile Organic Analytes
WQS	Water Quality Standards

A4 Problem Definition/Background

In 1991, the Texas Legislature passed the Texas Clean River Act (Senate Bill 818) in response to growing concerns that water resource issues were not being pursued in an integrated, systematic manner. The act requires that ongoing water quality assessments be conducted for each river basin in Texas, an approach that integrates water quality issues within the watershed. The Clean Rivers Program (CRP) legislation mandates that each river authority (or local governing entity) shall submit quality-assured data collected in the river basin to the commission. Quality-assured data in the context of the legislation means data that comply with Texas Commission on Environmental Quality (TCEQ) rules for surface water quality monitoring (SWQM) programs, including rules governing the methods under which water samples are collected and analyzed and data from those samples are assessed and maintained. This QAPP addresses the program developed between the Red River Authority and the TCEQ to carry out the activities mandated by the legislation. The QAPP was developed and will be implemented in accordance with provisions of the TCEQ Quality Management Plan (QMP), Revision 30 or most recent version.

The purpose of this QAPP is to clearly delineate the Red River Authority's (RRA) Quality Assurance (QA) policy, management structure, and procedures which will be used to implement the QA requirements necessary to verify and validate the surface water quality data collected. The QAPP is reviewed by the TCEQ to help ensure that data generated for the purposes described above are of known and documented quality and deemed acceptable for their intended use. This process will ensure that data collected under this QAPP and submitted to the Surface Water Quality Monitoring Information System (SWQMIS) have been collected and managed in a way that guarantees its reliability and therefore can be used in water quality assessments, total maximum daily load (TMDL) projects, water quality standards development, permit decisions, and other program activities deemed appropriate by the TCEQ. Project results will be used to support the achievement of CRP objectives, as contained in the *Guidance for Partners in the Texas Clean Rivers Program FY 2026–2027*. The FY 2026 monitoring schedule and QAPP are based on:

- ✓ results from previous Water Quality Assessment Reports,
- ✓ constituents listed on the *2024 Texas Integrated Report (IR)*,
- ✓ requests received from the Basins Steering Committees, and
- ✓ requirements, as requested from TCEQ.

Primary concerns in both the Canadian and Red River Basins are depressed dissolved oxygen levels, nitrate, elevated chloride, nutrient, bacteria and chlorophyll-*a* levels. Therefore, the monitoring plan developed by the Authority is designed to accomplish the following:

- ✓ to provide adequate baseline water quality data throughout each basin,
- ✓ to collect data necessary for future *IR* assessments,
- ✓ to consider Basin Steering Committees and stakeholder requests, and
- ✓ to collect data appropriate and useful for TCEQ water quality assessments

Figure 1 illustrates the vicinity of the Canadian and Red River Basins. **Figures 1-1 through 2-5** located in **Appendix C** identify the Authority's FY 26 Monitoring Sites. Under the guidance of this QAPP, the City of Sherman, and the North Texas Municipal Water Authority will collect and analyze specific water quality samples from sites in Reach I of the Red River Basin. The data collected is quality assured and submitted to the Authority on a quarterly or more frequent basis prior to the Authority's periodic data submittal to the TCEQ.



Red and Canadian River Basins Vicinity Map

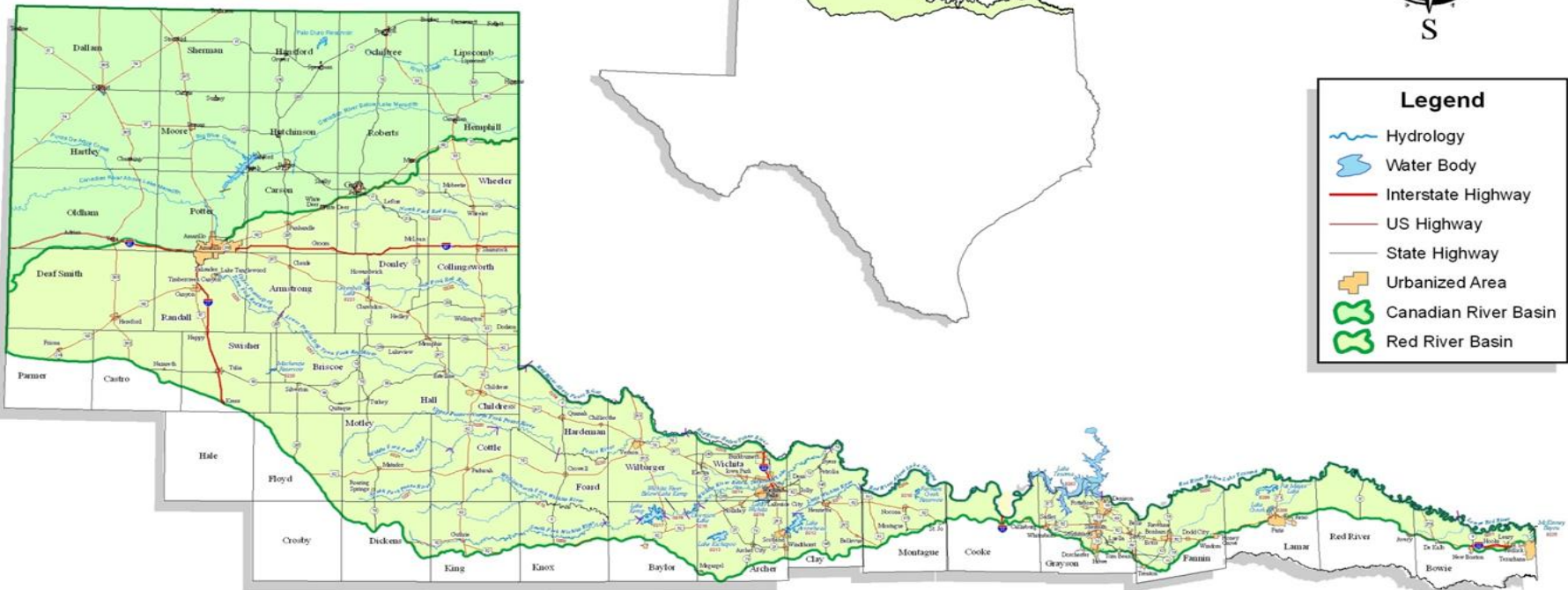


Figure 1

A5 Project/Task Description

The Authority's staff will be responsible for coordinating and conducting the collection of water samples and performing field measurements. The water samples will be relinquished to the Authority's Environmental Laboratory or the Lower Colorado River Authority (LCRA) for analysis. The City of Sherman (SH) and the North Texas Municipal Water District (NTMWD/NM) will be responsible for coordinating and conducting the collection of water samples and performing field measurements. NTMWD will collect and analyze water samples in their laboratory. SH staff will collect and analyze water samples in their laboratory, and ship water samples to the Authority's Environmental Laboratory and the LCRA laboratory. Laboratory and field sample results collected by the City of Sherman or the North Texas Municipal Water District will be submitted to the Authority on a quarterly or more frequent basis under this QAPP. The parameters to be analyzed by each laboratory are shown in **Appendix A**. Annual monitoring will include, at a minimum, quarterly:

- ✓ field measurements,
- ✓ flow measurements as applicable,
- ✓ indicator bacteria analysis, and
- ✓ conventional parameter analyses.

Diurnal (24-hour) monitoring will be conducted by the Authority at specific locations to address dissolved oxygen (DO) impairments and/or concerns identified by the TCEQ. Additional monitoring may be performed depending on the type of contaminant or the primary use of the water body.

In order to provide adequate watershed coverage, it was necessary for the Authority to divide both the Red and Canadian River Basins into five reaches or sub-watersheds identified as Red or Canadian Reach I, II, III, IV or V (please refer to basin reach maps located in **Appendix C** of this QAPP). The Reaches were created using natural hydrology composed of classified and unclassified water bodies as described in the *2022 Texas Surface Water Quality Standards (TSWQS)*. This monitoring plan places an emphasis on a different reach each year in both basins so that by the end of the fifth year, enough data will be collected for the next water quality assessment. The Authority's water quality monitoring plan will:

- ✓ include information from the most recent *Texas IR*,
- ✓ include input from monitoring partners, stakeholders and other interested parties,
- ✓ attempt to locate and identify sources of the elevated nutrient and bacteria concerns, and
- ✓ continue collecting surface water data necessary for present and future water quality assessments using a rotational monitoring approach.

Fiscal Year 2026 the Authority's Reaches of Focus will be:

- Canadian ~ Reach V
- Red ~ Reach IV

Fiscal Year 2027 the Authority's Reaches of Focus will be:

- Canadian ~ Reach I
- Red ~ Reach V

Canadian River Basin

The most common concerns or impairments in the Canadian River Basin are chlorophyll-*a*, bacteria, chloride, and nitrate. There are relatively few wastewater treatment facilities in this basin. Although effluent from these facilities can contribute to nutrient loads in downstream water bodies, they can also provide a consistent base flow in streams that may have gone dry without effluent flows. These effluent flows create habitat for aquatic life that would otherwise not exist. Several concerns for nutrients and chlorophyll-*a* in this basin appeared to be related to upstream wastewater treatment facilities. The low flows seen in many of the streams in the basin allowed for long residence times, which in turn provided adequate time for phytoplankton to consume the excess

nutrients and increase algal populations.

Chlorides were seen to be directly influenced by the drought with levels increasing over the duration of the drought in streams and in reservoirs as their elevations declined. Without freshwater inflows from precipitation, there is very little that can be done to address this concern.

Elevated bacteria levels found throughout the basin appeared to be largely related to livestock and wildlife; either through runoff from pastures and wooded riparian areas during rainfall events or from direct access of animals using the streams as a water source. For a full list of impairments and concerns in the Canadian River Basin please visit the following link: https://www.tceq.texas.gov/waterquality/assessment/305_303.html.

Red River Basin

The most common concerns or impairments in the Red River Basin are bacteria, chlorophyll-*a*, nutrients, and depressed dissolved oxygen. Similar to the Canadian River Basin, wastewater treatment facilities are relatively scarce at the west end of the basin and increase in number moving east from Vernon. As in the Canadian River Basin, effluent from these facilities provided additional stream flow, but also likely contributed to the increased number of segments with nutrient and chlorophyll-*a* concerns in the basin.

The number of segments with concerns or impairments for bacteria increased from west to east across the basin. Additionally, it appeared that the prevalence of runoff related bacteria issues increased moving east across the basin. This could be expected given the shift in climate from west to east. In the arid western portion of the basin, there was less total rainfall and fewer runoff events, but direct access to water bodies by livestock appears to be more common. In contrast, the eastern portion of the basin typically receives more precipitation which could result in more bacteria being washed into nearby water bodies through runoff. For a full list of impairments and concerns in the Red River Basin please visit the following link: https://www.tceq.texas.gov/waterquality/assessment/305_303.html.

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

See Appendix B for sampling design and monitoring pertaining to this QAPP.

Amendments to the QAPP

Amendments to the QAPP may be necessary to address incorrectly documented information or to reflect changes in project organization, tasks, schedules, objectives, and methods. Requests for amendments will be directed from the Red River Authority (RRA) Project Manager (PM) to the TCEQ CRP PM electronically. The RRA 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 the RRA PM, the RRA Quality Assurance Officer (QAO), the TCEQ CRP PM, the TCEQ CRP Lead Quality Assurance Specialist (QAS), the TCEQ CRP Project QAS, the TCEQ CRP Team Leader, the TCEQ Data Management and Analysis (DM&A) Team Leader, and any 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.

Amendments will be incorporated into the QAPP by way of attachment and distributed to personnel on the distribution list by the RRA PM. If adherence letters are required, the RRA 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. The RRA 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 the RRA, the TCEQ CRP PM, and TCEQ technical staff. Appendices will be written in an abbreviated format and will reference the RRA QAPP where appropriate. Appendices will be approved by the RRA PM, the RRA QAO, the RRA or LCRA Laboratory (as applicable), the TCEQ CRP PM, the TCEQ CRP Project QAS, the TCEQ Lead QAS, TCEQ CRP Team Leader, the TCEQ DM&A Team Leader, and additional parties affected by the appendix, as appropriate. Copies of approved QAPP appendices will be distributed by the RRA to project participants before data collection activities commence. The RRA 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. The RRA will maintain this documentation as part of the project's QA records and ensure that the documentation is available for review.

A6 Quality Objectives and Criteria

The purpose of routine water quality monitoring is to collect surface water quality data that can be used to characterize water quality conditions, identify significant long-term water quality trends, support water quality standards development, support the permitting process, and conduct water quality assessments in accordance with TCEQ's [Guidance for Assessing and Reporting Surface Water Quality in Texas, February 2024](https://www.tceq.texas.gov/downloads/water-quality/assessment/integrated-report-2024/2024-guidance.pdf) or most recent version (<https://www.tceq.texas.gov/downloads/water-quality/assessment/integrated-report-2024/2024-guidance.pdf>). These water quality data, and data collected by other organizations (e.g., United States Geological Survey [USGS], TCEQ, etc.), will be subsequently reconciled for use and assessed by the TCEQ. The purpose of 24-hour monitoring is to collect data that can be used to address DO impairments.

Systematic watershed monitoring is defined as sampling that is planned for a short duration (1 to 2 years), is designed to screen waters that would not normally be included in the routine monitoring (RT) program, investigates areas of potential concern, and investigates possible sources of water quality impairments or concerns. Due to the limitations regarding these data (e.g., not temporally representative, limited number of samples, biological sampling does not meet the specimen vouchering requirements), the data will be used to determine whether any locations have values exceeding the TCEQ's water quality criteria and/or screening levels (or in some cases values elevated above normal). The RRA will use this information to determine future monitoring priorities. These water quality data and data collected by other organizations (e.g., USGS, TCEQ, etc.), will be subsequently reconciled for use and assessed by the TCEQ.

The measurement performance specifications to support the project purpose for a minimum data set are specified in Appendix A.

Ambient Water Reporting Limits (AWRLs)

For surface water to be evaluated for compliance with Texas Surface Water Quality Standards (TSWQS) and screening levels, data must be reported at or below specified reporting limits. To ensure data are collected at or below these reporting limits, required ambient water reporting limits (AWRLs) have been established. A full listing of AWRLs can be found at <https://www.tceq.texas.gov/assets/public/waterquality/crp/QA/awrlmaster.pdf>.

The limit of quantitation (LOQ) is the minimum reporting limit, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence by the laboratory analyzing the sample. Analytical results shall be reported down to the laboratory's LOQ (i.e., the laboratory's LOQ for a given parameter is its reporting limit) as specified in Appendix A.

The following requirements must be met in order to report results to the CRP:

- The laboratory's LOQ for each analyte must be set at or below the AWRL. It is the responsibility of RRA to ensure that any laboratories used to generate CRP data have satisfactory LOQs.
- Once the LOQ is established in the QAPP, that is the reporting limit for that parameter until such time as the laboratory amends the QAPP and lists an updated LOQ.

- The laboratory must demonstrate its ability to quantitate at its LOQ for each analyte by running an LOQ check sample for each analytical batch of CRP samples analyzed.
- Under reasonable circumstances (e.g., the use of a subcontracted lab), data may be reported above or below the LOQ stated in this QAPP, so long as the LOQ remains at or below the AWRL stated in this QAPP.
- Measurement performance specifications for LOQ check samples are found in Appendix A.
- The LOQ for total dissolved solids is higher than the established AWRL since concentrations for this parameter are extremely high in both the Canadian and Red River Basins and values are typically not observed at or below the defined AWRL.

Laboratory Measurement Quality Control (QC) Requirements and Acceptability Criteria are provided in Section B4.

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.

Laboratory precision is assessed by comparing replicate analyses of laboratory control samples (LCS) in the sample matrix (e.g., deionized water, sand, commercially available tissue), matrix spike/matrix spike duplicate (MS/MSD), or sample/duplicate (DUP) pairs, as applicable. 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 Appendix A.

Bias

Bias is the systematic or persistent distortion of a measurement process, which causes errors in one direction (i.e., the expected sample measurement is different from the sample's true value). Bias is a statistical measurement of correctness and includes multiple components of systematic error. Bias is determined through the analysis of LCS and LOQ check samples 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 Appendix A.

Representativeness

Site selection, the appropriate sampling regime, comparable monitoring and collection methods, and use of only approved analytical methods will assure that the measurement data represents the conditions at the site. Routine data collected under CRP are considered to be spatially and temporally representative of ambient water quality conditions. Water quality data are collected on a routine frequency and are separated by approximately even time intervals. At a minimum, samples are collected over at least two seasons (to include inter-seasonal variation) and over two years (to include inter-year variation) and include some data collected during an index period (March 15–October 15). Although data may be collected during varying regimes of weather and flow, the data sets will not be biased toward unusual conditions of flow, runoff, or season. The goal for meeting maximum representation of the water body will be tempered by funding availability.

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 as described in this QAPP and in TCEQ guidance. 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 the Data Management Plan in Section B7.

Completeness

The completeness of the data describes how much of the data are 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.

A7 Distribution List

Texas Commission on Environmental Quality P.O. Box 13087 Austin, Texas 78711-3087

Kiran Freeman, Project Manager
Clean Rivers Program
MC-234
(917) 539-8139
kiran.freeman@tceq.texas.gov

Cathy Anderson, Team Leader
Data Management and Analysis Team
MC-234
(512) 239-1805
cathy.anderson@tceq.texas.gov

Loren Walker, Lead CRP Quality Assurance Specialist
Laboratory and Quality Assurance Section
MC-165
(512) 239-6340
loren.walker@tceq.texas.gov

Red River Authority of Texas P.O. Box 240 Wichita Falls, Texas 76307-0240

Dan Medenwaldt, Project Manager
(940) 636-8024
daniel.medenwaldt@rra.texas.gov

Dan Medenwaldt, Quality Assurance Officer
(940) 636-8024
daniel.medenwaldt@rra.texas.gov

Red River Authority of Texas Environmental Laboratory P.O. Box 240 Wichita Falls, Texas 76307-0240

Justlyn Ferrol, Manager
(940) 723-1717
justlyn.ferrol@rra.texas.gov

Tiarra Georges Quality Assurance Officer
(940) 723-1717
tiarra.georges@rra.texas.gov

Lower Colorado River Authority Environmental Laboratory Services 3505 Montopolis Drive Austin, Texas 78767-0220

Jason Woods, Project Manager
(512) 356-6023
Jason.Woods@lcra.org

Angel Mata, Quality Assurance Officer
(512) 356-6023
Angel.Mata@lcra.org

Dale Jurecka, Manager
(512) 356-6023
Dale.Jurecka@lcra.org
City of Sherman
288 Post Oak Road
Sherman, Texas 75090

Nathan Whiddon, Project Manager
(903) 892-7286
nathanw@cityofsherman.com

City of Sherman Utilities Laboratory
288 Post Oak Street
Sherman, Texas 75090

Nicole Moseley, Manager
(903) 892-7256
nicolem@cityofsherman.com

North Texas Municipal District
201 East Brown Street
P.O. Box 2408
Wylie, Texas 75098

Kristen Suprobo, Project Manager
(972) 442-5405
ksuprobo@NTMWD.com

North Texas Municipal District Laboratory
201 East Brown Street
P.O. Box 2408
Wylie, Texas 75098

Kelly Harden, Manager
(972) 442-5405
kharden@NTMWD.com

Chester Wilson Jr, Quality Assurance Officer
(903) 868-2516
chesterw@cityofsherman.com

Nicole Moseley, Quality Assurance Officer
(903) 892-7256
nicolem@cityofsherman.com

Teressa Sullivan, Quality Assurance Officer
(972) 442-5405
tsullivan@NTMWD.com

Catherine Hobbs, Quality Assurance Officer
(972) 442-5405
ckleber@NTMWD.com

The TCEQ CRP PM will provide the approved QAPP and any amendments and appendices to TCEQ staff listed in A7 and the RRA. The RRA will provide copies of this project plan and any amendments or appendices of this plan to each person on this list and to each sub-tier project participant (e.g., subcontractors, subparticipants, or other units of government). The RRA will document distribution of the plan and any amendments and appendices, maintain this documentation as part of the project's quality assurance records, and ensure the documentation is available for review.

A8 Project/Task Organization

Description of Responsibilities

TCEQ

Jason Godeaux

Manager, Monitoring and Assessment Section

Responsible for oversight of the implementation of CRP QAPPs, directs the day-to-day management of the section.

Sarah Whitley***Team Leader, Water Quality Standards and Clean Rivers Program***

Responsible for TCEQ activities supporting the development and implementation of the Texas CRP. Responsible for verifying that the TCEQ QMP is followed by TCEQ 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 QA guidance for the CRP. Reviews and approves all QA audits, corrective actions, reports, work plans, contracts, QAPPs, and TCEQ QMP. Enforces corrective action, as required, where QA protocols are not met. Ensures CRP personnel are fully trained.

Sunshyne Hendrix***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. Reviews and approves CRP QAPPs in coordination with other CRP staff. Coordinates documentation and monitors implementation of corrective actions for the CRP.

Kiran Freeman***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). Coordinates the review and approval of CRP QAPPs in coordination with the TCEQ CRP Project QAS. Ensures maintenance of QAPPs. Assists TCEQ CRP Lead QAS 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 PM. Reviews and approves data and reports produced by contractors. Notifies TCEQ CRP QA Specialists of circumstances that 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 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, Data Management and Analysis Team***

Responsible for coordination and tracking of CRP data sets from initial submittal through TCEQ CRP PM review and approval. Ensures that data are reported following instructions in the Data Management Reference Guide (DMRG), July 2019 or most current version. Runs automated data validation checks in SWQMIS and coordinates data verification and error correction with TCEQ CRP PMs. Generates SWQMIS summary reports to assist CRP PMs' 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 (SE) code(s), collecting entity (CE) code(s), and monitoring type (MT) 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).

D. Jody Koehler***TCEQ Quality Assurance Manager***

Responsible for coordinating development and implementation of TCEQ's QA program. Provides oversight and guidance for TCEQ's QA program. Responsible for the development and maintenance of the TCEQ QMP. TCEQ's QA Manager, or designated QA staff in the Laboratory and Quality Assurance Section of the Air Monitoring Division, is responsible for review and approval of program/project QAPPs to ensure QAPPs conform to applicable requirements as detailed in TCEQ's QMP.

Loren Walker

CRP Lead Quality Assurance Specialist

Participates in the development, approval, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Assists program manager and TCEQ CRP Project QAS in developing and implementing the quality system. Reviews and approves CRP QAPPs, QAPP amendments, and QAPP special appendices. Prepares and distributes annual audit plans. Conducts monitoring systems audits of planning agencies. Concurs with corrective actions. 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 audit records for the CRP.

Red River Authority

Dan Medenwaldt

Project Manager

Responsible for implementing and monitoring CRP requirements in contracts, QAPPs, and QAPP amendments and appendices. Coordinates basin planning activities and work of basin partners. Ensures monitoring systems audits are conducted to ensure QAPPs are followed by RRA participants and that projects are producing data of known quality. Ensures that subparticipants are qualified to perform contracted work. Ensures TCEQ CRP PM 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.

Dan Medenwaldt

Quality Assurance Officer

Responsible for coordinating the implementation of the QA program. Responsible for writing and maintaining the QAPP and monitoring its implementation. 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 QA records. Responsible for coordinating with the TCEQ CRP PM to resolve QA-related issues. 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. Conducts monitoring systems audits on project participants to determine compliance with project and program specifications, issues written reports, and follows through on findings. Ensures that field staff is properly trained and that training records are maintained.

Glen Hite

Data 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 Red River Authority's internet sites.

Justlyn Ferrol

Laboratory Manager

Oversees all operations of the laboratory and Quality System, including proficiency studies, verifies all analyses (bench sheets through final analytical report); reviews, validates, and approves data, completes drinking water reports; verifies and sends outgoing reports; clientele relation maintenance and documentation; personnel; pipette calibrations; data entry; audit and Corrective Action Reports (CAR), assistance/monitoring; employee records; equipment management; orders supplies. Assists in the Laboratory. Technical Manager.

Tiarra Georges

Laboratory Project Quality Assurance Officer

Ensures proper implementation of the Quality System; reviews SOPs, Quality Manual, and lab documenting procedures; audits all analyses (bench sheets through final analytical report); performance record keeping including but not limited to Method Detection Limits, Linear Calibration Range verification and Limit of Quantitation verification; personnel training; pipette calibrations; data entry; reviews, validates, and approves

data, completes drinking water reports; audits and CAR completion and monitoring; verifies and sends outgoing reports; orders, receive and manage supplies. Assists in the Laboratory.

