Annual Review Certification

for

Texas Stream Team Program Surface Water Quality Monitoring Project
Quality Assurance Project Plan (QAPP)
Revision 2

Federal ID # 9961430

QTRAK # 26-033

Original QAPP Effective Period: 11-18-2025 – 11-18-2028

Year: 2 of 3

Signatures below document certification of the annual review of Nonpoint Source Program Clean Water Act 319(h) *Texas Stream Team Program Surface Water Quality Monitoring Project QAPP* by Texas State University (TXST) and the Texas Commission on Environmental Quality (TCEQ) Project Managers. The original QAPP was approved by TCEQ on 11/18/2025. 1 QAPP Amendment(s) have occurred since QAPP execution.

The TXST and TCEQ Project Managers have verified that the original QAPP accurately reflects current project requirements. The QAPP Amendment that occurred in the last year is provided as an attachment to this certification. The QAPP is now approved until 11/18/2027.

The next annual review will be initiated on 08/20/2027. Amendments that are necessary in the interim must be fully approved before their provisions are implemented.

| | |
|---|---|
| 9/30/2026 | Ricardo Briones 10/2/2026 |
| Aspen Navarro, Date | Ricardo Briones, Date |
| TXST Project Manager | TCEQ Project Manager |
| The Meadows Center for Water and the Environment | Nonpoint Source Program, TCEQ |

Enclosures:

QAPP Amendment #1

cc: Melissa Benfer, Project Officer, EPA
Jason Natho, QA Manager, TCEQ
James Babcock, Lead NPS QA Specialist, TCEQ

Brooke T. Paup, *Chairwoman*
Catarina R. Gonzales, *Commissioner*
Tonya R. Miller *Commissioner*
Kelly Keel, *Executive Director*

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

September 23, 2026

Ricardo Briones
Project Manager
TCEQ Nonpoint Source Program
12100 Park 35 Circle, Building F
Austin, TX 78753

Subject: Amendment #1 to the Texas Stream Team Program Surface Water Quality Monitoring Project Quality Assurance Project Plan (QAPP) Revision 2

Federal Grant # 9961430

QTRAK # 26-033

Dear Mr. Briones:

The above-referenced Quality Assurance project Plan (QAPP) Amendment was approved today, September 23, 2026.

Please ensure the amendment is distributed in a timely manner to the appropriate entities listed in Section A7 of the QAPP. Distribution documentation must be available for review during an audit.

Should you have questions, feel free to contact me at james.babcock@tceq.texas.gov.

Sincerely,

James Babcock

James Babcock
Lead NPS Quality Assurance Specialist

Enclosure

Cc: Jason Natho, TCEQ Quality Assurance Manager
Faith Hambleton, TCEQ NPS Team Lead
Kristin DeBone, TCEQ NPS Quality Assurance Coordinator

# Amendment #1
# to the Texas Stream Team Program Surface Water Quality Monitoring Project
# Quality Assurance Project Plan (QAPP)
# Revision 2

Texas State University
San Marcos, TX 78666

Funding Source: Nonpoint Source Program CWA §319(h)

Prepared in cooperation with the Texas Commission on Environmental Quality
and the U.S. Environmental Protection Agency
Federal IDs # ~~9961428, 9961429~~, 9961430
QTRAK # 26-033

Effective Date: Upon date of final approval of the amendment

Questions concerning this QAPP should be directed to:

Aspen Navarro
Deputy Director, Watershed Studies
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San Marcos, Texas 78666
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AspenNavarro@txstate.edu

**Justification:** This QAPP amendment updates the document to reflect organizational responsibilities, active contract documentation, and the transition from WWDV/Datamap to the Data Hub for data management and recordkeeping. It also corrects outdated program information and terminology, removes references to discontinued macroinvertebrate training, updates monitoring procedures and parameter responsibilities for phosphate and Secchi transparency measurements, and makes minor technical corrections. In addition, the amendment revises Optical Brightener and Advanced Manual requirements.

**Summary of Changes:**

| Section(s) | QAPP Page # | Change | Justification |
|---|---|---|---|
| Cover page | 1 | Removed federal ID # 9961428 and added the active federal ID #. | The contract associated with the removed federal ID is now closed. |
| Cover page | 1 | Removed federal ID # 9961429 | Removed due to the contract having no QA task. |
| A2, A7, A8, and A10. | 2, 18, 19, 23 | Replaced D. Jody Koehler with Jason Natho as the TCEQ QA Manager. | TCEQ staff changed. |
| Table A3.1 | 6 | Removed the WWDV acronym. | Transitioning to an Esri Data Hub (Hub). |
| A4 | 8 | Adjusted the Texas Stream Team creation year; | The incorrect established date was included; |
| A4 | 8 | Removed macroinvertebrates | Macroinvertebrate was discontinued in the prior QAPP; |
| A4 | 8 | Replaced WWDV language with Data Hub (Hub) language. | Transitioning to an Esri Data Hub (Hub). |
| A5 | 9, 11 | Replace WWDV language with Data Hub (Hub) language. | Transitioning to an Esri Data Hub (Hub). |
| A5 | 9 | Defined the Esri products being used. | Provided more details regarding the specific Esri products are used for the spatial and QC components of monitoring sites. |
| A6 | 12 | Removed phosphate language from the LCRA CRWN | CRWN will collect this parameter using TXST |

| Section(s) | QAPP Page # | Change | Justification |
|---|---|---|---|
| | | protocol difference bulleted list. | equipment and protocol. |
| Table A6.1 | 13-14 | Removed “Transparency Tube” as a piece of equipment under Transparency. | Refrained from listing the equipment specifically to match the remainder of the table. |
| A10 | 23 | Update the organizational chart to show Aspen serving as both Project Manager (PM) and Quality Assurance Officer (QAO). | As of this time TXST/MCWE will not be hiring separate people for this position so did not want to imply self-supervision. |
| A12.2 | 24 | Included “Paper” in the Form column | Adjusted language to note that paper and electronic Monitoring Forms will be retained. |
| B1 | 26 | Replace WWDV language with Data Hub (Hub) language. | Transitioning to an Esri Data Hub (Hub). |
| B2 | 27-29 | Corrected the spelling of Whirl-Pak Bag® and replaced WWDV language. | Transitioning to an Esri Data Hub (Hub). |
| Table B2.2 | 30 | Updated all TNRIS links and updated the TNRIS acronym to TXGIO. | TNRIS changed their name, so all links were broken and needed to be relinked. |
| Table B2.2 | 30 | Removed USDA row/data. | All hydro data is now on the HUC layer/source, so this data is no longer needed. |
| B4 | 32 | Replaced WWDV language under the Recording Data section. | Transitioning to an Esri Data Hub (Hub). |
| B7 | 33-35 | Replace WWDV language with Hub language. | Transitioning to an Esri Data Hub (Hub). |
| B7 | 35 | Removed Salesforce details. | Transitioning to an Esri Data Hub (Hub) and away from the Salesforce Database, so Salesforce is no longer relevant. |

| Section(s) | QAPP Page # | Change | Justification |
|---|---|---|---|
| B7 | 35 | Added security details for the Esri data platform. | Security details added for the new ESRI data platform added. |
| C1 | 36 | Replaced WWDV language with Hub language. | Transitioning to an Esri Data Hub (Hub). |
| D1 | 40 | Replaced WWDV language with Hub language. | Transitioning to an Esri Data Hub (Hub). |
| D2 | 41 | Replaced WWDV language with Hub language. | Transitioning to an Esri Data Hub (Hub). |
| Appendix B | 46 | Removed the Scope of Work for Contract 24-50135 and 25-00061. | Contract 24-50135 is now closed. In addition, contract 25-00061 has no QA component and will be removed too. |
| Appendix D | 57 | Replaced WWDV language with Hub language. | Transitioning to an Esri Data Hub (Hub). |
| Appendix G | 63 | Updated the link to the Optical Brightener Water Quality Community Scientist Manual and the Advanced Water Quality Community Scientist Manual | To remove the *E. coli* bacteria certification requirement for Optical Brightener certification, replace WWDV language with Data Hub (Hub) language, remove macroinvertebrate references; and clarify in the Advanced Manual that streamflow monitoring is not required when no nearby gauge is available and the monitoring site's centroid of flow is inaccessible. |

**Detail of Changes:**

**Table A3.1 List of Acronyms**

| Acronym | Definition |
|---|---|
| AWRL | Ambient Water Reporting Limits |
| BMP | Best Management Practice |
| CAP | Corrective Action Plan |
| CWA | Clean Water Act |
| CRWN | Colorado River Watch Network |
| CS | Community Scientist |
| DI | Deionized Water |
| DMRG | Data Management Reference Guide |
| DQO | Data Quality Objectives |
| EPA | United States Environmental Protection Agency |
| FEM | Federal Equivalent Method |
| GIS | Geographic Information System |
| LCRA | Lower Colorado River Watch Network |
| LCS | Laboratory Control Samples |
| LOQ | Limits of Quantitation |
| NPS | Nonpoint Source |
| QA | Quality Assurance |
| QC | Quality Control |
| QAO | Quality Assurance Officer |
| QAPP | Quality Assurance Project Plan |
| QAS | Quality Assurance Specialist |
| QMP | Quality Management Plan |
| RG | Regulatory Guidance |
| SOP | Standard Operating Procedure |
| SWQM | Surface Water Quality Monitoring |
| SWQMIS | Surface Water Quality Monitoring Information System |
| TCEQ | Texas Commission on Environmental Quality |
| TXST | Texas State |
| UV | Ultraviolet |
| VWQM | Volunteer Water Quality Monitoring |
| WQX | Water Quality Exchange |
| ~~WWDV~~ | ~~Waterways Dataviewer~~ |

## A4 PROJECT PURPOSE, PROBLEM DEFINITION, AND BACKGROUND

Texas State (TXST) coordinates the Texas Stream Team, a statewide community science (CS) program that certifies volunteers to collect environmental and surface water quality data. By augmenting professional monitoring efforts, CS play a critical role in expanding the understanding of water conditions across Texas. The program operates in partnership with the TCEQ and the EPA through CWA Section 319(h) NPS Program funding, with additional support from statewide match contributions. To strengthen

its reach, TXST collaborates with local governments, watershed groups, nonprofits, and community organizations to recruit, train, and sustain a diverse network of CS.

Through this collaborative model, the program addresses the growing demand for broad, consistent, and accessible water quality information. Such data are vital for watershed planning, public education, and informed decision-making. Texas water resources continue to face multiple pressures that make expanded, quality-assured CS monitoring critical:

1. Geographic Scale and Monitoring Demand – Texas has more than 11,000 named rivers and streams, spanning over 191,000 miles of waterways, creating practical challenges for comprehensive professional coverage with finite resources.
2. Growth and Development – Texas's population continues to grow rapidly, with urbanization and land-use change increasing stormwater volume and pollutant loading to receiving waters. This trend elevates this risk of NPS pollutions and episodic water quality degradation.
3. Regulatory Data Needs – The Texas Clean Rivers Program (Senate Bill 818) recognizes that many areas lack sufficient water quality data to support sound local and state decisions. Assistance from CS can help close geographic and temporal data gaps to improve screening, prioritization, and follow-up monitoring.
4. NPS Pollution – NPS remains a major cause of impairments statewide; historical reporting attributes roughly three-quarters of listed impairments to NPS contributions, underscoring the need for distributed monitoring.
5. Public Health – The Texas Integrated Report has identified widespread bacteria impairments that threaten contact recreation uses. Public concern about potentially harmful bacteria in swimming areas and popular waterways underscores the need for distributed, frequent ambient monitoring and timely communication.

Given these conditions, professional monitoring often focuses on severely impaired or high-priority waters, leaving gaps in spatial coverage, event capture, and long-term trend documentation. Quality-assured CS monitoring complements professional efforts by increasing site density and sampling frequency, improving early detection of anomalies, and providing locally relevant information for planning and outreach.

This quality assurance project plan (QAPP) establishes the policies, procedures, and quality assurance (QA)/quality control (QC) framework that ensure CS-generated data are of known and documented quality and acceptable for screening, education, planning, research, and coordinated monitoring purposes. Data produced under this QAPP are not intended for enforcement. Data supports:

- Generating reliable screening-level ambient water quality data with high spatial and temporal coverage
- Identifying potential water quality problems early ("red-flag" detection) for professional follow-up
- Supporting watershed education and community engagement, linking land use, best management practices (BMPs), and water outcomes
- Informing watershed planning and BMP effectiveness evaluations, including historic and post-implementation comparisons

- Contributing datasets for long-term trends, research, and decision support
- Enhancing coordination with the Clean Rivers Program and local stakeholders to optimize monitoring strategies and priorities

This QAPP applies to all Texas Stream Team-affiliated CS monitoring programs. It defines the framework for training, sampling, equipment calibration, data management, and reporting. Partner organizations help ensure local ownership and long-term program sustainability. The Lower Colorado River Authority's Colorado River Watch Network (CRWN) maintains its own procedures and quality systems but collaborates with TXST through shared data, coordinated training, and joint outreach. CRWN volunteers and staff are also counted as part of TXST's §319 program match contributions.

Building on its history since 199~~1~~0, Texas Stream Team has mobilized thousands of CS and partner groups across the state to augment professional monitoring and generate quality-controlled data for the statewide Data Hub (Hub) ~~Waterways Dataviewer (WWDV)~~. These data have informed watershed protection plans, TCEQ and Clean Rivers Program decisions, community outreach, and local water resource planning. The continued implementation of this QAPP supports the expansion of distributed, community-based monitoring to meet Texas's water quality management goals.

Since its inception, Texas Stream Team has developed and implemented successive QAPPs to ensure scientifically rigorous, quality-assured data collection protocols. Over the years, these plans have supported the integration of multiple monitoring types, beginning with core water quality parameters such as dissolved oxygen, pH, conductivity, and temperature. The program later expanded to include advanced monitoring for nutrients, bacteria, ~~macroinvertebrates,~~ riparian assessments, and other specialized studies in response to emerging watershed priorities. With the most recent being the optical brightener testing. Each iteration of the QAPP has built upon previous work, broadening both the scope and depth of community-based monitoring while maintaining consistency with state and federal standards as much as possible.

This QAPP is prepared in accordance with TCEQ's quality management plan (QMP) and EPA's most recent QAPP Standard. This QAPP is reviewed and approved by TCEQ to help ensure that environmental data generated for the purposes described above are of known and documented quality, deemed accepted for their intended use. This process will ensure that data submitted and uploaded to Hub ~~WWDV~~ have been collected and analyzed in a way that guarantees their reliability and can be used by programs deemed appropriate by TCEQ.

## A5 PROJECT TASK DESCRIPTION

TXST will oversee statewide CS monitoring using approved training certifications and standard data collection protocols. Monitoring will be conducted by volunteers trained under the Texas Stream Team and CRWN programs, with procedures provided in Appendix H. The work will produce:

- Recruitment and training of volunteers in accordance with approved protocols.
- Routine collection of water quality data following standardized, documented field procedures.

- Establishment and maintenance of monitoring sites in partnership with local groups and stakeholders.
- Region-specific monitoring plans for each established group, documenting roles, site information, and protocols.
- Quality-assured datasets uploaded into the ~~WWDV~~ Hub for statewide accessibility.
- Updated site metadata and geospatial records maintained in the ~~WWDV~~ Hub.
- Periodic field audit session documentation to verify CS precision and data quality.
- Watershed-specific summary reports provided to project partners and other interested organizations.

Volunteer monitoring occurs year-round on a rolling basis. Monitors collect water quality data at approved sites following the methods outlined in Texas Stream Team Manuals (Manuals), Texas Stream Team Field Guides (Field Guides), and QAPP appendices. Inactive monitoring sites may be reactivated, or new sites proposed. Proposals must include contact information, latitude/longitude coordinates, county, river basin, nearby landmarks, and whether the site is on public or private property. TXST staff evaluate each request through an approval process that prioritizes overlap with state monitoring sites, safety, and representation of overall water quality conditions. All approved sites are documented in monitoring plans and tracked in the ~~WWDV~~Hub with metadata that includes coordinates, waterbody, and associated partner groups. Sites are reviewed regularly to confirm data coverage and continuity within priority watersheds. Esri ArcGIS Pro and ArcGIS Online products are used to map and verify monitoring sites.

Key water quality parameters include physical, chemical, and field-based measurements such as: monthly Core water chemistry indicators (dissolved oxygen, pH, temperature, specific conductance, transparency), flow observations, and field conditions; biannual Riparian Evaluation monitoring; and monthly NPS pollution parameters (e.g., nutrients, bacteria, optical brighteners) collected by monitors with additional training.

Monitoring plans are created electronically when a group or volunteer initiates monitoring within a watershed. New monitoring groups may begin once their monitoring plan is approved. Developing a plan involves filling leadership positions and working with TXST staff to select appropriate sites, based on stakeholder priorities, watershed needs, long-term monitoring goals, and coordination with professional monitoring efforts. Leadership positions include:

- Group Leader – serves as the primary point of contact for TXST (required for each group).
- Training Coordinator/QAO – schedules trainings, posts them to the public online calendar, recruits' participants, and submits materials to TXST. This role also conducts biennial QC field audits with active CS. Trainers must attend the annual TXST Trainer Meeting or send a designated alternate.
- Data Coordinator – reviews monitoring forms submitted by CS (electronic or hard copy), performs QC checks, and follows data management protocols outlined in Section B7 Environmental Information Management.

- Equipment Coordinator – tracks and maintains monitoring equipment, manages supply check-outs, conducts inventories, restocks supplies, and performs equipment maintenance.

Monitoring plans include:

- Group name
- Names of all CS within the group
- Contact information for the four leadership roles (Group Leader, Training Coordinator/QAO, Data Coordinator, and Equipment Coordinator)
- Site ID numbers assigned by TXST staff
- Parameters to be collected
- Available supplies
- Group goals, including water quality concerns within their watershed and any other organizations receiving the data, and for what purpose

Plans are reviewed for compliance with the QAPP and approved by the TXST Data Manager and Project Manager. Copies are provided to the group and stored electronically at the TXST office. Plans are revised as needed based on volunteer interest, funding availability, partner input, or upon request.

All monitoring data submitted through the Esri Survey123 system undergo automated review for completeness, significant figures, and valid value ranges. Regions without Data Coordinators have their data QC performed directly by TXST staff.

Data quality objectives are assessed through multiple checks:

- Training QA/QC – required certification and refresher trainings, plus biennial QC audit sessions led by a certified Training Coordinator/QAO.
- Data Review – Data Coordinators and TXST staff review monitoring forms prior to entry and flag errors/inconsistencies.
- Verification/Validation – Automated validations set to compare values against acceptable ranges.
- Audit & Oversight – TXST Data Manager and Project Manager review monitoring plans and datasets for adherence to QAPP requirements prior to approval.

If data quality objectives are not met, monitoring plan revisions, re-trainings, or corrective actions are implemented.

TXST staff provide ongoing oversight, database review, and annual reporting. Data analyses evaluate trends, identify water quality concerns, and inform watershed planning and stakeholder engagement through quarterly watershed summary reports. Analyses include time-series evaluations, comparisons to state standards, and identification of exceedances. Additional datasets (TCEQ Surface Water Quality Monitoring (SWQM), and partner datasets) may be acquired for comparative or contextual analysis.

Final project products include updated monitoring plans, a statewide georeferenced database of CS results maintained in the ~~WWDV~~ Hub, periodic internal summaries, and deliverables such as written reports and maps made available to partners, stakeholders, and the public. Project activities follow a schedule of routine monitoring and data review, annual trainer meetings, biennial audits, and ongoing updates to

monitoring plans based on program needs.

The Texas Stream Team projects this QAPP is associated with, ~~24-50135,~~ ~~25-00061~~, ~~and~~ 26-00046~~, and 27-00016~~ will continue Texas Stream Team efforts starting from December 2025 through December 2028. All tasks, deliverables, and monitoring dates are estimates. Work covered under this QAPP will not begin until the QAPP is executed.

See Appendix A for a project location map.

See Appendix B for the scope of work and deliverable due dates for the contract tasks referenced in this QAPP.
See Section B1 for monitoring to be conducted under this QAPP.

**Amendments**
Amendments to the QAPP must be approved to reflect changes in project organization, tasks, schedules, objectives, and methods, address deficiencies and nonconformances, improve operational efficiency, and accommodate unique or unanticipated circumstances. Requests for amendments are submitted by the TXST Project Manager to the TCEQ NPS Project Manager in writing using the QAPP Amendment Shell. The changes are effective immediately upon approval by the TCEQ QA Manager, TCEQ NPS Project Manager, TCEQ NPS Data Manager, and Lead NPS Quality Assurance Specialist (QAS), or their designees.

Amendments to the QAPP and the reasons for the changes will be documented, and full copies of amendments will be forwarded to all persons on the QAPP distribution list by the TXST QAO.

**Annual QAPP Reviews, Certifications, and Revisions**
This QAPP shall be reviewed in its entirety and certified annually by the TXST Project Manager and TCEQ NPS Project Manager. A letter certifying this annual review must be submitted to the TCEQ NPS Project Manager no later than 90 days prior to the QAPP anniversary date to prevent QAPP expiration and interruption in work due to issuance of a stop work order. Amendments approved since QAPP approval or the previous annual certification must be included as an attachment along with the letter. Only non-substantive changes not affecting the project design or quality or quantity of work to be performed can be included in the annual certification letter. This includes organizational changes or schedule changes based on a contract amendment that do not impact data deliverables. If changes beyond these are necessary, a QAPP amendment must be submitted and approved before the changes are implemented and before the annual review may be certified. The TCEQ NPS Project Manager is required to review the QAPP and provide certification of annual reviews to the TCEQ QA Manager and EPA Region 6 Project Officer no later than 30 days before QAPP anniversary date. If the QAPP expires, work described within this document must be halted.

If the project will extend beyond the third QAPP anniversary date, a full QAPP revision is required. If the QAPP expires, work described within this document must be halted.

## A6 INFORMATION/DATA QUALITY OBJECTIVES AND PERFORMANCE/ACCEPTANCE CRITERIA

This project will collect volunteer water quality monitoring (VWQM) (i.e., Standard Core, Probe Core, Advanced, *E. coli* Bacteria, and Optical Brightener) and non-water quality (i.e., Riparian) data. Volunteers located within the Lower Colorado Watershed follow the Lower Colorado River Authority (LCRA) CRWN procedures and protocols for collecting surface water quality parameters provided in Appendix H. Two ~~three~~ differences exist between TXST and LCRA CRWN measurement protocols:

- ~~Phosphate – the LCRA CRWN program does not include phosphate as a water quality monitoring parameter.~~
- Dissolved oxygen - LCRA CRWN CS have the option to perform a third titration if the first and second titrations have a difference larger than 0.5 mg/L. TXST requires that CS discard the results and begin again if the difference in the two titrations is larger than 0.5 mg/L.
- Nitrate-nitrogen. - LCRA CRWN allows for an alternative option to measure nitrates using the CHEMets® Colorimeter method as outlined in more detail in the LCRA CRWN manual (Appendix H).