Dan Medenwaldt
Field Supervisor

Responsible for overseeing the field personnel that conduct sampling events. Ensures that all field personnel are properly trained and that training records are maintained. Ensures that all field staff are equipped to conduct the necessary monitoring. Ensures that personnel and equipment are available at appropriate times. The Field Supervisor also ensures that all field data are collected as outlined in this QAPP and the *TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, August 2012 (RG-415)* or most current version. Serves as CRP Sample Custodian. Coordinates and maintains records of data verification and validation. Assists with monitoring systems audits on project participants to determine compliance with project and program specifications.

Dan Medenwaldt / Matthew Tullock / Ryan Lawrence / Sarah Burgett / Fabian Heaney
Field Staff / Data Entry Technician

Responsible for entering quality assured SWQM data into the Authority's water quality database. Assists during data collection events and serves as alternate CRP Sample Custodian.

Lower Colorado River Authority Environmental Laboratory Services

The Lower Colorado River Authority Laboratory is a river authority laboratory that is able to perform sophisticated chemical tests as required by the CRP and has contracted with the RRA to perform specific specialized analyses. The RRA will utilize LCRA in emergency situations where analysis(es) is/are unable to be performed due to equipment failure or in the instance a requested analysis is not currently within the RRA's scope of accredited analyses as it pertains to the National Environmental Laboratory Accreditation Program (NELAP) Field of Accreditation (FOA) certificate issued to the Authority.

Jason Woods
Project Manager

Responsible for implementing and monitoring CRP requirements in contracts, QAPPs, and QAPP amendments and appendices. Ensures internal monitoring systems audits are conducted to ensure that LCRA Environmental Laboratory is producing data of known quality. 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 customer or to the TCEQ.

Dale Jurecka
Laboratory 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 Clean Rivers Program. Ensures that laboratory personnel have adequate training and 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.

Angel Mata
Quality Assurance Officer

Responsible for the overall quality control and quality assurance of analyses performed by LCRA's Environmental Laboratory Services. Monitors the implementation of the Authority's 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.

City of Sherman

Collects and analyzes specific water quality samples required for their specific operations. Data which are submitted to the Authority, as identified in **Appendix A, Table A6.3** for use in the CRP, will be collected and analyzed under the guidelines set forth in this QAPP.

Nathan Whiddon ***Project Manager***

Responsible for implementing and monitoring CRP requirements of the QAPP(s), QAPP amendments and appendices. Coordinates planning activities and ensures internal monitoring systems audits are conducted to ensure that staff adheres to the QAPP and that the City of Sherman Utilities Laboratory participants are producing data of known quality. Ensures that subordinates are qualified to perform contracted work. Ensures that the Red River Authority CRP Project Manager and/or QA Specialist are notified of deficiencies and corrective actions, and that issues are resolved.

Chester Wilson Jr. ***Quality Assurance Officer***

Responsible for coordinating the implementation of the QA program. Notifies the RRA Project Manager of particular circumstances which 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. Conducts internal monitoring systems audits to determine compliance with project and program specifications. Ensures that field staff are properly trained and that training records are maintained.

Nicole Moseley ***Laboratory Manager***

Responsible for ensuring that all samples received in the laboratory are within the allotted time, and that proper chain-of-custody procedures have been observed. Ensures samples are analyzed in accordance with standard accepted methods as described in the SOP manual. Conducts internal laboratory audits to determine compliance with project and program specifications related to laboratory analysis. The Laboratory Manager further ensures that all analytical results are correctly performed and properly recorded on the laboratory data sheets and in the appropriate analytical log books prior to transmittal to the City of Sherman CRP Project Manager.

Nicole Moseley ***Laboratory Quality Assurance Officer***

Responsible for coordinating the implementation of the Laboratory QA program. 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. Conducts internal laboratory audits to determine compliance with project and program specifications related to laboratory analysis. Responsible for identifying, and maintaining Laboratory quality assurance records. Maintains laboratory training records.

Derek Insall ***Field Supervisor***

Responsible for overseeing the field personnel that conduct sampling events. Ensures that all field personnel are properly trained and equipped to conduct the necessary monitoring. Ensures that personnel and equipment are available at appropriate times. The Field Supervisor ensures that all field data are collected as outlined in this QAPP and the *TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, August 2012 (RG-415)* or most current version.

North Texas Municipal Water District

Collects and analyzes specific water quality samples required for their specific operations. Data which are submitted to the Authority, as identified in **Appendix A, Table A6.2** for use in the CRP, will be collected and analyzed under the guidelines set forth in this QAPP.

Kristen Suprobo
Project Manager

Responsible for overall project direction. As CRP Project Manager, is responsible for all CRP related activities conducted by NTMWD. The Project Manager will also oversee submittal of water quality samples to the contract laboratory, as appropriate, and will be responsible for confirming that requested analyses are carried out. Ensures that field staff are trained and that training records are maintained.

Teressa Sullivan
Quality Assurance Officer

Responsible for coordinating the implementation of the CRP QA program within NTMWD. Responsible for maintaining the CRP QAPP and monitoring its implementation within NTMWD. 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. Notifies the CRP Project Manager of particular circumstances which may adversely affect the quality of data. Coordinates with the CRP Project Manager to monitor deficiencies and corrective action. Coordinates and maintains records of data verification and validation submitted to RRA.

Kelly Harden
Laboratory Manager

Serves as primary laboratory contact. Responsible for ensuring that all samples received in the NTMWD Environmental Laboratory do not exceed holding time(s), and that the chain-of-custody has been observed. Ensures that the samples are analyzed in accordance with standard accepted methods as described in this QAPP and the SOP manual. Ensures all results are properly recorded on laboratory data sheets and in the appropriate analytical log books. Responsible for the implementation of the QA program for the NTMWD Environmental Laboratory. Ensures laboratory staff is properly trained. Responsible for distribution of hardcopy and electronic reports to customers.

Catherine Hobbs
Laboratory Quality Assurance Officer

Responsible for coordinating the implementation of the Laboratory QA program. Notifies NTMWD Laboratory Manager of particular circumstances which 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. Conducts internal monitoring systems audits to determine compliance with project and program specifications related to laboratory analysis. Responsible for identifying, and maintaining Laboratory quality assurance records. Maintains laboratory training records.

Robert Huffman
Field Supervisor

As CRP Field Supervisor, is responsible for ensuring that field samples and measurements are collected and recorded according to methodologies detailed in *TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, August 2012 (RG-415)*. The Field Supervisor role will have primary responsibility for initiating corrective actions in the field in support of data completeness goals of 90%. The Field Supervisor will ensure proper use of CRP Field Data Sheets, field notebooks, proper calibration of equipment and that chain-of-custody forms are correctly completed and received by the laboratory.

A9 Project QAM Independence

TCEQ uses a semi-decentralized QA program, which is organizationally independent of operational programs and activities within the agency. TCEQ's QA program has sufficient access and authority to coordinate the development and implementation of the agency's quality system.

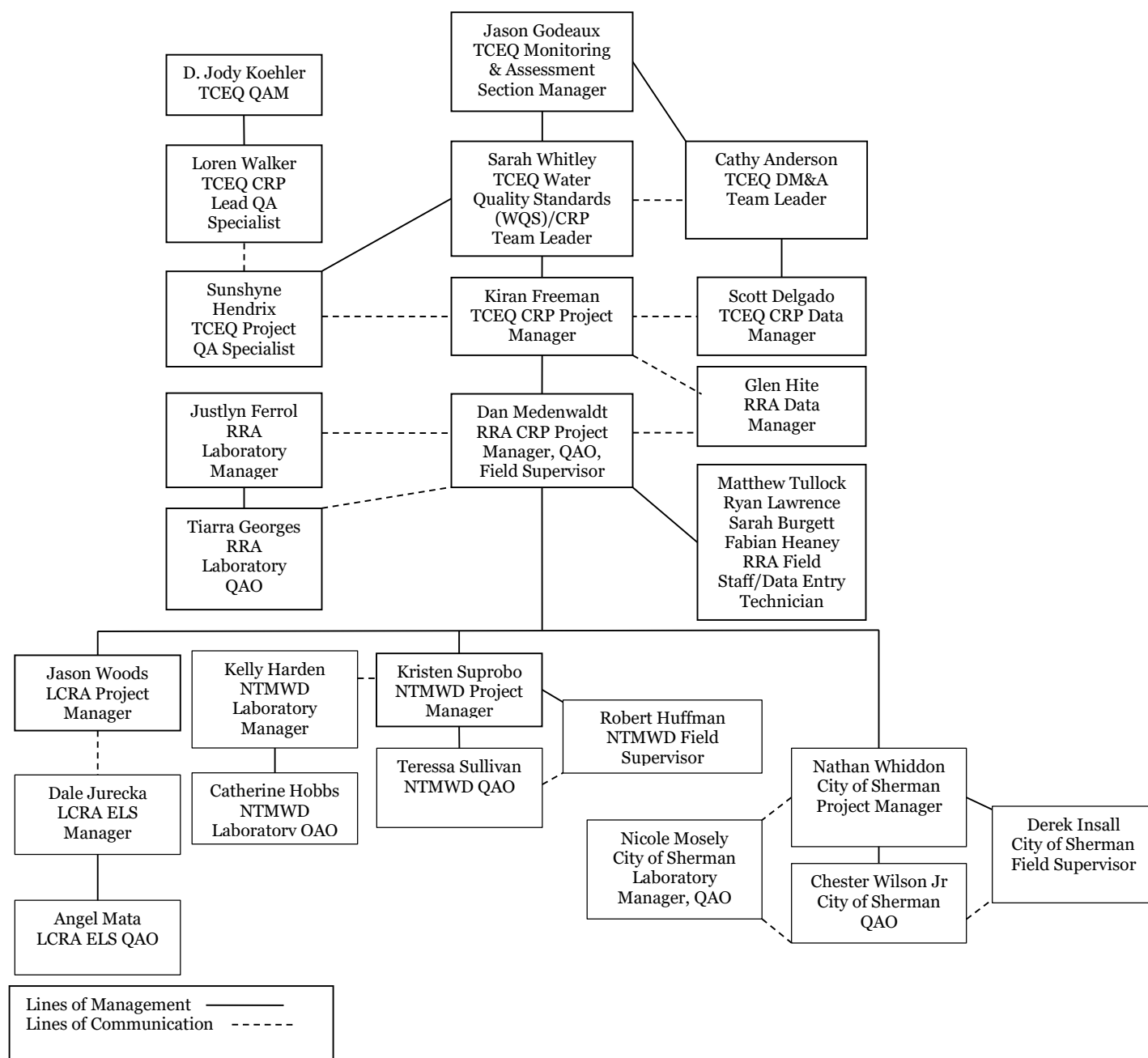
The TCEQ QA Manager (QAM) and designated TCEQ QA staff from the Laboratory and Quality Assurance Section within the Air Monitoring Division of the Office of Air are independent of activities performed by CRP. No CRP staff have authority to sign QAPPs, amendments, or appendices on behalf of TCEQ's QAM or the Lead CRP QAS. Similarly, TCEQ's QAM and the Lead CRP QAS cannot sign QAPPs, amendments or appendices on behalf of CRP staff.

Roles of project QA staff are described in Section A8. An illustration of QA independence and lines of communication and supervision for this project are detailed in the project organization chart in A10. Communication for deficiencies and corrective actions are described in Section C1.

A10 Project Organizational Chart and Communication

Project Organization Chart

Figure A10.1. Organization Chart with Lines of Communication



A11 Special Training/Certification

Before new field personnel independently conduct field work, respective Project Managers (or designee) trains them in proper instrument calibration, field sampling techniques, and field analysis procedures. The respective QAO (or designee) will document the successful field demonstration. The QAO (or designee) will retain documentation of training and the successful field demonstration in the employee's personnel file (or other designated location) and ensure that the documentation will be available during monitoring systems audits.

The requirements for obtaining certified positional data using a global positioning system (GPS) are located in Section B7, Data Management.

Contractors and subcontractors must ensure that laboratories analyzing samples under this QAPP meet the requirements contained in The National Environmental Laboratories Accreditation Conference (NELAC) Institute Standard (2016) Volume 1, Module 2, Section 4.5 (concerning Subcontracting of Environmental Tests).

A12 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.

Table A12.1 Project Documents and Records

Document/Record	Location	Retention (yrs)	Format
QAPPs, Amendments and Appendices	RRA	Seven	Paper, Digital
Field SOPs	RRA, SH ¹ , NM	Seven	Paper, Digital
Laboratory QA Manuals	RRA, LCRA ¹ , SH ¹ , NM	Seven	Paper, Digital
Laboratory SOPs	RRA, LCRA ¹ , SH ¹ , NM	Seven	Paper, Digital
QAPP Distribution Documentation	RRA, LCRA ¹ , SH ¹ , NM	Seven	Paper, Digital
Field Staff Training Records	RRA, SH ¹ , NM	Seven	Paper, Digital
Field Equip. Calibration/Maintenance Logs	RRA, SH ¹ , NM	Seven	Paper, Digital
Field Instrument Printouts	RRA, SH ¹ , NM	Seven	Paper, Digital
Field Notebooks or Data Sheets	RRA, SH ¹ , NM	Seven	Paper, Digital
Chain of Custody Records	RRA, LCRA ¹ , SH ¹ , NM	Seven	Paper, Digital
Laboratory Calibration Records	RRA, LCRA ¹ , SH ¹ , NM	Seven	Paper, Digital
Laboratory Instrument Printouts	RRA, LCRA ¹ , SH ¹ , NM	Seven	Paper, Digital
Laboratory Data Reports/Results	RRA, LCRA ¹ , SH ¹ , NM	Seven	Paper, Digital
Laboratory Equip. Maintenance Logs	RRA, LCRA ¹ , SH ¹ , NM	Seven	Paper, Digital
Corrective Action Documentation	RRA, LCRA ¹ , SH ¹ , NM	Seven	Paper, Digital

¹ LCRA and SH document retention is five years

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 NELAC Institute (TNI) Standard (2016), 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.

- ✓ Title of report and unique identifiers on each page
- ✓ Name and address of the laboratory
- ✓ Name and address of the client
- ✓ A clear identification of the sample(s) analyzed
- ✓ Date and time of sample receipt
- ✓ Identification of method used
- ✓ Identification of samples that did not meet QA requirements and why (e.g., holding times exceeded)
- ✓ Sample results

- ✓ Units of measurement
- ✓ Sample matrix
- ✓ Dry weight or wet weight (as applicable)
- ✓ Station information
- ✓ Date and time of collection
- ✓ Sample depth
- ✓ Holding time for *E. coli*
- ✓ Clearly identified subcontract laboratory results (as applicable)
- ✓ A name and title of person accepting responsibility for the report
- ✓ Narrative information on QC failures or deviations from requirements that may affect the quality of results or is necessary for verification and validation of data
- ✓ LOQ and LOD (formerly referred to as the reporting limit and the method detection limit, respectively), and qualification of results outside the working range (if applicable)
- ✓ Certification of NELAP compliance

Electronic Data

Data will be submitted electronically to the TCEQ in the event/result file format described in the most current version of the [DMRG](https://www.tceq.texas.gov/waterquality/data-management/dmrg_index.html), which can be found at https://www.tceq.texas.gov/waterquality/data-management/dmrg_index.html. A completed data review checklist and data summary (see Appendix F) will be included with each data submittal.

The City of Sherman will submit both field data sheets and laboratory reports for parameters outlined in **Tables A6.3-A, A6.3-B, A6.3-C, and A6.3-D** from surface water quality monitoring events on a quarterly or more frequent basis to the Authority in either digital or paper format. Data packets submitted to the Authority will be reviewed for completeness and then entered by the Authority's CRP Data Entry Technician into the Authority's SWQM Database for submission to TCEQ.

The North Texas Municipal Water District will submit both field data sheets and laboratory reports for parameters outlined in **Tables A6.2-A, A6.2-B, A6.2-C, A6.2-D and A6.2-E** from surface water quality monitoring events on a quarterly or more frequent basis to the Authority in either digital or paper format. Data packets submitted to the Authority will be reviewed for completeness and then entered by the Authority's CRP Data Entry Technician into the Authority's SWQM Database for submission to TCEQ.

The LCRA Environmental Laboratory is utilized as a contract lab. Results from samples submitted to the LCRA Laboratory are electronically submitted to the Authority for review and submission in each data submittal to the TCEQ.

B1 Sampling Process Design

See Appendix B for sampling process design information and monitoring tables associated with data collected under this QAPP.

B2 Sampling Methods

Field Sampling Procedures

Field sampling will be conducted in accordance with the latest versions of the *TCEQ Surface Water Quality Monitoring Procedures Volume 1: Physical and Chemical Monitoring Methods, 2012* (RG-415) and *Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014* (RG-416), collectively referred to as “SWQM Procedures.” Updates to SWQM Procedures are posted to the Surface Water Quality Monitoring Procedures website (https://www.tceq.texas.gov/waterquality/monitoring/swqm_guides.html), and shall be incorporated into the Authority’s, NTMWD’s, and the City of Sherman’s procedures, QAPP, SOPs, etc., within 60 days of any final published update. Additional aspects outlined in Section B below reflect specific requirements for sampling under CRP and/or provide additional clarification.

Table B2.1 Sample Storage, Preservation, and Handling Requirements

Parameter	Container ¹	Preservation ²	Sample Volume ³	Holding Time ⁴
Bacteriological (Water)				
<i>Enterococcus</i>	I	Sodium Thiosulfate, Cool to <6° C but not frozen	120 mL	8 Hours
<i>Escherichia coli</i>	I	Sodium Thiosulfate, Cool to <6° C but not frozen	120 mL	30 Hours ⁷
Conventional and Minerals (Water)				
Alkalinity, Total	P	Cool to <6° C but not frozen	1.0 L	14 Days
Chloride	P	Cool to <6° C but not frozen	125 mL	28 Days
Solids, Suspended (TSS)	P	Cool to <6° C but not frozen	1.0 L	7 Days
Solids, Dissolved (TDS)	P	Cool to <6° C but not frozen	250 mL	7 Days
Sulfate	P	Cool to <6° C but not frozen	125 mL	28 Days
Turbidity	P	Cool to <6° C but not frozen	250 mL	48 Hours
Nutrients (Water)				
Ammonia	P	Cool to <6° C but not frozen, H ₂ SO ₄ to pH<2	500 mL	28 Days
Chlorophyll- <i>a</i> and Pheophytin	P Amber ⁵	Unfiltered, Dark, Cool to <6° C but not frozen	250 mL	48 Hours
		Filtered, Dark, Frozen - EPA		24 Days ⁶
		Filtered, Dark, Frozen - SM		28 Days ⁶
Nitrate + Nitrite	P	Cool to <6° C but not frozen, H ₂ SO ₄ to pH<2	500 mL	28 Days
Nitrate	P	Cool to <6° C but not frozen	125 mL	48 Hours
Nitrite	P	Cool to <6° C but not frozen	125 mL	48 Hours
Total Organic Carbon (TOC) ⁸	P	Cool to <6° C but not frozen, H ₃ PO ₄ to pH<2	500 mL	28 Days
Total Kjeldahl Nitrogen (TKN)	P	Cool to <6° C but not frozen, H ₂ SO ₄ to pH<2	500 mL	28 Days
Total Phosphorus	P	Cool to <6° C but not frozen, H ₂ SO ₄ to pH<2	500 mL	28 Days
Metals (Water)				
Hardness, Total	P	Cool to <6° C but not frozen, HNO ₃ to pH<2	250 mL	6 Months
Iron, Total	P	Cool to <6° C but not frozen, HNO ₃ to pH<2	500 mL	6 Months
Manganese, Total	P	Cool to <6° C but not frozen, HNO ₃ to pH<2	500 mL	6 Months

¹ IDEXX (I) or Polyethylene (P).

² Sample preservation is performed immediately upon sample collection.

³ Sample bottles are combined by preservative to minimize volumes and reduce container size and space.

4. Samples are analyzed as soon as possible after collection. The times listed are the maximum times that samples are held before sample preparation or analysis and still be considered valid.
5. Chlorophyll-*a* and Pheophytin will be collected in amber containers.
6. EPA method 445, Section 8.3 states that samples can be analyzed up to 24 days after filtering, as long as they remain frozen. The 48 hours allotted for the samples to be filtered is not part of the 24 day holding time following filtration. NTMWD utilizes SM 10200 H for Chlorophyll-*a* and Pheophytin which has a different holding time compared to EPA method 445
7. *E.coli* samples analyzed by SM 9223 B should always be processed as soon as possible and incubated within 8 hours of sample collection. When transport conditions necessitate sample incubation after 8 hours from time of collection, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.
8. NTMWD is the only entity analyzing TOC.

Sample Containers

Certificates from sample container manufacturers are maintained in a notebook by the Authority or by the laboratory. The Authority utilizes commercially purchased disposable plastic leak proof sample containers for all conventional parameters. The sample containers are selected based on requirements from 40 Code of Federal Regulations (CFR) 136 and are both chemically and thermally preserved. Commercially purchased pre-sterilized plastic containers in 120 mL with sodium thiosulfate are used for collecting bacteriological samples. The Authority will provide the City of Sherman with the appropriate sample collection bottles.

NTMWD utilizes commercially purchased disposable plastic leak proof sample containers for the following conventional parameters: Total Organic Carbon and metals (iron and manganese). For all other conventional parameters, NTMWD utilizes reusable plastic leak proof sample containers that have been cleaned in accordance with NTMWD's Labware Cleaning Procedures (36-084). All sample containers are selected based on requirements from 40 CFR 136 and are both chemically and thermally preserved. Commercially purchased pre-sterilized plastic containers in 120 and/or 290 mL with sodium thiosulfate are used by NTMWD for collecting bacteriological samples. Certificates of Analysis for both commercially purchased disposable plastic leak proof sample containers and pre-sterilized plastic containers in 120 and/or 290 mL with sodium thiosulfate are permanently maintained by NTMWD.

Processes to Prevent Contamination

SWQM Procedures outline the necessary steps to prevent contamination of samples, including: direct collection into sample containers, when possible; use of certified containers for organics; and clean sampling techniques for metals. Field QC samples (identified in Section B4) 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 D. Flow worksheets, aquatic life use monitoring checklists, habitat assessment forms, field biological assessment forms, and records of bacteriological analyses (if applicable) are part of the field data record. The following will be recorded for all visits:

- Station ID
- Sampling date
- Location
- Sampling depth
- Sampling time
- Sample collector's name
- Values for all field parameters collected

Additional notes containing detailed observational data not captured by field parameters may include:

- Water appearance
- Weather
- Biological activity
- Recreational activity
- Unusual odors

- Pertinent observations related to water quality or stream uses
- Watershed or instream activities
- Specific sample information
- Missing parameters

Recording Data

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

- Write legibly, in indelible ink.
- Make changes by crossing out original entries with a single line strike-out, entering the changes, and initialing and dating the corrections.
- Close-out incomplete pages with an initialed and dated diagonal line.

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 RRA PM/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 TCEQ CRP PM 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.

Analytical Methods

The analytical methods, associated matrices, and performing laboratories are listed in Appendix A. The authority for analysis methodologies under CRP is derived from the Texas Administrative Code (TAC), Title 30, Chapter 307, in that data generally are generated for comparison to those standards and/or criteria. The TSWQS state “procedures for laboratory analysis must be in accordance with the most recently published edition of the book entitled Standard Methods for the Examination of Water and Wastewater, the TCEQ SWQM Procedures as amended, 40 Code of Federal Regulations (CFR) 136, or other reliable procedures acceptable to the TCEQ, and in accordance with chapter 25 of this title.”

Laboratories collecting data under this QAPP must be accredited by the National Environmental Laboratory Accreditation Program (NELAP) in accordance with TAC, Title 30, Chapter 25. Copies of laboratory quality manuals (QMs) and SOPs shall be made available for review by the TCEQ.

Standards Traceability

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

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 supervisor, who will make the determination and notify the RRA QAO 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 RRA PM. If a CAP is necessary (Figure C1.1), the RRA QAO will submit the CAP to the TCEQ CRP PM in a timely manner for review. Additionally, the RRA PM will summarize the CAP in the associated progress report submitted to the TCEQ CRP PM.

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

The TCEQ has determined that analyses associated with qualifier codes (e.g., “holding time exceedance,” “sample received unpreserved,” “estimated value”) 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. However, when data is lost, its absence will be described in the data summary report submitted with the corresponding data set, and a CAP (as described in Section C1) may be necessary.

Acquired Data

Non-directly measured data, secondary data, or acquired data involves the use of data collected under another project and collected with a different intended use than this project. The acquired data still meets the quality requirements of this project and is defined below. The following data source(s) will be used for this project:

USGS gage station data will be used throughout this project to aid in determining gage height and flow. Rigorous QA checks are completed on gage data by the USGS and the data are approved by the USGS and permanently stored at the USGS. This data will be submitted to the TCEQ under parameter code 00061 (instantaneous flow) or parameter code 74069 (flow estimate) depending on the proximity of the monitoring station to the USGS gage station.

Reservoir stage data are collected every day from the USGS, International Boundary and Water Commission (IBWC), and the United States Army Corps of Engineers (USACE) websites. These data are preliminary and subject to revision. The Texas Water Development Board (TWDB) derives reservoir storage (in acre-feet) from these stage data (elevation in feet above mean sea level), by using the latest rating curve datasets available. These data are published at the TWDB website at <http://waterdatafortexas.org/reservoirs/statewide>. Information about measurement methodology can be found on the TWDB website. These data will be submitted to the TCEQ under parameter code 00052 (reservoir stage), parameter code 00053 (reservoir percent full), and parameter code 00054 (reservoir storage).

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 following information concerning the sample is recorded on the COC form (see Appendix E). The following list of items matches the COC form in Appendix E.

Date and time of collection

Site identification
Sample matrix
Number of containers
Preservative used
Was the sample filtered
Analyses required
Name of collector
Custody transfer signatures and dates and time of transfer
Bill of lading, if applicable

Sample Labeling

Samples from the field are labeled on the container, or on a label, with an indelible marker. Label information includes:

Site identification
Date and time of collection
Preservative added, if applicable
Indication of field-filtration for metals, as applicable
Sample type (i.e., analyses) to be performed

Sample Handling

Written SOPs have been developed for sample handling, sample receiving, and sample shipping which are included in the QA Manual which is edited and maintained by each entity's CRP QAO. The SOPs utilized for all Clean Rivers Program sampling include the following procedures:

During preparations for a sampling event, preliminary sample and event information is recorded on a COC form, leaving only the date, time and sample information to be recorded when the sample is collected.

1. Prior to the scheduled monitoring event(s), sample kits are prepared. The kits include sample containers with or without preservatives as required by the analysis method.
2. Samples are collected under protocols documented in the TCEQ's *SWQM Procedures Manual*. Samples are packed in loose ice in accordance with the preservation (or preserved according to) criteria listed in **Table B2.1** of this QAPP.
3. The date, time, collector and specific conductance (*E. coli*, TKN/Nitrogen/Ammonia, TDS/TSS, and anion sample containers only) information is completed on the sample container labels and the COC.
4. The ice chests containing the samples are secured until delivered to the laboratory. If the samples are left overnight in a vehicle, the vehicle will be locked and monitored periodically.
5. The samples are received in the laboratory in a designated area where the Sample Collector relinquishes the samples to the sample custodian who in turn inspects the containers and signs the COC on the receiving line.
6. Each sample is logged into the Laboratory Information Management System (LIMS) and assigned a unique Sample ID Number. Information documented in the LIMS includes:
 - ✓ Date Received
 - ✓ Client
 - ✓ Sample ID Number
 - ✓ Sample Location
 - ✓ Sample Source
 - ✓ Collected by
 - ✓ Collection Date
 - ✓ Collection Time
 - ✓ Analyses
 - ✓ Time Sample Received
 - ✓ Preservative
 - ✓ Chain of Custody Number

7. The LIMS generates a label with the Sample ID Number, Analysis, Sample Location and Bottle ID Number which is placed on the sample container by the sample custodian.
8. Samples are then transferred to the laboratory storage facility by the sample custodian. Access to the storage facility is limited to authorized personnel only.
9. In the event that the Authority ships samples to LCRA for analyses, the samples to be shipped are recorded on a separate COC form with the original COC number written in the comment section. The samples along with the COC are then packed in an insulated shipping container with ice depending on the preservation requirements. The shipping container is then sealed, and labeled with LCRA's name and address. The sealed sample containers are then shipped via overnight delivery. LCRA is contacted by phone and/or e-mail informing them of the shipped sample(s) and when they should expect delivery.

Sample Tracking Procedure Deficiencies and Corrective Action

All deficiencies associated with COC procedures, as described in this QAPP, are immediately reported to the RRA PM. 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 RRA PM/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 CRP PM in the project progress report. CAPs will be prepared by RRA and submitted to TCEQ CRP PM.

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

B4 Quality Control

Sampling Quality Control Requirements and Acceptability Criteria

The minimum field QC requirements, and program-specific laboratory QC requirements, are outlined in SWQM Procedures. Specific requirements are outlined below. Field QC sample results are submitted with the laboratory data report (see Section A12).

Field blank

Field blanks are required for total metals-in-water samples when collected without sample equipment (i.e., as grab samples). For other types of samples, they are optional. A field blank is prepared in the field by filling a clean container with pure deionized water and appropriate preservative, if any, for the specific sampling activity being undertaken. Field blanks are used to assess contamination from field sources, such as airborne materials, containers, or preservatives. Field blanks for total metals-in-water samples will be collected at a frequency of one per day of sampling. Only those samples collected on dates with associated field blanks collected on the same day will be submitted to TCEQ.

The analysis of field blanks should yield values lower than the LOQ. When target analyte concentrations are high, blank values should be lower than 5% of the lowest value of the batch, or corrective action will be implemented.

Field blanks are associated with batches of field samples. In the event of a field blank failure for one or more target analytes, all applicable data associated with the field batch may need to be qualified as not meeting project QC requirements, and these qualified data will not be reported to the TCEQ. These data include all samples collected on that day during that sample run and should not be confused with the laboratory analytical batch.

Field equipment blank

Field equipment blanks are required for metals-in-water samples when collected using sampling equipment. The field equipment blank is a sample of analyte-free media which has been used to rinse common sampling equipment to check the effectiveness of decontamination procedures. It is collected in the same type of container as the environmental sample, preserved in the same manner, and analyzed for the same parameter. Field equipment blanks for dissolved metals-in-water samples will be collected at a frequency of one per day of

sampling. Only those samples collected on dates with associated field equipment blanks collected on the same day will be submitted to TCEQ.

The analysis of field equipment blanks should yield values lower than the LOQ, or, when target analyte concentrations are very high, blank values must be less than 5% of the lowest value of the batch, or corrective action will be implemented.

Field equipment blanks are associated with batches of field samples. In the event of a field equipment blank failure for one or more target analytes, all applicable data associated with the field batch may need to be qualified as not meeting project QC requirements, and these qualified data will not be reported to the TCEQ. These data include all samples collected on that day during that sample run and should not be confused with the laboratory analytical batch.

Laboratory Measurement Quality Control Requirements and Acceptability Criteria

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 24 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 in this section (e.g., sample duplicates, surrogates, internal standards, continuing calibration samples, interference check samples, positive control, negative control, and media blank), are run as specified in the methods and in SWQM Procedures. 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 QMs. The minimum requirements that all participants abide by are stated below.

Comparison Counting

For routine bacteriological samples, repeat counts on one or more positive samples are required, at least monthly. If possible, the analyst will compare counts with another analyst who also performs the analysis. Replicate counts by the same analyst should agree within 5 percent, and those between analysts should agree within 10 percent. The analyst(s) will record the results.

Limit of Quantitation (LOQ)

The laboratory will analyze a calibration standard (if applicable) at the LOQ published in Appendix A of this QAPP on each day calibrations are performed. In addition, an LOQ check sample will be analyzed with each analytical batch. Calibrations including the standard at the LOQ listed in Appendix A will meet the calibration requirements of the analytical method, or corrective action will be implemented.

LOQ Check Sample

An LOQ check sample 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 sample is spiked into the sample matrix at a level less than or equal to the LOQ published in Appendix A of this QAPP, for each analyte for each analytical batch of CRP samples run. If it is determined that samples have exceeded the high range of the calibration curve, samples should be diluted or run on another curve. For diluted or high concentration samples

run on batches with calibration curves that do not include the LOQ published in Appendix A of this QAPP, a check sample will be run at the low end of the calibration curve.

The LOQ check sample is carried through the complete preparation and analytical process and is performed at a rate of one per analytical batch.

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

$$\%R = S_R / S_A \times 100$$

Measurement performance specifications are used to determine the acceptability of LOQ check sample analyses as specified in Appendix A of this QAPP.

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 midpoint 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 and is performed 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; S_R is the measured result; and S_A is the true result:

$$\%R = S_R / S_A \times 100$$

Measurement performance specifications are used to determine the acceptability of LCS analyses as specified in Appendix A.

Laboratory Duplicates

A laboratory duplicate is an aliquot taken from the same container as an original sample under laboratory conditions and processed and analyzed independently. A laboratory duplicate is achieved by preparing 2 separate aliquots of a sample, LCS, or matrix spike. Both samples are carried through the entire preparation and analytical process. Laboratory duplicates are used to assess precision and are performed at a rate of one per preparation batch.

For most parameters except bacteria, precision is evaluated using the relative percent difference (RPD) between 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:

$$RPD = \frac{|X_1 - X_2|}{\left(\frac{X_1 + X_2}{2}\right)} \times 100$$

If the precision criterion is exceeded, the data are not acceptable for use under this project and are not reported to TCEQ. Results from all samples associated with that failed duplicate (usually a maximum of 10 samples) are considered to have excessive analytical variability and are qualified as not meeting project QC requirements.

For bacteriological parameters, precision is evaluated using the results from laboratory duplicates.

Bacteriological duplicates are analyzed at a 10% frequency (or once per preparation batch, whichever is more frequent). Sufficient volume should be collected to analyze laboratory duplicates from the same sample container.

The base-10 logarithms of the results from the original sample and its duplicate are calculated. The absolute value of the difference between the two base-10 logarithms is calculated and compared to the precision criterion in Appendix A.

$$|\text{Log A} - \text{Log B}| = \text{Log Range}$$

If the difference in logarithms is greater than the precision criterion, the data are not acceptable for use under this project and are not reported to TCEQ. Results from all samples associated with that failed duplicate (usually a maximum of 10 samples) are considered to have excessive analytical variability and are qualified as not meeting project QC requirements.

The precision criterion in Appendix A for bacteriological duplicates applies only to samples with concentrations > 10 MPN.

Matrix spike

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 the quality control data in the associated batch passes, it will be the decision of the laboratory QAO or RRA PM 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, RRA may consider excluding all of the results in the batch related to the analyte that failed recovery.

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 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, data qualifying codes). In all cases, the corrective action must be documented.

The method blank shall be analyzed at a minimum of one per preparation batch. In those instances for which no separate preparation method is used (e.g., VOA) 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 Requirements, Deficiencies, and Corrective Actions

Sampling QC excursions are evaluated by the RRA PM/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 RRA PM/QAO will be relied upon in evaluating results.

Laboratory measurement quality control failures are evaluated by the laboratory staff. The disposition of such failures and the nature and disposition of the failure is reported to the Laboratory QAO. The Laboratory QAO will discuss the failure with the RRA PM. If applicable, the RRA PM will include this information in a CAP and submit the CAP to the TCEQ CRP PM.

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

Additionally, in accordance with CRP requirements and the TNI Standard (Volume 1, Module 2, Section 4.5, Subcontracting of Environmental Tests) when a laboratory that is a signatory of this QAPP finds it necessary and/or advantageous to subcontract analyses, the laboratory that is the signatory on this QAPP must ensure that the subcontracting laboratory is NELAP-accredited (when required) and understands and follows the QA/QC requirements included in this QAPP. This includes confirming that the sub-contracting laboratory has LOQs at or below TCEQ AWRLs and performs all required QC analysis outlined in this QAPP. The signatory laboratory is also responsible for QA of the data prior to delivering it to the RRA, including review of all applicable QC samples related to CRP data. As stated in section 4.5.5 of the TNI Standard, the laboratory performing the subcontracted work shall be indicated in the final report and the signatory laboratory shall make a copy of the subcontractor's report available to the client (RRA) when requested.

B5 Instrument/Equipment Calibration, Testing, Inspection, and Maintenance

All sampling equipment testing and maintenance requirements are detailed in the SWQM Procedures. Sampling equipment is inspected and tested upon receipt and is assured appropriate for use by the Project Manager/Field Supervisor. Equipment records are kept on all field equipment and a supply of critical spare parts is maintained.

All laboratory tools, gauges, instrument, and equipment testing and maintenance requirements are contained within laboratory QM(s).

Instrument Calibration and Frequency

Field equipment calibration requirements are contained in the SWQM Procedures. Post-calibration check error limits and the disposition resulting from errors are adhered to. Data collected from field instruments that do not meet the post-calibration check error limits specified in the SWQM Procedures will not be submitted for inclusion into SWQMIS.

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

B6 Inspection/Acceptance of Supplies and Consumables

RRA/SH/NTMWD staff inspect supplies and consumables before acceptance. Reference to the laboratory QM may be appropriate for laboratory-related supplies and consumables.

B7 Data Management

Data Management Process

Water quality data that are generated by the Authority's CRP staff are manually recorded onto Field Data Sheets (See **Appendix D**) and entered into the Authority's SWQM Database. Water quality data received in electronic format from the City of Sherman and the North Texas Municipal Water District are also manually entered into the Authority's SWQM Database.

Prior to data entry, the Authority's CRP QAO performs a manual/visual quality check to ensure all field data sheets and laboratory results are completed in their entirety for all SWQM data received from the Authority's CRP staff and other entities monitoring under this QAPP. Following the visual quality check of the SWQM data, the Authority's CRP Data Entry Technician enters the data to the Authority's SWQM Database. The data is formatted, as specified in the most recent version of the TCEQ's *DMRG and SWQM Procedures Manual*. The Authority's CRP Data Manager then performs automated quality control checks to ensure that the SWQM data meets requirements, as specified on the SWQM Data Checklist (See **Appendix F**). Once these checks have been completed and any outliers have been identified, the Authority's CRP QAO researches and verifies those outliers. At a minimum, 10% of all SWQM data to be submitted is checked against the original Field Data Sheets and laboratory bench sheets by the Authority's CRP QAO. The Authority's CRP Data Manager then corrects any errors discovered during the Authority's CRP QAO's 10% check prior to the data submittal to TCEQ. The Authority's CRP Data Manager performs quality checks on the data utilizing the TCEQ's SWQMIS validation tool. The Authority's CRP Data Manager then electronically submits the datasets, data summaries and the SWQMIS Data Loading Validator Reports to the TCEQ CRP Project Manager. Once the TCEQ CRP Project Manager reviews the data, he/she notifies the TCEQ CRP Data Manager, who uploads the data to the TCEQ's SWQMIS Database.

Data Dictionary

Terminology and field descriptions are included in the 2019 *DMRG*, or most recent version. For the purpose of verifying which source codes are included in this QAPP, a table outlining the codes to be used when submitting data under this QAPP is included below. **Submitting Entity** specifies the entity responsible for the submission of data to TCEQ, while **Collecting Entity** indicates the actual entity collecting the samples in the field.

Name of Entity	Tag Prefix	Submitting Entity	Collecting Entity
Red River Authority of Texas	RR	RR	RR
City of Sherman	RR	RR	SH
North Texas Municipal Water District	RR	RR	NM

Data Errors and Loss

Prior to submittal of SWQM data to the TCEQ, automated and manual reviews of the data are performed. Reportable data meeting quality assurance requirements, as specified in the QAPP, but requiring further explanation are described in the Data Summary Report, which is submitted with each SWQM data submittal.

Record Keeping and Data Storage

1. Archives/Data File Backups

Backup of data is performed routinely. Backup sets are maintained onsite for rapid recovery and replicated offsite as an additional safeguard against hazards which may affect the Authority's Main Office.

2. Disaster Recovery

Restoration of individual data files and source programs may be obtained from existing backups. A control duplicate of the CRP data volume contained on the Local Area Network (LAN) file server may be restored to any workstation or server upon recovery of the system.

3. Archives/Data Retention

Complete original data sets are archived on permanent media and retained indefinitely by the Authority. The Authority applies the rules of Generally Accepted Accounting Principles for internal controls and custody of funds in maintaining its data security and storage. That is, all software applications, source programs and archived data are retained in original form with a backup copy stored off-site. All data files are retained in their original media and format without modification.

Data Handling, Hardware, and Software Requirements

Hardware Considerations

Data management occurs within the framework of a LAN utilizing a Windows 2012R2 Server configured as follows: Dual Intel Xeon E5-2620 Processors 2.00 GHz, 15M Cache, 7.2GT/s QPI, Turbo, 6C 95W, 32GB RDIMM, 1600MT/s, Low Volt, Dual Rank, x4 Data Width, two 500GB 7.2K RPM SATA 3Gbps 3.5in Hot-plug Hard Drives connected via Hardware Raid 1. Workstation minimum configurations are as follows: Intel processors running at 3.0 GHz or higher, 500 GB Hard Drive, 16 GB Ram, Microsoft Windows 11 OS. The LAN, Server and workstations are maintained by the Authority's IT Administrator under the direction of the General Manager.

Software Considerations

The Authority employs a complement of proprietary software applications and support utilities in the accomplishment of data management objectives. Software acquisitions and upgrades follow a defined procedure in that all critical software meets the data management objectives for the intended use, is compatible with other statistical and geographic software applications.

The Authority utilizes Microsoft Access 2016 as its primary database management software application to screen and manage all data entering the data management system.

Other applications considered essential to the data management system are Corel WordPerfect, Microsoft Office Suite 2016 for general word processing, presentations, graphics and subsidiary data management and analysis. AutoCAD 2012 and ArcGIS 10.1 are used for high end graphics and the Geographical Information System (GIS). StatSoft Statistica 12.0 for Windows is the primary statistical analysis software applied to processed data. Microsoft Excel 2016 is utilized as subsidiary analysis software and to maintain compatibility with other entities. Microsoft SQL Server is the primary software to help run the BTLIMS for data management.

Information Resource Management Requirements

Data will be managed in accordance with the TCEQ DMRG (most recent revision), and applicable RRA information resource management policies.

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 SWQMIS database. Positional data obtained by CRP grantees using a GPS will follow the TCEQ's OPP 8.11 policy regarding the collection and management of positional data. 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 SLOC.

C1 Assessments 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	RRA	Monitoring of the project status and records to ensure requirements are being fulfilled	Report to TCEQ in quarterly report. Submit CAPs to TCEQ as needed.
Monitoring Systems Audit of Basin Planning Agency	Dates to be determined by TCEQ CRP	TCEQ	Field sampling, handling and measurement; facility review; and data management as they relate to CRP	30 days to provide corrective actions response to the TCEQ
Monitoring Systems Audit of Program Subparticipants	Dates to be determined by the Authority (At least once per biennium)	RRA	Field sampling, handling and measurement; facility review; and data management as they relate to CRP	30 days to respond in writing to the RRA. RRA will report problems to TCEQ in progress report.
Laboratory Assessment	Dates to be determined by TCEQ	TCEQ Laboratory Assessor	Analytical and quality control procedures employed at the laboratory and the contract laboratory	30 days to provide corrective actions response to the TCEQ

Corrective Action Process for Deficiencies

Deficiencies are any deviation from the QAPP, SWQM Procedures, DMRG, SOPs, or other applicable guidance documents. Deficiencies may invalidate resulting data and require corrective action. Deficiencies that can be prevented from occurring again in the future require a CAP. TCEQ QA staff recognize that deficiencies may occur that are out of the control of RRA staff and/or their subparticipant's staff. Such deficiencies do not require a CAP. However, when a deficiency impacts data quality or quantity, the TCEQ CRP PM must be notified (within three business days of discovery) and the data loss noted in the associated monitoring activities report and data summary. 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 RRA PM (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 RRA PM/QAO, to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP.

TCEQ staff are tasked with reviewing CAPs written by RRA concerning deficiencies associated with CRP work. This includes the TCEQ CRP Team Leader, PM, Project QAS, and Lead QAS. The RRA PM/QAO should submit CAPs to their assigned TCEQ CRP PM in a timely manner. RRA can begin implementing corrective actions without TCEQ approval. However, TCEQ may request alternate or modified corrective actions if deemed necessary.

A template for writing CAPs is provided in the [Guidance for Partners in the Texas Clean Rivers Program FY 2026–2027](#) (Exhibit 2C). While CAPs need not adhere to this specific format, they must include information for all of the listed elements. Incomplete CAPs will be returned to the RRA QAO for revision. All CAPs for a FY should be cataloged in the quarterly progress reports submitted to the TCEQ CRP PM by the RRA PM. This documentation should include, at a minimum, the report number, date(s) of deficiency occurrence, description of deficiency, action taken, CAP status, and the date the CAP was closed (if applicable).

Significant conditions that, 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 RRA PM is responsible for ensuring that corrective actions have been implemented and tracks deficiencies and corrective actions. Records of audit findings and corrective actions are maintained by the RRA PM. Audit reports and associated corrective action documentation will be submitted to the TCEQ with the quarterly progress reports.

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.

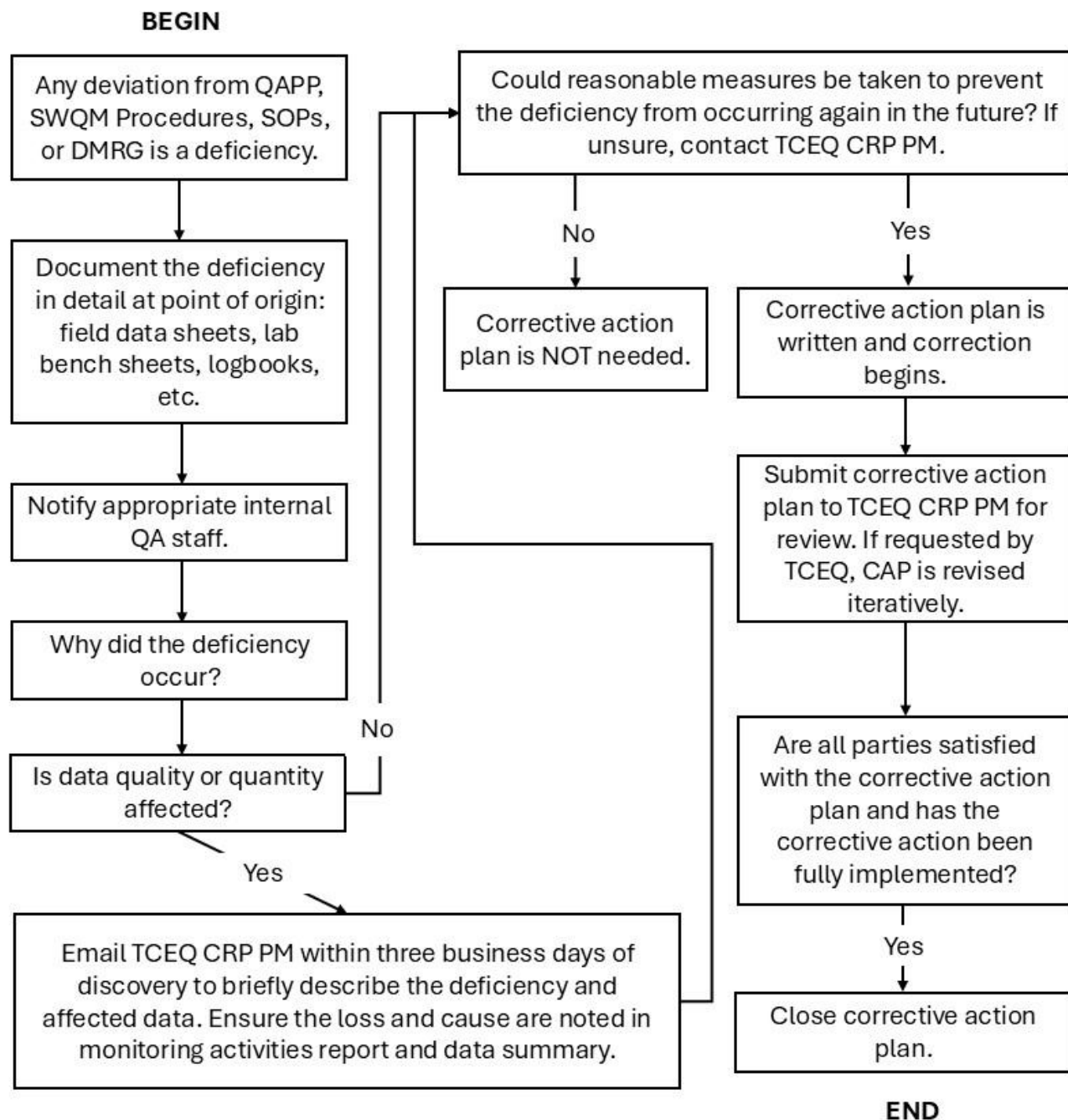
Corrective Action

CAPs should:

- Identify the problem, nonconformity, or undesirable situation
- Identify immediate remedial actions if possible
- Identify the underlying cause(s) of the problem
- Describe the programmatic impact
- Identify whether the problem is likely to recur, or occur in other areas
- Assist in determining the need for corrective action and actions to prevent reoccurrence
- Employ 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 and action(s) to prevent reoccurrence

A flow chart has been developed to facilitate the process (see Figure C1.1: Corrective Action Process for Deficiencies).