The measurement performance criteria to support the project objectives for the water and non-water quality data types are specified in Tables A6.1 and A6.2.

## Table A6.1 Measurement Water Quality Performance Specifications

| Parameter | Units | Matrix | Method | TCEQ Parameter Code | AWRL | Precision (RPD of LCS/LCSD) | Completeness (%) |
|---|---|---|---|---|---|---|---|
| **FIELD** | | | | | | | |
| Algae | 1-absent<br>2-rare<br>3-common<br>4-abundant<br>5-dominant | Water | TXST or CRWN SOP | NA | NA* | NA | 90 |
| Days Since Last Significant Rainfall | Days | NA | TXST or CRWN SOP | 72053 | NA* | NA | 90 |
| Flow Estimate | cfs | Water | TXST or CRWN SOP | 74069 | NA* | NA | 90 |
| Flow Method | 1=gage<br>2=elec<br>3=mech<br>4=weir/flu<br>5=doppler | Water | TXST or CRWN SOP | 89835 | NA* | NA | 90 |
| Flow Severity | 1-no flow<br>2-low<br>3-normal<br>4-flood<br>5-high<br>6-dry | Water | TXST or CRWN SOP | 01351 | NA* | NA | 90 |
| Flow Stream, instantaneous (cubic feet per sec) | cfs | Water | TCEQ SWQM Procedures Manual Vol. 1, TXST SOP or CRWN SOP | 00061 | NA* | NA | NA |
| Nitrate-Nitrogen | Mg/L | Water | TXST or CRWN SOP | NA | 0.1 mg/L | NA | 90 |
| PH | Standard units (s.u.) | Water | TXST or CRWN SOP | 00400 | NA* | NA | 90 |
| Phosphate | Mg/L | Water | TXST SOP | NA | 0.02-50 mg/L | NA | 90 |
| Present Weather | 1-clear<br>2-cloudy<br>3-overcast<br>4-rain | Air | TXST or CRWN SOP | 89966 | NA* | NA | 90 |
| Optical Brightener | Presence<br>Absence | Water | TXST SOP** | NA | NA | NA | 90 |

| Parameter | Units | Matrix | Method | TCEQ Parameter Code | AWRL | Precision (RPD of LCS/LCSD) | Completeness (%) |
|---|---|---|---|---|---|---|---|
| Oxygen, dissolved | mg/L | Water | TXST or CRWN SOP | 00300 | NA* | 0.5 | 90 |
| Rainfall Accumulation (last 3 days) | Inches | NA | TXST or CRWN SOP | NA | NA* | NA | 90 |
| Salinity | PPT, tidally influenced sites only | Water | TXST or CRWN SOP | 00480 | NA* | NA | 90 |
| Specific Conductance, (us/cm @ 25C) | uS/cm | Water | TXST or CRWN SOP | 00094 | NA* | NA | 90 |
| Temperature, Air | degC | Air | TXST or CRWN SOP | 00020 | NA* | NA | 90 |
| Temperature, Water | degC | Water | TXST or CRWN SOP | 00010 | NA* | NA | 90 |
| Tide Stage | 1-low<br>2-falling<br>3-slack<br>4-rising<br>5-high | Water | TXST or CRWN SOP | 89972 | NA* | NA | 90 |
| Total Depth | m | Water | TXST or CRWN SOP | 82903 | NA* | NA | 90 |
| Transparency, ~~Transparency Tube~~ | m | Water | TXST or CRWN SOP | 00078 | NA | NA | 90 |
| Turbidity | Nephelometric Turbidity Units (NTU) | Water | TXST SOP** | NA | 0.5 NTU | NA | 90 |
| Water Clarity | 1-clear<br>2-cloudy<br>3-turbid | Water | TXST or CRWN SOP | NA | NA* | NA | 90 |
| Water Color | 1- no color<br>2- light green<br>3- dark green<br>4-tan<br>5-red<br>6-green/brown<br>7-black | Water | TXST or CRWN SOP | NA | NA* | NA | 90 |
| Water Conditions | 1-calm<br>2-ripples<br>3-waves<br>4-white caps | Water | TXST or CRWN SOP | 89968 | NA* | NA | 90 |
| Water Odor | 1-none<br>2-oil | Water | TXST or CRWN SOP | NA | NA* | NA | 90 |

| Parameter | Units | Matrix | Method | TCEQ Parameter Code | AWRL | Precision (RPD of LCS/LCSD) | Completeness (%) |
|---|---|---|---|---|---|---|---|
| | 3-acrid<br>4-sewage<br>5-rotten eggs<br>6-fishy | | | | | | |
| Water Surface | 1-clear<br>2-scum<br>3-foam<br>4-debris<br>5-sheen | Water | TXST or CRWN SOP | NA | NA* | NA | 90 |
| **BACTERIA** | | | | | | | |
| *E. coli* | Colony forming units (cfu) per 100 mL | Water | TXST or CRWN SOP | N/A | 1 cfu per 100 mL | NA | 90 |
| *E. coli*, Holding time | Hours*** | Water | TXST or CRWN SOP | 31704 | NA | NA | NA |

*Reporting to be consistent with TXST or SWQM guidance and based on measurement capability.
**CRWN VWQM do not test for this parameter.
****E. coli* samples will be processed as soon as possible not to exceed 8 hours.

**Table A6.1 References:**

- TXST standard operating procedure (SOP): Core Water Quality Manual, May 2023; Advanced Water Quality Manual, April 2019; Optical Brightener Water Quality Manual, November 2024; Field Guide(s).
- CRWN SOP: LCRA, CRWN, SOPs, 9th edition, 2012
- TCEQ SOP: TCEQ *Surface Water Quality Monitoring Procedures*, Volume 1: Regulatory Guidance (RM)-415, August 2012.

**Table A6.2 Measurement Non-Water Quality Performance Specifications**

| PARAMETER | UNITS | MATRIX | METHOD |
|---|---|---|---|
| Active floodplain present | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Energy dissipation | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| New plant colonization | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Stabilized vegetation | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Age diversity | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Species diversity | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Plant vigor | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Water storage | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Bank and channel erosion | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Sediment deposition | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |

**Table A6.2 References:**

- TXST SOP: Riparian Evaluation Citizen Scientist Manual, January 2022

## 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 repeated measurements of the same property under identical, or substantially similar conditions, and is an indication of random error.

A field split is a single sample subdivided by CS immediately following collection according to procedures specified in the respective Manual and analyzed as two separately identified samples. Split samples are preserved, handled, shipped, and

analyzed identically and are used to assess variability in all of these processes.

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) or sample/duplicate pairs in the case of bacterial analysis. Precision results are compared against measurement performance specifications and used during evaluation of analytical performance. Program-defined measurement performance specifications for precision are defined in Table A6.1.

**Representativeness**

Representativeness is defined as the measure of the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition**.**

For Routine Sampling:

Site selection, the appropriate sampling regime, the sampling of all pertinent media, and use of only approved analytical methods to partners and volunteers according to the respective manual (Appendix G), and use of only approved analytical methods will assure that the measurement data represent the conditions at the site. Routine monitoring conducted with the intent to collect data for water quality assessment are considered spatially and temporally representative of routine water quality conditions, are collected on a routine frequency, and the monitoring events are separated by approximately even time intervals. At a minimum, CS are asked to collect samples consistently for one year, where possible. 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 total representation of the water body will be tempered by the available funding.

**Completeness**

Completeness is a measure of the amount of valid data obtained from a measurement system, expressed as a percentage of the number of valid measurements that should have been collected (i.e., measurements that were planned to be collected). Ideally, 100 percent of the data should be obtained. However, the possibility of data loss 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 percent data completion is achieved.

**Comparability**

Comparability is the qualitative term that expresses the measure of confidence that two or more data sets can contribute to a common analysis. 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 SWQM Procedures Vol. 1.* Comparability is also guaranteed by reporting data in standard units, by using accepted rules for significant figures, and by reporting data in a standard format as specified in Section B7.

**Sensitivity**

Sensitivity is the capability of a method or instrument to discriminate between measurement responses representing different levels of the variable of interest. See discussions below on ambient water reporting limits (AWRLs) and LOQs for the term "detection limit" is closely related to sensitivity requirements of this project and is often used synonymously.

## A7 DISTRIBUTION LIST

The Lead NPS QA Specialist will provide approved versions of this QAPP and any amendments or revisions to the TCEQ NPS Project Manager and TCEQ QA Manager. The TCEQ NPS Project Manager will provide approved copies to the TXST Project Manager, and TCEQ QA Manager, and EPA Project Officer within two weeks of approval. The TCEQ NPS Project Manager will document transmittal of the QAPP to the list below and maintain this documentation as part of the project's QA records. This documentation will be available for review.

~~D. Jody Koehler~~ Jason Natho
TCEQ QA Manager
Jason.Natho@tceq.texas.gov ~~jody.koehler@tceq.texas.gov~~
(512) 239-1672~~1990~~

Melissa Benfer, Project Officer
EPA Region 6
benfer.melissa@epa.gov
(214) 665-8423

TXST will provide copies of this QAPP and any amendments or revisions of this QAPP to each project participant defined in the list below. The TXST will document receipt of the QAPP by each participant and maintain this documentation as part of the project's QA records. This documentation will be available for review.

**TEXAS STATE UNIVERSITY – TEXAS STREAM TEAM**
**601 University Drive**
**San Marcos, TX 78666**

Aspen Navarro, Project Manager
Aspennavarro@txstate.edu
(512)-245-7376

Aspen Navarro, Quality Assurance Officer (QAO)
Aspennavarro@txstate.edu
(512)-245-7376

Laura Parchman, Data Manager
L.Parchman@txstate.edu
(512)-245-3461

## A8 PROJECT ORGANIZATION

**TCEQ**

**Air Monitoring Division**

**~~D. Jody Koehler~~ Jason Natho**
**TCEQ QA Manager**
Responsible for coordination, development, and implementation of TCEQ's QA program. Provides QA oversight and guidance for TCEQ's programs and is 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 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.

**James Babcock**
**Lead NPS QA Specialist**
Assists the TCEQ NPS Project Manager in QA related issues.
P~~p~~rovides guidance in the planning, development, implementation, and maintenance of the QAPP by the Program; reviews and approves the QAPP; coordinates and performs QA audits and reviews corrective action plans (CAPs) related to audits or as requested by the Program; and reports and consults with TCEQ's QA Manager to ensure QA requirements of TCEQ and EPA are met.

**Water Quality Planning Division**

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

**Ricardo Briones**
**TCEQ NPS Project Manager**
Maintains a thorough knowledge of work activities, commitments, deliverables, and time frames associated with projects. Develops lines of communication and working relationships between the contractor, TCEQ, and EPA. Tracks deliverables to ensure that tasks are completed as specified in the contract. Responsible for ensuring that the project deliverables are submitted on time and are of acceptable quality and quantity to achieve project objectives. Serves on planning team for NPS projects. Provides contractor with most recent version of QAPP Shell document. Participates in the development, approval, implementation, and maintenance of the QAPP. Conducts independent technical review of the QAPP to ensure compliance with project needs/requirements. Responsible for verifying that the approved QAPP is implemented by the contractor. Notifies the Lead NPS QA Specialist and NPS Data Manager of circumstances which adversely affect the quality of data derived from the collection and analysis of samples. Monitors and enforces corrective action.

**Kristin DeBone**

**NPS QA Coordinator**
Assists Lead NPS QA Specialist with NPS QA management. Serves as liaison between NPS management and TCEQ QA management. Responsible for NPS guidance development related to program QA. Assists with development and maintenance of data management-related SOP for NPS data management. Participates in the development, approval, implementation, and maintenance of the QAPP. Provides input and oversight regarding corrective actions. Maintains record of corrective actions.

**Texas State University**

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

**TXST QAO**
Responsible for coordinating development and implementation of the QA program. Responsible for ensuring the most recent version of the NPS QAPP Shell document is acquired from the TCEQ NPS Project Manager and used for writing and maintaining the QAPP. Responsible for maintaining records of QAPP distribution, including appendices and amendments. Responsible for maintaining written records of sub-tier commitment to requirements specified in this QAPP. Responsible for identifying, receiving, and maintaining project QA records. Responsible for coordinating with the TCEQ NPS Manager to resolve QA-related issues. Notifies the TXST Project Manager and TCEQ NPS Project Manager and documents circumstances which may adversely affect the quality of data. Responsible for validation and verification of all data collected and acquired. Coordinates the research and review of technical QA material and data related to water quality monitoring system design and analytical techniques. Facilitates, conducts, and documents readiness reviews, monitoring, and/or technical systems audits.

**Laura Parchman**
**TXST Data Manager**
Responsible for the acquisition, verification, and transfer of data to TCEQ. Oversees data management for the QAPP. Performs data QAs prior to transfer of data to TCEQ. Responsible for transferring data to TCEQ in the Event/Result file format specified in the Data Management Reference Guide (DMRG). Ensures data are submitted according to QAPP and work plan specifications. Provides the point of contact for the TCEQ NPS Data Manager to resolve issues related to the data.

**Texas State Partners**
**Field Supervisor**

Responsible for ensuring that participants receive the necessary resources and training to effectively perform all aspects of the sampling and measurement of surface waters and other parameters in the field. Duties include overseeing the collection of water samples and field data measurements in a timely manner that meet the quality objectives specified in Section A6, as well as the requirements of Sections B1 through B7. Responsible for field scheduling, staffing, and ensuring that staff is appropriately trained as specified in Section A11. Responsible for adhering to Texas Stream Team Procedures in this QAPP and all updates as appropriate. For a complete list of partners, visit the Partners page[1] on the Texas Stream Team website.

**U.S. EPA Region 6**

**Melissa Benfer,**
**EPA Project Officer**
Responsible for managing the CWA Section 319(h) funded grant on behalf of EPA. Assists TCEQ in approving projects that are consistent with the management goals designated under the State's NPS Management Program and meet federal guidance. Coordinates the review of project work plans, draft deliverables, and works with the State in making these items approvable. Meets with the State at least annually to evaluate the progress of each project and, when conditions permit, participates in project site visits. Fosters communication within EPA by updating management and others, both verbally and in writing, on the progress of the State's program and on other issues as they arise. Assists in grant close-out procedures ensuring all deliverables have been satisfied prior to closing a grant.

[1] www.meadowscenter.txst.edu/Leadership/TexasStreamTeam/Partners.html

## A10 PROJECT ORGANIZATION CHART AND COMMUNICATIONS

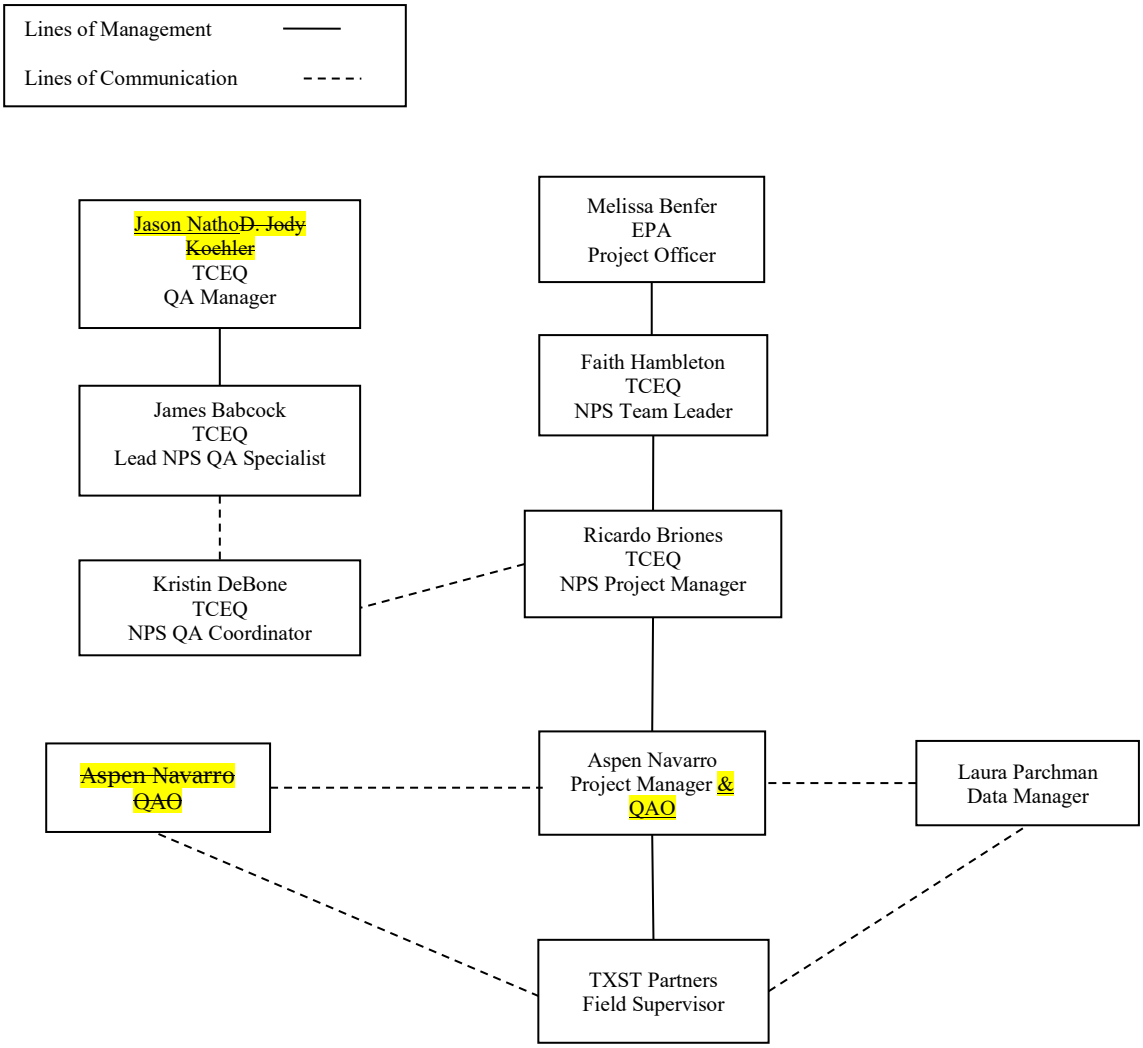



**Figure A10.1 Organization Chart**

## A12 DOCUMENTS AND RECORDS

### Electronic Data

The documents that describe, specify, report, or certify activities included in this QAPP are listed below. Electronic records are backed up every 24 hours and are maintained on multiple computers and at least one virtual TXST server.

**Table A12.2 Records and Documents Retention Requirements**

| Document/Record | Location | Retention | Form |
|---|---|---|---|
| QAPP, amendments, annual certifications, and appendices | TXST | 4 years | Electronic |
| QAPP distribution documentation (Training Enrollment Form) | TXST | 4 years | Electronic |
| Corrective action documentation | TXST | 4 years | Electronic |
| Field data sheets (Monitoring Forms~~–paper/electronic~~) | TXST | 4 years | Paper / Electronic |
| Field equipment calibration/maintenance log (Monitoring Form) | TXST | 4 years | Electronic |
| Field SOPs (Manuals and Field Guides) | TXST | 4 years | Electronic |
| Monitoring Site Request Forms | TXST | 4 years | Electronic |
| Monitoring Plans | TXST | 4 years | Electronic |
| Private Property Access Forms | TXST | 4 years | Electronic |
| Training Enrollment Forms | TXST | 4 years | Electronic |
| Training records | TXST | 4 years | Electronic |
| Water Quality Data Analysis Files (Watershed Summary Reports) | TXST | 4 years | Electronic |
| Progress report/final report | TXST | 4 years | Electronic |

## B1 IDENTIFICATION OF PROJECT ENVIRONMENTAL INFORMATION OPERATIONS

The sample design follows the intent of the EPA, TCEQ NPS Program, and Texas Stream Team to use the data collected using criteria described in the QAPP for education, local decision-making, research, baseline data, screening, BMP effectiveness, and problem identification. TXST actively promotes water quality and NPS pollution education and awareness through CS activities. Volunteers are instructed to monitor at most monthly, or as defined in their Monitoring Plan and/or Training Enrollment Form. TXST staff work with partners to prepare the Monitoring Plans. The plans are reviewed and approved by the Data Manager and the Project Manager. A copy of the Monitoring Plan is sent to the participating partner and stored at the TXST offices.

Additionally, data collected under this QAPP will provide participants the opportunity to access interdisciplinary science-based data collection methods, which combine language arts, earth sciences, geography, mathematics, and chemistry. Efforts are made to identify and/or establish water quality monitoring projects in areas where NPS pollution or other water quality issues are known or suspected. TXST, its CS, and partners collect environmental data to inform and make Texans aware of water quality, land use, and associated NPS impacts and the role people play in contributing to those impacts. Information collected can also be used to identify water quality trends and to

characterize water quality conditions.

This QAPP encompasses all training types conducted by the Texas Stream Team program including Standard Core, Probe Core, Advanced, *E. coli* Bacteria, Riparian Evaluation and Optical Brightener. Each training and monitoring type collect different data types from different media. See Tables A6.1 and A6.2 for a list of parameters associated with each type of monitoring and the method(s) used to measure them.

**Site Selection Criteria**
Some general guidelines are followed when selecting monitoring sites. Fixed station and systematic monitoring sites are chosen based on the following site selection guidelines:

1. Site should be safely accessible year-round (exception: during major flood events).
2. Site should provide the best representation for the overall water quality conditions of a water body.
3. Site should be free of backwater effects during normal conditions.
4. Perennial flowing streams are preferable to intermittent streams.
5. Lake and estuary locations should be located within major arms and/or near dams.
6. Coastal sites are best situated to allow representative sampling, regardless of the tidal cycle.
7. Before submitting a New Monitoring Site Request Form[1] to establish a new site, go to the ~~Datamap~~ Hub[2] to see if an inactive site exists nearby. It is preferred that existing inactive sites with historical water quality data be reactivated than to create a new site, but if those conditions are not met, then a new site should be created by submitting a New Monitoring Site Request Form. New sites created will prioritize overlap with a SWQM site.

Fixed station and systematic monitoring sites are located preferentially according to local interests and concerns and in coordination with TXST partners where applicable. TXST staff will identify sites that maximize stream or basin spatial coverage.

**Monitoring Sites**
Monitoring site information submitted to TXST is maintained in the ~~WWDV~~ Hub. Monitoring site information in the ~~WWDV~~ Hub is reviewed and updated throughout the year as needed based on current CS monitoring activities. All data are tracked, maintained, and available on the ~~WWDV~~ Hub.

There are currently around 360 active monitoring sites in the Texas Stream Team program (see ~~Datamap~~ Hub). Sites are designated as "active" if monitoring has taken place at the site within the past year. Based on the voluntary nature of the program, the exact number of monitoring sites being monitored is unknown at the beginning of each year. This information is submitted to TCEQ in the annual report and is available for review on the ~~WWDV~~ Hub within 60 days of submission from the CS.

**Critical vs. non-critical measurements**

1 https://survey123.arcgis.com/share/dbc6589894814d858df3503f869d0bc6
2 https://www.arcgis.com/apps/dashboards/0dea3b21787e446e8ede35bd0977f00f

All data collected in this project and entered into the ~~WWDV~~ Hub are considered critical to achievement of the project objectives associated with this QAPP.