Figure C1.1 Corrective Action Process for Deficiencies



C2 Reports to Management

Table C2.1 QA Management Reports

Type of Report	Frequency (daily, weekly, monthly, quarterly, etc.)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation	Report Recipients
Corrective Action Plans	As Needed	As Needed	Field Staff Laboratory Staff	RRA QA Staff or Laboratory Management as appropriate, TCEQ CRP Project Manager
Progress Reports	Quarterly	December 15, 2025 March 15, 2026 June 15, 2026 September 15, 2026 December 15, 2026 March 15, 2027 June 15, 2027 August 15, 2027	RRA Project Manager	TCEQ CRP Project Manager
Monitoring Systems Audit Report and Response	As Needed	As Needed	RRA PM/QAO	TCEQ CRP Project Manager
Data Summary	As Needed	As Needed	RRA Data Manager	TCEQ CRP Project Manager

Reports to Red River Authority Project Management

The Authority's CRP Project Manager will be kept apprised of all project status, results of assessments and any significant QA issues as they occur. Additionally, written reports and daily time sheets will contain information regarding daily activities.

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.

Progress Report

Summarizes the RRA's activities for each task; reports monitoring status, problems, delays, deficiencies, status of open CAPs, and documentation for completed CAPs; and outlines the status of each task's deliverables.

Monitoring Systems Audit Report and Response

Following any audit performed by the RRA, a report of findings, recommendations and response is sent to the TCEQ in the quarterly progress report.

Data Summary

Contains basic identifying information about the data set and comments regarding inconsistencies and errors identified during data verification and validation steps or problems with data collection efforts (e.g., deficiencies).

Reports by TCEQ Project Management

Contractor Evaluation

The RRA participates in a contractor evaluation by the TCEQ annually for compliance with administrative and programmatic standards. Results of the evaluation are submitted to the TCEQ Financial Administration Division, Procurement and Contracts Section.

D1 Data Review, Verification, and Validation

All field and laboratory data will be reviewed and verified for integrity, continuity, reasonableness, and conformance to project requirements, and then validated against the project objectives and measurement performance specifications which are listed in Section A6 of this QAPP. Only those data which are supported by appropriate quality control data and meet the measurement performance specifications defined for this project will be considered acceptable and will be reported to the TCEQ for entry into SWQMIS.

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 D1.1. 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 which 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 D1.1, is performed by the RRA DM and QAO. 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 completed and sent 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 QAS. 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 RRA PM 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, the responsible party should document the nonconforming activities and submit the information to the RRA DM 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.

Table D1.1: Data Review Tasks

Data to be Verified	Field Task	Laboratory Task	QA Task	Lead Organization Data Manager Task
Sample documentation complete; samples labeled, sites identified	1		2,5	
Field QC samples collected for all analytes as prescribed in the TCEQ <i>SWQM Procedures Manual</i>	1		2,5	
Standards and reagents traceable		2,3,5		
Chain of custody complete/acceptable	1	2,3,5		
NELAP Accreditation is current		2,3,5		
Sample preservation and handling acceptable	1	2,3,5		
Holding times not exceeded	1	2,3,5		
Collection, preparation, and analysis consistent with SOPs and QAPP	1	2,3,5		
Field documentation (e.g., biological, stream habitat) complete	1			
Instrument calibration data complete	1	3		
Bacteriological records complete	1	3		
QC samples analyzed at required frequency		2,3,5		
QC results meet performance and program specifications		2,3,5		
Analytical sensitivity (LOQs / AWRLs) consistent with QAPP		2,3,5		
Results, calculations, transcriptions checked	1	2,3,5		2,4,5
Laboratory bench-level review performed		3		
All laboratory samples analyzed for all scheduled parameters		2,3,5		
Corollary data agree		2,3,5		4
Nonconforming activities documented	1	2,3,5		2,4,5
Outliers confirmed and documented; reasonableness check performed				2,4
Dates formatted correctly	1	2,3,5		2,4
Depth reported correctly and in correct units	1			2,4
TAG IDs correct			2,5	2,4
TCEQ Station ID number assigned	1			2,4
Valid parameter codes			2,5	2,4
Codes for submitting entity(ies), collecting entity(ies), and monitoring type(s) used correctly			2,5	2,4
Time based on 24-hour clock	1	2,3,5	2,5	2,4
Absence of transcription error confirmed	1	2,3,5	2,5	2,4
Absence of electronic errors confirmed			2,5	2,4
Sampling and analytical data gaps checked (e.g., all sites for which data are reported are on the coordinated monitoring schedule)	1		2,5	2,4
Field instrument pre and post calibration results within limits	1		2,5	2,4,5
10% of data manually reviewed			2	2,4

1. Field Staff

2. RRA QAO

3. Laboratory Staff (QA officer/Laboratory Supervisor)

4. RRA CRP Staff (Data Manager/Project Manager)

5. Sub-tier Participant QAO

D2 Reconciliation with User Requirements

Data produced in this project, and data collected by other organizations (e.g., USGS, TCEQ, etc.), will be analyzed and reconciled with project data quality requirements. Data which do not meet requirements will not be submitted to SWQMIS nor will be considered appropriate for any of the uses noted in Section A4.

Appendix A: Measurement Performance Specifications (Table A6.1-3)

Measurement performance specifications define the data quality needed to satisfy project objectives. To this end, measurement performance specifications are qualitative and quantitative statements that:

- clarify the intended use of the data
- define the type of data needed to support the end use
- identify the conditions under which the data should be collected

Appendix A of the QAPP addresses measurement performance specifications, including:

- analytical methodologies
- AWRLs
- limits of quantitation
- bias limits for LCSs
- precision limits for laboratory control sample duplicates (LCSDs)
- completeness goals
- qualitative statements regarding representativeness and comparability

The items identified above should be considered for each type of monitoring activity. The CRP encourages that data be collected to address multiple objectives to optimize resources; however, caution should be applied when attempting to collect data for multiple purposes because measurement performance specifications may vary according to the purpose. For example, limits of quantitation may differ for data used to assess standards attainment and for trend analysis. When planning projects, first priority will be given to the main use of the project data and the data quality needed to support that use, then secondary goals will be considered.

Procedures for laboratory analysis must be in accordance with the most recently published edition of Standard Methods for the Examination of Water and Wastewater, 40 CFR 136, or otherwise approved independently. Only data collected that have a valid TCEQ parameter code assigned in Tables A6 are stored in SWQMIS. Any parameters listed in Tables A6 that do not have a valid TCEQ parameter code assigned will not be stored in SWQMIS.

Tables A6.1–3: Measurement Performance Specifications

TABLE A6.1-A Measurement Performance Specifications for RRA					
Field Parameters					
Parameter	Units	Matrix	Method	Parameter Code	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	Field
TEMPERATURE, AIR (DEGREES FAHRENHEIT)	DEG F	air	NA	00021	Field
TRANSPARENCY, SECCHI DISC (METERS)	meters	water	TCEQ SOP V1	00078	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)	uS/cm	water	EPA 120.1, TCEQ SOP V1	00094	Field

OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G, TCEQ SOP V1	00300	Field
PH (STANDARD UNITS)	s.u.	water	EPA 150.1, TCEQ SOP V1	00400	Field
WATER CLARITY (1=EXCELLENT,2=GOOD,3=FAIR,4=POOR)	NA	water	NA	20424	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	Field
RESERVOIR STAGE (FEET ABOVE MEAN SEA LEVEL)***	FT ABOVE MSL	water	TWDB	00052	Field
RESERVOIR STORAGE (ACRE-Feet)***	acre-feet	water	TWDB	00054	Field
RESERVOIR PERCENT FULL ***	% RESERVOIR CAPACITY	water	TWDB	00053	Field
RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING	NS	other	TCEQ Drought Guidance	00051	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	Field
WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD.,4=STRONG)	NU	other	NA	89965	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER)	NU	other	NA	89966	Field
WATER SURFACE(1=CALM,2=RIPPLE,3=WAVE,4=WHITECAP)	NU	water	NA	89968	Field
WATER ODOR (1=SEWAGE, 2=OILY/CHEMICAL, 3=ROTTEN EGGS, 4=MUSKY, 5=FISHY, 6=NONE, 7=OTHER (WRITE IN COMMENTS))	NU	water	NA	89971	Field
WATER COLOR 1=BRWN 2=RED 3=GRN 4=BLCK 5=CLR 6=OT	NU	water	NA	89969	Field

** To be routinely reported when collecting data from perennial pools.
*** As published by the Texas Water Development Board on their website
<https://www.waterdatafortexas.org/reservoirs/statewide>

References:

United States Environmental Protection Agency (USEPA), Clean Water Act Analytical Methods
Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring
Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing
Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A6.1-B Measurement Performance Specifications for RRA					
Flow Parameters					
Parameter	Units	Matrix	Method	Parameter Code	Lab
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	Field
STREAM FLOW ESTIMATE (CFS)	cfs	Water	TCEQ SOP V1	74069	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	Field
References: TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).					

TABLE A6.1-C Measurement Performance Specifications for RRA										
Conventional Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
ALKALINITY, TOTAL (MG/L AS CaCO ₃)	mg/L	water	SM 2320B	00410	20	20	70-130	15	85-115	RR
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540D	00530	5	2.5	70-130	15	85-115	RR
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM4500- NH ₃ D, EPA350.1	00610	0.1	0.05	70-130	15	85-115	RR, LC**
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	RR
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.02	70-130	20	80-120	LC**
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	15	90-110	RR, LC**
NITRITE PLUS NITRATE, TOTAL ONE LAB DETERMINED VALUE (MG/L AS N)	mg/L	water	EPA 353.2, SM4500- NO ₃ H	00630	0.05	0.04	70-130	15	90-110	RR. LC**
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.4	00665	0.06	0.02	70-130	15	90-110	RR, LC**
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	SM4500 P E	00665	0.06	0.06	70-130	15	90-110	RR
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	5	70-130	15	90-110	RR, LC**
SULFATE (MG/L AS SO ₄)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	5	70-130	15	90-110	RR, LC**

PHEOPHYTIN-A UG/L FLUOROMETRIC METHOD	µg/L	Water	EPA 445.0	32213	3	2	70-130	15	80-120	RR
RESIDUE, TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540C	70300	10	50*	70-130	15	85-115	RR
CHLOROPHYLL-A, FLUOROMETRIC METHOD, UG/L	µg/L	water	EPA 445.0	70953	3	2	70-130	15	80-120	RR
TURBIDITY, LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	SM 2130B	82079	0.5	0.5	70-130	15	85-115	RR
*The LOQ for total dissolved solids (TDS) is higher than the established AWRL since concentrations for this parameter are extremely high in both the Canadian and Red River Basins and values are typically not observed at concentrations below 50 mg/L. **LC - Lower Colorado River Authority listed as a backup in the event analysis cannot be performed by the RR Laboratory. References: United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020 U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136 American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022. TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).										

TABLE A6.1-D Measurement Performance Specifications for RRA										
Bacteriological Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Log Difference of Duplicates	Bias %Rec. of LCS	Lab
<i>E. COLI</i> , COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-B**	31699	1	1	NA	0.50*	NA	RR
<i>ENTEROCOCCI</i> , ENTEROLERT, IDEXX, (MPN/100 ML)	MPN/100 mL	water	IDEXX Laboratories Enterolert®	31701	10***	10	NA	0.50*	NA	RR
<i>E.COLI</i> , COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	RR
* 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 B4. ** <i>E. coli</i> samples analyzed by these methods 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 30 hours. *** <i>Enterococcus</i> Samples should be diluted 1:10 for all waters. References: Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version Annual Book of ASTM Standards, Section 11, Water and Environmental Technology, Volume 11.02, Water TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).										

TABLE A6.1-E Measurement Performance Specifications for RRA					
24 Hour Parameters in Water					
Parameter	Units	Matrix	Method	Parameter Code	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE), 24HR AVG	DEG C	Water	TCEQ SOP V1	00209	field
WATER TEMPERATURE, DEGREES CENTIGRADE, 24HR MAX	DEG C	Water	TCEQ SOP V1	00210	field
TEMPERATURE, WATER (DEGREES CENTIGRADE) 24HR MIN	DEG C	Water	TCEQ SOP V1	00211	field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR AVG	uS/cm	Water	TCEQ SOP V1	00212	field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MAX	uS/cm	Water	TCEQ SOP V1	00213	field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MIN	uS/cm	Water	TCEQ SOP V1	00214	field
PH, S.U., 24HR MAXIMUM VALUE	std. units	Water	TCEQ SOP V1	00215	field
PH, S.U., 24HR, MINIMUM VALUE	std. units	Water	TCEQ SOP V1	00216	field
WATER TEMPERATURE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00221	field
SPECIFIC CONDUCTANCE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00222	field
pH, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00223	field
DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89855	field
DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89856	field
DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89857	field
DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	89858	field
References: TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).					

TABLE A6.2-A Measurement Performance Specifications for NTMWD					
Field Parameters					
Parameter	Units	Matrix	Method	Parameter Code	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	Field
TEMPERATURE, AIR (DEGREES FAHRENHEIT)	DEG F	air	SM 2550 B and TCEQ SOP V1	00021	Field
TRANSPARENCY, SECCHI DISC (METERS)	meters	water	TCEQ SOP V1	00078	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)	uS/cm	water	EPA 120.1, TCEQ SOP V1,	00094	Field
OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G, TCEQ SOP V1	00300	Field
PH (STANDARD UNITS)	s.u.	water	EPA 150.1, TCEQ SOP V1	00400	Field
WATER CLARITY (1=EXCELLENT,2=GOOD,3=FAIR,4=POOR)	NA	water	NA	20424	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	Field
RESERVOIR STAGE (FEET ABOVE MEAN SEA LEVEL)***	FT ABOVE MSL	water	TWDB	00052	Field
RESERVOIR STORAGE (ACRE-Feet)***	acre-feet	water	TWDB	00054	Field
RESERVOIR PERCENT FULL***	% RESERVOIR CAPACITY	water	TWDB	00053	Field
RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING	NS	other	TCEQ Drought Guidance	00051	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	Field

% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	Field
WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD.,4=STRONG)	NU	other	NA	89965	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER)	NU	other	NA	89966	Field
WATER SURFACE(1=CALM,2=RIPPLE,3=WAVE,4=WHITECAP)	NU	water	NA	89968	Field
WATER ODOR (1=SEWAGE, 2=OILY/CHEMICAL, 3=ROTTEN EGGS, 4=MUSKY, 5=FISHY, 6=NONE, 7=OTHER (WRITE IN COMMENTS))	NU	water	NA	89971	Field
WATER COLOR 1=BRWN 2=RED 3=GRN 4=BLCK 5=CLR 6=OT	NU	water	NA	89969	Field
** To be routinely reported when collecting data from perennial pools. *** As published by the Texas Water Development Board on their website https://www.waterdatafortexas.org/reservoirs/statewide References: United States Environmental Protection Agency (USEPA), Clean Water Act Analytical Methods Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415). TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).					

TABLE A6.2-B Measurement Performance Specifications for NTMWD					
Flow Parameters					
Parameter	Units	Matrix	Method	Parameter Code	Lab
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	Field
STREAM FLOW ESTIMATE (CFS)	cfs	Water	TCEQ SOP V1	74069	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	Field
References: TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).					

TABLE A6.2-C Measurement Performance Specifications for NTMWD										
Conventional Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
ALKALINITY, TOTAL (MG/L AS CaCO ₃)	mg/L	water	SM 2320B	00410	20	20	NA	20	NA	NM
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540D	00530	5	2.5	NA	20	NA	NM
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.1	00610	0.1	0.1	70-130	20	80-120	NM
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)*	00615	0.05	0.02	70-130	20	80-120	NM
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)*	00620	0.05	NA	70-130	20	80-120	NM
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	NM
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.1	00665	0.06	0.02	70-130	20	80-120	NM
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.3*	00665	0.06	0.02	70-130	20	80-120	NM
CARBON, TOTAL ORGANIC, NPOC (TOC), MG/L	mg/L	water	SM 5310 C	00680	2	0.5	70-130	20	80-120	NM
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0	00940	5	1	70-130	20	90-110	NM
SULFATE (MG/L AS SO ₄)	mg/L	water	EPA 300.0	00945	5	1	70-130	20	90-110	NM
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	µg/L	water	SM 10150 B	32211	3	3	70-130	20	80-120	NM
PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH.	µg/L	water	SM 10150 B	32218	3	3	NA	NA	NA	NM

RESIDUE, TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540C	70300	10	10	NA	20	80-120	NM
TURBIDITY, LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	SM 2130B	82079	0.5	0.1	70-130	20	80-120	NM
*Listed as an alternate method in case instrument error would prevent samples from being analyzed within specific holding times. References: United States Environmental Protection Agency (USEPA), Clean Water Act Analytical Methods Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).										

TABLE A6.2-D Measurement Performance Specifications for NTMWD

Bacteriological Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Log Difference of Duplicates	Bias %Rec. of LCS	Lab
<i>E. COLI</i> , COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	Colilert**	31699	1	1	NA	0.50*	NA	NM
<i>E. COLI</i> , COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	NM
* 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 B4. ** <i>E. coli</i> samples analyzed by these methods 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 30 hours. References: Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version Annual Book of ASTM Standards, Section 11, Water and Environmental Technology, Volume 11.02, Water TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).										

TABLE A6.2-E Measurement Performance Specifications for NTMWD										
Metals in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
HARDNESS, TOTAL (MG/L AS CaCO ₃)*	mg/L	water	SM 2340 C	00900	5	5	NA	20	80-120	NM
IRON, TOTAL (UG/L AS FE)	µg/L	water	EPA 200.8	01045	300	200	70-130	20	80-120	NM
MANGANESE, TOTAL (UG/L AS MN)	µg/L	water	EPA 200.8	01055	50	1	70-130	20	80-120	NM
*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). References: United States Environmental Protection Agency (USEPA), Clean Water Act Analytical Methods Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).										

TABLE A6.3-A Measurement Performance Specifications for SH

Field Parameters					
Parameter	Units	Matrix	Method	Parameter Code	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	Field
TEMPERATURE, AIR (DEGREES FAHRENHEIT)	DEG F	air	NA	00021	Field
TRANSPARENCY, SECCHI DISC (METERS)	meters	water	TCEQ SOP V1	00078	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)	uS/cm	water	EPA 120.1, TCEQ SOP V1,	00094	Field
OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G, TCEQ SOP V1	00300	Field
PH (STANDARD UNITS)	s.u.	water	EPA 150.1, TCEQ SOP V1	00400	Field
WATER CLARITY (1=EXCELLENT,2=GOOD,3=FAIR,4=POOR)	NA	water	NA	20424	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	Field
RESERVOIR STAGE (FEET ABOVE MEAN SEA LEVEL)***	FT ABOVE MSL	water	TWDB	00052	Field
RESERVOIR STORAGE (ACRE-Feet)***	acre-feet	water	TWDB	00054	Field
RESERVOIR PERCENT FULL***	% RESERVOIR CAPACITY	water	TWDB	00053	Field
RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING	NS	other	TCEQ Drought Guidance	00051	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	Field

WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD.,4=STRONG)	NU	other	NA	89965	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER)	NU	other	NA	89966	Field
WATER SURFACE(1=CALM,2=RIPPLE,3=WAVE,4=WHITECAP)	NU	water	NA	89968	Field
WATER ODOR (1=SEWAGE, 2=OILY/CHEMICAL, 3=ROTTEN EGGS, 4=MUSKY, 5=FISHY, 6=NONE, 7=OTHER (WRITE IN COMMENTS))	NU	water	NA	89971	Field
WATER COLOR 1=BRWN 2=RED 3=GRN 4=BLCK 5=CLR 6=OT	NU	water	NA	89969	Field
** To be routinely reported when collecting data from perennial pools. *** As published by the Texas Water Development Board on their website https://www.waterdatafortexas.org/reservoirs/statewide References: United States Environmental Protection Agency (USEPA), Clean Water Act Analytical Methods Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415). TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).					

TABLE A6.3-B Measurement Performance Specifications for SH					
Flow Parameters					
Parameter	Units	Matrix	Method	Parameter Code	Lab
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	Field
STREAM FLOW ESTIMATE (CFS)	cfs	Water	TCEQ SOP V1	74069	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	Field
References: TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).					

TABLE A6.3-C Measurement Performance Specifications for SH										
Conventional Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
ALKALINITY, TOTAL (MG/L AS CaCO ₃)	mg/L	water	SM 2320B	00410	20	20	70-130	15	85-115	RR, LC**
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540D	00530	5	2.5	70-130	15	85-115	RR, LC**
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM4500-NH ₃ D, EPA 350.1	00610	0.1	0.05	70-130	15	85-115	RR, LC**
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0	00615	0.05	0.02	70-130	20	80-120	LC
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0	00620	0.05	0.02	70-130	20	80-120	LC
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	RR, LC**
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.4	00665	0.06	0.02	70-130	20	80-120	RR, LC**
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	SM 4500 P E***	00665	0.06	0.06	70-130	20	80-120	RR
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0	00940	5	5	70-130	20	80-120	RR, LC
SULFATE (MG/L AS SO ₄)	mg/L	water	EPA 300.0	00945	5	5	70-130	20	80-120	RR, LC
PHEOPHYTIN-A UG/L FLUOROMETRIC METHOD	µg/L	Water	EPA 445	32213	3	2	70-130	15	80-120	RR, LC**
RESIDUE, TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540C	70300	10	50*	70-130	15	85-115	RR, LC**
CHLOROPHYLL-A, FLUOROMETRIC METHOD, UG/L	µg/L	water	EPA 445.0	70953	3	2	70-130	15	80-120	RR, LC**
TURBIDITY, LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	SM 2130B	82079	0.5	0.5	70-130	20	80-120	SH

*The LOQ for total dissolved solids (TDS) is higher than the established AWRL since concentrations for this parameter are extremely high in both the Canadian and Red River Basins and values are typically not observed at concentrations below 50 mg/L.

**LC - Lower Colorado River Authority listed as a backup in the event analysis cannot be performed by the RR Laboratory.

*** Listed as a backup in case instrument error would prevent samples from being analyzed within specific holding times.

References:

United States Environmental Protection Agency (USEPA), Clean Water Act Analytical Methods

Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version

TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).

TABLE A6.3-D Measurement Performance Specifications for SH

Bacteriological Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Log Difference of Duplicates	Bias %Rec. of LCS	Lab
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	Colilert-18, Quanti-Tray, Colilert Quanti-tray**	31699	1	1	NA	0.50*	NA	SH
E.COLI, COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	SH
* 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. ** E. coli samples analyzed by these methods 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 30 hours. ***Enterococcus Samples should be diluted 1:10 for all waters. References: Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version Annual Book of ASTM Standards, Section 11, Water and Environmental Technology, Volume 11.02, Water TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).										

Appendix B: Task 3 Work Plan & Sampling Process Design and Monitoring Schedule (Plan)

Task 3: Water Quality Monitoring

Objective: Water quality monitoring will focus on the characterization of a variety of locations and conditions. This will include a combination of the following:

- Planning and coordinating basin-wide monitoring.
- Routine, regularly scheduled monitoring to collect long-term information and support statewide assessment of water quality.
- Systematic, regularly scheduled short-term monitoring to screen water bodies for issues.

Task Description: The Performing Party will provide detailed quarterly progress reports that summarize all CRP activities in both the Canadian and Red River Basins. Additionally, the Performing Party will coordinate with all sub participants and monitoring entities to hold an annual Coordinated Monitoring Meeting to help plan monitoring locations and needs. All activities under this task will follow the guidelines as describe in the FY2026-2027 CRP Guidance.