## B2 METHODS FOR ENVIRONMENTAL INFORMATION ACQUISITION

**Field Sampling Procedures:**
The field sampling procedures are documented in Manuals and Field Guides provided in Appendix G. LCRA CRWN procedures and protocols are provided in Appendix H.

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

| Parameter | Matrix | Container | Sample Volume | Preservation | Holding Time |
|---|---|---|---|---|---|
| Dissolved Oxygen | Water | Glass Mixing Bottle | 25 mL | Fixed with manganous sulfate, alkaline potassium iodide azide, and sulfuric acid | 4 hours |
| *E. coli* | Water | Sterile Whirl-Pak bag® | 100 mL | Refrigerate @ 4˚C* | 6 hours |
| Nitrate Nitrogen | Water | Plastic Test Tube | 10 mL | Refrigerate @ 4˚C* | 48 hours |
| Phosphate Phosphorous | Water | Plastic Test Tube | 10 mL | Refrigerate @ 4˚C* | 48 hours |
| Turbidity | Water | 60 or 120 cm Plastic Turbidity Tube | Approx. 1L | NA | NA |
| Optical Brightener | Water | Sterile black photosensitive Whirl-Pak bag® | 100 mL or enough to cover sample material | UV protection* | NA |

**Preservation performed immediately upon collection (within 15 minutes)*

**Sample Containers**
All sample containers will meet the requirements as outlined in Table B2.1. Sterile Whirl-Pak~~pak~~ Bags® are used for bacteriological samples and are disposable. Other containers are rinsed twice with (deionized) DI water after each use before storing them in kit and twice with sample water before filling the container with sample water for testing.

**Processes to Prevent Contamination**
Procedures documented in Manuals and Field Guides or the TCEQ SWQM Procedures

Manual, Volume I[1] (August 2012) outline the necessary steps to prevent contamination of samples. These steps may include: direct collection into sample containers when possible, rinsing sample containers twice before/after use as appropriate, and the use of hand sanitizer or disposable gloves. Field QC samples (identified in Appendix C) including field blanks and duplicates are collected to verify that contamination has not occurred.

**Documentation of Field Sampling Activities**
Monitoring events are documented on the Monitoring Forms in either hard copy or electronic form as presented in Appendix C. For all monitoring events, site ID, location, sampling time, date, and depth, sample collector's name/signature, group name, calibration information (if applicable), and reagent expiration dates (if applicable) are recorded. Additional fields to record for *E. coli* monitoring events include incubation temperature, incubation duration, *E. coli* colony counts, dilution aliquot, field blanks, and media expiration dates. Values for all measured parameters and field observations are recorded on the Monitoring Form.

If reagents or media are expired, it is documented on the Monitoring Form. Sampling is not encouraged with expired reagents and bacteria media; if expired, the corresponding values will be flagged in the database and excluded from data reports and EPA Water Quality Exchange (WQX) submissions (See Section D1). Detailed observational data are recorded including water appearance, weather, field observations such as biological activity and stream uses, algae cover, unusual odors, days since last significant rainfall, and flow severity. Comments related to field measurements, number of participants, total time spent sampling, and total round-trip distance traveled to the sampling site are also recorded.

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

1. Legible writing in ink. Correct errors with a single line through writing, followed by initial and date.
2. Data are submitted via the ~~WWDV,~~ electronic Monitoring Form, and/or hard copies are scanned/photographed and submitted via email.

**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 equipment malfunctions, calibrations, sample site considerations, etc. Failures or deviations from the QAPP are documented on the field data sheet/QC checklist. The TXST Data Manager in consultation with the QAO will determine if the deviation from the QAPP compromises the validity of the resulting data. For a comprehensive understanding of TXST's data validation checks, look to Section D1 of this QAPP.

**Standards Traceability**
All conductivity standards are produced or purchased by TXST, partners, or volunteers

[1] https://www.tceq.texas.gov/publications/rg/rg-415/index.html

as needed. All conductivity standards purchased are traceable to certified reference materials.

**Analytical Method Deficiencies and Corrective Actions**
Deficiencies in field that could result in analysis deficiency involve, but are not limited to instrument malfunctions, failures in calibration, blank contamination, QC samples outside QAPP defined limits, etc. In many cases, the CS will be able to correct the problem. If the problem is resolvable, then they will document the problem on the field data sheet and complete the analysis. If the problem is not resolvable, then it is conveyed to the TXST Project Manager who will make the determination and notify the TXST QAO. If the analytical system failure may compromise the sample results, the resulting data will not be reported to TXST. The nature and disposition of the problem is reported on the Monitoring Form which is sent to the TXST Project Manager. The TXST Project Manager will inform the TCEQ NPS Project Manager in writing immediately upon discovery of a deficiency, and the actions and resolutions will be documented in writing in the project quarterly progress reports and corrective action plan (CAP).

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

**Existing Information**
The ~~WWDV utilizes~~ Hub map overlays from Esri as well as data layers from additional sources. Maps published by the TXST also utilize data layers from the sources listed in Table B2.2.

**Table B2.2 Data Sources Used for Analysis***

| Geospatial Data or Data Type | Source | Date(s) | Analysis and/or Processing** | QA Information | Data Use(s) |
|---|---|---|---|---|---|
| TCEQ 2022 Segments - Line | TCEQ | Most up-to-date available | N/A | Conducted by item owner | Used to reference and align monitoring locations with official stream segment boundaries. |
| TCEQ 2022 Segments - Poly | TCEQ | Most up-to-date available | N/A | Conducted by item owner | Used to reference and align monitoring locations with official stream segment boundaries. |
| Permitted Wastewater Outfalls | TCEQ | Most up-to-date available | N/A | Conducted by item owner | Identifies potential sources of nutrient or bacteria inputs affecting monitored waterways. |
| SWQM Stations | TCEQ | Most up-to-date available | N/A | Conducted by item owner | Provides comparison points between CS data and state agency datasets. Also used for newly created sites. |
| StratMap Boundaries | ~~TNRIS~~ TxGIO | Most up-to-date available | N/A | Conducted by item owner | Ensures consistency of monitoring and reporting within standardized geographic and political boundaries |
| TxDOT Roadways | TxGIO ~~TNRIS~~ | Most up-to-date available | N/A | Conducted by item owner | Assists in site access planning and evaluating proximity of monitoring sites to road-related runoff sources. |
| StratMap Transportation | TxGIO ~~TNRIS~~ | Most up-to-date available | N/A | Conducted by item owner | Provides broader context for transportation networks that may influence watershed hydrology and pollutant pathways. |
| Hydrologic Unit Code (HUC) | TxGIO ~~NRIS~~ | Most up-to-date available | N/A | Conducted by item owner | Supports watershed-based management by organizing monitoring sites within hierarchical drainage units. |
| ~~12 Digit Watershed Boundary Dataset~~ | ~~USDA Geospatial Data Gateways~~ | ~~Most up-to-date available~~ | ~~N/A~~ | ~~Conducted by item owner~~ | ~~Allows fine-scale watershed delineation to link monitoring data to specific sub-watersheds.~~ |

*Metadata that contains the Federal Geographic Data Committee (FGDC) minimum documentation requirements will be created for any acquired spatial data manipulated through data analysis and/or processing.

**More detailed information on spatial analysis and data processing is provided in Sections B2 (Methods for Environmental Information Acquisition), B4 (Quality Control), and B7 (Environmental Information Management).

## B4 QUALITY CONTROL

### Sampling Quality Control Requirements and Acceptability Criteria

The field QC protocols are outlined in Manuals and Field Guides (Appendix G). LCRA CRWN procedures and protocols are provided in Appendix H.

### Existing Data Quality Control Requirements and Acceptability Criteria

QC requirements and acceptability criteria for existing data are described in A5, D1, and D2 below.

### Quality Control or Acceptability Requirement Deficiencies and Corrective Actions

Sampling QC excursions are evaluated by the TXST Project Manager, in consultation with the TXST QAO. Discrepancies in sample results are used to assess the sampling process, including environmental variability. Rejecting sample results based on wide variability is a possibility. The arbitrary rejection of results based on pre-determined

limits is not practical, therefore, the professional judgment of the TXST Project Manager and QAO will be relied upon in evaluating results.

Field blanks for *E. coli* bacteria samples and duplicates for dissolved oxygen modified Winkler titrations are scrutinized very closely. *E. coli* field blank values exceeding the acceptance criteria will automatically invalidate the sample, especially in cases where bacteria colony growth occurs which is likely indicative of contamination. The acceptance criteria for the dissolved oxygen duplicate is 0.5 mg/L. If the difference between the duplicates is greater than 0.5 mg/L, then the sample will need to be reanalyzed.

Instrument calibration error limits provided below are also enforced where applicable to ensure instrument is operating effectively. Procedures for conducting, documenting, and checking error limits for calibrations are provided in the Manuals and Field Guides (Appendix G. LCRA CRWN procedures and protocols are provided in Appendix H.

**Table B4.1 Texas Stream Team Parameter Error Limits**

| Monitoring Type | Parameter | Error Limit |
|---|---|---|
| Standard and Probe Core – Freshwater | Conductivity | ± 20% of calibration standard solution |
| Standard Core – Saltwater | Salinity | ± 1 ppt |
| Standard Probe | Dissolved Oxygen | ± 6% saturation |
| Standard Probe | pH | ± 0.5 s.u. |

Best professional judgment will be relied upon in evaluating water quality and non-water quality data. Field values falling outside the acceptance criteria may invalidate the sample. Notations of field blank, duplicate, and calibration error limit excursions are noted on the Monitoring Form for inclusion in the ~~WWDV~~ Hub. For a comprehensive understanding of TXST's data validation checks, look to Section D1 of this QAPP document.

TXST staff evaluate all CS data submissions based on established QAO detailed within the Manuals and Field Guides. If data results do not meet the criteria in the Manuals and Field Guides, the data will be flagged in the ~~WWDV~~ Hub for further review (see Section D1). Additionally, if certain information is omitted on a datasheet, these omissions will automatically be flagged within the ~~WWDV~~ Hub for further review and follow up with the CS submitting the data (see Section D2).

## B7 ENVIRONMENTAL INFORMATION MANAGEMENT

### Personnel

Section A8 lists responsibilities for data management personnel with lines of communication displayed in Section A10.

### Data Management Process

Monitoring sites are visited at most monthly by CS and measurements are collected on-site or water samples are collected and analyzed as described in Sections B1 and B2

and the corresponding training Manual or Field Guide referenced in Appendix G. Results are documented on field data Monitoring Forms referenced in Appendix C. Paper and electronic Monitoring Forms are provided as pathways for data entry. Paper forms can be submitted by email or hard copies can be mailed to TXST staff. Paper forms can also be submitted to a Data Coordinator/TXST partner for entry into the ~~WWDV~~ Hub. Electronic monitoring forms can be accessed on the internet via phone or computer and entered directly from the field at the time measurements are collected or from paper forms later. All LCRA CRWN data are submitted by the Data Coordinator to the TXST Data Manager in an Excel file format and uploaded directly into the ~~WWDV~~ Hub. All data are verified and validated at various/multiple levels using information provided on the QC checklist provided on the second page of the Monitoring Forms. The data are verified and validated prior to submitting the data by the CS, Data Coordinator, and/or TXST staff depending on the pathway of data entry. Data are collectively uploaded to the TXST ~~WWDV~~ Hub ~~and Datamap~~ monthly, and the EPA WQX biannually by the TXST Data Manager.

If issues are identified, the CS will be contacted to resolve any data quality issues. If not resolvable, the data will be entered into the database and flagged as not meeting the QC checklist protocol. All data deliverables are documented in progress reports and submitted to TCEQ NPS Project Manager for review and approval.

**Record-keeping and Data Storage**

Record-keeping and document control procedures are contained in the Manuals and Field Guides referenced in Appendix G and this QAPP. Following data verification and validation, the original forms and data are stored as digital scans of hard copy paper forms, on ~~the Esri cloud for electronic Monitoring Forms, on the Salesforce contractor cloud-based server for WWDV data, and~~ the TXST cloud-based storage in accordance with the record-retention schedule in Section A12. Two copies of the database are backed up monthly on cloud-based servers. If necessary, disaster recovery will be accomplished by information resources staff using the backup databases and/or archived hardcopy paper/electronic forms. AGOL serves as the operational platform for hosted datasets, maps, applications, and services. Automated monthly exports and backups of critical datasets are maintained to support data preservation and disaster recovery. Critical maps, datasets, and related records are archived in a separate off-platform repository. In the event of data loss or disruption, recovery will be performed using retained backups, archived records, and original hard-copy or electronic source field data sheets.

**Archives/Data Retention**

Complete original data sets are archived on separate cloud-based servers and retained by the TXST staff, Esri system, and external Salesforce contractor for a retention period specified in Section A12.

**Data Verification/Validation**

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

**Forms and Checklists**

See Appendix C for the Field Data Monitoring Forms and QC Checklists.
See Appendix F for the Manuals and Field Guides that contain information about the Data Entry Checklist (See Section 3.2 Data Entry Checklist in the Core Water Quality Community Scientist Manual[1]).

**Data Dictionary**
Terminology and field descriptions are included in the Manuals (see Appendix G). For the purposes of verifying which entity codes are included in this QAPP, a table outlining the entities that will be used when submitting data under this QAPP (Please see table under Electronic Data section).

**Data Handling**
Data are processed using the Microsoft Excel. Data integrity is maintained by the implementation of password protections which control access to the database and by limiting update rights to a select user group. The database administrator is responsible for assigning user rights and assuring database integrity.

~~[1]2023 Texas Stream Team Core Water Quality Community Scientist Manual~~

**Hardware and Software Requirements**
Hardware and software procurements are sufficient to run Microsoft Excel under the Windows operating system in a networked environment. Information Resources staff are responsible for assuring hardware configurations meet the requirements for running current and future data management/database software as well as providing technical support.

**Information Resource Management Requirements**
Parameters monitored and corresponding reporting units follow the guidelines provided in the TCEQ Data Management Reference Guide. In addition, contract requirements include a 60-day turnaround time for data collected and submitted by CS to be made publicly available on the ~~WWDV~~ Hub ~~from the WWDV~~. The TXST Data Manager uploads data monthly to ensure requirements are met. These requirements are documented in quarterly progress reports to TCEQ NPS Project Manager.

**Backup/Disaster Recovery**
Data are maintained in ~~two~~ a cloud system~~s~~ via Esri ArcGIS Online, ~~and Salesforce (WWDV)~~ and are automatically backed up per platform capabilities~~y~~. ~~Salesforce uses policy-based daily backups with on-demand snapshots before major changes.~~ Esri content benefits from SaaS resiliency and a 14-day recycle bin for deleted items. Independent copies of spatial and water quality data are exported monthly to the TXST shared drive. Additionally, water quality data are uploaded twice a year to the EPA's WQX portal on the Central Data Exchange.

In the event of a catastrophic failure, the Data Manager initiates recovery. ~~Salesforce data and metadata are restored to a selected restore point and validated for integrity.~~ Esri items are recovered from the recycle bin if within the retention window; if

[1] https://docs.gato.txst.edu/312151/CoreManual.pdf

platform restores are incomplete, authoritative copies from TXST storage are imported to backfill gaps.

**Quality Assurance/Control**
See Section D of this QAPP.

## C1 ASSESSMENTS AND RESPONSE ACTIONS

The following table presents the types of assessments and response action for data collection activities applicable to the QAPP. LCRA CRWN procedures and protocols are provided in Appendix H.

## Table C1.1 Assessments and Response Requirements

| Assessment Activity | Approximate Schedule | Responsible Party | Scope | Response Requirements |
|---|---|---|---|---|
| Status Monitoring Oversight, etc. | Continuous | TXST Project Manager | Monitoring of the project status and records to ensure QAPP requirements are being fulfilled. | Report quarterly to the TCEQ in Progress Report. |
| Submission of Field Data Sheets (Monitoring Forms) | Within 120 days of collection | CS/TXST partner | The CS/TXST partner will submit a Monitoring Form from their sampling event within 120 days of collection. Any data submitted after 120 days from the sampling event will be accepted at the TXST staff/partner discretion. | CS/TXST partner submit Monitoring Form via hard copy, Survey123, or the ~~WWDV~~ Hub. |
| Review of Field Data Sheets (Monitoring Forms) | Within 60 days of submission | TXST staff/partner | The CS will submit a Monitoring Form from their sampling event. The TXST staff/partner will review the Monitoring Form for conformance with the executed QAPP within 60 days of receiving the form. | The TXST Project Manager has 60 days to review the data and respond to the CS/TXST partner with comments. |
| Monitoring Systems Audit/Field Audit Session | Every two years | TXST QAO/Certified Trainer | Site visits may be conducted to audit field sampling technique, data management, and related QA oversight. Documentation will take place on the Field Audit Session form provided on the back of the monitoring form. | Feedback by TXST staff/trainer following field audit session (see Field Audit Session documentation on Monitoring forms) |
| Training Systems Audit | In conjunction with training sessions | TXST staff/trainer | TXST CS monitor and Trainer certification | Training records submitted to TXST and/or partner |
| Field Sampling Readiness Review | Training Phase III - Prior to first sampling event for all monitoring projects. | TXST QAO, Project Manager, or Field Supervisor | The TXST QAO (or designee) will review the executed QAPP in detail with field staff to ensure that the requirements of the QAPP are understood. The scope of this review will include QAPP sampling, handling and measurement, recording data, and equipment and reagent check. | TXST staff/trainer submits completed Training Sign-in0Sheet for certification |
| Monitoring Systems Audit | Dates to be determined by TCEQ | TCEQ QAS | The assessment will be tailored in accordance with objectives needed to ensure compliance with the executed QAPP. | 30 days to respond in writing to TCEQ to provide corrective actions addressing negative audit findings. |
| Site Visit | Dates to be determined by TCEQ | TCEQ NPS Project Manager | Status of activities. Overall compliance with work plan and executed QAPP. | As needed |

**Corrective Action Process for Deficiencies and Nonconformances**
Deficiencies are any unauthorized deviations from the approved QAPP and procedures referenced in the QAPP. Deficiencies may invalidate resulting data. All deficiencies from the QAPP require documentation of the nonconformance and corrective action. Deficiencies must be documented in a CAP and corrected in a timely manner. Corrective action may include samples be discarded and re-collected. Deficiencies are documented in logbooks, field data sheets, etc. by field staff. It is the responsibility of the TXST Project Manager, in consultation with the TXST QAO, to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP.

Nonconformances must be communicated to the TCEQ NPS Project Manager immediately via email. A CAP Form (See Appendix F for the form and an example) must be submitted to the TCEQ NPS Project Manager within 14 days of the deficiency occurring. Once it is approved, the TCEQ NPS Project Manager will send the CAP to the NPS QA Coordinator who will then email the CAP to the Lead NPS QAS (and TCEQ DM&A Data Manager if data quality is affected) within 30 days of the initial notice of deficiency per TCEQ Quality Management Plan. The deficiency must also be communicated to the TCEQ NPS Project Manager through the Corrective Action Status Table (see Appendix E for the table and an example) to be included with the quarterly progress report.

The TXST Project Manager is responsible for implementing and tracking corrective actions. All CAPs will be documented on the Corrective Action Status Table, which will be submitted to the TCEQ NPS Project Manager with the quarterly progress report for review and approval. Records of TCEQ audit findings and corrective actions are maintained by both TCEQ and the TXST QAO. Documentation of corrective action to address audit findings will be submitted to TCEQ within 30 days of receipt of audit report.

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

**Corrective Action Plans**
CAPs are designed to prevent recurrence of a deficiency and should specifically:

- Identify and describe the deficiency, problem, nonconformity, or undesirable situation.
- Identify the root cause(s) of the problem.
- Identify programmatic impact of the deficiency.
- Identify whether the problem is likely to recur or occur in other areas.
- Identify immediate remedial actions if possible.
- Include a description of the need for Corrective Action.
- Include a description of cause(s), determine solution, and propose an action plan.
- Establish timelines and provide a schedule.
- Identify personnel responsible for action.
- Document the corrective action and verify its effectiveness.

## D1 ENVIRONMENTAL INFORMATION REVIEW

For the purposes of this document, data verification is a systematic process for evaluating performance and compliance of a set of data to ascertain its completeness, correctness, and

conformance/compliance of a specific data set against the method, procedural, or contractual requirements using the methods and criteria defined in the QAPP. Validation means those processes taken independently of the data-generation processes to evaluate the technical usability of the verified data with respect to the planned objectives or intention of the project. Additionally, validation can provide a level of overall confidence in the reporting of the data based on the methods used.

All water quality and non-water quality data will be reviewed and verified upon submission by TXST QAO or their designee, the group training coordinator or partner for conformance to project requirements, and then validated against the data quality objectives (DQO) which are listed in Section A6. Data must also conform to specified monitoring procedures, QC protocols, and project specifications. The respective field, data management, and QAO data verification responsibilities and acceptability criteria are listed by task in Table D1.l.

Data review and verification will be performed using a Data Entry Checklist (See 3.2 Data Entry Checklist of the Core Manual in Appendix G) followed by automated database functions that will validate data as the information is entered into the ~~WWDV~~ Hub. The data to be verified and evaluated against project specifications are checked for errors, especially errors in transcription, calculations, and data input. Potential errors are identified by examination of documentation and by manual and computer assisted examination of corollary or unreasonable data. If a question arises or a potential error or anomaly is identified, the CS or partner of the monitor responsible for generating the data is contacted to resolve the issue. Issues that can be corrected are corrected and documented. If there are errors in the calibration log, expired reagents used to generate the sampling data, or any other deviations from the field or bacteria data, the corresponding data are flagged in the database.

When one or more data entry does not meet the data verification procedures (Table D1.1), the data are flagged for review. TXST staff evaluate the flagged data submissions by first looking for typos, mis-recordings, or data boxes that were left blank. If during the review process a question about the validity or the level of detail about the data submitted is detected by TXST staff, the volunteer who submitted the data will be contacted for further clarification. If the issue is not resolved, the data will continue to be flagged for not meeting QA protocols.

A second element of the validation process is consideration of any findings identified during the assessments listed in Table C1.1. Any issues requiring corrective action must be addressed, and the potential impact of these issues on previously collected data will be assessed by the TXST QAO. The TXST Project Manager, with the concurrence of the QAO validates that the data meet the DQO of the project and are suitable for reporting to TCEQ.