The Performing Party will complete the following subtasks:

Monitoring Description—The goal of the Performing Party’s Clean Rivers Program monitoring is to provide quality assured data for water bodies throughout both the Canadian and Red River Basins in an effort to promote the accurate assessment of water quality. The Performing Party strives to accomplish this task by pursuing water quality monitoring within every assessment unit of all identified water bodies.

For FY 2026, the Performing Party will monitor and collect water quality samples for analysis from a minimum of 48 stations total among both the Canadian and Red River Basins. Each station will be analyzed for field, conventional, flow, and bacteria parameters. The monitoring schedule will be designed in such a way that a proportionate amount of sites will be visited each month allowing for the monitoring of each site once per quarter of the year.

In FY 2027, the Performing Party will monitor at a similar level of effort as in FY 2026. The actual number of sites, location, frequency, and parameters collected for FY 2027 will be based on priorities identified at the Basin Steering Committee and Coordinated Monitoring Meetings and included in the amended Appendix B schedule of the Performing Party’s QAPP.

All monitoring will be completed according to the Performing Party QAPP, the *TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods* (RG-415) and the *TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data* (RG-416).

Coordinated Monitoring Meeting—The Performing Party will hold an annual coordinated monitoring meeting as described in the FY2026-2027 CRP Guidance. Qualified monitoring organizations will be invited to attend the working meeting in which monitoring needs and purposes will be discussed segment by segment and station by station. Information from participants and stakeholders will be used to select stations and parameters that will enhance overall water quality monitoring coverage, eliminate duplication of effort, and address basin priorities. A summary of the changes to the monitoring schedule will be provided to the participants within two weeks of the meeting. Changes to the monitoring schedule will be entered into the statewide Coordinated Monitoring Schedule (CMS; cms.lcra.org) and communicated to meeting attendees. Changes to monitoring schedules that occur during the year will be entered into the CMS and communicated to meeting attendees. All requirements related to meetings will be followed and required meetings will be conducted in-person or via TCEQ approved virtual format.

Monitoring Activities—Each progress report will include a description of activities including all types of monitoring performed, number of sampling events, and the types of monitoring conducted in the quarter. The Performing Party will complete and submit a monitoring activities report as an attachment to the progress report.

Deliverables and Due Dates:

September 1, 2025 through August 31, 2026

- A. Conduct water quality monitoring, submit monitoring activities report, summarize activities, and submit with progress report—December 15, 2025; March 15 and June 15, 2026
- B. Coordinated Monitoring Meeting—between March 15 and April 30, 2026
- C. Coordinated Monitoring Meeting Summary of Changes—within 2 weeks following the meeting
- D. Email notification that Coordinated Monitoring Schedule updates are complete—May 31, 2026

September 1, 2026 through August 31, 2027

- A. Conduct water quality monitoring, submit monitoring activities report, summarize activities, and submit with progress report—September 15 and December 15, 2026; March 15 and June 15 and August 15, 2027
- B. Coordinated Monitoring Meeting—between March 15 and April 30, 2027
- C. Coordinated Monitoring Meeting Summary of Changes—within 2 weeks following the meeting
- D. Email notification that Coordinated Monitoring Schedule updates are complete—May 31, 2027

Sample Design Rationale FY 2026

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 Integrated Report of Surface Water Quality, 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 RRA coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed

Based on evaluations of previous assessments and screening efforts by the TCEQ and the Authority, the hydrologic subdivisions of each basin have been prioritized according to the level of concern. Utilizing the current *2024 Texas Water Quality Integrated Report*, a priority list was prepared and presented for discussion at the Authority's Annual Coordinated Monitoring Meeting with the other monitoring entities and the TCEQ. This meeting was based on the need to maximize monitoring efforts in an attempt to expend the limited resources as prudently as possible. This approach enables comprehensive monitoring to occur on a rotational reach basis and completely encompasses the basins within the five-year basin management cycle.

Canadian River Basin

Monitoring in the Canadian River Basin will remain the same in FY2026 for all participating entities, with the following exceptions detailed below:

Red River Authority of Texas

The Authority will make the following changes to its monitoring schedule for FY2026. Due to rising costs, a budget evaluation was performed; therefore, stations were evaluated and low priority sites were dropped from the monitoring schedule.

Description	Station ID	Change(s)
Unnamed Tributary of West Amarillo Creek at Loop335 Eastbound Access Road 470 M East of its Intersection with FM/RM1061 Northwest of Amarillo	17056	RRA will no longer monitor this station.

Red River Basin

Monitoring in the Red River Basin will remain the same in FY2026 for all participating entities, with the following exceptions detailed below:

Red River Authority of Texas

The Authority will make the following changes to its monitoring schedule for FY2026. Due to rising costs, a budget evaluation was performed; therefore, stations were evaluated and low priority sites were dropped from the monitoring schedule.

Description	Station ID	Change(s)
Sweetwater Creek at US83 6.25 KM North Northwest of Wheeler	10072	RRA will no longer monitor this station.
Wichita River at US183/US283 Near Lake Kemp Dam 10.7 KM North US 82/US 283 Intersection 9.8 KM North of Mabelle	10158	RRA will no longer monitor this station.
North Fork Red River at FM2473 11.85 KM Southwest of Wheeler	10179	RRA will no longer monitor this station.
Red River at SH37/FM195 Intersection 27.75 KM North of Clarksville	15779	RRA will no longer monitor this station.
South Canal 80 M Downstream of Lake Diversion Spillway Near Dundee	18831	RRA will no longer monitor this station.
Smith Creek at Lamar CR31700 Near City of Paris	21026	RRA will no longer monitor this station.
Red River at US75 North of Denison	21031	RRA will no longer monitor this station.

City of Sherman

The City of Sherman will make no changes to its monitoring schedule for FY2026.

North Texas Municipal Water District (NTMWD)

The NTMWD will make no changes to its monitoring schedule for FY2026.

Site Selection Criteria

This data collection effort involves routine monitoring (RT) water quality procedures that are consistent with the TCEQ SWQM program. Some general guidelines are followed when selecting sampling sites, as outlined below, and discussed thoroughly in SWQM Procedures, Volumes I and II. Overall consideration is given to accessibility and safety. All monitoring activities have been developed in coordination with the CRP Steering Committee and with the TCEQ. The site selection criteria specified are those the TCEQ would like considered to produce data which is complementary to that collected by the state and which may be used in assessments, etc.

1. Locate stream sites so that samples can be safely collected from the centroid of flow. Centroid is defined as the midpoint of that portion of stream width which contains 50 percent of the total flow. If multiple potential sites on a stream segment are appropriate for monitoring, choose one that would best represent

the water body, and not a site that displays unusual conditions or contaminant source(s). Avoid backwater areas or eddies when selecting a stream site.

2. At a minimum for reservoirs, locate sites near the dam (reservoirs) and in the major arms. Larger reservoirs might also include stations in the middle and upper (riverine) areas. Select sites that best represent the water body by avoiding coves and back water areas. A single monitoring site is considered representative of 25 percent of the total reservoir acres, but not more than 5,120 acres.
3. Monitoring sites are selected to maximize stream coverage or basin coverage. Very long segments may require more stations. As a rule of thumb, stream segments between 25 and 50 miles long require two stations, and longer than 50 miles require three or more depending on the existence of areas with significantly different sources of contamination or potential water quality concerns. Major hydrological features, such as the confluence of a major tributary or an instream dam, may also limit the spatial extent of an assessment based on one station.
4. Because historical water quality data can be very useful in assessing use attainment or impairment, it may be best to use sites that are on current or past monitoring schedules.
5. All classified segments (including reservoirs) should have at least one Monitoring site that adequately characterizes the water body, and monitoring should be coordinated with the TCEQ or other qualified monitoring entities reporting routine data to TCEQ.
6. Monitoring sites may be selected to bracket sources of pollution, influence of tributaries, changes in land uses, and hydrological modifications.
7. Sites should be accessible. When possible, stream sites should have a USGS or IBWC stream flow gauge. If not, it should be possible to conduct flow measurement during routine visits.

Monitoring Sites for FY 2026

Table B1.1 Sample Design and Schedule, FY 2026

TABLE B1.1
Sample Design and Schedule - FY 2026

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
CANADIAN RIVER BRIDGE AT US 60-83 AT CANADIAN	10032	0101	1	RR	RR	RT									4			4	4		4	
CANADIAN RIVER BRIDGE ON SH 70 NORTH OF PAMPA	10033	0101	1	RR	RR	RT									4			4	4		4	
DIXON CREEK AT SH 152 WEST OF RR2171 EAST OF BORGER	17045	0101A	1	RR	RR	RT									4			4	4		4	
DIXON CREEK 150 M UPSTREAM OF HUTCHINSON COUNTY ROAD V UPSTREAM OF CANADIAN RIVER CONFLUENCE NE OF BORGER	10016	0101A	1	RR	RR	RT	2														2	
ROCK CREEK 15 M DOWNSTREAM OF CHICKASAW RD BRIDGE IN ELECTRIC CITY NEAR BORGER	10024	0101B	1	RR	RR	RT									4			4	4		4	
BIG BLUE CREEK 250 YDS UPSTREAM OF FM 1913 APPROXIMATELY 21 MI SE OF DUMAS	15270	0102A	1	RR	RR	RT									4			4	4		4	
CANADIAN RIVER BRIDGE AT US 87-287 NORTH OF AMARILLO	10054	0103	1	RR	RR	RT												4	4		4	
EAST AMARILLO CREEK 15 METERS UPSTREAM OF CITY OF AMARILLO RIVER ROAD WWTP OUTFALL	10017	0103A	1	RR	RR	RT									4			4	4		4	

TABLE B1.1
Sample Design and Schedule - FY 2026

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
EAST AMARILLO CREEK IMMEDIATELY DOWNSTREAM OF US 287 NORTH OF AMARILLO	10018	0103A	1	RR	RR	RT									4			4	4		4	
EAST AMARILLO CREEK AT LOOP 335 AND US 287 IN AMARILLO	21024	0103A	1	RR	RR	RT									4			4	4		4	
THOMPSON PARK LAKE NORTH END OF NORTH LAKE 213 M W OF US 87 FRONTAGE RD AND 1.34 KM NORTH OF NE 24TH ST IN AMARILLO	15775	0103A	1	RR	RR	RT									4			4			4	
WOLF CREEK BRIDGE AT SH 305 NORTH OF LIPSCOMB	10058	0104	1	RR	RR	RT									4			4	4		4	
WOLF CREEK 50 M UPSTREAM OF FM 1454 APPROXIMATELY 27.4 KM/17 MI EAST OF LIPSCOMB	10059	0104	1	RR	RR	RT									4			4	4		4	
MUD CREEK AT US 259 3.1 KM NORTH OF DE KALB	15319	0201A	5	RR	RR	RT	2								4			4	4		4	
RED RIVER DOWNSTREAM LAKE TEXOMA AT US 259 9.3 KM NORTH OF US 259/FM 114 INTERSECTION 21 KM NORTH OF DEKALB	10125	0202	5	RR	RR	RT									4			4	4		4	
RED RIVER AT NORTHBOUND US 271 IN ARTHUR CITY 0.75 KM NORTH OF FM 197/US 271 INTERSECTION	10126	0202	5	RR	RR	RT									4			4	4		4	
RED RIVER AT SH 78 355 M NORTHWEST OF FANNIN CR 200/SH 78 INTERSECTION AT TEXAS STATE LINE 10 KM NORTHEAST OF CITY OF RAVENNA	10127	0202	4	RR	RR	RT									4			4			4	

TABLE B1.1
Sample Design and Schedule - FY 2026

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
BOIS D'ARC CREEK AT FM 409 NORTHWEST OF HONEY GROVE	21029	0202A	4	RR	NM	RT					12				12			12	12		12	
BOIS D' ARC CREEK AT FM 898/OAK HILL ROAD 1.4 KM NORTHEAST OF CITY OF WHITEWRIGHT	15036	0202A	4	RR	RR	RT									4			4	4		4	
BOIS D' ARC CREEK AT SH56 WEST OF DODD CITY	22105	0202A	4	RR	NM	RT					12				12			12	12		12	
BOIS D' ARC LAKE AT HWY 897 5.4 KM NORTH OF INTERSECTION OF HWY 82 AND HWY 897	22448	0202A	4	RR	NM	RT					12				12			12			12	
BOIS D' ARC LAKE 1.2 KM NORTHWESTOF BOIS D'ARC LAKE SOUTH BOAT RAMP	22449	0202A	4	RR	NM	RT					12				12			12			12	
BOIS D' ARC LAKE 0.6 KM WEST OF NTMWD INTAKE STRUCTURE	22450	0202A	4	RR	NM	RT					12				12			12			12	
CORNELIASON CREEK AT FM 1897/OLE AMBROSE ROAD 0.27 KM NORTH OF FM 1897/US 69 INTERSECTION 0.9 KM NORTH OF BELLS	10117	0202B	4	RR	RR	RT									4			4	4		4	
PECAN BAYOU AT BLANTON CREEK CEMETARY ROAD/RED RIVER CR 2235 11.65 KM NORTH OF CITY OF BAGWELL	14472	0202C	5	RR	RR	RT									4			4	4		4	
PINE CREEK AT SOUTHBOUND US 271 APPROX 7.8 KM NORTH OF THE CITY OF PARIS	10120	0202D	5	RR	RR	RT									4			4	4		4	

TABLE B1.1
Sample Design and Schedule - FY 2026

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
DEAN GILBERT LAKE NEAR THE DAM SOUTHWEST OF THE HWY 82 AND FM 1417 INTERSECTION IN SHERMAN TEXAS	21130	0202E	4	RR	SH	RT									3			3			3	
POST OAK CREEK AT FIRST COUNTY ROAD CROSSING DOWNSTREAM SHERMAN WWTP 0.33 KM SOUTH OF E FM 1417/SH 11 INTERSECTION 5.75 KM SE OF SHERMAN	10114	0202E	4	RR	SH	RT									4			4	4		4	
POST OAK CREEK AT FM 1417 0.25 KM WEST OF SH 11/FM 1417 INTERSECTION 5.3 KM SOUTHEAST OF SHERMAN	10115	0202E	4	RR	SH	RT									4			4	4		4	
CHOCTAW CREEK AT SH 11 1.6 KM SOUTHEAST OF FM 1417/SH 11 INTERSECTION 7 KM SOUTHEAST OF SHERMAN	10111	0202F	4	RR	SH	RT									4			4	4		4	
CHOCTAW CREEK AT LUELLA ROAD 7.3 KM SSE OF SHERMAN FIRST CROSSING UPSTREAM CONFLUENCE WITH POST OAK CREEK	10112	0202F	4	RR	SH	RT									4			4	4		4	
CHOCTAW CREEK AT US 82 5.07KM DOWNSTREAM OF SH 56 EAST OF SHERMAN	18370	0202F	4	RR	SH	RT									4			4	4		4	
SMITH CREEK AT SOUTHBOUND US 271 385 M UPSTREAM OF THE CONFLUENCE WITH PINE CREEK 7 KM NORTH OF CITY OF PARIS	17044	0202G	5	RR	RR	RT									4			4	4		4	
SMITH CREEK AT LOOP 286/US 82 IN THE CITY OF PARIS	21027	0202G	5	RR	RR	RT									4			4	4		4	
LITTLE PINE CREEK AT FM 195	18514	0202I	5	RR	RR	RT	2								4			4	4		4	

TABLE B1.1
Sample Design and Schedule - FY 2026

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
SIX MILE CREEK AT FM 195 NORTHEAST OF PARIS	21298	0202P	5	RR	RR	RT									4			4	4		4	
PICKENS LAKE MID LAKE AT HERMAN BAKER PARK 1.0 KM EAST OF FM 1417 AND 700 M NORTHEAST OF END OF SOUTHRIDGE LANE SOUTHWEST OF SHERMAN	16945	0202Q	4	RR	SH	RT									3			3			3	
LAKE TEXOMA NEAR BIG MINERAL ARM 4.1KM EAST OF US 377/OXFORD DRIVE INTERSECTION 1.5 KM E OF WEST SHORE 15 KM NORTHWEST OF POTTSBORO	10130	0203	4	RR	RR	RT									4			4			4	
HONEY GROVE CREEK AT FANNIN CR 2770	21030	0202L	4	RR	NM	RT					12				12			12	12		12	
BONHAM CITY LAKE EQUIDISTANT BETWEEN INTAKE STRUCTURE AT TIMBER CREEK ON DAM AND CITY PARK BOAT RAMP ON RR 3 8.25 KM NORTH OF BONHAM	16943	0202M	4	RR	NM	RT					12				12			12			12	
HICKS CREEK APPROX 400 M UPSTREAM OF PINE CREEK CONFLUENCE AT PRIVATE ROAD 1.55 KM EAST OF US 271 10 KM NNE OF THE CITY OF PARIS	10121	0202N	5	RR	RR	RT									4			4	4		4	
HICKS CREEK AT US 271 11 KM NORTH OF THE CITY OF PARIS	10122	0202N	5	RR	RR	RT									4			4	4		4	
LAKE TEXOMA AT US 377 0.42 KM NORTH OF TEXAS BANK ON US 377 8.05 KM NORTH OF GORDONVILLE	10131	0203	4	RR	RR	RT									4			4			4	
LAKE TEXOMA-LITTLE MINERAL ARM AT BOAT RAMP AT SIMMONS SHORE IN PRESTON 4.5 KM E OF FM 120 5.5 KM N OF FM 406 12.5 KM NNW OF DENISON	15388	0203	4	RR	NM	RT					12				12			12			12	

TABLE B1.1
Sample Design and Schedule - FY 2026

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
LAKE TEXOMA LITTLE MINERAL ARM SOUTHEAST OF PRESTON SHORE NEAR INTAKE STRUCTURE EQUIDISTANT BETWEEN SHORELINES 1.5 KM EAST OF FM 120	17480	0203	4	RR	RR	RT									4			4			4	
LAKE TEXOMA 260 METERS DUE WEST FROM LAKE TEXOMA DAM 282 METERS EAST AND 392 METERS NORTH TO THE INTERSECTION OF FM 1310 AND NORTH SH 91 NORTH OF DENISON	20545	0203	4	RR	NM	RT					12				12			12			12	
MUSTANG CREEK AT SPALDING ROAD 0.47 KM WEST OF SPALDING ROAD/SIEBERT HILL LANE INTERSECTION 1.75 KM EAST OF SADLER	17504	0203C	4	RR	RR	RT									4			4	4		4	
DEAVER CREEK AT US 82 AT CENTER MEDIAN 1.25 KM EAST OF SPALDING ROAD/US 82 INTERSECTION 4.6 KM EAST OF SADLER	17503	0203D	4	RR	RR	RT									4			4	4		4	
RED RIVER AT IH 35 5.25 KM NORTH OF FM 1202/IH 35 INTERSECTION AT TEXAS SHORE 11 KM NORTH NORTHWEST OF GAINESVILLE.	10132	0204	3	RR	RR	RT									4			4	4		4	
RED RIVER AT US 81 2.1 KM NORTH OF US 81/PARR ROAD INTERSECTION 6.5 KM NORTH OF RINGGOLD	10133	0204	3	RR	RR	RT									4			4	4		4	
MOSS LAKE AT SPILLWAY 130 M WEST OF FM 1201 467 M NORTH OF FISH CREEK DAM INTAKE STRUCTURE 18.25 KM NORTHWEST OF GAINESVILLE	15447	0204B	4	RR	RR	RT									4			4			4	
RED RIVER BRIDGE ON IH 44/US 277/US 281 313 M NORTHEAST OF TEXAS SHORE NEAR MID BRIDGE 4.0 KM NORTHEAST OF CITY OF BURKBURNETT	10134	0205	3	RR	RR	RT									4			4	4		4	
WILDHORSE CREEK AT US 281/277/IH44 3.1 KM NORTHEAST OF BURKBURNETT	10096	0205A	3	RR	RR	RT									4			4	4		4	

TABLE B1.1
Sample Design and Schedule - FY 2026

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
RED RIVER AT SH 6 12.75 KM NORTH OF QUANAH	10135	0206	3	RR	RR	RT									4			4	4		4	
GROESBECK CREEK AT SH6 NORTH OF QUANAH	20166	0206A	3	RR	RR	RT									4			4	4		4	
LOWER PRAIRIE DOG TOWN FORK RED RIVER AT US 62-83 3.4 KM NORTH OF US 83/RR 2465 INTERSECTION 16 KM NORTH OF CHILDRESS	10136	0207	1	RR	RR	RT									4			4	4		4	
LOWER PRAIRIE DOG TOWN FORK RED RIVER AT SH 207 10 KM SOUTHWEST OF FM 2272/SH 207 INTERSECTION 30.45 KM SOUTH OF CLAUDE	13637	0207	1	RR	RR	RT									4			4	4		4	
LOWER PRAIRIE DOG TOWN FORK RED RIVER AT US 70 70 M SOUTHWEST OF THE NORTHERN TIP OF SOUTHBOUND US 70 BRIDGE 26.4 KM NORTH OF TURKEY	16037	0207	1	RR	RR	RT									4			4	4		4	
BUCK CREEK AT US 83 1.5 M NORTH OF US 83/SH 256 INTERSECTION 30.7 KM NORTH OF CHILDRESS 16.8 KM SOUTHWEST OF DODSON	15811	0207A	1	RR	RR	RT									4			4	4		4	
FARMERS CREEK RESERVOIR/NOCONA LAKE MID LAKE NEAR DAM 1.3 KM SW OF OAK SHORES ROAD/FM 2953 INTERSECTION 0.36 KM SOUTH OF MID DAM	10139	0210	3	RR	RR	RT									4			4			4	
LITTLE WICHITA RIVER AT FM 2332 0.63 KM UPSTREAM FROM MOUTH AT RED RIVER CONFLUENCE 9.2 KM NORTHWEST OF RINGGOLD	10140	0211	3	RR	RR	RT									4			4	4		4	
LAKE ARROWHEAD MID LAKE NEAR DAM 609 M SOUTH OF MID DAM 765 M SE OF LITTLE WICHITA R INTAKE STRUCTURE 14 KM NE OF SCOTLAND	10142	0212	3	RR	RR	RT									4			4			4	

TABLE B1.1
Sample Design and Schedule - FY 2026

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
LAKE KICKAPOO NEAR MID DAM 521 M SOUTH OF NORTH FORK LITTLE WICHITA RIVER INTAKE STRUCTURE 13.8 KM SOUTH OF US 82/SH 25 INTERSECTION	10143	0213	3	RR	RR	RT									4			4			4	
WICHITA RIVER AT FM 368 325 M NORTH OF FM 368/FM 1206 INTERSECTION 7.38 KM SOUTHWEST OF CITY OF IOWA PARK 9.15 KM NORTH OF HOLLIDAY	10154	0214	3	RR	RR	RT									4			4	4		4	
WICHITA RIVER AT SH 25 1.3 KM NORTH OF SH 258/SH 25 INTERSECTION 14.5 KM NORTHWEST OF CITY OF HOLLIDAY	10155	0214	3	RR	RR	RT									4			4	4		4	
WICHITA RIVER AT FM 810 1.25 KM SOUTH OF FM 1740/FM 810 INTERSECTION 9.65 KM WEST OF BYERS	10145	0214	3	RR	RR	RT									4			4	4		4	
WICHITA RIVER AT END OF EASTLAND LANE 0.75 KM SE OF RIVER ROAD/EASTLAND LANE INTERSECTION 5.5 KM NORTH NORTHEAST OF WICHITA FALLS	10148	0214	3	RR	RR	RT									4			4	4		4	
WICHITA RIVER AT SH 240 345 M NORTHWEST OF SH 240/EASTSIDE DRIVE/FRONT STREET INTERSECTION IN WICHITA FALLS	10150	0214	3	RR	RR	RT									4			4	4		4	
BEAVER CREEK AT FM 2326 2.0 KM SOUTHWEST OF SH 25/FM 2326 INTERSECTION 22 KM NORTHWEST OF HOLLIDAY	15120	0214A	3	RR	RR	RT									4			4	4		4	
BUFFALO CREEK AT FM 1814/BELL ROAD 3.6 KM SOUTH OF CITY OF IOWA PARK	10097	0214B	3	RR	RR	RT									4			4	4		4	
BUFFALO CREEK AT COLEMAN PARK ROAD 2.95 KM SOUTHWEST OF IOWA PARK 1.7 KM UPSTREAM OF FM 368	16036	0214B	3	RR	RR	RT									4			4	4		4	