**Table D1.1 Data Verification Procedures**

| Data to be Verified | Field Task | Database Task | QAO Task |
|---|---|---|---|
| Sample documentation complete (Monitoring Form); samples labeled; sites identified | Y | Y | Y |
| Sample preservation and handling acceptable | Y | N | N |
| Holding times not exceeded | Y | N | N |
| Collection, preparation, and analysis consistent with SOPs and QAPP | Y | N | N |
| Instrument calibration data complete | Y | Y | Y |
| Bacteriological records complete | Y | Y | Y |

| Data to be Verified | Field Task | Database Task | QAO Task |
|---|---|---|---|
| QC samples analyzed at required frequency | Y | Y | Y |
| QC results meet performance and program specifications | Y | Y | Y |
| Analytical sensitivity (Limit of Quantitation /AWRL) consistent with QAPP | Y | Y | Y |
| Results, calculations, transcriptions checked | Y | Y | Y |
| Nonconforming activities documented | Y | Y | Y |
| Outliers confirmed and documented; reasonableness check performed | Y | Y | Y |
| Dates formatted correctly and in correct units | Y | Y | Y |
| Depth reported correctly | Y | Y | Y |
| Time based on 24-hour clock | Y | Y | Y |
| Absence of transcription error confirmed | Y | Y | Y |
| Absence of electronic errors confirmed | N | Y | Y |
| Field instrument pre and post calibration results within limits | Y | N | N |
| 10% verification check of proper data verification procedures being followed | N | N | Y |

## D2 USEABILITY DETERMINATION

Data produced for this project will adhere to procedures outlined in Section D1. TXST will employ these procedures to ensure that all data included in the ~~WWDV~~ Hub database can be used for educational purposes, local decision-making, research, screening, BMP effectiveness, problem identification, and other uses deemed appropriate by end users. TXST may choose to communicate data findings at targeted watershed stakeholder forums as well as at Clean Rivers Program annual basin-wide steering committee meetings, websites, newsletters, and Watershed Summary Reports. The online ~~WWDV~~ Hub allows anyone to access TXST data and use it for the above-mentioned purposes as well as a general understanding of where TXST CS are currently monitoring and have been in the past.

Data which do not meet requirements described in this QAPP will be flagged in the ~~WWDV~~ Hub and may not be considered appropriate for the uses noted above. The purpose of flagged data is to note inconsistencies or what may be data. Data are analyzed using automated validations embedded in the ~~WWDV~~ Hub and Survey123 form and supported by manual review by TXST partners and staff. The ~~WWDV~~ Hub is designed to flag data that do not meet the QC checklist associated with each monitoring type (as outlined on the back of Monitoring Forms). Flagged data are retained in the ~~WWDV~~ Hub but are clearly identified to prevent inappropriate use. These flags indicate inconsistencies, potential transcription errors, or results with excessive variability. If data anomalies or departures from planning assumptions are identified, the Data Manager and QAO will determine whether the data should be qualified, excluded, or otherwise limited in use. In such cases, corrective actions may include:

- Communicating limitations of flagged data to end users.
- Updating or clarifying measurement performance specifications.
- Providing feedback to CS or partners to reduce recurrence of issues.

The TXST Data Manager, in coordination with the TXST QAO, is responsible for reviewing compiled results against the measurement performance criteria established in this QAPP. Limitations on the use of data will be reported in Watershed Summary Reports, through annotations in the ~~WWDV~~ Hub and during stakeholder and partner meetings. In addition, findings and limitations may be communicated via the TXST website, newsletters, and other

program reports to ensure transparency.

## APPENDIX B. CONTRACT SCOPE OF WORK AND DELIVERABLE DUE DATES

### ~~SCOPE OF WORK (24-50135)~~

**Task 1: Project Administration**

**Objective:** To effectively administer, coordinate, and monitor all work performed under this project including technical and financial supervision and preparation of status reports.

**Subtask 1.1: Project Oversight —** The Performing Party will provide technical and fiscal oversight of the staff and/or subgrantee(s)/subcontractor(s) to ensure Tasks and Deliverables are acceptable and completed as scheduled and within budget. Project oversight status will be provided to the TCEQ Project Manager with the quarterly Progress Reports.

**Subtask 1.2: Progress Reports (PRs)** — The Performing Party will submit PRs to the TCEQ Project Manager by the 15th of the month following the end of each quarter. PRs will include reporting on the status of Deliverables and proposed revisions to due dates, narrative description of progress by Task, and status of nonconformances/corrective actions. The TCEQ Project Manager will provide a PR template to the Performing Party.

**Subtask 1.3: Reimbursement Forms (Financial Status Reports)** — The Performing Party will submit reimbursement forms in accordance with the Special Terms and Conditions in the Contract.

**Subtask 1.4: Contract Communication** — The Performing Party will maintain regular telephone and/or email communication with the TCEQ Project Manager regarding the status and progress of the project and any matters that require attention between PRs. The Performing Party will participate in quarterly conference calls with the TCEQ Project Manager to discuss items such as project Tasks, financial status, Quality Assurance Project Plans (QAPPs), corrective actions, and any other matters that require attention. The TCEQ Project Manager may request additional information from the Performing Party prior to the call or meeting. The Performing Party will provide meeting notes and identify action items from the conference calls.

The first conference call held each fiscal year of the project will cover, as applicable, any staff changes, the previous year's performance, budget estimates, invoicing issues, quality assurance issues, corrective actions, and overall project progress.

Matters that must be communicated to the TCEQ Project Manager include, but are not limited to:

- Notification a minimum of 14 days before the Performing Party has scheduled public meetings or events, or other major Task activities.
- Notification within 48 hours following events or circumstances that may require changes to the Budget, Scope of Work, or Deliverable Due Dates.
- Requests for prior approval of activities or expenditures for which the Contract requires advance approval or that are not specifically included in the Scope of Work.

**Subtask 1.5: Contractor Evaluation** — The Performing Party will participate in an annual Contractor Evaluation at the end of each state fiscal year.

**Subtask 1.6: Contractor Workshop and Post Award Meeting** — The Performing Party will attend a contractor workshop hosted by TCEQ at the beginning of the project. The Performing Party will attend a post award meeting with the TCEQ Project Manager to discuss details of the project and due dates for deliverables. The Performing Party will provide meeting notes and identify action items from the post award meeting.

**Subtask 1.7: Coordination Call with EPA** — Upon request by TCEQ and EPA, the Performing Party will participate in a call with EPA to share progress on goals, measures of success, challenges and draft documents.

**Subtask 1.8: Project Article** — Upon request by TCEQ, the Performing Party will provide a project article. The article will state the project's purpose, describe the activities of the past fiscal year, and include photographs of the project. The Performing Party will address TCEQ comments on the article and provide a final article.

**Subtask 1.9: Contract Budget Updates** — The Performing Party will discuss fiscal year budgets with the TCEQ Project Manager on a quarterly basis, at a minimum. These updates, recoded in PRs, will be revised when fiscal year spending projections change, or upon request by the TCEQ Project Manager. In the second year of the project, the Performing Party will provide an Annual Budget Update that details fiscal year spending projections associated with planned project activities. The update in the final year of the project will include a budget for all remaining project activities. The TCEQ Project Manager will provide a template for the Annual Budget Update.

**Deliverables:**

1.2 PRs (quarterly)
1.3 Reimbursement forms (see Special Terms and Conditions in the Contract)
1.4 Quarterly conference call meeting notes and action items (within five business days of the call)
1.5 Documentation of the Performing Party's participation in the Contractor Evaluation (annually, within five business days following request)
1.6 List of Performing Party attendees and date of contractor workshop (in PR)
1.6 Post award meeting notes and action items (within five business days of the meeting)
1.7 Coordination call with EPA (upon request)
1.8 Project Article and photographs (upon request)
1.9 Annual Budget Update (within two weeks following request)

**Task 2: Quality Assurance**

**Objective**: To refine, document, and implement data quality objectives (DQOs) and quality assurance/quality control (QA/QC) activities that ensure data of known and acceptable quality are generated by this project.

**Subtask 2.1: QAPP Planning Meetings** — The Performing Party will schedule a QAPP planning meeting with the TCEQ Project Manager within 30 days of Contract execution, to implement a systematic planning process based on the elements in the applicable QAPP Shell, which will be provided by the TCEQ Project Manager. The information developed during this meeting will be incorporated into a QAPP by the Performing Party.

**Subtask 2.2: QAPP** — The Performing Party will develop and submit to TCEQ a QAPP with project-specific DQOs and other components consistent with the following documents:

- TCEQ NPS QAPP Shell(s)
- EPA Requirements for QAPPs (QA/R5)
- EPA Guidance for Geospatial Data QAPPs (QA/G-5G)
- EPA QAPP Requirements for Secondary Data Research Projects
- TCEQ Surface Water Quality Monitoring (SWQM) Procedures

The Performing Party will develop the QAPP in consultation with the TCEQ Project Manager, QA staff, and contractors. The Performing Party will address comments and submit a final QAPP for review. The QAPP must be signed/fully approved by TCEQ before any environmental data operations begin.

**Subtask 2.3: QAPP Annual Reviews, Revisions, and Updates** — The Performing Party will submit documentation certifying its annual review or supporting the revision or reissuance of the QAPP at least 90 days prior to the QAPP anniversary date. Amendments approved since the initial QAPP approval, or a subsequent certified annual review (if applicable) or revision must be submitted along with the certification. For multi-year QAPPs, if extensive changes to a QAPP are necessary, a full revision/update is required. No work described in a QAPP will be conducted outside the effective period of the QAPP.

**Subtask 2.4: Amendments** — The Performing Party will submit Draft QAPP Amendments for TCEQ review when changes to QAPPs are necessary. Draft QAPP Amendments should be submitted at least 90 days prior to the scheduled initiation of changes and must be accompanied by a justification, summary of changes, and detail of changes. The Performing Party will submit Final QAPP Amendments within 30 days of receipt of any comments provided by TCEQ. Final QAPP Amendments will be submitted to TCEQ with the Performing Party's signatures and responses to comments and circulated for appropriate TCEQ signatures. QAPP Amendments must be approved by TCEQ before any changes conveyed within Amendments are implemented.

**Subtask 2.5: Corrective Action Plans (CAPs)** — The Performing Party will provide CAPs, as needed, to document deviations from the approved QAPP, including, but not limited to sampling method requirements or sample design, failures associated with chain-of-custody procedures, or failures associated with field and laboratory measurement systems. Draft CAPs will be submitted to TCEQ for review by TCEQ's designated due date The Performing Party will address TCEQ's comments. The Performing Party will submit final CAPs to TCEQ by the designated due date.

**Deliverables:**

2.1 QAPP Planning Meeting and notes (meeting within 30 days of Contract execution, notes within five business days following meeting)
2.2 Draft QAPP (120 days prior to the scheduled initiation of environmental data operations)
2.2 Final QAPP (30 days prior to the scheduled initiation of environmental data operations)
2.3 QAPP Annual Reviews and Revisions (at least 90 days prior to the QAPP approval anniversary)
2.4 Draft QAPP Amendments (at least 90 days prior to the scheduled initiation of changes or additions to activities listed in the current QAPP)
2.4 Final QAPP Amendments (at least 30 days prior to the scheduled initiation of changes or additions to activities listed in the current QAPP)
2.5 Draft CAPs (as needed, within 14 business days after receiving request)
2.5 Final CAPs (within 14 business days of receiving comments)

**Task 3: Water Quality Data Reporting and Dataviewer Management**

**Objective:** To maintain and update the Database and Dataviewer, and to generate reports. All submitted data collected under the QAPP are entered into the Dataviewer.

**Subtask 3.1: Data Submittals** — The Performing Party will enter all data collected under the QAPP into their Database within 90 days of data submission by community scientists. Data from the Dataviewer will be transferred to an online publicly accessible Datamap within 60 days of data submission by community scientists. The Performing Party will submit quarterly Data Activity Reports to the TCEQ Project Manager that will communicate the number of community scientists trained, number of community scientists monitoring, and number of monitoring events. The Performing Party will also submit data to EPA Water Quality Exchange (WQX) semi-annually. The Performing Party will email the TCEQ Project Manager a confirmation of each data submittal to WQX.

**Subtask 3.2: Data Summary Reports** — The Performing Party will compile and distribute selected community science Data Summary Reports on a quarterly basis. The reports will contain the data collected under the QAPP for sites/segments/basins agreed upon by the Performing Party, TCEQ, community scientist stakeholders, partners, and Clean Rivers Planning agencies. The Data Summary Reports will also contain maps that illustrate the community scientist water quality data collected for each respective watershed. The Performing Party will submit Draft Data Summary Reports and presentations to the TCEQ Project Manager for review and approval at least two weeks prior to the scheduled public release.

**Subtask 3.3: Water Quality Monitoring Optical Brightener Technique Study** — The Performing Party will conduct a study to evaluate water quality testing methods and tools targeting optical brighteners from human sources of sewage wastewater for cost effectiveness and efficiency. The Performing Party will submit a report summarizing the results of the water quality monitoring optical brightener study.

**Deliverables:**

3.1 Data Activity Reports (quarterly, with PRs)
3.1 Data Submittals to EPA (twice per year, documented in PRs and proof of submission emailed to TCEQ Project Manager)
3.2 Draft Data Summary Reports with watershed maps (quarterly, at least two weeks prior to the scheduled public release)
3.2 Final Data Summary Reports and watershed maps with response to comments (quarterly, with PRs)
3.3 Draft Water Quality Monitoring Optical Brightener Technique Study Report (quarter 5, with PR)
3.3 Final Water Quality Monitoring Optical Brightener Technique Study Report (quarter 7, month 1)

**Task 4: Community Science Activities**

**Objective:** To engage, manage, expand, and strengthen a minimum of 400 statewide water quality community scientists and associated partner networks in activities related to water quality. The Performing Party will provide water quality monitoring training to support existing and new groups performing volunteer monitoring.

**Subtask 4.1: Support Existing and New Community Scientists** —The Performing Party will engage a minimum of 400 community scientists annually in activities related to water quality. The Performing Party will maintain a limited supply of kits and replacement reagents to equip community scientists who do not currently have partner support or where partner funding is unavailable.

**Subtask 4.2: Establish New Partnerships and Groups** — The Performing Party will create at least three new partnerships and three new community science groups per year to recruit community scientists in areas developing and implementing WPPs, along with other areas in the state.

**Subtask 4.3: Annual Trainer Meeting** — The Performing Party will hold one Statewide Trainer Meeting per year with the primary objective of gathering input and feedback toward the Performing Party's advancement of program objectives, QAPP/protocol updates, and improvement of volunteer and support efforts. The Performing Party will submit the agenda to the TCEQ Project Manager for review and approval at least two weeks prior to the meeting.

**Subtask 4.4: Core Community Scientist Water Quality Monitoring Trainings** — The Performing Party will support water quality monitoring trainings which cover core parameters (dissolved oxygen, pH, conductivity, salinity, Secchi disk, transparency tube, field observations/comments) and methods addressed in the latest TCEQ-approved QAPP. Training will emphasize watershed awareness through discussion and demonstration of the relationship between monitoring tests and field observations to corresponding nonpoint source pollution issues. The Performing Party's staff or certified trainers will conduct at least eight Core Trainings per year.

**Subtask 4.5: Advanced and *E. coli* Bacteria Community Scientist Water Quality Monitoring Trainings** — The Performing Party will support water quality monitoring trainings which cover the nonpoint source pollution suite (*E. coli* bacteria, nitrates, orthophosphates, flow, turbidity) parameters and methods addressed in the latest TCEQ-approved QAPP. Training will emphasize watershed awareness through discussion and demonstration of the relationship between monitoring tests and field observations to corresponding nonpoint source pollution issues. The Performing Party's staff or certified trainers will conduct at least four Advanced or *E. coli* Bacteria Trainings per year.

**Subtask 4.6: Certify Community Scientists as a Trainer** — The Performing Party will train and certify community scientists to provide Texas Stream Team Trainings, including watershed and nonpoint source pollution education. The Performing Party's staff or certified trainers will train at least three certified community scientists per year to become Texas Stream Team trainers.

**Subtask 4.7: Bioassessment and Riparian Evaluation Program** — The Performing Party will develop and support new community scientists and groups/partners in the adoption of Bioassessment and Riparian Evaluation activities. The Performing Party staff or certified trainers will conduct at least one Bioassessment or Riparian Evaluation trainings per year.

**Subtask 4.8: Community Science Tasks Report** — The Performing Party will produce a Draft and Final Community Scientist Tasks Report that describes project activities completed under this Task. The report will identify and discuss the extent to which goals and purposes have been achieved. The report will emphasize successes, failures, and lessons learned. The Draft Community Scientist Tasks Report will be submitted to the TCEQ Project Manager for review. The Final Community Scientist Tasks Report will address TCEQ comments. If the TCEQ Project Manager determines that the Draft Task Report requires no edits by the Performing Party, the Draft Task Report will also serve as the Final Task Report.

**Deliverables:**

4.1 Documentation of progress toward the goal of engaging 400 community scientists per year (quarterly, with PRs)
4.2 Documentation of new community scientist groups and new partnerships established, minimum of three new groups and three new partnerships per year (quarterly, with PRs)
4.3 Draft Annual Statewide Trainer Meeting agenda (annually, at least two weeks prior to Annual Trainer Meeting)
4.3 Documentation of Annual Statewide Trainer Meeting, minimum of two (quarters 3 and 7, with PRs)
4.4 Documentation of core community scientist water quality monitoring trainings, minimum of eight per year (quarterly, with PRs)
4.5 Documentation of Advanced or *E. coli* bacteria community scientist water quality monitoring trainings, minimum of four per year (quarterly, with PRs)
4.6 Documentation of trainer certifications, minimum of three per year (quarters 3 and 7, with PRs)
4.7 Documentation of trainings for Bioassessment/Riparian program, minimum of one per year (quarters 3 and 7, with PRs)
4.8 Draft Community Science Tasks Report (quarter 8, month 1)
4.8 Final Community Science Tasks Report (within 15 business days of receiving comments)

**Task 5: Watershed Services**

**Objective:** To offer and provide services that contribute to the successful implementation of accepted WPPs across Texas. The Performing Party will achieve this by working with Watershed Coordinators to engage stakeholders in watersheds approved by the TCEQ Project Manager and assess the alignment of watershed/WPP needs with capabilities of the Performing Party.

**Subtask 5.1: Outreach to Watershed Coordinators** — The Performing Party will correspond with a minimum of eight Watershed Coordinators or project leads per year and offer services to support implementation of WPPs. Services may include:

- Providing information regarding matching/in-kind funds.
- Assisting with water quality and data collection.
- Assisting with analyses of monitoring data.
- Providing community science programming and curricula.

**Subtask 5.2: Watershed Services Task Report** — The Performing Party will provide a Draft and Final Watershed Services Task Report summarizing all activities covered by this Task. The Draft Watershed Services Task Report will be submitted to the TCEQ Project Manager for review. The Final Watershed Services Task Report will address TCEQ comments. If the TCEQ Project Manager determines that the Draft Task Report requires no edits by the Performing Party, the Draft Task Report will also serve as the Final Task Report.

**Deliverables:**

5.1 Documentation of correspondence with Watershed Coordinators or project leads, minimum of 8 per year (quarterly, in PRs)
5.2 Draft Watershed Services Task Report (quarter 8, month 1)
5.2 Final Watershed Services Task Report (within 15 business days of receiving comments)

**Task 6: Water Resource Education and Outreach**

**Objective:** To provide watershed education to a minimum of 2,500 people annually on nonpoint source pollution and activities that support water conservation and management.

**Subtask 6.1: Texas Stream Team Curriculum, Spring Lake Education Program** — The Performing Party will incorporate Texas Stream Team activities into the Meadows Center's existing Spring Lake education program to reach a targeted portion of the 125,000 annual expected visitors.

The Performing Party will use the Spring Lake education program to:

- Promote/hold one teacher workshop per year.
- Conduct four Enviroscape watershed model demonstrations or watershed activities per year.
- Provide four water quality monitoring certifications for all grade levels per year.

**Subtask 6.2: Newsletters** — The Performing Party will produce and distribute four online newsletters to community scientists, partners, and other interested parties per year. Information in the newsletters will target new potential partners and users of the Performing Party's data and services. Draft newsletters will be submitted to the TCEQ Project Manager for review and approval at least two weeks prior to distribution or release. The final newsletters will address TCEQ comments.

**Subtask 6.3: Research Publication Submission** — The Performing Party will submit an article regarding the evaluation of the effectiveness of water resource community science to a research journal and will present the findings at a scientific conference(s). The Performing Party will provide the abstract and presentation to the TCEQ Project Manager for review and approval at least 14 days prior to deadlines for submission to scientific conference(s).

**Subtask 6.4: Watershed Education and Outreach Task Report** — The Performing Party will produce a Draft and Final Watershed Education and Outreach Task Report that describes project activities under this Task and discusses the extent to which goals have been achieved. The report will emphasize successes, failures, and lessons learned. The Draft Watershed Education and Outreach Task Report will be submitted to the TCEQ Project Manager for review. The Final Watershed Education and Outreach Task Report will address TCEQ comments. If the TCEQ Project Manager determines that the Draft Task Report requires no edits by the Performing Party, the Draft Task Report will also serve as the Final Task Report.

**Deliverables:**

6.1 Documentation of teacher workshops, including agenda, sign-in sheets, and presentation materials, minimum of one per year (quarters 4 and 8, with PRs)
6.1 Documentation of Enviroscape watershed model demonstrations, minimum of four per year (quarters 4 and 8, with PRs)
6.1 Documentation of providing water quality monitoring certifications, minimum of four per year (quarters 4 and 8)
6.2 Draft online newsletters, minimum of eight (at least two weeks prior to distribution or release)
6.2 Final online newsletters, minimum of eight (quarterly, with PRs)
6.3 Draft research publication (quarter 7, month 2)
6.3 Documentation of research publication submission (quarter 8, month 1)
6.3 Draft abstract and presentation for scientific conference(s) (at least 14 business days before submission)
6.3 Documentation of presentation at scientific conference(s) (quarter 8, month 1)
6.4 Draft Watershed Education and Outreach Task Report (quarter 8, month 1)
6.4 Final Watershed Education and Outreach Task Report (within 15 business days of receiving comments)

**Task 7: Final Report**

**Objective:** To produce a Final Report that summarizes all activities completed and conclusions reached during the project. The Final Report will discuss the extent to which project goals and purposes have been achieved and information about methods used. The Final Report should emphasize successes, failures, lessons learned. The Final Report should include analyses estimating the project's water quality improvements and/or load reductions, if applicable. The Final Report will summarize all the Task Reports either in the text or as appendices.

**Subtask 7.1: Draft Final Report** — At least 30 days prior to submitting the Final Report, the Performing Party will provide a Draft Final Report. The comprehensive report should document all Deliverables under this Scope of Work. The Draft Final Report will be structured per the following outline:

- Title
- Table of Contents
- Project Description and Purpose
- Study Area (including maps)
- Summary of all Tasks
- Amount of project funding and amount spent
- Discussion: include deliverables not completed and lessons learned
- Water quality results achieved and estimated load reductions (if applicable to project)
- Appendices (if needed)

**Subtask 7.2: Final Report** — The Performing Party will revise the Draft Final Report to address comments provided by the TCEQ Project Manager. At least two weeks before the expiration of the Contract, the Performing Party will submit the Final Report to the TCEQ Project Manager.

**Deliverables:**
7.1 Draft Final Report (quarter 8, month 1)
7.2 Final Report (at least two weeks prior to end of contract)

## ~~SCOPE OF WORK (25-00061)~~

**Task 1: Project Administration**

**Objective:** To effectively administer, coordinate, and monitor all work performed under this project including technical and financial supervision and submittal of Progress Reports.