TABLE B1.1
Sample Design and Schedule - FY 2026

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
LAKE IOWA PARK IN MAIN POOL 0.4 KM UPSTREAM FROM CENTER OF DAM STRUCTURE 22.5 KM NORTHWEST OF WICHITA FALLS	17947	0214G	3	RR	RR	RT									4			4			4	
NORTH FORK BUFFALO CREEK RESERVOIR MID LAKE NEAR DAM 211 M NORTH AND 158 M WEST OF DAM RELEASE	20162	0214H	3	RR	RR	RT									4			4			4	
HOLLIDAY CREEK AT HARDING STREET 97 M EAST OF WILLIAMS AVENUE/HARDING STREET INTERSECTION IN WICHITA FALLS	10095	0214C	3	RR	RR	RT									4			4	4		4	
HOLLIDAY CREEK AT WICHITA FALLS COUNTRY CLUB GOLF COURSE APPROX 120 METERS NORTH AND 10 METERS WEST OF THE INTERSECTION OF BRIDWELL STREET AND 30TH STREET IN WICHITA FALLS	21025	0214C	3	RR	RR	RT									4			4	4		4	
UNNAMED TRIBUTARY OF BUFFLAW CREEK AT COLEMAN PARK ROAD DOWNSTREAM OF THE CITY OF IOWA PARK WWTP	21172	0214F	3	RR	RR	RT									4			4	4		4	
DIVERSION LAKE NEAR DAM 0.64 KM NORTHWEST OF SPILLWAY FACE 390 M WEST OF DAM EQUIDISTANT BETWEEN SHORELINES 22.8 KM WEST OF HOLLIDAY	10157	0215	3	RR	RR	RT									4			4			4	
LAKE KEMP NEAR DAM 0.80 KM SW OF WATER INTAKE STRUCTURE AT WICHITA RIVER 0.72 KM NORTH OF WILLINGHAM LOOP 1.64 KM WEST OF US 283	10159	0217	3	RR	RR	RT									4			4			4	
NORTH WICHITA RIVER AT FM 1919 5.25 KM NORTHWEST OF BAYLOR CR 129/FM 1919 INTERSECTION 16.8 KM NORTHWEST OF SEYMOUR	10161	0218	3	RR	RR	RT									4			4	4		4	
NORTH WICHITA RIVER AT SH 6 19KM SOUTH OF CROWELL AND 7.5 KM NORTH OF TRUSCOTT	10162	0218	3	RR	RR	RT									4			4	4		4	

TABLE B1.1
Sample Design and Schedule - FY 2026

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
LAKE WICHITA NEAR MID DAM 376 M SE OF END OF CITY ACCESS RD IN WICHITA FALLS 2.94KM SW OF SOUTHWEST PKWY/LAKE PARK DR INTERSECTION	10163	0219	3	RR	RR	RT									4			4			4	
PEASE RIVER AT FM 104/RR 104 16.7 KM SOUTH OF KIRKLAND	10167	0220	3	RR	RR	RT									4			4	4		4	
SALT FORK RED RIVER 80 M DOWNSTREAMMM OF US 83 AT SOUTH BANK 11 KM NORTH OF WELLINGTON	10171	0222	1	RR	RR	RT									4			4	4		4	
NORTH FORK RED RIVER AT US 83 4.25 KM NORTH OF SHAMROCK	10178	0224	1	RR	RR	RT									4			4	4		4	
MCCLELLAN CREEK AT SH 273 0.22 KM SOUTH OF SH 273/HUDGINS ROAD INTERSECTION 10.5 KM NORTH OF CITY OF MCLEAN	10064	0224A	1	RR	RR	RT									4			4	4		4	
SOUTH FORK WICHITA RIVER AT SH 6 6.7 KM NORTH OF BENJAMIN	10185	0226	3	RR	RR	RT									4			4	4		4	
SOUTH FORK WICHITA RIVER AT LOW FLOW DAM 1.69 KM DOWNSTREAM OF KING CR 274 10.6 KM EAST OF GUTHRIE	13636	0226	2	RR	RR	RT									4			4	4		4	
PEASE RIVER AT US 287 0.91 KM SOUTHEAST OF RR 925/US 287 INTERSECTION 4.6 KM NORTHWEST OF DOWNTOWN VERNON	10166	0230	3	RR	RR	RT									4			4	4		4	
UPPER PEASE/NORTH FORK PEASE RIVER AT US 283 3 KM NORTH OF VERNON	10165	0230	3	RR	RR	RT									4			4	4		4	

TABLE B1.1
Sample Design and Schedule - FY 2026

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
PARADISE CREEK AT US 287 3.75 KM EAST OF VERNON	10094	0230A	3	RR	RR	RT									4			4	4		4	
SWEETWATER CREEK AT RR 592/FM 592 3.33 KM NORTH OF SH 152/RR 592 INTERSECTION 14.15 KM EAST OF WHEELER	10070	0299A	1	RR	RR	RT									4			4	4		4	
WASHITA RIVER AT FM 2654 4.73 KM NORTH OF FM 277/FM 2654 INTERSECTION 12.54 KM NORTH OF ALLISON	10067	0299B	1	RR	RR	RT									4			4	4		4	

Appendix C: Station Location Maps

Station Location Maps

Maps of stations monitored by the RRA, NTMWD, and the City of Sherman are provided below. The maps were generated by the RRA. 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:

Dan Medenwaldt
Red River Authority CRP project Manager
(940) 636-8024
daniel.medenwaldt@rra.texas.gov.