**Subtask 1.1: Project Oversight** — The Performing Party will provide technical and fiscal oversight of the staff and/or subgrantee(s)/subcontractor(s) to ensure Tasks and Deliverables are acceptable and completed as scheduled and within budget. Project oversight status will be provided to the TCEQ Project Manager with the quarterly Progress Reports.

**Subtask 1.2: Progress Reports (PRs)** — The Performing Party will submit PRs to the TCEQ Project Manager by the 15th of the month following the end of each quarter. PRs will include reporting on the status of Deliverables and proposed revisions to due dates, narrative description of progress by Task, and status of nonconformances/corrective actions. The TCEQ Project Manager will provide a PR template to the Performing Party.

**Subtask 1.3: Reimbursement Forms (Financial Status Reports)** — The Performing Party will submit reimbursement forms in accordance with the Special Terms and Conditions in the Contract.

**Subtask 1.4: Contract Communication** — The Performing Party will maintain regular telephone and/or email communication with the TCEQ Project Manager regarding the status and progress of the project and any matters that require attention between PRs. The Performing Party will participate in project meetings (in person or virtual) with the TCEQ Project Manager to discuss items such as Tasks, financial status, Quality Assurance Project Plans (QAPPs), and corrective actions. The TCEQ Project Manager may request additional information from the Performing Party prior to the project meetings. The Performing Party will provide meeting notes and identify action items within seven days of each project meeting.

The Performing Party will attend a contractor workshop hosted by TCEQ and a project specific post award meeting with the TCEQ Project Manager to discuss details of the project and due dates for Deliverables at the beginning of the project. The post award meeting will serve as the first project meeting.

Project related matters that are not specifically included in the Scope of Work or require additional notification must be communicated to the TCEQ Project Manager. These communications may include, but are not limited to:

- Notification of non-contractual events or circumstances that may require changes to the Budget, Scope of Work, or Deliverable Due Dates.
- Requests for prior approval of activities or expenditures for which the Contract requires advance approval.

**Subtask 1.5: Contractor Evaluation** — The Performing Party will participate in an annual Contractor Evaluation at the end of each state fiscal year. The TCEQ Project Manager will provide a draft annual evaluation to the Performing Party for comment before a final evaluation is completed.

**Subtask 1.6: Coordination Call with EPA** — Upon request by TCEQ and EPA, the Performing Party will participate in a call with EPA to share progress on goals, measures of success, challenges, and draft documents.

**Subtask 1.7: Project Article** — The Performing Party, upon request by TCEQ, will provide a project article that will state the project's purpose, describe the activities of the past fiscal year, and include photographs of the project. The Performing Party will address TCEQ comments on the draft version and provide a final article.

**Subtask 1.8: Contract Budget Updates** — The Performing Party will provide updated budget estimates on a quarterly basis. These updates, recorded in PRs, will be revised when fiscal year spending projections change, or upon request by the TCEQ Project Manager. In the second year of the Contract, the Performing Party will provide an Annual Budget Update for the current state fiscal year detailing spending projections associated with planned project activities. The TCEQ Project Manager will provide a template for the Annual Budget Update.

**Deliverables:**

1.2 PRs (quarterly)
1.3 Reimbursement forms (see Special Terms and Conditions in the Contract)
1.4 Project meeting notes and action items (quarterly, within seven days following the meeting)
1.4 Post award meeting notes and action items (within seven days following the meeting)
1.5 Documentation of the Performing Party's participation in the Contractor Evaluation (annually, within seven days following request)
1.6 Coordination call with EPA (upon request)
1.7 Project Article and photographs (upon request)
1.8 Annual Budget Update (within two weeks following request)

**Task 2: Community Science Activities**

**Objective:** To engage, manage, expand, and strengthen Texas Stream Team groups and associated partner networks in activities related to water quality with a focus on inclusivity and extended reach. The Performing Party will provide water quality monitoring guidance, supplies, and translated materials to support existing and new groups performing volunteer monitoring, thereby enhancing accessibility and inclusivity across diverse communities.

**Subtask 2.1: Establish New Groups** — The Performing Party will create at least three new community science groups to recruit community scientists in areas implementing watershed protection plans, along with other areas in the state.

**Subtask 2.2: Translations** — The Performing Party will translate program training and monitoring documents into Spanish and/or Vietnamese.

**Deliverables:**

2.1 Documentation of new community scientist groups established, minimum of three (with PRs).
2.2 Draft program document translations (final quarter, month 1)
2.2 Final program document translations (final quarter, month 3)

**Task 3: Final Report**

**Objective:** To produce a Final Report that summarizes all completed Task activities and conclusions reached during the project. The Final Report will discuss the extent to which project goals and purposes have been achieved and information about methods used. The Final Report should emphasize successes, failures, and lessons learned.

**Subtask 3.1: Draft Final Report** — At least 45 days prior to submitting the Final Report, the Performing Party will provide a Draft Final Report. This comprehensive report should document all Deliverables under this Scope of Work. The Draft Final Report will be structured per the following outline:

- Title
- Table of Contents
- Executive Summary
- Introduction
- Project Description and Purpose
- Methods
- Study Area (including maps)
- Summary of work completed in all Tasks
- Amount of project funding and amount spent
- Discussion: include deliverables not completed, lessons learned, and recommendations
- References
- Appendices (if needed)

**Subtask 3.2: Final Report** — The Performing Party will revise the Draft Final Report to address comments provided by the TCEQ Project Manager. At least 14 days before the expiration of the Contract, the Performing Party will submit the Final Report to the TCEQ Project Manager.

**Deliverables:**

3.1 Draft Final Report (final quarter, month 1)
3.2 Final Report (at least 14 days prior to end of Contract)

## SCOPE OF WORK (26-00046)

### Task 1: Project Administration

**Objective:** To effectively administer, coordinate, and monitor all work performed under this project including contractual, technical and financial supervision and submittal of Progress Reports. This project is expected to be completed in two years (eight quarters).

**Subtask 1.1: Project Oversight** — The Performing Party will provide contractual, technical and fiscal oversight of work performed by project staff and/or any subgrantee(s)/subcontractor(s) to ensure Tasks and Deliverables are acceptable and completed as scheduled and within budget. Project oversight status will be provided to the TCEQ Project Manager with the quarterly Progress Reports.

**Subtask 1.2: Progress Reports (PRs)** — The Performing Party will submit PRs to the TCEQ Project Manager by the 15th of the month following the end of the quarter. If the 15th is not a business day, the PR is due on the next business day. PRs will include reporting on the status of Deliverables and proposed revisions to due dates, narrative descriptions of progress made on each Task, including Subtasks, and status of nonconformances/corrective actions. The TCEQ Project Manager will provide a PR template to the Performing Party.

**Subtask 1.3: Reimbursement Forms (Financial Status Reports)** — The Performing Party will submit reimbursement forms at quarterly intervals. Reimbursement Forms will follow the Financial Status Report template provided by TCEQ. The reporting periods will correspond to the State of Texas fiscal year (September-November, December-February, March-May, and June-August). Requests for reimbursement must be submitted within 30 days after the close of each quarter with the exception of the last fiscal quarter of the Contract, when the final invoice will be due within 45 days after the close of the Contract.

**Subtask 1.4: Contract Communication** — The Performing Party will maintain regular telephone and/or email communication with the TCEQ Project Manager regarding the status and progress of the project and any matters that require attention between PRs. The Performing Party will participate in project meetings (in person or virtual) with the TCEQ Project Manager to discuss items such as Tasks, financial status, Quality Assurance Project Plans (QAPPs), and corrective actions. The Performing Party will provide meeting notes to the TCEQ Project Manager and identify action items within seven days of each project meeting.

The Performing Party will attend a workshop hosted by TCEQ and a project-specific post award meeting with the TCEQ Project Manager to discuss details of the project and due dates for Deliverables at the beginning of the project. The post award meeting will serve as the first project meeting.

**Subtask 1.5: Performing Party Evaluation** — The Performing Party will participate in an annual performance evaluation at the end of each state fiscal year. The TCEQ Project Manager will provide a draft evaluation to the Performing Party for comment before a final evaluation is completed.

**Subtask 1.6: Coordination Call with EPA** — Upon request by TCEQ, the Performing Party will participate in a call with EPA to share progress on goals, measures of success, challenges, and draft documents.

**Subtask 1.7: Project Article** — The Performing Party, upon request by TCEQ, will provide a project article that will state the project's purpose and describe the activities of the past fiscal year and include photographs of the project. The Performing Party will address TCEQ comments on the draft version and provide a Final Article.

**Subtask 1.8: Contract Budget Updates** — The Performing Party will provide updated budget estimates on a quarterly basis. These updates, recorded in the PRs, will be revised when fiscal year spending projections change, or upon request by the TCEQ Project Manager. In the second year of the Contract, the Performing Party will provide an Annual Budget Update for the current State of Texas fiscal year detailing spending projections associated with planned project activities. The TCEQ Project Manager will provide a template for the Annual Budget Update.

**Deliverables:**

1.2 PRs (quarterly) until project finished
1.3 Reimbursement forms (quarterly) until project finished
1.4 Project meeting notes and action items (quarterly, within seven days following the meeting)
1.4 Post award meeting notes and action items (within seven days following the meeting)
1.5 Documentation of the Performing Party's participation in the performance evaluation (annually, within seven days following request)
1.6 Coordination call with EPA (upon request)
1.7 Project Article and photographs (upon request)
1.8 Annual Budget Update (within 14 days following receipt of written request)

## Task 2: Quality Assurance

**Objective:** To refine, document, and implement Data Quality Objectives (DQOs) and Quality Assurance (QA)/Quality Control (QC) activities that ensure data of known and acceptable quality are generated by this project.

**Subtask 2.1: QAPP Planning Meetings** — The Performing Party will schedule a Quality Assurance Project Plan (QAPP) planning meeting with the TCEQ Project Manager within 30 days of Contract execution, to discuss project activities and the elements in the applicable QAPP Shell. The information developed during this meeting will be incorporated into a QAPP by the Performing Party. The TCEQ Project Manager will provide the appropriate shell(s) to the Performing Party.

**Subtask 2.2: QAPP** — The Performing Party will develop and submit to TCEQ a QAPP with project specific DQOs and other components consistent with the following documents:

TCEQ QAPP Shell(s)/example(s) - provided by TCEQ Project Manager
EPA Quality Assurance Project Plan Standard (CIO 2105-S-02.0)

The Performing Party will develop the QAPP in consultation with the TCEQ Project Manager, QA staff, and subgrantees/subcontractors (if any). The Performing Party will address comments and submit a final QAPP for review. The QAPP must be signed by TCEQ before the Performing Party and its subcontractors(s)/subgrantees(s) can initiate environmental data operations.

**Subtask 2.3: QAPP Annual Reviews and Revisions** — The Performing Party will submit documentation certifying its annual review or supporting the revision of the QAPP at least 90 days prior to the QAPP anniversary or expiration date. QAPP Amendments approved since the initial QAPP was approval or a subsequent certified annual review (if applicable) must be submitted along with the certification. For multi-year QAPPs, if extensive changes are necessary, a full revision is required. No work described in a QAPP will be conducted outside the effective QAPP period.

**Subtask 2.4: QAPP Amendments** — The Performing Party will submit Draft QAPP Amendments for TCEQ review when changes to the QAPP are necessary. The TCEQ Project Manager will provide a QAPP Amendment Shell. Draft QAPP Amendments should be submitted at least 90 days prior to the scheduled initiation of changes and must be accompanied by a justification, summary of changes, and detail of changes. The Performing Party will submit Final QAPP Amendments within 30 days of receipt of any comments provided by TCEQ. Final QAPP Amendments will be submitted to TCEQ with the Performing Party's signatures and responses to comments and circulated for appropriate TCEQ signatures. QAPP Amendments must be approved by TCEQ before the Performing Party and its subcontractors(s)/subgrantees(s) can implement any changes conveyed within those QAPP Amendments.

**Subtask 2.5: Corrective Action Plans (CAPs)** — The Performing Party will provide CAPs, as needed, to document deviations from the approved QAPP, including, but not limited to deviations from sampling method requirements, sample design, failures associated with chain-of-custody procedures, or failures associated with field and laboratory measurement systems. Draft CAPs will be submitted to TCEQ for review by TCEQ's designated due date. The Performing Party will address TCEQ's comments and will submit final CAPs to TCEQ by the designated due date.

**Subtask 2.6: Quality Assurance Audits** — The Performing Party will participate in quality assurance-related auditing activities conducted by TCEQ as described in the QAPP. The Performing Party will provide responses to any audit findings or deficiencies within a timeframe designated by TCEQ.

**Deliverables:**

2.1 QAPP Planning Meeting and notes (meeting within 30 days of following Contract execution, notes due within seven days following the meeting)
2.2 Draft QAPP (120 days prior to the scheduled initiation of environmental data operations)
2.2 Final QAPP (60 days prior to the scheduled initiation of environmental data operations)
2.3 QAPP Annual Reviews and Revisions (at least 90 days prior to the QAPP approval anniversary)
2.4 Draft QAPP Amendments (at least 90 days prior to the scheduled initiation of changes or additions to activities listed in the current QAPP)
2.4 Final QAPP Amendments (at least 30 days prior to the scheduled initiation of changes or additions to activities listed in the current QAPP)
2.5 Draft CAPs (as needed, within 14 days after receiving request)
2.5 Final CAPs (within 14 days of receiving comments)
2.6 Documentation of participation in Quality Assurance Audits, including dates audits were conducted (as needed, in PRs)

## Task 3: Data Reporting and Management

**Objective:** To maintain and update water quality data within the Datamap and Dataviewer database platforms, ensuring that all submitted data collected under the QAPP are accurately entered. This task also aims to generate comprehensive reports to enhance transparency, stakeholder engagement, and accessibility of water quality information.

**Subtask 3.1: Data Submittals** — The Performing Party will enter all data collected under the QAPP into their Database within 90 days of data submission by community scientists. Data from the Dataviewer will be transferred to an online publicly accessible Datamap within 60 days of data submission by community scientists. The Performing Party will submit quarterly Data Activity Reports, detailing the number of community scientists trained, the number of active monitors, and the number of monitoring events. Additionally, the Performing Party will submit data to the EPA Water Quality Exchange (WQX) twice per year and provide confirmation of each data submittal to TCEQ, until the project closes.

**Subtask 3.2: Watershed Summary Reports** — The Performing Party will compile and distribute selected community science Watershed Summary Reports on a quarterly basis. These reports will include community science data collected under the QAPP agreed upon by the Performing Party, TCEQ, stakeholders, partners, and Clean Rivers Program agencies. The reports will feature data analyses to evaluate water quality data and compare results to state water quality standards, as well as watershed characteristics, spatial mapping, and demographic data for each respective watershed. The Performing Party will submit Draft Watershed Summary Reports to the TCEQ Project Manager for review and approval at least 14 days prior to the scheduled public release.

**Deliverables:**

3.1 Data Activity Reports (quarterly, with PRs)
3.1 Confirmation of Data Submittal to EPA (twice per year, with PRs)
3.2 Draft Watershed Summary Reports (with PRs)
3.2 Final Watershed Summary Reports (at least 14 days prior to distribution)

## Task 4: Community Science Activities

**Objective:** To engage, manage, expand, and strengthen a minimum of 300 statewide water quality community scientists and associated partner networks in activities related to water quality. The Performing Party will provide water quality monitoring guidance, training, multilingual resources, and supplies to support existing and new groups performing volunteer monitoring. The Performing Party will translate public outreach materials and provide a translator for public meetings, as needed.

**Subtask 4.1: Support Community Scientists** — The Performing Party will engage a minimum of 300 existing and new community scientists annually in activities related to water quality. The Performing Party will maintain a limited supply of kits and replacement reagents to equip community scientists who do not currently have partner support or where partner funding is unavailable.

**Subtask 4.2: Establish New Partnerships and Groups** — The Performing Party will create at least three new partnerships and three new community science groups per year (two-year period) to recruit community scientists in areas implementing watershed protection plans, along with other areas in the state.

**Subtask 4.3: Annual Trainer Meeting** — The Performing Party will hold two annual statewide Annual Trainer Meetings with the primary objective of gathering input and feedback toward the Performing Party's advancement of program objectives, QAPP/protocol updates, and improvement of volunteer and support efforts. The Performing Party will submit the agenda and presentation to the TCEQ Project Manager for review and approval at least 14 days prior to the meeting.

**Subtask 4.4: Community Scientist Trainings** — The Performing Party will support and conduct various water quality monitoring trainings. The trainings will cover parameters and methods addressed in the approved QAPP, as well as field audits. Emphasizing watershed awareness, these trainings will demonstrate the relationship between monitoring tests and nonpoint source pollution issues. The Performing Party's staff or certified trainers will conduct at least 9 trainings or field audits per project year (18 total).

**Subtask 4.5: Certify Trainers** — The Performing Party will train and certify community scientists to provide Texas Stream Team trainings, including watershed and nonpoint source pollution education. The Performing Party's staff or certified trainers will train at least three certified community scientists annually for a two-year period to become Texas Stream Team trainers.

**Deliverables:**

4.1 Documentation of progress toward the goal of engaging 300 community scientists per year (quarterly, with PRs)
4.2 Documentation of new community scientist groups established, minimum of three per year (quarters 4 and 8, with PRs)
4.2 Documentation of new partnerships established, minimum of three per year (quarters 4 and 8, with PRs)
4.3 Draft Annual Statewide Trainer Meeting agenda and presentation, minimum of two (at least 14 days prior to the Annual Trainer Meeting)
4.3 Documentation of Annual Statewide Trainer Meeting, minimum of two (quarters 4 and 8, with PRs)
4.4 Documentation of community scientist water quality monitoring trainings or audits, minimum of nine per year (quarters 4 and 8, with PRs)
4.5 Documentation of trainer certifications, minimum of three per year (quarters 4 and 8, with PRs)

## Task 5: Watershed Services

**Objective:** To offer and provide services that contribute to the successful implementation of accepted Watershed Protection Plans (WPPs) across Texas. The Performing Party will achieve this by working with Watershed Coordinators to engage stakeholders in watersheds approved by the TCEQ Project Manager and assess the alignment of watershed/WPP needs with capabilities of the Performing Party.

**Subtask 5.1: Watershed Coordinator Outreach** — The Performing Party will correspond with a minimum of eight Watershed Coordinators or project leads and offer services to support implementation of WPPs. Services may include:

- Providing information regarding matching/in-kind funds.
- Assisting with water quality and data collection.
- Assisting with analyses of monitoring data.
- Providing community science programming and curricula.

**Deliverables:**

5.1 Documentation of correspondence and support provided with Watershed Coordinators or project leads, minimum of 8 per year for a two-year period (quarters 4 and 8, with PRs)

## Task 6: Education and Outreach

**Objective:** To provide multilingual watershed education to a minimum of 2,500 people annually on nonpoint source pollution and activities that support water conservation and management. The Performing Party will translate public outreach materials into Spanish and provide a translator for public meetings, as needed.

**Subtask 6.1: Texas Stream Team Integration at Spring Lake** — The Performing Party will incorporate Texas Stream Team activities into the Meadows Center's existing Spring Lake Education program to reach a targeted portion of the 125,000 annual visitors. The Performing Party will use the Spring Lake program to:

- Conduct four Enviroscape watershed model demonstrations or watershed activities per year of the project.
- Provide one water quality monitoring training for all grade levels per year of the project.

**Subtask 6.2: Newsletters** — The Performing Party will produce and distribute four online newsletters to community scientists, partners, and other stakeholders per year. Information in the newsletters will target new potential partners and users of the Performing Party's data and services. Draft Newsletters will be submitted to the TCEQ Project Manager for review and approval at least 14 days prior to distribution or release.

**Deliverables:**

6.1 Documentation of Enviroscape watershed model demonstrations, minimum of four per year (quarters 4 and 8, with PRs)
6.1 Documentation of providing water quality monitoring training, minimum of one (quarter8, with PR)
6.2 Draft online newsletters, minimum of eight (quarterly, with PRs)
6.2 Final online newsletters, minimum of eight (at least 14 days prior to distribution)

## Task 7: Final Report

**Objective:** To produce a Final Report that summarizes all completed Task activities and conclusions reached during the project. The Final Report will discuss the extent to which project goals and purposes have been achieved and information about methods used, Standard Operation Procedures. The Final Report should emphasize successes, failures, and lessons learned. The Final Report should include analyses estimating the project's water quality improvements and/or load reductions, if applicable.

**Subtask 7.1: Draft Final Report** — At least 45 days prior to submitting the Final Report, the Performing Party will provide a Draft Final Report. The comprehensive report should document all Deliverables under this Scope of Work. The Draft Final Report should be structured per the following outline:

- Title
- Table of Contents
- Executive Summary
- Introduction
- Project Description and Purpose
- Methods
- Study Area/maps (maps subject to TCEQ approval)
- Summary of work completed in all Tasks
- Results and Observations
- Amount of federal project funding and amount spent, unspent
- Discussion: include deliverables not completed, lessons learned, and recommendations
- Water quality results achieved/estimated load reductions (if applicable to project)
- References
- Appendices (if needed)

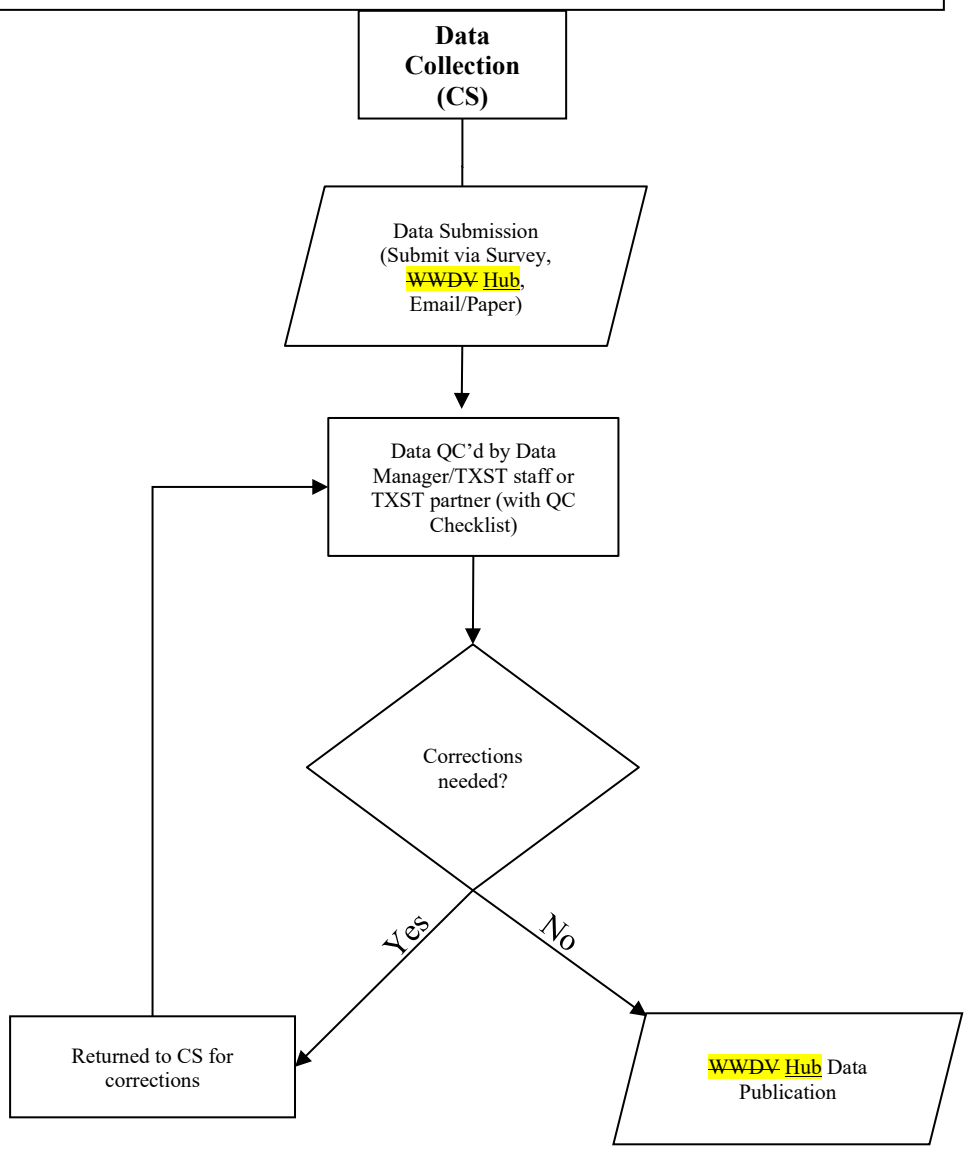
**Subtask 7.2: Final Report** — The Performing Party will revise the Draft Final Report to address comments provided by the TCEQ Project Manager. At least 14 days before the expiration of the Contract, the Performing Party will submit the Final Report to the TCEQ Project Manager.