Figure 1-1

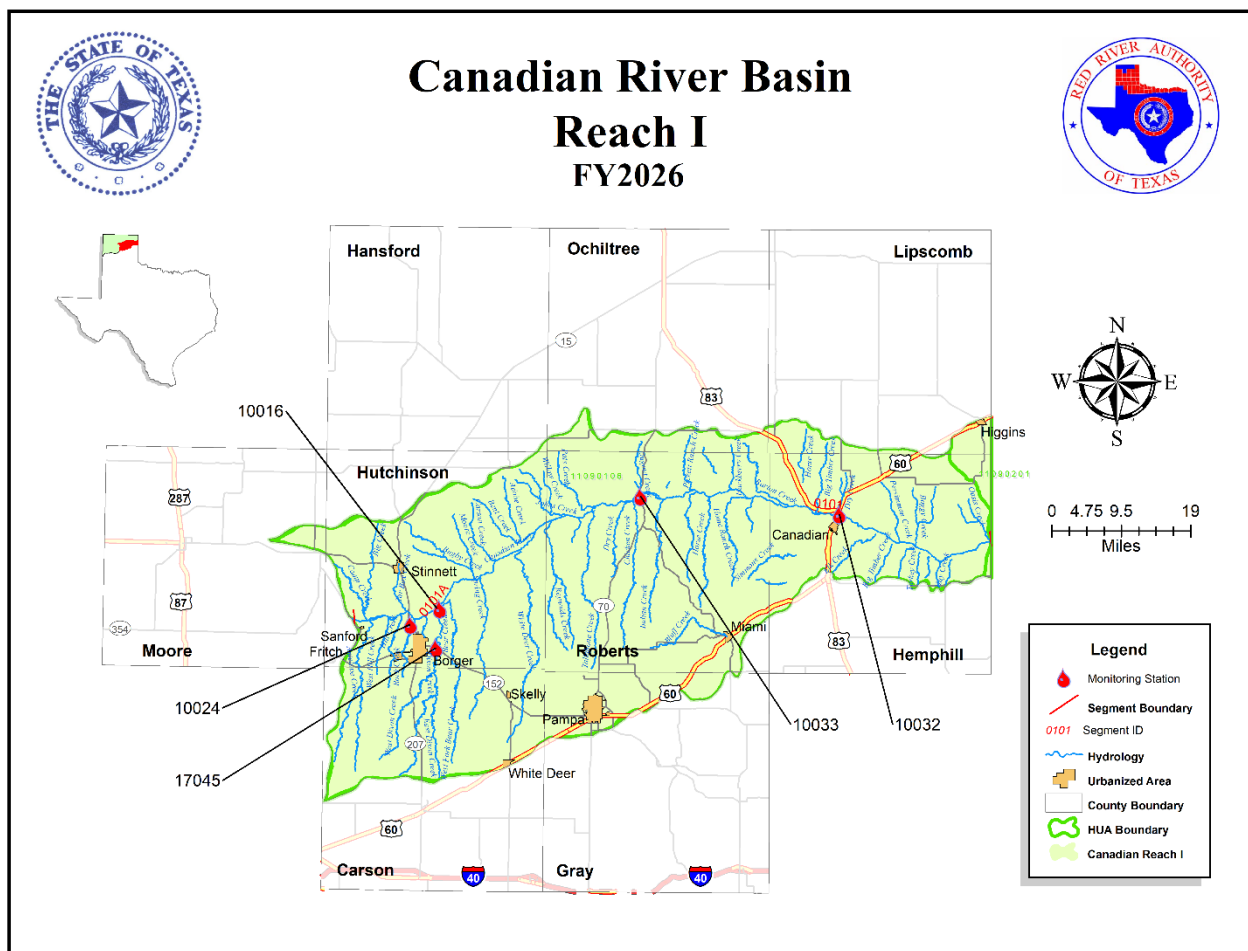


Figure 1-2

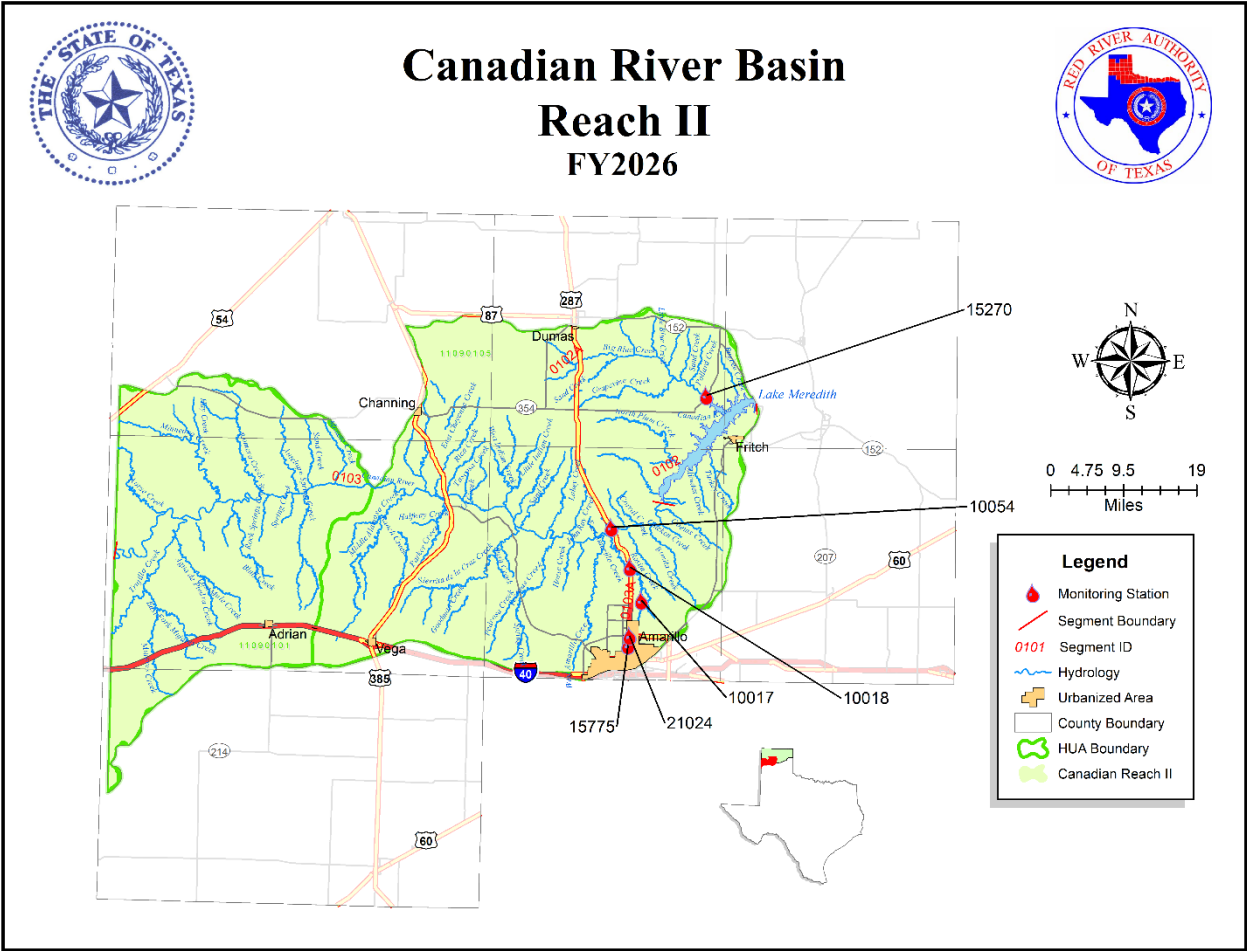


Figure 1-3

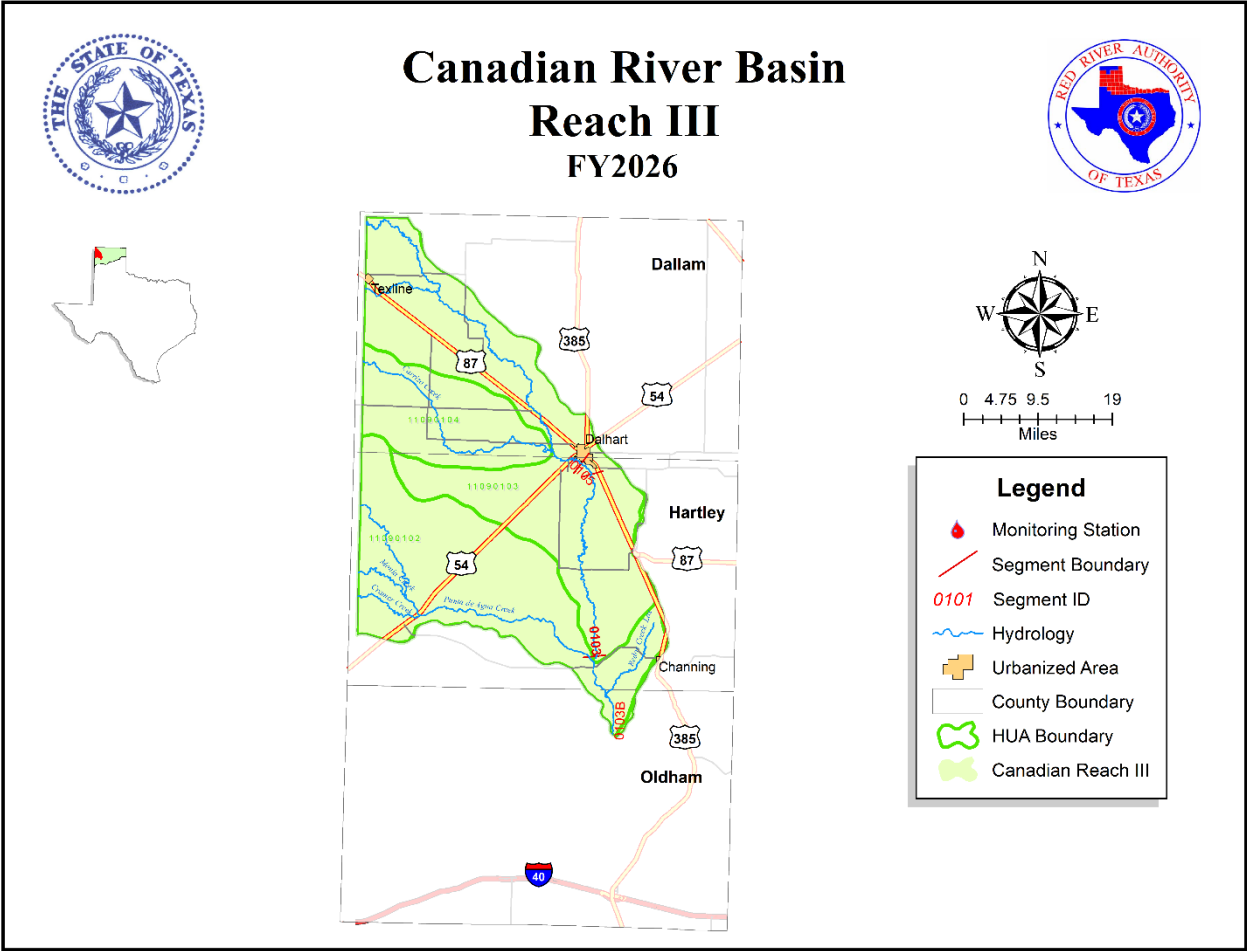


Figure 1-4

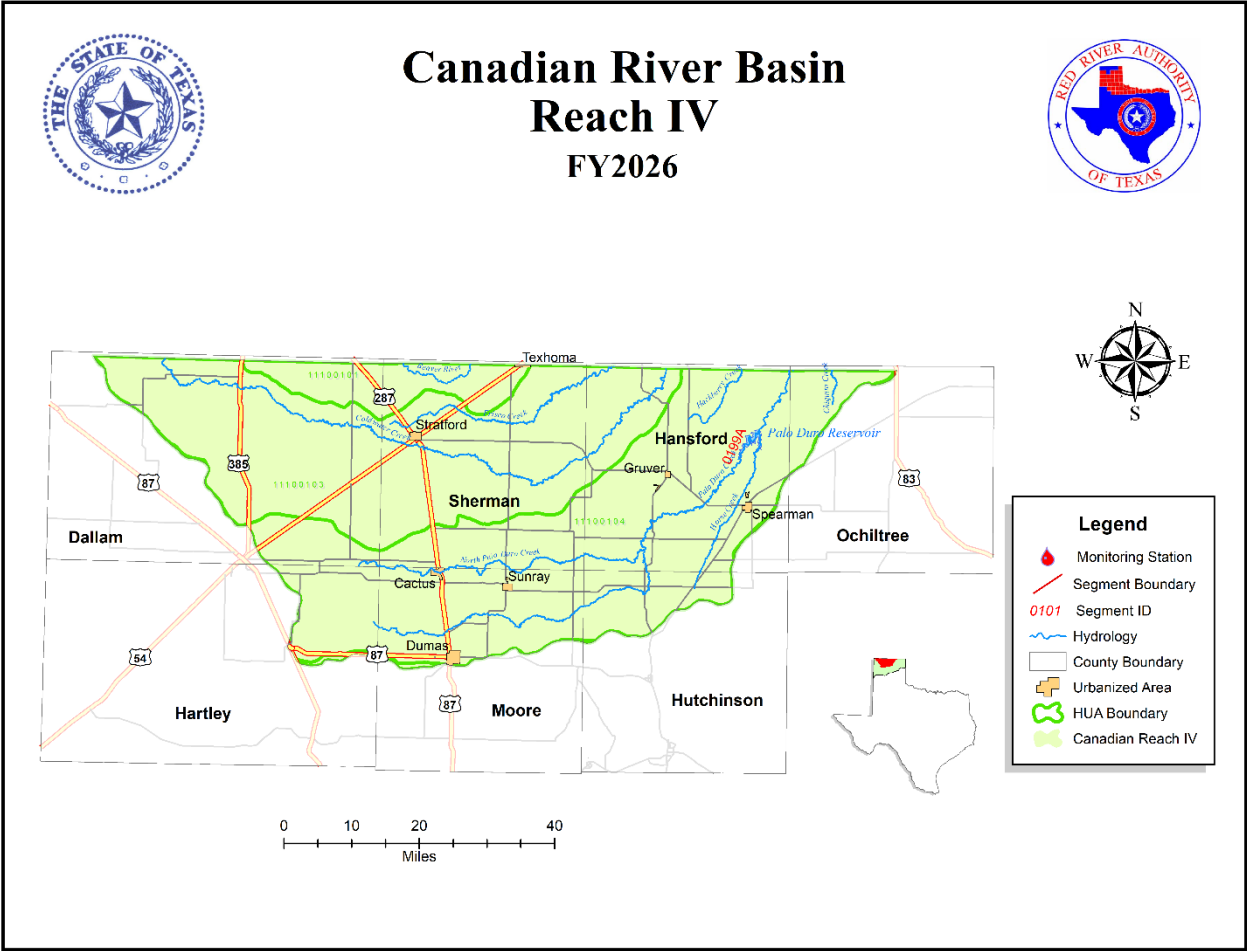


Figure 1-5

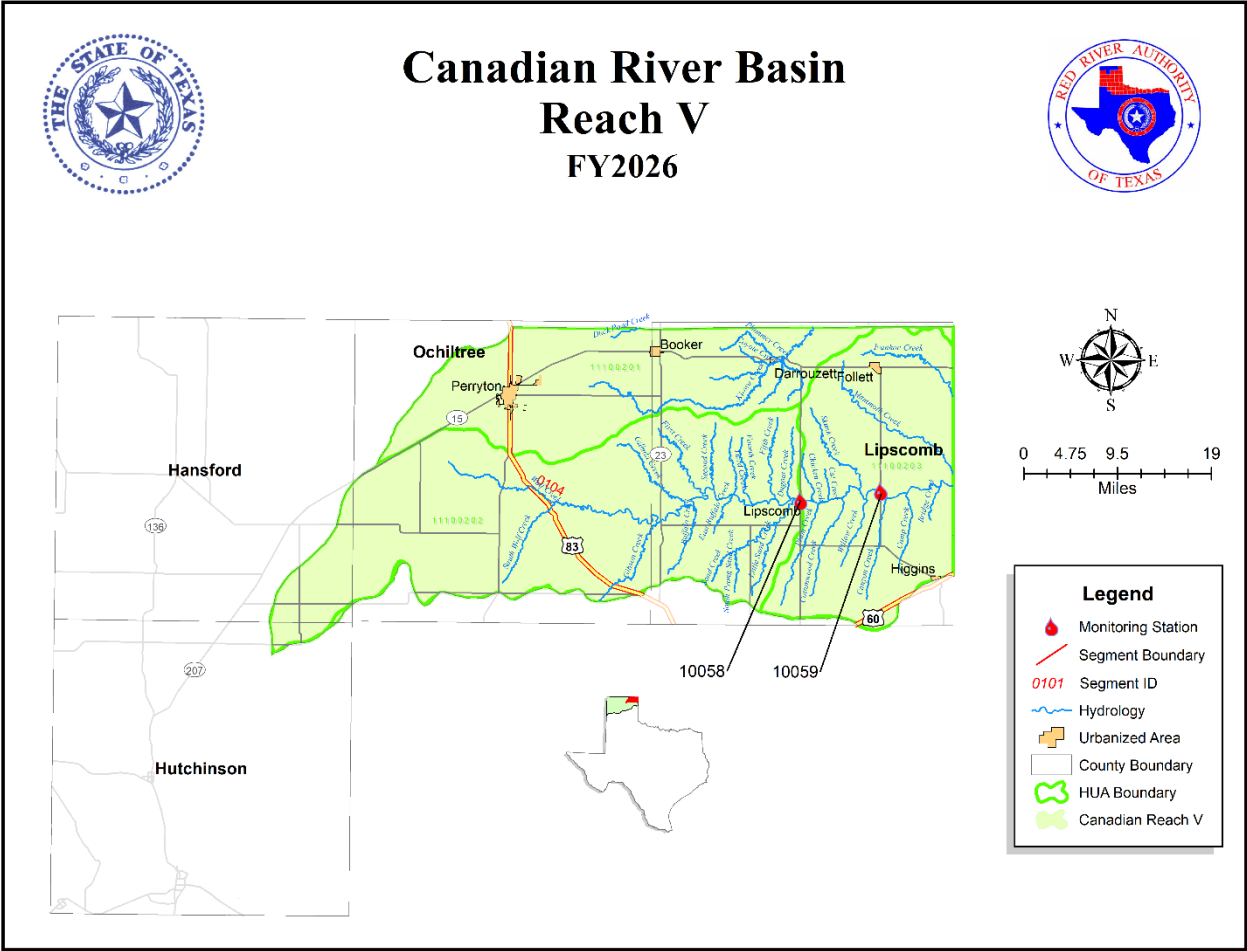


Figure 2-1.1

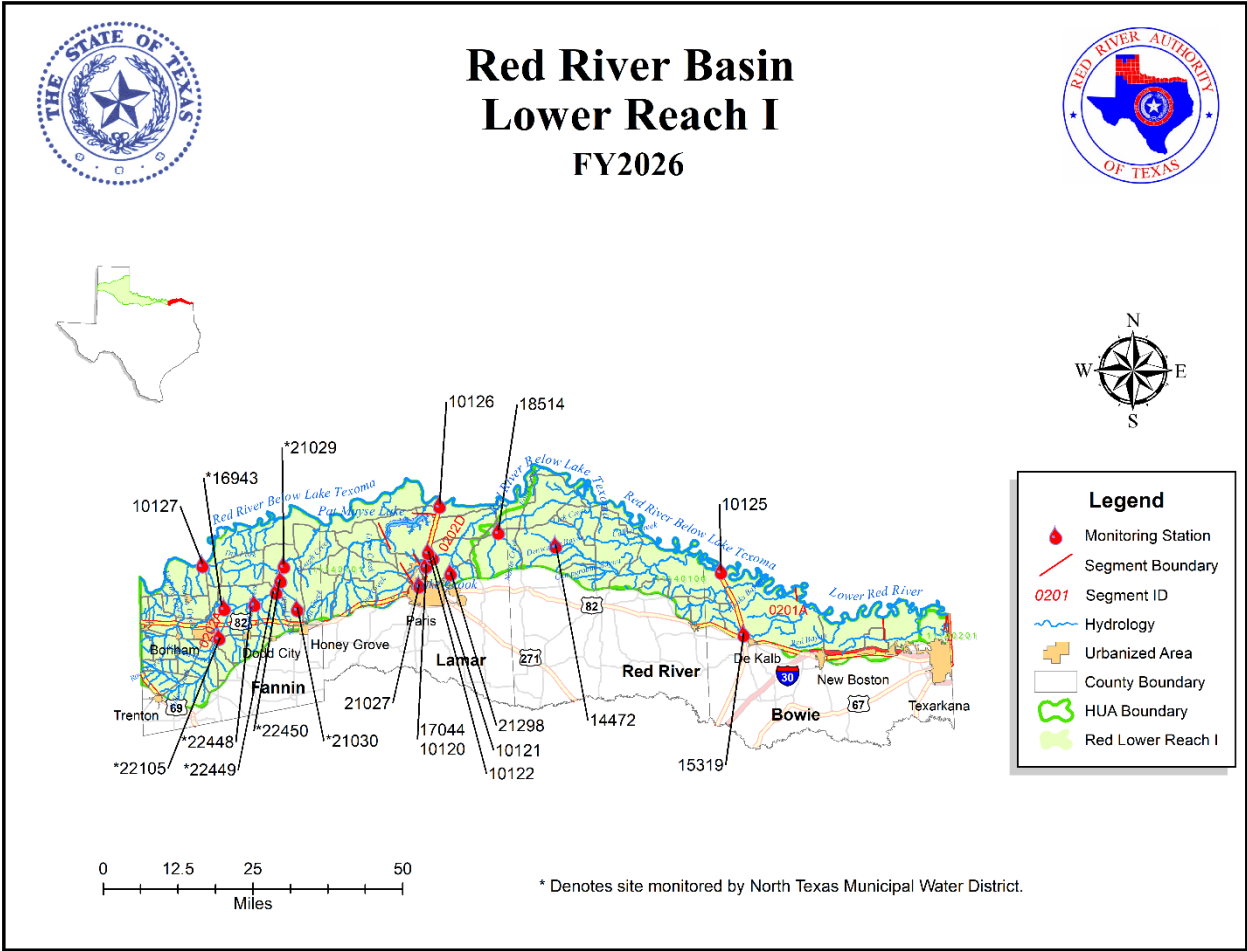


Figure 2-1.2

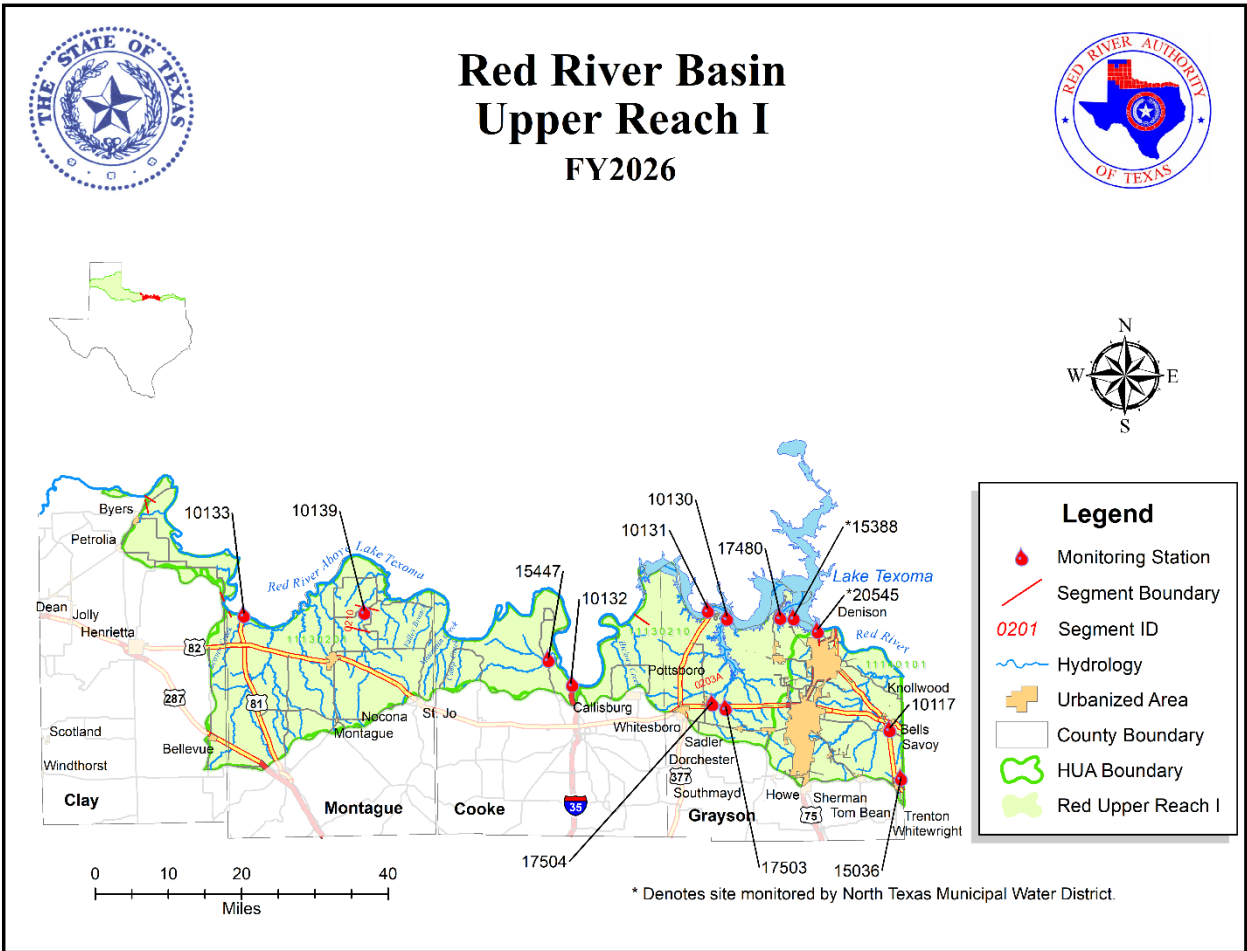


Figure 2-1.3

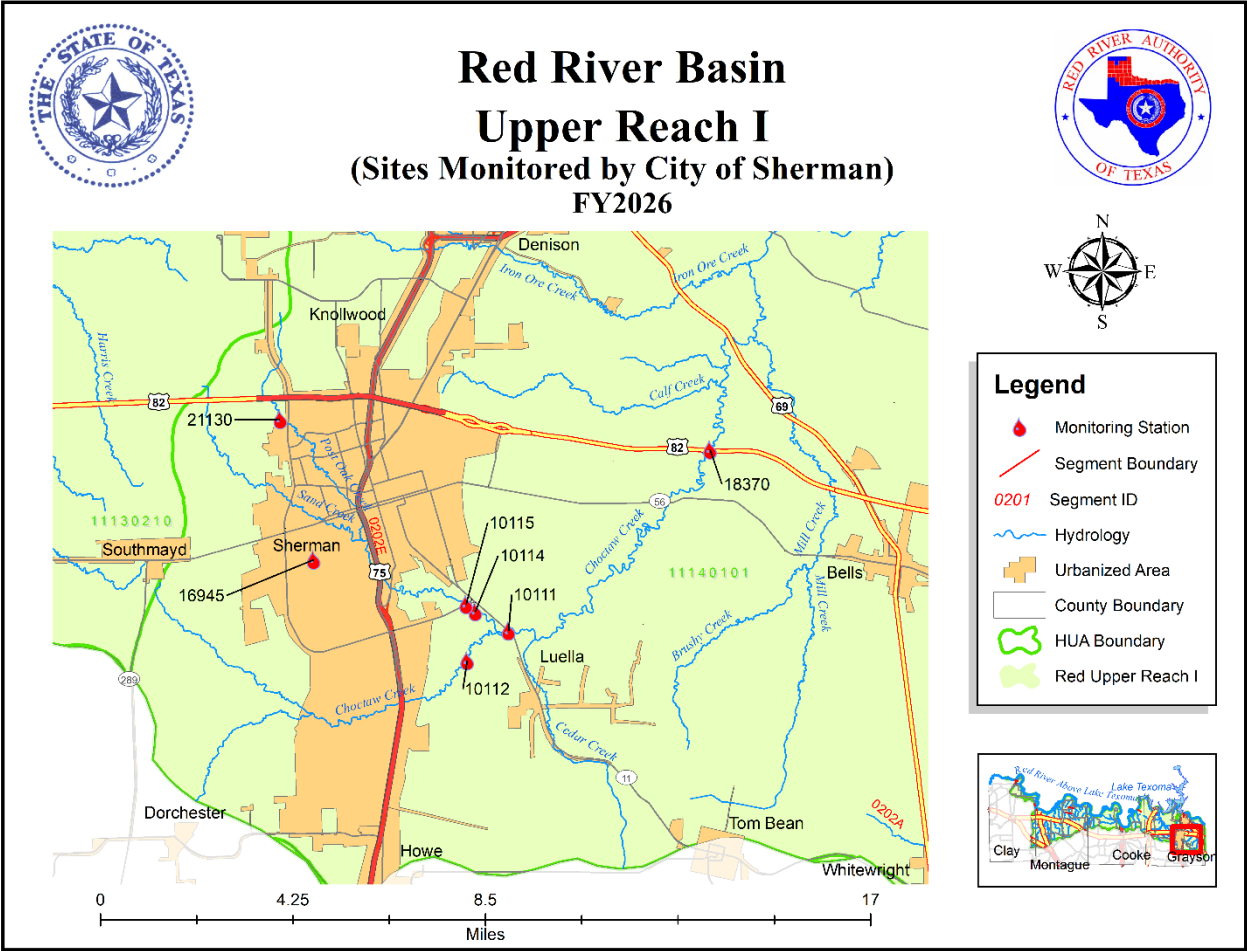


Figure 2-2

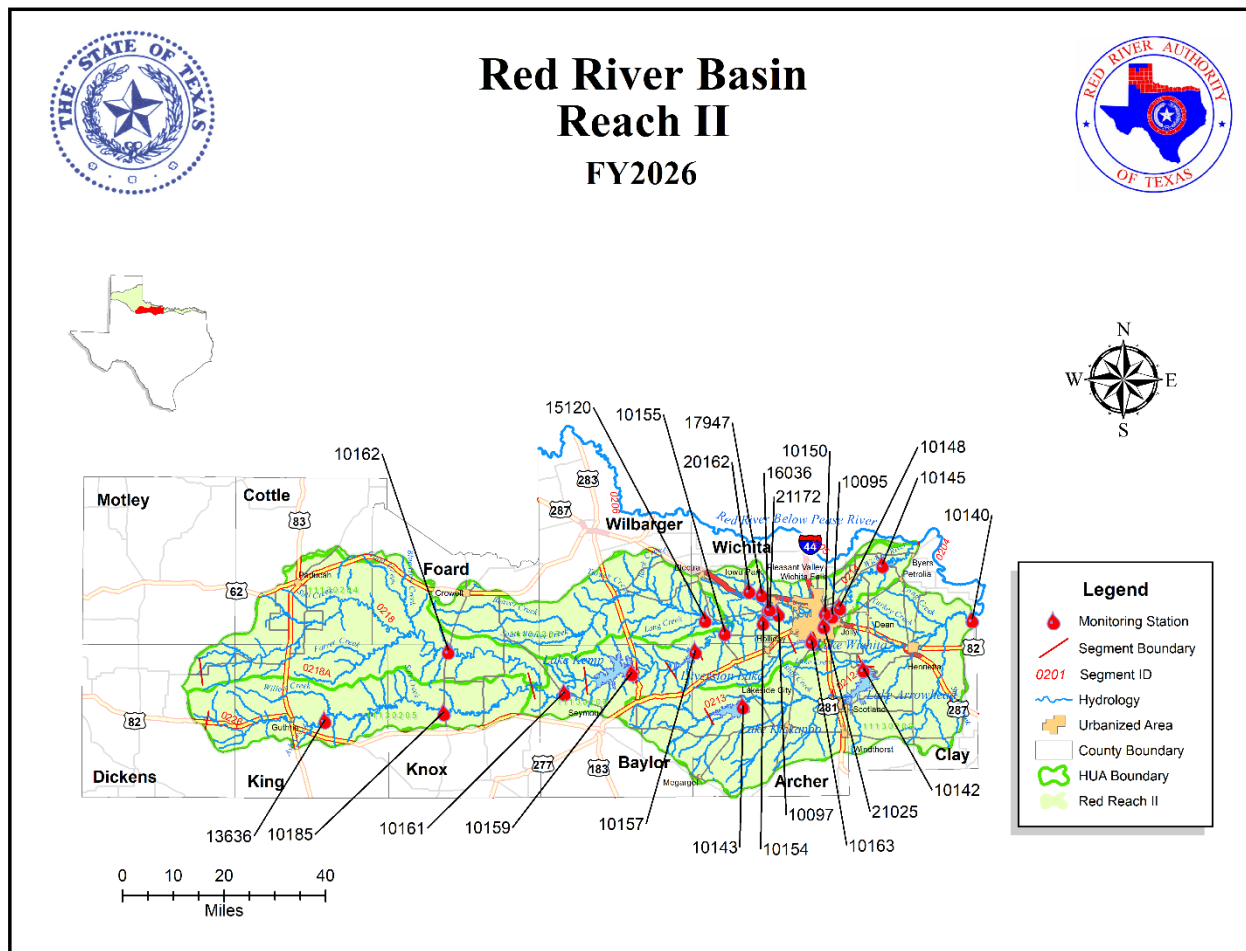


Figure 2-3

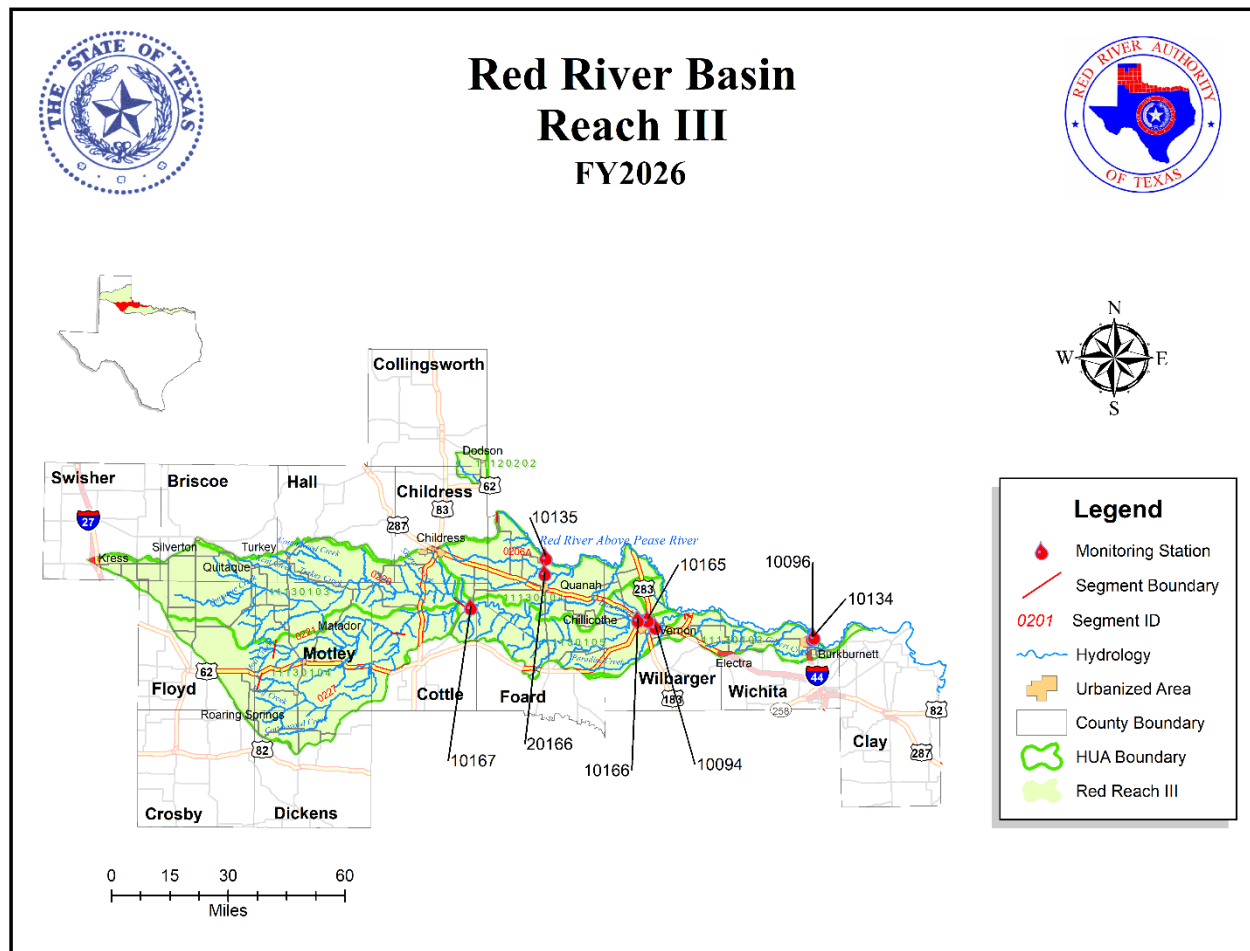


Figure 2-4

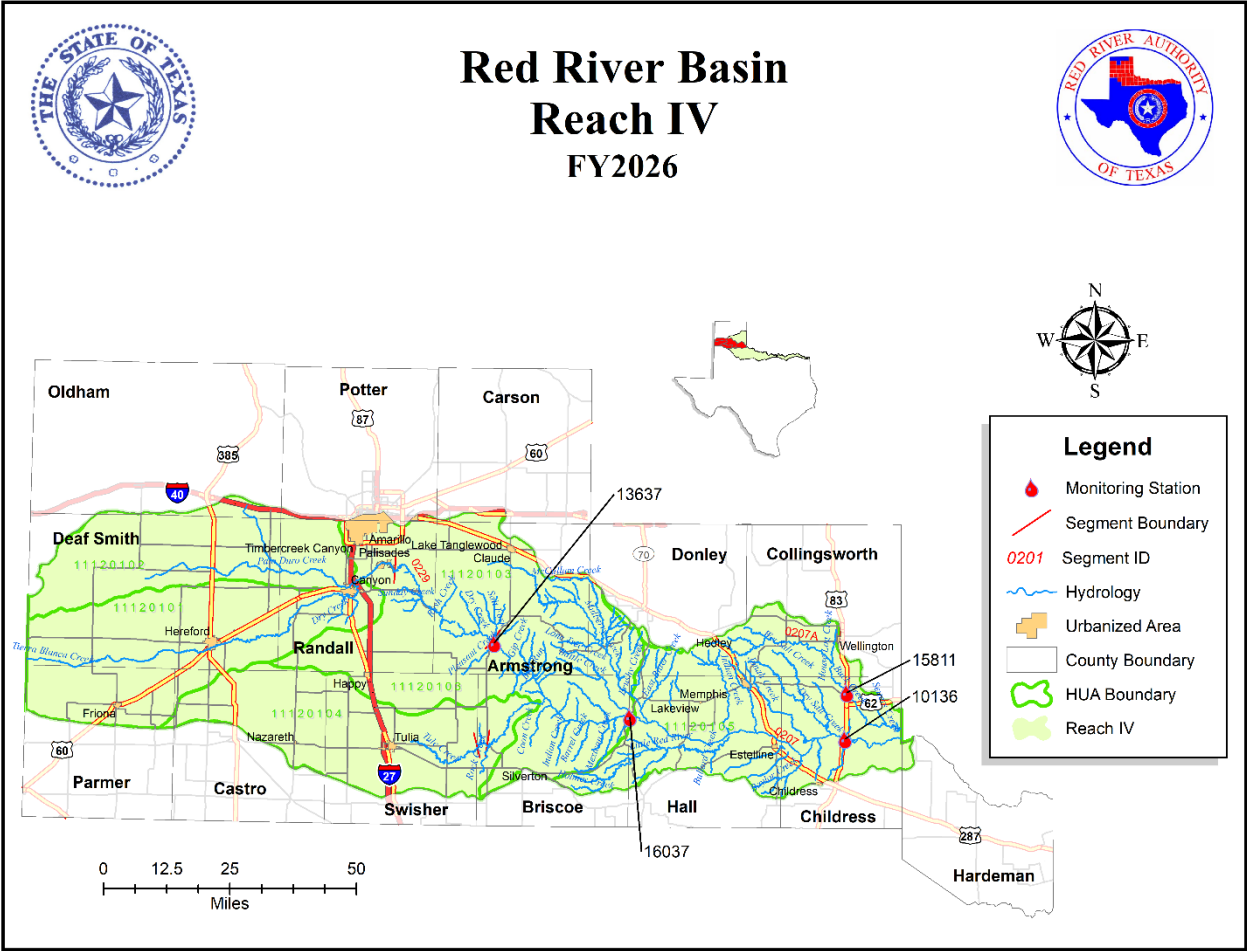
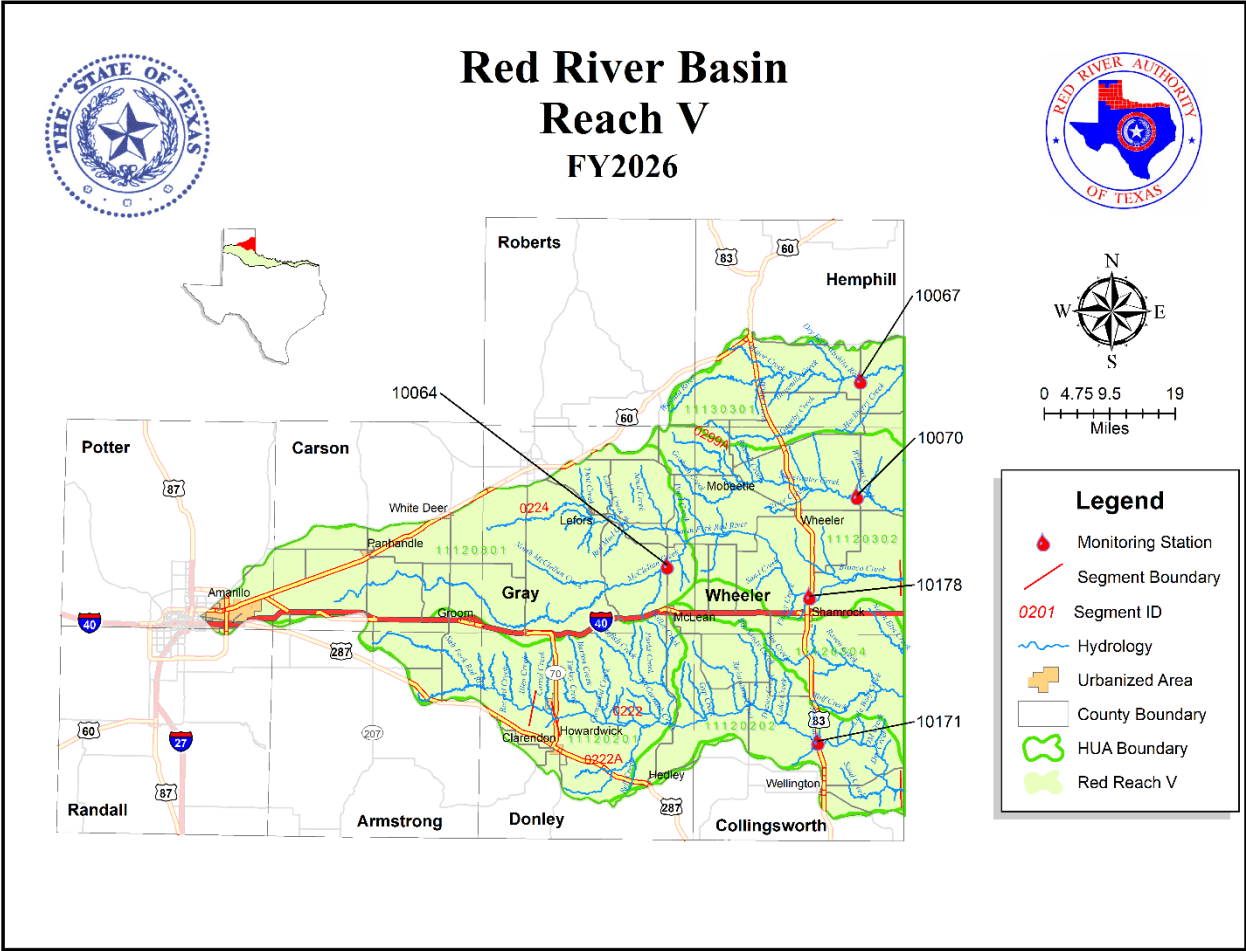