**Deliverables:**

7.1 Draft Final Report (at least 45 days prior to end of quarter eight)
7.2 Final Report (at least 14 days prior to end of quarter eight)

# APPENDIX D. DATA MANAGEMENT PROCESS FLOW CHART

## TXST Data Management Process Flow Chart



## APPENDIX G. TEXAS STREAM TEAM MANUALS, FIELD GUIDES, TRAINER ENROLLMENT FORM, AND MAINTENANCE GUIDES

**Manuals**

2023 Texas Stream Team Core Water Quality Community Scientist Manual (Updated 2/2025)
2023 *E. coli* Bacteria Water Quality Community Scientist Manual (Updated 5/2025)
~~Texas Stream Advanced Water Quality Community Scientist Manual (Updated 7/2023)~~
2026 Texas Stream Advanced Water Quality Community Scientist Manual (Updated 8/2026)
Texas Stream Team Riparian Evaluation Citizen Scientist Manual (Updated 2/2025)
~~2025 Optical Brightener Water Quality Community Scientist Manual (December 2024)~~
2026 Optical Brightener Water Quality Community Scientist Manual (Updated August 2026)

**Field Guides**

Standard Core Field Guide
Standard Core Salinity Field Guide
Probe Core Field Guide
*E. coli* Bacteria Field Guide
Advanced Field Guide – Streamflow & Turbidity
Advanced Field Guide – Nitrate-Nitrogen & Phosphate
Optical Brightener Field Guide

**Enrollment Forms**

Training Enrollment Form
Trainer Enrollment Form

**Maintenance Guides**

Standard Core Equipment Maintenance Guide
Probe Kit Maintenance Guide

**Distribution:** QAPP Amendments will be distributed to all personnel on the original QAPP by the TXST Project Manager. Records of distribution will be maintained by the TXST, and documentation of distribution must be available upon request in the event of an audit.

**Adherence Letters:** The TXST will secure written documentation from additional project participants stating the organization's awareness of and commitment to requirements contained in this QAPP amendment. The TXST will maintain this documentation as part of the project's quality assurance records. This documentation will be available for review in the event of an audit.

**Approval:** The changes are effective upon final approval of the amendment by all signatories. These changes will be included as an attachment to the annual review certification on the QAPP anniversary date. The TCEQ and Texas State University acknowledge and accept these changes by signing this amendment. TCEQ will accept scanned copies of signature pages.

9/22/2026
_____
Aspen Navarro, Date
Project Manager and QAO

9/22/2026
_____
Laura Parchman, Data Manager Date

Ricardo Briones 9/23/2026
_____
Ricardo Briones, TCEQ NPS Project Manager Date

9/23/2026
_____
Kristin DeBone, TCEQ NPS QA Coordinator Date

Faith Hambleton
_____9/23/2026_
Faith Hambleton, TCEQ NPS Team Leader Date

James Babcock 09/23/2026
_____
James Babcock, TCEQ Lead NPS QA Specialist Date

09/23/2026
_____
Jason Natho ~~D. Jody Koehler~~,
TCEQ QA Manager Date

Brooke T. Paup, *Chairwoman*
Catarina R. Gonzales, *Commissioner*
*Tonya R. Miller, Commissioner*
Kelly Keel, *Executive Director*

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

November 18, 2025

Ricardo Briones
Project Manager
TCEQ Nonpoint Source Program
12100 Park 35 Circle, Building F
Austin, TX 78753

Subject: Approval: Texas Stream Team Program Surface Water Quality Monitoring Project Quality Assurance Project Plan (QAPP) Revision 2

Federal Grant # 9961428, 9961429, 9961430

Dear Mr. Briones:

The above-referenced Quality Assurance Project Plan (QAPP) was approved today, November 18, 2025.

Please ensure the QAPP is distributed in a timely manner to the appropriate entities listed in Section A7 of the QAPP. Distribution documentation must be available for review during an audit.

Should you have questions, feel free to contact me at james.babcock@tceq.texas.gov.

Sincerely,

James Babcock

James Babcock
Lead NPS Quality Assurance Specialist

Enclosure

Cc: Tina Treviño, TCEQ Quality Assurance Team Lead
D. Jody Koehler, TCEQ Quality Assurance Manager
Faith Hambleton, TCEQ NPS Program Manager
Kristin DeBone, TCEQ NPS Quality Assurance Coordinator

# A1 TITLE PAGE

Texas Stream Team Program Surface Water Quality Monitoring Project
Quality Assurance Project Plan (QAPP)
Revision 2

Funding Source: Nonpoint Source (NPS) Program Clean Water Act (CWA) §319(h)

Prepared in cooperation with
the Texas Commission on Environmental Quality (TCEQ)
and the U.S. Environmental Protection Agency (EPA)

Federal IDs # 9961428, 9961429, 9961430
QTRAK # 26-033

Effective Period: Three years from date of final approval

Questions concerning this QAPP should be directed to:

Aspen Navarro
Deputy Director and Project Manager
The Meadows Center for Water and the Environment
601 University Drive
San Marcos, Texas 78666
(512)245-7376
AspenNavarro@txstate.edu

## A2 APPROVAL PAGE

By signing this document, signatories acknowledge their respective organizations' awareness of and adherence to requirements contained in this QAPP in accordance with roles and responsibilities as described in Section A8 Project Organization and throughout.

**TEXAS COMMISSION ON ENVIRONMENTAL QUALITY**

**Air Monitoring Division**

Laboratory and Quality Assurance Section

11/18/2025

D. Jody Koehler Date
TCEQ Quality Assurance (QA) Manager

11/18/2025

James Babcock Date
Lead NPS QA Specialist (QAS)

**Water Quality Planning Division**

NPS Program

11/18/2025

Faith Hambleton, Team Leader Date

11/17/2025

Kristin DeBone, NPS QA Coordinator Date

Ricardo Briones 11/13/2025
Ricardo Briones, NPS Project Manager Date

**TEXAS STATE UNIVERSITY – TEXAS STREAM TEAM**

_____ 11/13/2025
Aspen Navarro, Project Manager Date

_____ 11/13/2025
Aspen Navarro, Date
Quality Assurance Officer (QAO)

_____ 11/13/2025
Laura Parchman, Date
Data Manager

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**Table A3.1 List of Acronyms**

| Acronym | Definition |
|---|---|
| AWRL | Ambient Water Reporting Limits |
| BMP | Best Management Practice |
| CAP | Corrective Action Plan |
| CWA | Clean Water Act |
| CRWN | Colorado River Watch Network |
| CS | Community Scientist |
| DI | Deionized Water |
| DMRG | Data Management Reference Guide |
| DQO | Data Quality Objectives |
| EPA | United States Environmental Protection Agency |
| FEM | Federal Equivalent Method |
| GIS | Geographic Information System |
| LCRA | Lower Colorado River Watch Network |
| LCS | Laboratory Control Samples |
| LOQ | Limits of Quantitation |
| NPS | Nonpoint Source |
| QA | Quality Assurance |
| QC | Quality Control |
| QAO | Quality Assurance Officer |
| QAPP | Quality Assurance Project Plan |
| QAS | Quality Assurance Specialist |
| QMP | Quality Management Plan |
| RG | Regulatory Guidance |
| SOP | Standard Operating Procedure |
| SWQM | Surface Water Quality Monitoring |
| SWQMIS | Surface Water Quality Monitoring Information System |
| TCEQ | Texas Commission on Environmental Quality |
| TXST | Texas State |
| UV | Ultraviolet |
| VWQM | Volunteer Water Quality Monitoring |
| WQX | Water Quality Exchange |
| WWDV | Waterways Dataviewer |

## A4 PROJECT PURPOSE, PROBLEM DEFINITION, AND BACKGROUND

Texas State (TXST) coordinates the Texas Stream Team, a statewide community science (CS) program that certifies volunteers to collect environmental and surface water quality data. By augmenting professional monitoring efforts, CS play a critical role in expanding the understanding of water conditions across Texas. The program operates in partnership with the TCEQ and the EPA through CWA Section 319(h) NPS Program funding, with additional support from statewide match contributions. To strengthen its reach, TXST collaborates with local governments, watershed groups, nonprofits, and community organizations to recruit, train, and sustain a diverse network of CS.

Through this collaborative model, the program addresses the growing demand for broad, consistent, and accessible water quality information. Such data are vital for watershed planning, public education, and informed decision-making. Texas water resources continue to face multiple pressures that make expanded, quality-assured CS monitoring critical:

1. Geographic Scale and Monitoring Demand – Texas has more than 11,000 named rivers and streams, spanning over 191,000 miles of waterways, creating practical challenges for comprehensive professional coverage with finite resources.
2. Growth and Development – Texas's population continues to grow rapidly, with urbanization and land-use change increasing stormwater volume and pollutant loading to receiving waters. This trend elevates this risk of NPS pollutions and episodic water quality degradation.
3. Regulatory Data Needs – The Texas Clean Rivers Program (Senate Bill 818) recognizes that many areas lack sufficient water quality data to support sound local and state decisions. Assistance from CS can help close geographic and temporal data gaps to improve screening, prioritization, and follow-up monitoring.
4. NPS Pollution – NPS remains a major cause of impairments statewide; historical reporting attributes roughly three-quarters of listed impairments to NPS contributions, underscoring the need for distributed monitoring.
5. Public Health – The Texas Integrated Report has identified widespread bacteria impairments that threaten contact recreation uses. Public concern about potentially harmful bacteria in swimming areas and popular waterways underscores the need for distributed, frequent ambient monitoring and timely communication.

Given these conditions, professional monitoring often focuses on severely impaired or high-priority waters, leaving gaps in spatial coverage, event capture, and long-term trend documentation. Quality-assured CS monitoring complements professional efforts by increasing site density and sampling frequency, improving early detection of anomalies, and providing locally relevant information for planning and outreach.

This quality assurance project plan (QAPP) establishes the policies, procedures, and quality assurance (QA)/quality control (QC) framework that ensure CS-generated data are of known and documented quality and acceptable for screening, education, planning, research, and coordinated monitoring purposes. Data produced under this QAPP are not intended for enforcement. Data supports:

- Generating reliable screening-level ambient water quality data with high spatial and temporal coverage
- Identifying potential water quality problems early ("red-flag" detection) for professional follow-up
- Supporting watershed education and community engagement, linking land use, best management practices (BMPs), and water outcomes
- Informing watershed planning and BMP effectiveness evaluations, including historic and post-implementation comparisons
- Contributing datasets for long-term trends, research, and decision support
- Enhancing coordination with the Clean Rivers Program and local stakeholders to optimize monitoring strategies and priorities

This QAPP applies to all Texas Stream Team-affiliated CS monitoring programs. It defines the framework for training, sampling, equipment calibration, data management, and reporting. Partner organizations help ensure local ownership and long-term program sustainability. The Lower Colorado River Authority's Colorado River Watch Network (CRWN) maintains its own procedures and quality systems but collaborates with TXST through shared data, coordinated training, and joint outreach. CRWN volunteers and staff are also counted as part of TXST's §319 program match contributions.

Building on its history since 1991, Texas Stream Team has mobilized thousands of CS and partner groups across the state to augment professional monitoring and generate quality-controlled data for the statewide Waterways Dataviewer (WWDV). These data have informed watershed protection plans, TCEQ and Clean Rivers Program decisions, community outreach, and local water resource planning. The continued implementation of this QAPP supports the expansion of distributed, community-based monitoring to meet Texas's water quality management goals.

Since its inception, Texas Stream Team has developed and implemented successive QAPPs to ensure scientifically rigorous, quality-assured data collection protocols. Over the years, these plans have supported the integration of multiple monitoring types, beginning with core water quality parameters such as dissolved oxygen, pH, conductivity, and temperature. The program later expanded to include advanced monitoring for nutrients, bacteria, macroinvertebrates, riparian assessments, and other specialized studies in response to emerging watershed priorities. With the most recent being the optical brightener testing. Each iteration of the QAPP has built upon previous work, broadening both the scope and depth of community-based monitoring while maintaining consistency with state and federal standards as much as possible.

This QAPP is prepared in accordance with TCEQ's quality management plan (QMP) and EPA's most recent QAPP Standard. This QAPP is reviewed and approved by TCEQ to help ensure that environmental data generated for the purposes described above are of known and documented quality, deemed accepted for their intended use. This process will ensure that data submitted and uploaded to WWDV have been collected and analyzed in a way that guarantees their reliability and can be used by programs deemed appropriate by TCEQ.

## A5 PROJECT TASK DESCRIPTION

TXST will oversee statewide CS monitoring using approved training certifications and standard data collection protocols. Monitoring will be conducted by volunteers trained under the Texas Stream Team and CRWN programs, with procedures provided in Appendix H. The work will produce:

- Recruitment and training of volunteers in accordance with approved protocols.
- Routine collection of water quality data following standardized, documented field procedures.
- Establishment and maintenance of monitoring sites in partnership with local groups and stakeholders.
- Region-specific monitoring plans for each established group, documenting roles, site information, and protocols.
- Quality-assured datasets uploaded into the WWDV for statewide accessibility.
- Updated site metadata and geospatial records maintained in the WWDV.
- Periodic field audit session documentation to verify CS precision and data quality.
- Watershed-specific summary reports provided to project partners and other interested organizations.

Volunteer monitoring occurs year-round on a rolling basis. Monitors collect water quality data at approved sites following the methods outlined in Texas Stream Team Manuals (Manuals), Texas Stream Team Field Guides (Field Guides), and QAPP appendices. Inactive monitoring sites may be reactivated, or new sites proposed. Proposals must include contact information, latitude/longitude coordinates, county, river basin, nearby landmarks, and whether the site is on public or private property. TXST staff evaluate each request through an approval process that prioritizes overlap with state monitoring sites, safety, and representation of overall water quality conditions. All approved sites are documented in monitoring plans and tracked in the WWDV with metadata that includes coordinates, waterbody, and associated partner groups. Sites are reviewed regularly to confirm data coverage and continuity within priority watersheds. Esri suite products are used to map and verify monitoring sites.

Key water quality parameters include physical, chemical, and field-based measurements such as: monthly Core water chemistry indicators (dissolved oxygen, pH, temperature, specific conductance, transparency), flow observations, and field conditions; biannual Riparian Evaluation monitoring; and monthly NPS pollution parameters (e.g., nutrients, bacteria, optical brighteners) collected by monitors with additional training.

Monitoring plans are created electronically when a group or volunteer initiates monitoring within a watershed. New monitoring groups may begin once their monitoring plan is approved. Developing a plan involves filling leadership positions and working with TXST staff to select appropriate sites, based on stakeholder priorities, watershed needs, long-term monitoring goals, and coordination with professional monitoring efforts. Leadership positions include:

- Group Leader – serves as the primary point of contact for TXST (required for each group).

- Training Coordinator/QAO – schedules trainings, posts them to the public online calendar, recruits' participants, and submits materials to TXST. This role also conducts biennial QC field audits with active CS. Trainers must attend the annual TXST Trainer Meeting or send a designated alternate.
- Data Coordinator – reviews monitoring forms submitted by CS (electronic or hard copy), performs QC checks, and follows data management protocols outlined in Section B7 Environmental Information Management.
- Equipment Coordinator – tracks and maintains monitoring equipment, manages supply check-outs, conducts inventories, restocks supplies, and performs equipment maintenance.

Monitoring plans include:

- Group name
- Names of all CS within the group
- Contact information for the four leadership roles (Group Leader, Training Coordinator/QAO, Data Coordinator, and Equipment Coordinator)
- Site ID numbers assigned by TXST staff
- Parameters to be collected
- Available supplies
- Group goals, including water quality concerns within their watershed and any other organizations receiving the data, and for what purpose

Plans are reviewed for compliance with the QAPP and approved by the TXST Data Manager and Project Manager. Copies are provided to the group and stored electronically at the TXST office. Plans are revised as needed based on volunteer interest, funding availability, partner input, or upon request.

All monitoring data submitted through the Esri Survey123 system undergo automated review for completeness, significant figures, and valid value ranges. Regions without Data Coordinators have their data QC performed directly by TXST staff.

Data quality objectives are assessed through multiple checks:

- Training QA/QC – required certification and refresher trainings, plus biennial QC audit sessions led by a certified Training Coordinator/QAO.
- Data Review – Data Coordinators and TXST staff review monitoring forms prior to entry and flag errors/inconsistencies.
- Verification/Validation – Automated validations set to compare values against acceptable ranges.
- Audit & Oversight – TXST Data Manager and Project Manager review monitoring plans and datasets for adherence to QAPP requirements prior to approval.

If data quality objectives are not met, monitoring plan revisions, re-trainings, or corrective actions are implemented.

TXST staff provide ongoing oversight, database review, and annual reporting. Data analyses evaluate trends, identify water quality concerns, and inform watershed planning and stakeholder engagement through quarterly watershed summary reports.

Analyses include time-series evaluations, comparisons to state standards, and identification of exceedances. Additional datasets (TCEQ Surface Water Quality Monitoring (SWQM), and partner datasets) may be acquired for comparative or contextual analysis.

Final project products include updated monitoring plans, a statewide georeferenced database of CS results maintained in the WWDV, periodic internal summaries, and deliverables such as written reports and maps made available to partners, stakeholders, and the public. Project activities follow a schedule of routine monitoring and data review, annual trainer meetings, biennial audits, and ongoing updates to monitoring plans based on program needs.

The Texas Stream Team projects this QAPP is associated with, Contract 24-50135, 25-00061, and 26-00046, will continue Texas Stream Team efforts starting from December 2025 through December 2028. All tasks, deliverables, and monitoring dates are estimates. Work covered under this QAPP will not begin until the QAPP is executed.

See Appendix A for a project location map.

See Appendix B for the scope of work and deliverable due dates for the contract tasks referenced in this QAPP.
See Section B1 for monitoring to be conducted under this QAPP.

**Amendments**
Amendments to the QAPP must be approved to reflect changes in project organization, tasks, schedules, objectives, and methods, address deficiencies and nonconformances, improve operational efficiency, and accommodate unique or unanticipated circumstances. Requests for amendments are submitted by the TXST Project Manager to the TCEQ NPS Project Manager in writing using the QAPP Amendment Shell. The changes are effective immediately upon approval by the TCEQ QA Manager, TCEQ NPS Project Manager, TCEQ NPS Data Manager, and Lead NPS Quality Assurance Specialist (QAS), or their designees.

Amendments to the QAPP and the reasons for the changes will be documented, and full copies of amendments will be forwarded to all persons on the QAPP distribution list by the TXST QAO.

**Annual QAPP Reviews, Certifications, and Revisions**
This QAPP shall be reviewed in its entirety and certified annually by the TXST Project Manager and TCEQ NPS Project Manager. A letter certifying this annual review must be submitted to the TCEQ NPS Project Manager no later than 90 days prior to the QAPP anniversary date to prevent QAPP expiration and interruption in work due to issuance of a stop work order. Amendments approved since QAPP approval or the previous annual certification must be included as an attachment along with the letter. Only non-substantive changes not affecting the project design or quality or quantity of work to be performed can be included in the annual certification letter. This includes organizational changes or schedule changes based on a contract amendment that do not impact data deliverables. If changes beyond these are necessary, a QAPP

amendment must be submitted and approved before the changes are implemented and before the annual review may be certified. The TCEQ NPS Project Manager is required to review the QAPP and provide certification of annual reviews to the TCEQ QA Manager and EPA Region 6 Project Officer no later than 30 days before QAPP anniversary date. If the QAPP expires, work described within this document must be halted.

If the project will extend beyond the third QAPP anniversary date, a full QAPP revision is required. If the QAPP expires, work described within this document must be halted.

## A6 INFORMATION/DATA QUALITY OBJECTIVES AND PERFORMANCE/ACCEPTANCE CRITERIA

This project will collect volunteer water quality monitoring (VWQM) (i.e., Standard Core, Probe Core, Advanced, *E. coli* Bacteria, and Optical Brightener) and non-water quality (i.e., Riparian) data. Volunteers located within the Lower Colorado Watershed follow the Lower Colorado River Authority (LCRA) CRWN procedures and protocols for collecting surface water quality parameters provided in Appendix H. Three differences exist between TXST and LCRA CRWN measurement protocols:

- Phosphate - the LCRA CRWN program does not include phosphate as a water quality monitoring parameter.
- Dissolved oxygen - LCRA CRWN CS have the option to perform a third titration if the first and second titrations have a difference larger than 0.5 mg/L. TXST requires that CS discard the results and begin again if the difference in the two titrations is larger than 0.5 mg/L.
- Nitrate-nitrogen. - LCRA CRWN allows for an alternative option to measure nitrates using the CHEMets® Colorimeter method as outlined in more detail in the LCRA CRWN manual (Appendix H).

The measurement performance criteria to support the project objectives for the water and non-water quality data types are specified in Tables A6.1 and A6.2.