Figure 2-5



Appendix D: Field Data Sheets



RED RIVER AUTHORITY OF TEXAS STREAM CRP FIELD DATA REPORTING FORM



Date:		Station Location:			TCEQ Site ID:	
Time:		Basin/Reach/Segment:	HUA No.		RRA Tag No:	
County:		Monitoring Type:	QAO:		DE:	
RRA Laboratory ID #:			Stream Width (ft):		Section Width (ft):	
Chain of Custody #:			Time Start:		Time End:	
Tech(s): Print/Sign				Section Midpoint	Section Depth (ft)	Velocity (ft/S)
Parameter Code	Sample Collection Depth _____ Meters					Discharge (CFS)
00010		Water Temp (°C)	1			
00094		Conductivity (uS/cm)	2			
00300		Dissolved Oxygen (mg/L)	3			
00400		pH (Standard Units)	4			
01351		Flow Severity 1 – No Flow 2 – Low Flow 3 – Normal 4 – Flood 5 – High 6 – Dry	5			
			6			
00061		Flow (CFS)	7			
74069		Flow Estimate (CFS)	8			
89835		Flow Measurement Method 1 – Gauge 2 – Electronic 3 – Mechanical 4 – Weir/Flume 5 – Doppler	9			
			10			
20424		Water Clarity 1 – Excellent 2 – Good 3 – Fair 4 – Poor	11			
			12			
89969		Water Color 1 – Brown 2 – Reddish 3 – Green 4 – Black 5 – Clear 6 – Other*	13			
			14			
89971		Water Odor 1 – Sewage 2 – Oily/Chem 3 – Rotten Eggs 4 – Musky 5 – Fishy 6 – None 7 – Other*	15			
			16			
00021		Air Temperature (° Fahrenheit)	17			
89966		Weather 1 – Clear 2 – Partly Cloudy 3 – Cloudy 4 – Rain 5 – Other*	18			
			19			
89965		Wind Condition 1 – Calm 2 – Slight 3 – Moderate 4 – Strong Direction _____	20			
72053		Significant Precip. (< or > Days)	Tech taking flow:			Total Flow in CFS
00078		Transparency, Secchi Disc (m)	Tech recording measurements:			
USGS Gauge ID:			Tech calculating flow:			
Secchi Disc (m)			Comments and details/descriptions for parameter codes marked other*:			
Disappear _____ Appear _____						

MEASUREMENT COMMENTS AND FIELD OBSERVATIONS

Biological Activities:		
Aquatic Vegetation:		
Terrestrial Vegetation:		
Aquatic Animals:		
Terrestrial Animals:		
Aquatic Insects:		
Terrestrial Insects:		
Left Bank:		
Right Bank:		
Watershed Activities:		
Water Quality/Stream Use:		
Specific Sample Info:		
Missing Parameters:		
Notes:		
Drought Parameters (if applicable)	Parameter Code	Result
Maximum Pool Width (m)	89864	
Maximum Pool Depth (m)	89865	
Pool Length (m)	89869	
Percent Pool Coverage in a 500 (m) Reach	89870	

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**RED RIVER AUTHORITY OF TEXAS
LAKE / RESERVOIR
CRP FIELD DATA REPORTING FORM**



Date:		Station Location:		TCEQ Site ID:	
Time:		Basin/Reach/Segment:	HUA No.	RRA Tag No:	
County:		Monitoring Type:	QAO:	DE:	
RRA Laboratory ID #:			Total Depth (m):	Total Measurements:	
Chain of Custody #:			Time Start:	Time End:	
Tech(s): Print/Sign			Sample Depth (m)	Temp (°C)	pH (s. u.)
D.O. (mg/L)			Conductivity (uS/cm)		
Parameter Code	Sample Collection Depth _____ Meters				
20424		Water Clarity 1 – Excellent 2 – Good 3 – Fair 4 – Poor			
89965		Wind Condition 1 – Calm 2 – Slight 3 – Moderate 4 – Strong Direction _____			
89966		Weather 1 – Clear 2 – Partly Cloudy 3 – Cloudy 4 – Rain 5 – Other*			
89968		Water Surface 1 – Calm 2 – Ripple 3 – Wave 4 – Whitecap			
89969		Water Color 1 – Brown 2 – Reddish 3 – Green 4 – Black 5 – Clear 6 – Other*			
89971		Water Odor 1 – Sewage 2 – Oily/Chem 3 – Rotten Eggs 4 – Musky 5 – Fishy 6 – None 7 – Other*			
00078		Transparency, Secchi Disk (m)			
72053		Significant Precip. (< or > Days)			
00021		Air Temperature (° Fahrenheit)			
00051		Reservoir Access Not Possible			
00052		Reservoir Stage (TWDB Website)			
00053		Reservoir Percent Full (TWDB Website)			
00054		Reservoir Storage (TWDB Website)			
82903		Depth Bottom of Water Body (m)			
USGS Gauge ID:		N/A			
Secchi Disc (m)		Disappear _____ Appear _____			
Comments and details/descriptions for parameter codes marked other*:					

MEASUREMENT COMMENTS AND FIELD OBSERVATIONS

Biological Activities:	
Aquatic Vegetation:	
Terrestrial Vegetation:	
Aquatic Animals:	
Terrestrial Animals:	
Aquatic Insects:	
Terrestrial Insects:	
Watershed Activities:	
Water Body Uses Observed:	
Specific Sample Info:	
Missing Parameters:	
Notes:	

Revision 06132019 – (RRACRPLFDS-005)



RED RIVER AUTHORITY OF TEXAS
24 Hour Monitoring
CRP FIELD DATA REPORTING FORM



Date:		Station Location:			TCEQ Site ID:		
Time:		Basin/Reach/Segment:	HUA No.		RRA Tag No:		
County:		Monitoring Type:	QAO:		DE:		
RRA Laboratory ID #:			Stream Width (ft):		Section Width (ft):		
Chain of Custody #:			Time Start:		Time End:		
Tech(s): Print/Sign				Section Midpoint	Section Depth (ft)	Velocity (ft/S)	Discharge (CFS)
Parameter Code	Sample Collection Depth _____ Meters						
00010		Water Temp (°C)	2				
00094		Conductivity (uS/cm)	3				
00300		Dissolved Oxygen (mg/L)	4				
00400		pH (Standard Units)	5				
01351		Flow Severity 1 – No Flow 2 – Low Flow 3 – Normal 4 – Flood 5 – High 6 – Dry	6				
			7				
00061		Flow (CFS)	8				
74069		Flow Estimate (CFS)	9				
89835		Flow Measurement Method 1 – Gauge 2 – Electronic 3 – Mechanical 4 – Weir/Flume 5 – Doppler	10				
			11				
20424		Water Clarity 1 – Excellent 2 – Good 3 – Fair 4 – Poor	12				
			13				
89969		Water Color 1 – Brown 2 – Reddish 3 – Green 4 – Black 5 – Clear 6 – Other*	14				
			15				
89971		Water Odor 1 – Sewage 2 – Oily/Chem 3 – Rotten Eggs 4 – Musky 5 – Fishy 6 – None 7 – Other*	16				
			17				
00021		Air Temperature (° Fahrenheit)	18				
89966		Weather 1 – Clear 2 – Partly Cloudy 3 – Cloudy 4 – Rain 5 – Other*	19				
			20				
89965		Wind Condition 1 – Calm 2 – Slight 3 – Moderate 4 – Strong Direction _____	Tech taking flow:				Total Flow in CFS
			Tech recording measurements:				
72053		Significant Precip. (< or > Days)	Tech calculating flow:				
00078		Transparency, Secchi Disc (m)	Comments and details/descriptions for parameter codes marked other*:				
USGS Gauge ID:			7Q2 For Site:				
			Does Flow Meet/Exceed 7Q2 Criteria: Yes / No				
Secchi Disc (m)	Disappear _____ Appear _____						

24 HOUR MEASUREMENT RESULTS SUMMARY

Parameter Description	Parameter Code	Result
Dissolved Oxygen (mg/L), 24-Hour Minimum	89855	
Dissolved Oxygen (mg/L), 24-Hour Maximum	89856	
Dissolved Oxygen (mg/L), 24-Hour Average	89857	
Dissolved Oxygen (mg/L), 24-Hour # of Measurements	89858	
Water Temperature (°C), 24-Hour Minimum	00211	
Water Temperature (°C), 24-Hour Maximum	00210	
Water Temperature (°C), 24-Hour Average	00209	
Specific Conductance (uS/cm), 24-Hour Minimum	00214	
Specific Conductance (uS/cm), 24-Hour Maximum	00213	
Specific Conductance (uS/cm), 24-Hour Average	00212	
pH (S.U.), 24-Hour Minimum	00216	
pH (S.U.), 24-Hour Maximum	00215	
MISSING PARAMETERS		
NOTES		

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**NORTH TEXAS MUNICIPAL WATER DISTRICT
STREAM
CRP FIELD DATA REPORTING FORM**



Date:		Station Location:		TCEQ Site ID:	
Time:		Basin/Reach/Segment:	HUA No.	RRA Tag No:	
County:		Monitoring Type:	QAO:	DE:	
RRA Laboratory ID #:			Stream Width (ft):	Section Width (ft):	
Chain of Custody #:			Time Start:	Time End:	
Tech(s): Print/Sign				Section Midpoint	Section Depth (ft)
Parameter Code	Sample Collection Depth _____ Meters			Velocity (ft/S)	Discharge (CFS)
00010		Water Temp (°C)	1		
00094		Conductivity (uS/cm)	2		
00300		Dissolved Oxygen (mg/L)	3		
00400		pH (Standard Units)	4		
01351		Flow Severity 1 – No Flow 2 – Low Flow 3 – Normal 4 – Flood 5 – High 6 – Dry	5		
			6		
00061		Flow (CFS)	7		
74069		Flow Estimate (CFS)	8		
89835		Flow Measurement Method 1 – Gauge 2 – Electronic 3 – Mechanical 4 – Weir/Flume 5 – Doppler	9		
			10		
20424		Water Clarity 1 – Excellent 2 – Good 3 – Fair 4 – Poor	11		
			12		
89969		Water Color 1 – Brown 2 – Reddish 3 – Green 4 – Black 5 – Clear 6 – Other*	13		
			14		
89971		Water Odor 1 – Sewage 2 – Oily/Chem 3 – Rotten Eggs 4 – Musky 5 – Fishy 6 – None 7 – Other*	15		
			16		
00021		Air Temperature (° Fahrenheit)	17		
89966		Weather 1 – Clear 2 – Partly Cloudy 3 – Cloudy 4 – Rain 5 – Other*	18		
			19		
89965		Wind Condition 1 – Calm 2 – Slight 3 – Moderate 4 – Strong Direction _____	20		
72053		Significant Precip. (< or > Days)	Tech taking flow:		
00078		Transparency, Secchi Disc (m)	Tech recording measurements:		
USGS Gauge ID:			Tech calculating flow:		
			Comments and details/descriptions for parameter codes marked other*:		
Secchi Disc (m) Disappear _____ Appear _____					

MEASUREMENT COMMENTS AND FIELD OBSERVATIONS

Biological Activities:		
Aquatic Vegetation:		
Terrestrial Vegetation:		
Aquatic Animals:		
Terrestrial Animals:		
Aquatic Insects:		
Terrestrial Insects:		
Left Bank:		
Right Bank:		
Watershed Activities:		
Water Quality/Stream Use:		
Specific Sample Info:		
Missing Parameters:		
Notes:		
Drought Parameters (if applicable)	Parameter Code	Result
Maximum Pool Width (m)	89864	
Maximum Pool Depth (m)	89865	
Pool Length (m)	89869	
Percent Pool Coverage in a 500 (m) Reach	89870	

Revision 06132019 – (RRACRPSFDS-004)



**NORTH TEXAS MUNICIPAL WATER DISTRICT
LAKE / RESERVOIR
CRP FIELD DATA REPORTING FORM**



Date:		Station Location:		TCEQ Site ID:	
Time:		Basin/Reach/Segment:	HUA No.	RRA Tag No:	
County:		Monitoring Type:	QAO:	DE:	
RRA Laboratory ID #:			Total Depth (m):	Total Measurements:	
Chain of Custody #:			Time Start:	Time End:	
Tech(s): Print/Sign			Sample Depth (m)	Temp (°C)	pH (s. u.)
D.O. (mg/L)			Conductivity (uS/cm)		
Parameter Code	Sample Collection Depth _____ Meters				
20424		Water Clarity 1 – Excellent 2 – Good 3 – Fair 4 – Poor			
89965		Wind Condition 1 – Calm 2 – Slight 3 – Moderate 4 – Strong Direction _____			
89966		Weather 1 – Clear 2 – Partly Cloudy 3 – Cloudy 4 – Rain 5 – Other*			
89968		Water Surface 1 – Calm 2 – Ripple 3 – Wave 4 – Whitecap			
89969		Water Color 1 – Brown 2 – Reddish 3 – Green 4 – Black 5 – Clear 6 – Other*			
89971		Water Odor 1 – Sewage 2 – Oily/Chem 3 – Rotten Eggs 4 – Musky 5 – Fishy 6 – None 7 – Other*			
00078		Transparency, Secchi Disk (m)			
72053		Significant Precip. (< or > Days)			
00021		Air Temperature (° Fahrenheit)			
00051		Reservoir Access Not Possible			
00052		Reservoir Stage (TWDB Website)			
00053		Reservoir Percent Full (TWDB Website)			
00054		Reservoir Storage (TWDB Website)			
82903		Depth Bottom of Water Body (m)			
USGS Gauge ID:	N/A				
Secchi Disc (m)	Disappear _____ Appear _____				
Comments and details/descriptions for parameter codes marked other*:					

MEASUREMENT COMMENTS AND FIELD OBSERVATIONS

Biological Activities:	
Aquatic Vegetation:	
Terrestrial Vegetation:	
Aquatic Animals:	
Terrestrial Animals:	
Aquatic Insects:	
Terrestrial Insects:	
Watershed Activities:	
Water Body Uses Observed:	
Specific Sample Info:	
Missing Parameters:	
Notes:	

Revision 06132019 – (RRACRPLFDS-005)



**CITY OF SHERMAN
STREAM
CRP FIELD DATA REPORTING FORM**



Date:		Station Location:			TCEQ Site ID:		
Time:		Basin/Reach/Segment:	HUA No.		RRA Tag No:		
County:		Monitoring Type:	QAO:		DE:		
RRA Laboratory ID #:			Stream Width (ft):		Section Width (ft):		
Chain of Custody #:			Time Start:		Time End:		
Tech(s): Print/Sign				Section Midpoint	Section Depth (ft)	Velocity (ft/S)	Discharge (CFS)
Parameter Code	Sample Collection Depth _____ Meters		1				
00010		Water Temp (°C)	2				
00094		Conductivity (uS/cm)	3				
00300		Dissolved Oxygen (mg/L)	4				
00400		pH (Standard Units)	5				
01351		Flow Severity 1 – No Flow 2 – Low Flow 3 – Normal 4 – Flood 5 – High 6 – Dry	6				
			7				
00061		Flow (CFS)	8				
74069		Flow Estimate (CFS)	9				
89835		Flow Measurement Method 1 – Gauge 2 – Electronic 3 – Mechanical 4 – Weir/Flume 5 – Doppler	10				
			11				
20424		Water Clarity 1 – Excellent 2 – Good 3 – Fair 4 – Poor	12				
			13				
89969		Water Color 1 – Brown 2 – Reddish 3 – Green 4 – Black 5 – Clear 6 – Other*	14				
			15				
89971		Water Odor 1 – Sewage 2 – Oily/Chem 3 – Rotten Eggs 4 – Musky 5 – Fishy 6 – None 7 – Other*	16				
			17				
00021		Air Temperature (° Fahrenheit)	18				
89966		Weather 1 – Clear 2 – Partly Cloudy 3 – Cloudy 4 – Rain 5 – Other*	19				
			20				
89965		Wind Condition 1 – Calm 2 – Slight 3 – Moderate 4 – Strong Direction _____	Tech taking flow:				Total Flow in CFS
			Tech recording measurements:				
72053		Significant Precip. (< or > Days)	Tech calculating flow:				
00078		Transparency, Secchi Disc (m)	Comments and details/descriptions for parameter codes marked other*:				
USGS Gauge ID:							
Secchi Disc (m)		Disappear _____ Appear _____					

MEASUREMENT COMMENTS AND FIELD OBSERVATIONS

Biological Activities:		
Aquatic Vegetation:		
Terrestrial Vegetation:		
Aquatic Animals:		
Terrestrial Animals:		
Aquatic Insects:		
Terrestrial Insects:		
Left Bank:		
Right Bank:		
Watershed Activities:		
Water Quality/Stream Use:		
Specific Sample Info:		
Missing Parameters:		
Notes:		
Drought Parameters (if applicable)	Parameter Code	Result
Maximum Pool Width (m)	89864	
Maximum Pool Depth (m)	89865	
Pool Length (m)	89869	
Percent Pool Coverage in a 500 (m) Reach	89870	

Revision 06132019 – (RRACRPSFDS-004)



**CITY OF SHERMAN
LAKE / RESERVOIR
CRP FIELD DATA REPORTING FORM**



Date:		Station Location:		TCEQ Site ID:	
Time:		Basin/Reach/Segment:	HUA No.	RRA Tag No:	
County:		Monitoring Type:	QAO:	DE:	
RRA Laboratory ID #:			Total Depth (m):	Total Measurements:	
Chain of Custody #:			Time Start:	Time End:	
Tech(s): Print/Sign			Sample Depth (m)	Temp (°C)	pH (s. u.)
D.O. (mg/L)			Conductivity (uS/cm)		
Parameter Code	Sample Collection Depth _____ Meters				
20424		Water Clarity 1 – Excellent 2 – Good 3 – Fair 4 – Poor			
89965		Wind Condition 1 – Calm 2 – Slight 3 – Moderate 4 – Strong Direction _____			
89966		Weather 1 – Clear 2 – Partly Cloudy 3 – Cloudy 4 – Rain 5 – Other*			
89968		Water Surface 1 – Calm 2 – Ripple 3 – Wave 4 – Whitecap			
89969		Water Color 1 – Brown 2 – Reddish 3 – Green 4 – Black 5 – Clear 6 – Other*			
89971		Water Odor 1 – Sewage 2 – Oily/Chem 3 – Rotten Eggs 4 – Musky 5 – Fishy 6 – None 7 – Other*			
00078		Transparency, Secchi Disk (m)			
72053		Significant Precip. (< or > Days)			
00021		Air Temperature (° Fahrenheit)			
00051		Reservoir Access Not Possible			
00052		Reservoir Stage (TWDB Website)			
00053		Reservoir Percent Full (TWDB Website)			
00054		Reservoir Storage (TWDB Website)			
82903		Depth Bottom of Water Body (m)			
USGS Gauge ID:		N/A			
Secchi Disc (m)		Disappear _____ Appear _____			
Comments and details/descriptions for parameter codes marked other*:					

MEASUREMENT COMMENTS AND FIELD OBSERVATIONS

Biological Activities:	
Aquatic Vegetation:	
Terrestrial Vegetation:	
Aquatic Animals:	
Terrestrial Animals:	
Aquatic Insects:	
Terrestrial Insects:	
Watershed Activities:	
Water Body Uses Observed:	
Specific Sample Info:	
Missing Parameters:	
Notes:	

Revision 06132019 – (RRACRPLFDS-005)

Appendix E: Chain of Custody Forms

Laboratory Use Only: COC#

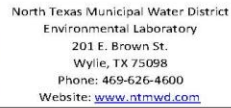


P.O. Box 240, Wichita Falls, TX 76307-0240
3000 Hammon Rd, Wichita Falls, TX 76310-7500
Phone: 940-723-1717 • Fax: 940-723-6529
Website: www.rra.texas.gov • Email: lab@rra.texas.gov

Document Number: 300

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Work Order _____

Red River Authority of Texas FY 26-27 CRP QAPP
Last revised on August 26, 2025

Appendix F: Data Review Checklist and Summary Shells

Data Review Checklist

This checklist is to be used by the Planning Agency and other entities handling the monitoring data in order to review data before submitting to the TCEQ. This table may not contain all of the data review tasks being conducted.

Data Format and Structure	Y, N, or N/A
Are there any duplicate Tag Id numbers in the Events file?	
Do the Tag prefixes correctly represent the entity providing the data?	
Have any Tag Id numbers been used in previous data submissions?	
Are Tag IDs associated with a valid SLOC?	
Are sampling Dates in the correct format, MM/DD/YYYY with leading zeros?	
Are sampling Times based on the 24 hr clock (e.g. 09:04) with leading zeros?	
Is the Comments field filled in where appropriate (e.g. unusual occurrence, sampling problems, unrepresentative of ambient water quality)?	
Are Submitting Entity, Collecting Entity, and Monitoring Type codes used correctly?	
Do sampling dates in the Results file match those in the Events file for each Tag Id?	
Are values represented by a valid parameter code with the correct units?	
Are there any duplicate parameter codes for the same Tag Id?	
Are there any invalid symbols in the Greater Than/Less Than (GT/LT) field?	
Are there any Tag Ids in the Results file that are not in the Events file or vice versa?	
Data Quality Review	Y, N, or N/A
Are "less-than" values reported at the LOQ? If no, explain in Data Summary.	
Have the outliers been verified and a "1" placed in the Verify_flg field?	
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? Is the minimum 24 hour DO less than the maximum 24 hour DO? Do the values appear to be consistent with what is expected for site?	
Have at least 10% of the data in the data set been reviewed against the field and laboratory data sheets?	
Are all parameter codes in the data set listed in the QAPP?	
Are all stations in the data set listed in the QAPP?	
Documentation Review	Y, N, or N/A
Are blank results acceptable as specified in the QAPP?	
Were control charts used to determine the acceptability of lab duplicates (if applicable)?	
Was documentation of any unusual occurrences that may affect water quality included in the Event file's Comments field?	
Were there any failures in sampling methods and/or deviations from sample design requirements that resulted in unreportable data? If yes, explain in Data Summary.	
Were there any failures in field and/or laboratory measurement systems that were not resolvable and resulted in unreportable data? If yes, explain in Data Summary.	
Was the laboratory's NELAP Accreditation current for analysis conducted?	
Did participants follow the requirements of this QAPP in the collection, analysis, and reporting of data?	

Data Summary

Data Set Information

Data Source: _____

Date Submitted: _____

Tag_id Range: _____

Date Range: _____

- ☐ 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 criteria in the Data Review Checklist.

Planning Agency Data Manager: _____ Date: _____

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

- Inconsistencies with LOQs
- Failures in sampling methods and/or laboratory procedures that resulted in data that could not be reported to the TCEQ (indicate items for which the Corrective Action Process has been initiated and send *Corrective Action Status Report* with the applicable Progress Report).

Dataset ____ contains data from FY__ QAPP Submitting Entity code ____ and collecting entity _____. This is field and lab data that was collected by the (collecting entity). Analyses were performed by the (lab name). The following tables explain discrepancies or missing data as well as calculated data loss.

Discrepancies or missing data for the listed tag ID:

Tag ID	Station ID	Date	Parameters	Type of Problem	Comment/PreCAPs/CAPs

Data Loss

Parameter	Missing Data points out of Total	Percent Data Loss for this Dataset	Parameter	Missing Data points out of Total	Percent Data Loss for this Dataset