## Table A6.1 Measurement Water Quality Performance Specifications

| Parameter | Units | Matrix | Method | TCEQ Parameter Code | AWRL | Precision (RPD of LCS/LCSD) | Completeness (%) |
|---|---|---|---|---|---|---|---|
| **FIELD** | | | | | | | |
| Algae | 1-absent<br>2-rare<br>3-common<br>4-abundant<br>5-dominant | Water | TXST or CRWN SOP | NA | NA* | NA | 90 |
| Days Since Last Significant Rainfall | Days | NA | TXST or CRWN SOP | 72053 | NA* | NA | 90 |
| Flow Estimate | cfs | Water | TXST or CRWN SOP | 74069 | NA* | NA | 90 |
| Flow Method | 1=gage<br>2=elec<br>3=mech<br>4=weir/flu<br>5=doppler | Water | TXST or CRWN SOP | 89835 | NA* | NA | 90 |
| Flow Severity | 1-no flow<br>2-low<br>3-normal<br>4-flood<br>5-high<br>6-dry | Water | TXST or CRWN SOP | 01351 | NA* | NA | 90 |
| Flow Stream, instantaneous (cubic feet per sec) | cfs | Water | TCEQ SWQM Procedures Manual Vol. 1, TXST SOP or CRWN SOP | 00061 | NA* | NA | NA |
| Nitrate-Nitrogen | Mg/L | Water | TXST or CRWN SOP | NA | 0.1 mg/L | NA | 90 |
| PH | Standard units (s.u.) | Water | TXST or CRWN SOP | 00400 | NA* | NA | 90 |
| Phosphate | Mg/L | Water | TXST SOP** | NA | 0.02-50 mg/L | NA | 90 |
| Present Weather | 1-clear<br>2-cloudy<br>3-overcast<br>4-rain | Air | TXST or CRWN SOP | 89966 | NA* | NA | 90 |
| Optical Brightener | Presence<br>Absence | Water | TXST SOP** | NA | NA | NA | 90 |
| Oxygen, dissolved | mg/L | Water | TXST or CRWN SOP | 00300 | NA* | 0.5 | 90 |
| Rainfall Accumulation (last 3 days) | Inches | NA | TXST or CRWN SOP | NA | NA* | NA | 90 |
| Salinity | PPT, tidally influenced sites only | Water | TXST or CRWN SOP | 00480 | NA* | NA | 90 |
| Specific Conductance, (us/cm @ 25C) | uS/cm | Water | TXST or CRWN SOP | 00094 | NA* | NA | 90 |
| Temperature, Air | degC | Air | TXST or CRWN SOP | 00020 | NA* | NA | 90 |

| Parameter | Units | Matrix | Method | TCEQ Parameter Code | AWRL | Precision (RPD of LCS/LCSD) | Completeness (%) |
|---|---|---|---|---|---|---|---|
| Temperature, Water | degC | Water | TXST or CRWN SOP | 00010 | NA* | NA | 90 |
| Tide Stage | 1-low<br>2-falling<br>3-slack<br>4-rising<br>5-high | Water | TXST or CRWN SOP | 89972 | NA* | NA | 90 |
| Total Depth | m | Water | TXST or CRWN SOP | 82903 | NA* | NA | 90 |
| Transparency Tube | m | Water | TXST or CRWN SOP | 00078 | NA | NA | 90 |
| Turbidity | Nephelometric Turbidity Units (NTU) | Water | TXST SOP** | NA | 0.5 NTU | NA | 90 |
| Water Clarity | 1-clear<br>2-cloudy<br>3-turbid | Water | TXST or CRWN SOP | NA | NA* | NA | 90 |
| Water Color | 1- no color<br>2- light green<br>3- dark green<br>4-tan<br>5-red<br>6-green/brown<br>7-black | Water | TXST or CRWN SOP | NA | NA* | NA | 90 |
| Water Conditions | 1-calm<br>2-ripples<br>3-waves<br>4-white caps | Water | TXST or CRWN SOP | 89968 | NA* | NA | 90 |
| Water Odor | 1-none<br>2-oil<br>3-acrid<br>4-sewage<br>5-rotten eggs<br>6-fishy | Water | TXST or CRWN SOP | NA | NA* | NA | 90 |
| Water Surface | 1-clear<br>2-scum<br>3-foam<br>4-debris<br>5-sheen | Water | TXST or CRWN SOP | NA | NA* | NA | 90 |
| **BACTERIA** | | | | | | | |
| *E. coli* | Colony forming units (cfu) per 100 mL | Water | TXST or CRWN SOP | N/A | 1 cfu per 100 mL | NA | 90 |
| *E. coli*, Holding time | Hours*** | Water | TXST or CRWN SOP | 31704 | NA | NA | NA |

*Reporting to be consistent with TXST or SWQM guidance and based on measurement capability.
**CRWN VWQM do not test for this parameter.
****E. coli* samples will be processed as soon as possible not to exceed 8 hours.

**Table A6.1 References:**

- TXST standard operating procedure (SOP): Core Water Quality Manual, May 2023; Advanced Water Quality Manual, April 2019; Optical Brightener Water Quality Manual, November 2024; Field Guide(s).
- CRWN SOP: LCRA, CRWN, SOPs, 9th edition, 2012
- TCEQ SOP: TCEQ *Surface Water Quality Monitoring Procedures*, Volume 1: Regulatory Guidance (RM)-415, August 2012.

**Table A6.2 Measurement Non-Water Quality Performance Specifications**

| PARAMETER | UNITS | MATRIX | METHOD |
|---|---|---|---|
| Active floodplain present | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Energy dissipation | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| New plant colonization | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Stabilized vegetation | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Age diversity | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Species diversity | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Plant vigor | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Water storage | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Bank and channel erosion | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |
| Sediment deposition | Inner Bulls-eye = good<br>Middle Bulls-eye = at risk<br>Outer Bulls-eye = Dysfunctional | Riparian | TXST SOP |

**Table A6.2 References:**

- TXST SOP: Riparian Evaluation Citizen Scientist Manual, January 2022

**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 repeated measurements of the same property under identical, or substantially similar conditions, and is an indication of random error.

A field split is a single sample subdivided by CS immediately following collection according to procedures specified in the respective Manual and analyzed as two separately identified samples. Split samples are preserved, handled, shipped, and analyzed identically and are used to assess variability in all of these processes.

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) or sample/duplicate pairs in the case of bacterial analysis. Precision results are compared against measurement performance specifications and used during evaluation of analytical performance. Program-defined measurement performance specifications for precision are defined in Table A6.1.

**Representativeness**
Representativeness is defined as the measure of the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition.

For Routine Sampling:

Site selection, the appropriate sampling regime, the sampling of all pertinent media, and use of only approved analytical methods to partners and volunteers according to the respective manual (Appendix G), and use of only approved analytical methods will assure that the measurement data represent the conditions at the site. Routine monitoring conducted with the intent to collect data for water quality assessment are considered spatially and temporally representative of routine water quality conditions, are collected on a routine frequency, and the monitoring events are separated by approximately even time intervals. At a minimum, CS are asked to collect samples consistently for one year, where possible. 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 total representation of the water body will be tempered by the available funding.

**Completeness**
Completeness is a measure of the amount of valid data obtained from a measurement system, expressed as a percentage of the number of valid measurements that should have been collected (i.e., measurements that were planned to be collected). Ideally, 100 percent of the data should be obtained. However, the possibility of data loss 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 percent data completion is achieved.

**Comparability**

Comparability is the qualitative term that expresses the measure of confidence that two or more data sets can contribute to a common analysis. 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 SWQM Procedures Vol. 1.* Comparability is also guaranteed by reporting data in standard units, by using accepted rules for significant figures, and by reporting data in a standard format as specified in Section B7.

**Sensitivity**

Sensitivity is the capability of a method or instrument to discriminate between measurement responses representing different levels of the variable of interest. See discussions below on ambient water reporting limits (AWRLs) and LOQs for the term "detection limit" is closely related to sensitivity requirements of this project and is often used synonymously.

## A7 DISTRIBUTION LIST

The Lead NPS QA Specialist will provide approved versions of this QAPP and any amendments or revisions to the TCEQ NPS Project Manager and TCEQ QA Manager. The TCEQ NPS Project Manager will provide approved copies to the TXST Project Manager, TCEQ QA Manager, and EPA Project Officer within two weeks of approval. The TCEQ NPS Project Manager will document transmittal of the QAPP to the list below and maintain this documentation as part of the project's QA records. This documentation will be available for review.

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Melissa Benfer, Project Officer
EPA Region 6
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(214) 665-8423

TXST will provide copies of this QAPP and any amendments or revisions of this QAPP to each project participant defined in the list below. The TXST will document receipt of the QAPP by each participant and maintain this documentation as part of the project's QA records. This documentation will be available for review.

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## A8 PROJECT ORGANIZATION

### TCEQ

### Air Monitoring Division

**D. Jody Koehler**
**TCEQ QA Manager**
Responsible for coordination, development, and implementation of TCEQ's QA program. Provides QA oversight and guidance for TCEQ's programs and is 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 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.

**James Babcock**
**Lead NPS QA Specialist**
Assists the TCEQ NPS Project Manager in QA related issues.
provides guidance in the planning, development, implementation, and maintenance of the QAPP by the Program; reviews and approves the QAPP; coordinates and performs QA audits and reviews corrective action plans (CAPs) related to audits or as requested by the Program; and reports and consults with TCEQ's QA Manager to ensure QA requirements of TCEQ and EPA are met.

### Water Quality Planning Division

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

**Ricardo Briones**
**TCEQ NPS Project Manager**
Maintains a thorough knowledge of work activities, commitments, deliverables, and time frames associated with projects. Develops lines of communication and working relationships between the contractor, TCEQ, and EPA. Tracks deliverables to ensure that tasks are completed as specified in the contract. Responsible for ensuring that the project deliverables are submitted on time and are of acceptable quality and quantity to achieve project objectives. Serves on planning team for NPS projects. Provides contractor with most recent version of QAPP Shell document. Participates in the development, approval, implementation, and maintenance of the QAPP. Conducts independent technical review of the QAPP to ensure compliance with project needs/requirements. Responsible for verifying that the approved QAPP is implemented by the contractor. Notifies the Lead NPS QA Specialist and NPS Data Manager of

circumstances which adversely affect the quality of data derived from the collection and analysis of samples. Monitors and enforces corrective action.

**Kristin DeBone**
**NPS QA Coordinator**
Assists Lead NPS QA Specialist with NPS QA management. Serves as liaison between NPS management and TCEQ QA management. Responsible for NPS guidance development related to program QA. Assists with development and maintenance of data management-related SOP for NPS data management. Participates in the development, approval, implementation, and maintenance of the QAPP. Provides input and oversight regarding corrective actions. Maintains record of corrective actions.

**Texas State University**

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

**TXST QAO**
Responsible for coordinating development and implementation of the QA program. Responsible for ensuring the most recent version of the NPS QAPP Shell document is acquired from the TCEQ NPS Project Manager and used for writing and maintaining the QAPP. Responsible for maintaining records of QAPP distribution, including appendices and amendments. Responsible for maintaining written records of sub-tier commitment to requirements specified in this QAPP. Responsible for identifying, receiving, and maintaining project QA records. Responsible for coordinating with the TCEQ NPS Manager to resolve QA-related issues. Notifies the TXST Project Manager and TCEQ NPS Project Manager and documents circumstances which may adversely affect the quality of data. Responsible for validation and verification of all data collected and acquired. Coordinates the research and review of technical QA material and data related to water quality monitoring system design and analytical techniques. Facilitates, conducts, and documents readiness reviews, monitoring, and/or technical systems audits.

**Laura Parchman**
**TXST Data Manager**
Responsible for the acquisition, verification, and transfer of data to TCEQ. Oversees data management for the QAPP. Performs data QAs prior to transfer of data to TCEQ. Responsible for transferring data to TCEQ in the Event/Result file format specified in the Data Management Reference Guide (DMRG). Ensures data are submitted according to QAPP and work plan specifications. Provides the point of contact for the TCEQ NPS Data Manager to resolve issues related to the data.

**Texas State Partners**
**Field Supervisor**
Responsible for ensuring that participants receive the necessary resources and training to effectively perform all aspects of the sampling and measurement of surface waters and other parameters in the field. Duties include overseeing the collection of water samples and field data measurements in a timely manner that meet the quality objectives specified in Section A6, as well as the requirements of Sections B1 through B7. Responsible for field scheduling, staffing, and ensuring that staff is appropriately trained as specified in Section A11. Responsible for adhering to Texas Stream Team Procedures in this QAPP and all updates as appropriate. For a complete list of partners, visit the Partners page[1] on the Texas Stream Team website.

**U.S. EPA Region 6**

**Melissa Benfer,**
**EPA Project Officer**
Responsible for managing the CWA Section 319(h) funded grant on behalf of EPA. Assists TCEQ in approving projects that are consistent with the management goals designated under the State's NPS Management Program and meet federal guidance. Coordinates the review of project work plans, draft deliverables, and works with the State in making these items approvable. Meets with the State at least annually to evaluate the progress of each project and, when conditions permit, participates in project site visits. Fosters communication within EPA by updating management and others, both verbally and in writing, on the progress of the State's program and on other issues as they arise. Assists in grant close-out procedures ensuring all deliverables have been satisfied prior to closing a grant.

[1] www.meadowscenter.txst.edu/Leadership/TexasStreamTeam/Partners.html

## A9 PROJECT QA MANAGER INDEPENDENCE

TCEQ uses a semi-decentralized QA program, relying on one organizational unit to coordinate development and implementation of the agency-wide program and certain program quality systems, and relying on offices, divisions, and individual programs to implement other QA programs. TCEQ's QA program is organizationally independent and external to operational programs and activities within the agency and has sufficient access and authority to coordinate the development and implementation of the agency's quality system. The Air Monitoring Division, within the Office of Air, serves as the QA coordinating division for TCEQ.

With delegation from TCEQ's executive management, TCEQ's QA Manager is responsible for coordinating development and implementation of TCEQ's QA program. TCEQ's QA Manager coordinates the development, review, approval, and implementation of the TCEQ Quality Management Plan (TCEQ QMP) and agency-wide QA procedures. TCEQ's QA Manager has authority over all work areas and maintains a close liaison with QA staff, aids in the area of QA, and approves the QAPP. Designated lead QA staff are detailed in Appendix D of TCEQ's QMP or each program under TCEQ's Quality System. These staff have access to related work areas and sufficient authority and organizational freedom to identify, initiate, recommend, and provide solutions to quality problems and to verify the implementation of solutions to problems. With delegation from TCEQ's executive management, TCEQ's QA Manager is responsible for coordinating development and implementation of TCEQ's QA program. TCEQ's QA Manager coordinates the development, review, approval, and implementation of the TCEQ Quality Management Plan (TCEQ QMP) and agency-wide QA procedures. TCEQ's QA Manager has authority over all work areas and maintains a close liaison with QA staff, aids in the area of QA, and approves the QAPP. TCEQ's QA Manager and Lead QA Specialist are independent and external to data operations conducted under this QAPP. Operations Management or designee may not sign this QAPP for TCEQ's QA Manager and Lead QA Specialist. Additionally, TCEQ's QA Manager and Lead QA Specialist may not sign for Operations Management.

## A10 PROJECT ORGANIZATION CHART AND COMMUNICATIONS

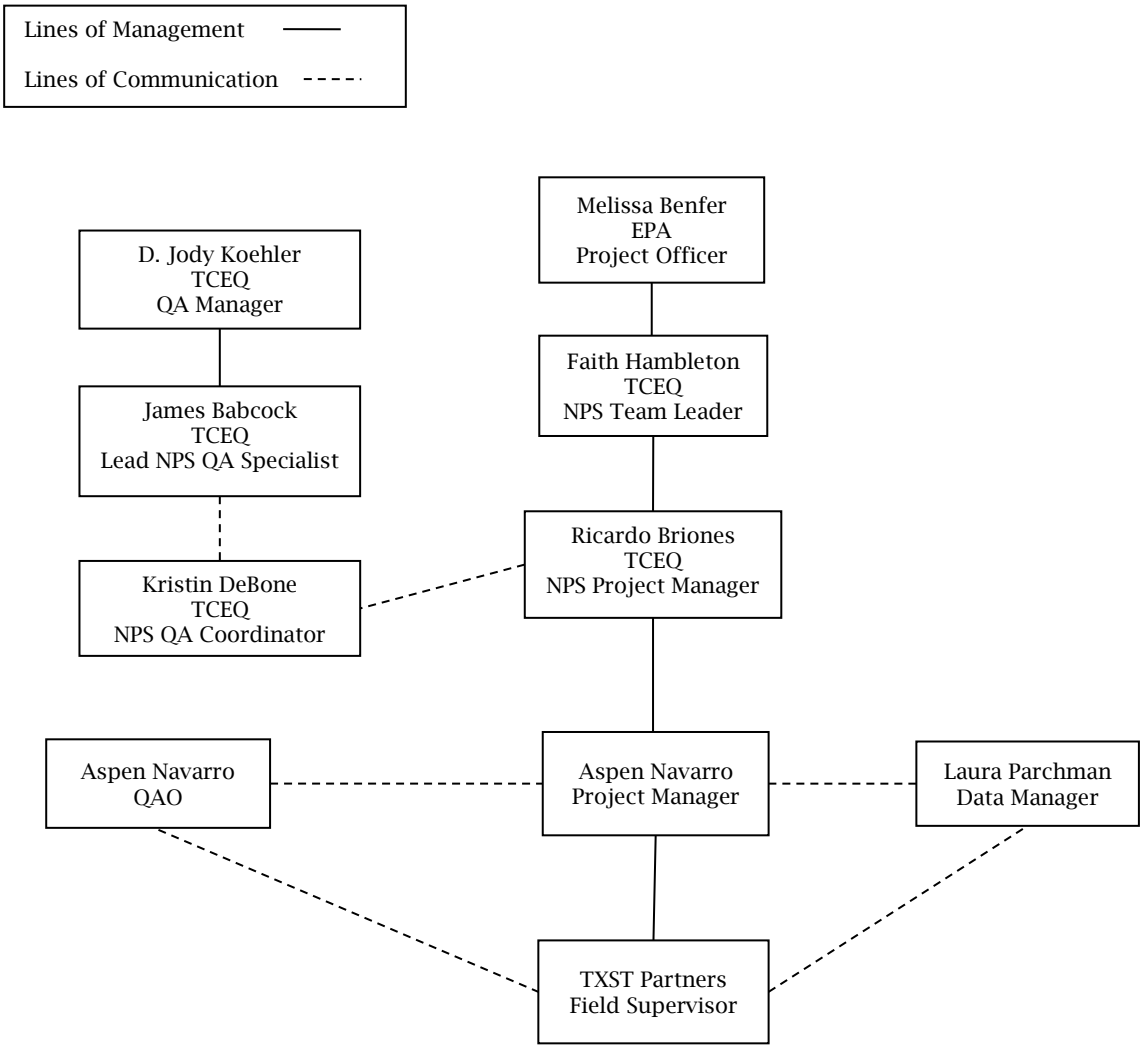


**Figure A10.1 Organization Chart**

## A11 PERSONNEL TRAINING/CERTIFICATION

TXST partners provide training on field techniques, QA, data management, and related topics necessary for the successful implementation of project tasks. The training procedures and requirements for certification of CS are described in the Manuals and Field Guides (Appendix G). Although the three-phase format is consistent across programs, the LCRA CRWN monitor training differs from the Texas Stream Team training because the monitoring procedures are program-specific, as described in Section A6 (Appendix H). Procedures and requirements for Trainers and QAO are outlined in the Manuals and Trainer Enrollment Form (Appendix G).

In accordance with the EPA directive Federal Equivalent Method (FEM) 2012-02 Rev. 1, TXST maintains documentation of organizational and personnel competency prior to performing grant-funded work that generates environmental measurement data. This includes ensuring that all trainers and QAOs demonstrate the technical competence to deliver valid environmental data through successful completion of training, demonstration of field skills, and adherence to documented procedures.

Records of trained staff, trainers, and CS—including educational credentials, training documentation, demonstrations of competency, assessments, and corrective actions—are retained by project management and are available for review during a monitoring systems audit.

## A12 DOCUMENTS AND RECORDS

**Electronic Data**
The documents that describe, specify, report, or certify activities included in this QAPP are listed below. Electronic records are backed up every 24 hours and are maintained on multiple computers and at least one virtual TXST server.

**Table A12.2 Records and Documents Retention Requirements**

| Document/Record | Location | Retention | Form |
|---|---|---|---|
| QAPP, amendments, annual certifications, and appendices | TXST | 4 years | Electronic |
| QAPP distribution documentation (Training Enrollment Form) | TXST | 4 years | Electronic |
| Corrective action documentation | TXST | 4 years | Electronic |
| Field data sheets (Monitoring Forms – paper/electronic) | TXST | 4 years | Electronic |
| Field equipment calibration/maintenance log (Monitoring Form) | TXST | 4 years | Electronic |
| Field SOPs (Manuals and Field Guides) | TXST | 4 years | Electronic |
| Monitoring Site Request Forms | TXST | 4 years | Electronic |
| Monitoring Plans | TXST | 4 years | Electronic |
| Private Property Access Forms | TXST | 4 years | Electronic |
| Training Enrollment Forms | TXST | 4 years | Electronic |
| Training records | TXST | 4 years | Electronic |
| Water Quality Data Analysis Files (Watershed Summary Reports) | TXST | 4 years | Electronic |
| Progress report/final report | TXST | 4 years | Electronic |

## B1 IDENTIFICATION OF PROJECT ENVIRONMENTAL INFORMATION OPERATIONS

The sample design follows the intent of the EPA, TCEQ NPS Program, and Texas Stream Team to use the data collected using criteria described in the QAPP for education, local decision-making, research, baseline data, screening, BMP effectiveness, and problem identification. TXST actively promotes water quality and NPS pollution education and awareness through CS activities. Volunteers are instructed to monitor at most monthly, or as defined in their Monitoring Plan and/or Training Enrollment Form. TXST staff work with partners to prepare the Monitoring Plans. The plans are reviewed and approved by the Data Manager and the Project Manager. A copy of the Monitoring Plan is sent to the participating partner and stored at the TXST offices.

Additionally, data collected under this QAPP will provide participants the opportunity to access interdisciplinary science-based data collection methods, which combine language arts, earth sciences, geography, mathematics, and chemistry. Efforts are made to identify and/or establish water quality monitoring projects in areas where NPS pollution or other water quality issues are known or suspected. TXST, its CS, and partners collect environmental data to inform and make Texans aware of water quality, land use, and associated NPS impacts and the role people play in contributing to those

impacts. Information collected can also be used to identify water quality trends and to characterize water quality conditions.

This QAPP encompasses all training types conducted by the Texas Stream Team program including Standard Core, Probe Core, Advanced, *E. coli* Bacteria, Riparian Evaluation and Optical Brightener. Each training and monitoring type collect different data types from different media. See Tables A6.1 and A6.2 for a list of parameters associated with each type of monitoring and the method(s) used to measure them.

**Site Selection Criteria**
Some general guidelines are followed when selecting monitoring sites. Fixed station and systematic monitoring sites are chosen based on the following site selection guidelines:

1. Site should be safely accessible year-round (exception: during major flood events).
2. Site should provide the best representation for the overall water quality conditions of a water body.
3. Site should be free of backwater effects during normal conditions.
4. Perennial flowing streams are preferable to intermittent streams.
5. Lake and estuary locations should be located within major arms and/or near dams.
6. Coastal sites are best situated to allow representative sampling, regardless of the tidal cycle.
7. Before submitting a New Monitoring Site Request Form[1] to establish a new site, go to the Datamap[2] to see if an inactive site exists nearby. It is preferred that existing inactive sites with historical water quality data be reactivated than to create a new site, but if those conditions aren't met, then a new site should be created by submitting a New Monitoring Site Request Form. New sites created will prioritize overlap with a SWQM site.

Fixed station and systematic monitoring sites are located preferentially according to local interests and concerns and in coordination with TXST partners where applicable. TXST staff will identify sites that maximize stream or basin spatial coverage.

**Monitoring Sites**
Monitoring site information submitted to TXST is maintained in the WWDV. Monitoring site information in the WWDV is reviewed and updated throughout the year as needed based on current CS monitoring activities. All data are tracked, maintained, and available on the WWDV.

There are currently around 360 active monitoring sites in the Texas Stream Team program (see Datamap). Sites are designated as "active" if monitoring has taken place at the site within the past year. Based on the voluntary nature of the program, the exact number of monitoring sites being monitored is unknown at the beginning of each

[1] https://survey123.arcgis.com/share/dbc6589894814d858df3503f869d0bc6
[2] https://www.arcgis.com/apps/dashboards/0dea3b21787e446e8ede35bd0977f00f

year. This information is submitted to TCEQ in the annual report and is available for review on the WWDV within 60 days of submission from the CS.

**Critical vs. non-critical measurements**
All data collected in this project and entered into the WWDV are considered critical to achievement of the project objectives associated with this QAPP.

## B2 METHODS FOR ENVIRONMENTAL INFORMATION ACQUISITION

**Field Sampling Procedures:**
The field sampling procedures are documented in Manuals and Field Guides provided in Appendix G. LCRA CRWN procedures and protocols are provided in Appendix H.

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

| Parameter | Matrix | Container | Sample Volume | Preservation | Holding Time |
|---|---|---|---|---|---|
| Dissolved Oxygen | Water | Glass Mixing Bottle | 25 mL | Fixed with manganous sulfate, alkaline potassium iodide azide, and sulfuric acid | 4 hours |
| *E. coli* | Water | Sterile Whirl-Pak bag® | 100 mL | Refrigerate @ 4˚C* | 6 hours |
| Nitrate Nitrogen | Water | Plastic Test Tube | 10 mL | Refrigerate @ 4˚C* | 48 hours |
| Phosphate Phosphorous | Water | Plastic Test Tube | 10 mL | Refrigerate @ 4˚C* | 48 hours |
| Turbidity | Water | 60 or 120 cm Plastic Turbidity Tube | Approx. 1L | NA | NA |
| Optical Brightener | Water | Sterile black photosensitive Whirl-Pak bag® | 100 mL or enough to cover sample material | UV protection* | NA |

**Preservation performed immediately upon collection (within 15 minutes)*

**Sample Containers**
All sample containers will meet the requirements as outlined in Table B2.1. Sterile Whirlpak Bags are used for bacteriological samples and are disposable. Other containers are rinsed twice with (deionized) DI water after each use before storing them in kit and twice with sample water before filling the container with sample water for testing.

**Processes to Prevent Contamination**
Procedures documented in Manuals and Field Guides or the TCEQ SWQM Procedures Manual, Volume I[1] (August 2012) outline the necessary steps to prevent contamination of samples. These steps may include: direct collection into sample containers when possible, rinsing sample containers twice before/after use as appropriate, and the use of hand sanitizer or disposable gloves. Field QC samples (identified in Appendix C) including field blanks and duplicates are collected to verify that contamination has not occurred.

**Documentation of Field Sampling Activities**
Monitoring events are documented on the Monitoring Forms in either hard copy or electronic form as presented in Appendix C. For all monitoring events, site ID, location, sampling time, date, and depth, sample collector's name/signature, group name, calibration information (if applicable), and reagent expiration dates (if applicable) are recorded. Additional fields to record for *E. coli* monitoring events include incubation temperature, incubation duration, *E. coli* colony counts, dilution aliquot, field blanks, and media expiration dates. Values for all measured parameters and field observations are recorded on the Monitoring Form.

If reagents or media are expired, it is documented on the Monitoring Form. Sampling is not encouraged with expired reagents and bacteria media; if expired, the corresponding values will be flagged in the database and excluded from data reports and EPA Water Quality Exchange (WQX) submissions (See Section D1). Detailed observational data are recorded including water appearance, weather, field observations such as biological activity and stream uses, algae cover, unusual odors, days since last significant rainfall, and flow severity. Comments related to field measurements, number of participants, total time spent sampling, and total round-trip distance traveled to the sampling site are also recorded.

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

1. Legible writing in ink. Correct errors with a single line through writing, followed by initial and date.
2. Data are submitted via the WWDV, electronic Monitoring Form, and/or hard copies are scanned/photographed and submitted via email.

**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 equipment malfunctions, calibrations, sample site considerations, etc. Failures or deviations from the QAPP are documented on the field data sheet/QC checklist. The TXST Data Manager in consultation with the QAO will determine if the deviation from the QAPP compromises the validity of the resulting data. For a comprehensive understanding of TXST's data validation checks, look to Section D1 of this QAPP.

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[1] https://www.tceq.texas.gov/publications/rg/rg-415/index.html

**Standards Traceability**
All conductivity standards are produced or purchased by TXST, partners, or volunteers as needed. All conductivity standards purchased are traceable to certified reference materials.

**Analytical Method Deficiencies and Corrective Actions**
Deficiencies in field that could result in analysis deficiency involve, but are not limited to instrument malfunctions, failures in calibration, blank contamination, QC samples outside QAPP defined limits, etc. In many cases, the CS will be able to correct the problem. If the problem is resolvable, then they will document the problem on the field data sheet and complete the analysis. If the problem is not resolvable, then it is conveyed to the TXST Project Manager who will make the determination and notify the TXST QAO. If the analytical system failure may compromise the sample results, the resulting data will not be reported to TXST. The nature and disposition of the problem is reported on the Monitoring Form which is sent to the TXST Project Manager. The TXST Project Manager will inform the TCEQ NPS Project Manager in writing immediately upon discovery of a deficiency, and the actions and resolutions will be documented in writing in the project quarterly progress reports and corrective action plan (CAP).

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

**Existing Information**
The WWDV utilizes map overlays from Esri as well as data layers from additional sources. Maps published by the TXST also utilize data layers from the sources listed in Table B2.2.

## Table B2.2 Data Sources Used for Analysis*

| Geospatial Data or Data Type | Source | Date(s) | Analysis and/or Processing** | QA Information | Data Use(s) |
|---|---|---|---|---|---|
| TCEQ 2022 Segments - Line | TCEQ | Most up-to-date available | N/A | Conducted by item owner | Used to reference and align monitoring locations with official stream segment boundaries. |
| TCEQ 2022 Segments - Poly | TCEQ | Most up-to-date available | N/A | Conducted by item owner | Used to reference and align monitoring locations with official stream segment boundaries. |
| Permitted Wastewater Outfalls | TCEQ | Most up-to-date available | N/A | Conducted by item owner | Identifies potential sources of nutrient or bacteria inputs affecting monitored waterways. |
| SWQM Stations | TCEQ | Most up-to-date available | N/A | Conducted by item owner | Provides comparison points between CS data and state agency datasets. Also used for newly created sites. |
| StratMap Boundaries | TNRIS | Most up-to-date available | N/A | Conducted by item owner | Ensures consistency of monitoring and reporting within standardized geographic and political boundaries |
| TxDOT Roadways | TNRIS | Most up-to-date available | N/A | Conducted by item owner | Assists in site access planning and evaluating proximity of monitoring sites to road-related runoff sources. |
| StratMap Transportation | TNRIS | Most up-to-date available | N/A | Conducted by item owner | Provides broader context for transportation networks that may influence watershed hydrology and pollutant pathways. |
| Hydrologic Unit Code (HUC) | TNRIS | Most up-to-date available | N/A | Conducted by item owner | Supports watershed-based management by organizing monitoring sites within hierarchical drainage units. |
| 12 Digit Watershed Boundary Dataset | USDA Geospatial Data Gateways | Most up-to-date available | N/A | Conducted by item owner | Allows fine-scale watershed delineation to link monitoring data to specific sub-watersheds. |

*Metadata that contains the Federal Geographic Data Committee (FGDC) minimum documentation requirements will be created for any acquired spatial data manipulated through data analysis and/or processing.

**More detailed information on spatial analysis and data processing is provided in Sections B2 (Methods for Environmental Information Acquisition), B4 (Quality Control), and B7 (Environmental Information Management).

## B3 INTEGRITY OF ENVIRONMENTAL INFORMATION

### Sample Labeling

Samples from the field are labeled directly on the container with an indelible marker. Label information includes:

1. Site identification or Station ID.
2. Date and time of sample collection.
3. Type of preservative added, if applicable.
4. Indication of field-filtration as applicable.
5. Sample type (i.e., analysis(es) to be performed, matrix, fresh or salt water, etc.).

### Sample Handling

The field sampling procedures are documented in Manuals and Field Guides (Appendix G). Standard and Probe Core parameters are collected as field measurements on site. Advanced and bacteria water samples collected for analysis of *E. coli*, nitrate-nitrogen, phosphate, and turbidity may be transported on ice in extreme situations, but this is not recommended. Optical brightener samples must be transported in a protective compartment to prevent ultraviolet (UV) contamination. Once samples have been transported to the destination, they should be processed immediately. All samples will be handled in accordance with the respective Manual and Field guide. LCRA CRWN procedures and protocols are provided in Appendix H.

### Sample Tracking Procedure Deficiencies and Corrective Action

Deficiencies in field measurement systems involve, but are not limited to such things as, instrument malfunctions and failures in calibration. In many cases, the CS or QAO will be able to correct the problem. If the problem is resolvable by the CS or QAO, then they will document the problem on the Monitoring Form and complete the analysis. If the problem is not resolvable by the CS or QAO, the parties will consult with the local partner or TXST staff to determine a solution. See C1 Assessments and Response Actions for more information regarding corrective actions.

## B4 QUALITY CONTROL

**Sampling Quality Control Requirements and Acceptability Criteria**
The field QC protocols are outlined in Manuals and Field Guides (Appendix G). LCRA CRWN procedures and protocols are provided in Appendix H.

**Existing Data Quality Control Requirements and Acceptability Criteria**
QC requirements and acceptability criteria for existing data are described in A5, D1, and D2 below.

**Quality Control or Acceptability Requirement Deficiencies and Corrective Actions**
Sampling QC excursions are evaluated by the TXST Project Manager, in consultation with the TXST QAO. Discrepancies in sample results are used to assess the sampling process, including environmental variability. Rejecting sample results based on wide variability is a possibility. The arbitrary rejection of results based on pre-determined limits is not practical, therefore, the professional judgment of the TXST Project Manager and QAO will be relied upon in evaluating results.

Field blanks for *E. coli* bacteria samples and duplicates for dissolved oxygen modified Winkler titrations are scrutinized very closely. *E. coli* field blank values exceeding the acceptance criteria will automatically invalidate the sample, especially in cases where bacteria colony growth occurs which is likely indicative of contamination. The acceptance criteria for the dissolved oxygen duplicate is 0.5 mg/L. If the difference between the duplicates is greater than 0.5 mg/L, then the sample will need to be reanalyzed.

Instrument calibration error limits provided below are also enforced where applicable to ensure instrument is operating effectively. Procedures for conducting, documenting, and checking error limits for calibrations are provided in the Manuals and Field Guides (Appendix G. LCRA CRWN procedures and protocols are provided in Appendix H.

**Table B4.1 Texas Stream Team Parameter Error Limits**

| Monitoring Type | Parameter | Error Limit |
|---|---|---|
| Standard and Probe Core – Freshwater | Conductivity | ± 20% of calibration standard solution |
| Standard Core – Saltwater | Salinity | ± 1 ppt |
| Standard Probe | Dissolved Oxygen | ± 6% saturation |
| Standard Probe | pH | ± 0.5 s.u. |

Best professional judgment will be relied upon in evaluating water quality and non-water quality data. Field values falling outside the acceptance criteria may invalidate the sample. Notations of field blank, duplicate, and calibration error limit excursions are noted on the Monitoring Form for inclusion in the WWDV. For a comprehensive understanding of TXST's data validation checks, look to Section D1 of this QAPP document.

TXST staff evaluate all CS data submissions based on established QAO detailed within the Manuals and Field Guides. If data results do not meet the criteria in the Manuals and Field Guides, the data will be flagged in the WWDV for further review (see Section D1). Additionally, if certain information is omitted on a datasheet, these omissions will automatically be flagged within the WWDV for further review and follow up with the CS submitting the data (see Section D2).

## B5 INSTRUMENT/EQUIPMENT CALIBRATION, TESTING, INSPECTION, AND MAINTENANCE

All sampling equipment testing and maintenance requirements are detailed in Manuals, Field Guides and maintenance guides (Appendix G). Maintenance and inventory records are individually maintained by TXST staff, CS, and partners for field equipment and critical spare parts. TXST staff, LCRA, and CRWN procedures and protocols are provided in Appendix H.

Field equipment calibration requirements are contained in Manuals and field guides (Appendix G). Post calibration error limits and the disposition resulting from error are adhered to. Data not meeting post-error limit requirements (see Section B4) will be flagged in the TXST database for further review by TXST staff. LCRA CRWN procedures and protocols are provided in Appendix H.

## B6 INSPECTION/ACCEPTANCE OF SUPPLIES AND SERVICES

See Section B2 for standards requirements. New batches of supplies are inspected and/or tested by TXST staff and encouraged to be tested by TXST partners and CS before use to verify that they function properly and are not contaminated. Reagents are used until they surpass the expiration dates as prescribed by the manufacturer. CS will note on each Monitoring Form all expired reagents. Expired reagents are replaced with fresh reagents when a CS requests a replacement due to reagent expiration, damage/contamination, or loss. Expired reagents can interfere with the validity of the resulting data, therefore, should not be used for calibrations, sampling, or analysis.

Replacement equipment and supplies along with specifications are provided on the Texas Stream Team website for all monitoring types. Partners and CS can purchase equipment and supplies from vendors directly, but specifications must be compatible. If an entity wishes to purchase supplies and/or equipment from a vendor other than those listed on the website, the volunteer will provide the name and specifications of the equipment and supplies to the TXST QAO for documentation.

## B7 ENVIRONMENTAL INFORMATION MANAGEMENT

### Personnel

Section A8 lists responsibilities for data management personnel with lines of communication displayed in Section A10.

### Data Management Process

Monitoring sites are visited at most monthly by CS and measurements are collected on-site or water samples are collected and analyzed as described in Sections B1 and B2 and the corresponding training Manual or Field Guide referenced in Appendix G. Results are documented on field data Monitoring Forms referenced in Appendix C. Paper and electronic Monitoring Forms are provided as pathways for data entry. Paper forms can be submitted by email or hard copies can be mailed to TXST staff. Paper forms can also be submitted to a Data Coordinator/TXST partner for entry into the WWDV. Electronic monitoring forms can be accessed on the internet via phone or computer and entered directly from the field at the time measurements are collected or from paper forms later. All LCRA CRWN data are submitted by the Data Coordinator to the TXST Data Manager in an Excel file format and uploaded directly into the WWDV. All data are verified and validated at various/multiple levels using information provided on the QC checklist provided on the second page of the Monitoring Forms. The data are verified and validated prior to submitting the data by the CS, Data Coordinator, and/or TXST staff depending on the pathway of data entry. Data are collectively uploaded to the TXST WWDV and Datamap monthly, and the EPA WQX biannually by the TXST Data Manager.

If issues are identified, the CS will be contacted to resolve any data quality issues. If not resolvable, the data will be entered into the database and flagged as not meeting the QC checklist protocol. All data deliverables are documented in progress reports and submitted to TCEQ NPS Project Manager for review and approval.

### Record-keeping and Data Storage

Record-keeping and document control procedures are contained in the Manuals and Field Guides referenced in Appendix G and this QAPP. Following data verification and validation, the original forms and data are stored as digital scans of hard copy paper forms, on the Esri cloud for electronic Monitoring Forms, on the Salesforce contractor cloud-based server for WWDV data, and the TXST cloud-based in accordance with the record-retention schedule in Section A12. Two copies of the database are backed up monthly on cloud-based servers. If necessary, disaster recovery will be accomplished by information resources staff using the backup databases and/or archived hardcopy paper/electronic forms.

### Archives/Data Retention

Complete original data sets are archived on separate cloud-based servers and retained by the TXST staff, Esri system, and external Salesforce contractor for a retention period specified in Section A12.

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

**Forms and Checklists**
See Appendix C for the Field Data Monitoring Forms and QC Checklists.
See Appendix F for the Manuals and Field Guides that contain information about the Data Entry Checklist (See Section 3.2 Data Entry Checklist in the Core Water Quality Community Scientist Manual[1]).

**Data Dictionary**
Terminology and field descriptions are included in the Manuals (see Appendix G). For the purposes of verifying which entity codes are included in this QAPP, a table outlining the entities that will be used when submitting data under this QAPP (Please see table under Electronic Data section).

**Data Handling**
Data are processed using the Microsoft Excel. Data integrity is maintained by the implementation of password protections which control access to the database and by limiting update rights to a select user group. The database administrator is responsible for assigning user rights and assuring database integrity.

**Hardware and Software Requirements**
Hardware and software procurements are sufficient to run Microsoft Excel under the Windows operating system in a networked environment. Information Resources staff are responsible for assuring hardware configurations meet the requirements for running current and future data management/database software as well as providing technical support.

**Information Resource Management Requirements**
Parameters monitored and corresponding reporting units follow the guidelines provided in the TCEQ Data Management Reference Guide. In addition, contract requirements include a 60-day turnaround time for data collected and submitted by CS to be made publicly available on the Datamap from the WWDV. The TXST Data Manager uploads data monthly to ensure requirements are met. These requirements are documented in quarterly progress reports to TCEQ NPS Project Manager.

**Backup/Disaster Recovery**
Data are maintained in two cloud systems, Esri ArcGIS Online and Salesforce (WWDV), and are automatically backed up per platform capabilities. Salesforce uses policy-based daily backups with on-demand snapshots before major changes. Esri content benefits from SaaS resiliency and a 14-day recycle bin for deleted items. Independent copies of spatial and water quality data are exported monthly to the TXST shared drive. Additionally, water quality data are uploaded twice a year to the EPA's WQX portal on the Central Data Exchange.

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[1] https://docs.gato.txst.edu/312151/CoreManual.pdf

In the event of a catastrophic failure, the Data Manager initiates recovery. Salesforce data and metadata are restored to a selected restore point and validated for integrity. Esri items are recovered from the recycle bin if within the retention window; if platform restores are incomplete, authoritative copies from TXST storage are imported to backfill gaps.

**Quality Assurance/Control**
See Section D of this QAPP.

## C1 ASSESSMENTS AND RESPONSE ACTIONS

The following table presents the types of assessments and response action for data collection activities applicable to the QAPP. LCRA CRWN procedures and protocols are provided in Appendix H.

**Table C1.1 Assessments and Response Requirements**

| Assessment Activity | Approximate Schedule | Responsible Party | Scope | Response Requirements |
|---|---|---|---|---|
| Status Monitoring Oversight, etc. | Continuous | TXST Project Manager | Monitoring of the project status and records to ensure QAPP requirements are being fulfilled. | Report quarterly to the TCEQ in Progress Report. |
| Submission of Field Data Sheets (Monitoring Forms) | Within 120 days of collection | CS/TXST partner | The CS/TXST partner will submit a Monitoring Form from their sampling event within 120 days of collection. Any data submitted after 120 days from the sampling event will be accepted at the TXST staff/partner discretion. | CS/TXST partner submit Monitoring Form via hard copy, Survey123, or the WWDV. |
| Review of Field Data Sheets (Monitoring Forms) | Within 60 days of submission | TXST staff/partner | The CS will submit a Monitoring Form from their sampling event. The TXST staff/partner will review the Monitoring Form for conformance with the executed QAPP within 60 days of receiving the form. | The TXST Project Manager has 60 days to review the data and respond to the CS/TXST partner with comments. |
| Monitoring Systems Audit/Field Audit Session | Every two years | TXST QAO/Certified Trainer | Site visits may be conducted to audit field sampling technique, data management, and related QA oversight. Documentation will take place on the Field Audit Session form provided on the back of the monitoring form. | Feedback by TXST staff/trainer following field audit session (see Field Audit Session documentation on Monitoring forms) |
| Training Systems Audit | In conjunction with training sessions | TXST staff/trainer | TXST CS monitor and Trainer certification | Training records submitted to TXST and/or partner |
| Field Sampling Readiness Review | Training Phase III - Prior to first sampling event for all monitoring projects. | TXST QAO, Project Manager, or Field Supervisor | The TXST QAO (or designee) will review the executed QAPP in detail with field staff to ensure that the requirements of the QAPP are understood. The scope of this review will include QAPP sampling, handling and measurement, recording data, and equipment and reagent check. | TXST staff/trainer submits completed Training Sign-in0Sheet for certification |
| Monitoring Systems Audit | Dates to be determined by TCEQ | TCEQ QAS | The assessment will be tailored in accordance with objectives needed to assure compliance with the executed QAPP. | 30 days to respond in writing to TCEQ to provide corrective actions addressing negative audit findings. |
| Site Visit | Dates to be determined by TCEQ | TCEQ NPS Project Manager | Status of activities. Overall compliance with work plan and executed QAPP. | As needed |

**Corrective Action Process for Deficiencies and Nonconformances**
Deficiencies are any unauthorized deviations from the approved QAPP and procedures referenced in the QAPP. Deficiencies may invalidate resulting data. All deficiencies from the QAPP require documentation of the nonconformance and corrective action. Deficiencies must be documented in a CAP and corrected in a timely manner. Corrective action may include samples be discarded and re-collected. Deficiencies are documented in logbooks, field data sheets, etc. by field staff. It is the responsibility of the TXST Project Manager, in consultation with the TXST QAO, to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP.

Nonconformances must be communicated to the TCEQ NPS Project Manager immediately via email. A CAP Form (See Appendix F for the form and an example) must be submitted to the TCEQ NPS Project Manager within 14 days of the deficiency occurring. Once it is approved, the TCEQ NPS Project Manager will send the CAP to the NPS QA Coordinator who will then email the CAP to the Lead NPS QAS (and TCEQ DM&A Data Manager if data quality is affected) within 30 days of the initial notice of deficiency per TCEQ Quality Management Plan. The deficiency must also be communicated to the TCEQ NPS Project Manager through the Corrective Action Status Table (see Appendix E for the table and an example) to be included with the quarterly progress report.

The TXST Project Manager is responsible for implementing and tracking corrective actions. All CAPs will be documented on the Corrective Action Status Table, which will be submitted to the TCEQ NPS Project Manager with the quarterly progress report for review and approval. Records of TCEQ audit findings and corrective actions are maintained by both TCEQ and the TXST QAO. Documentation of corrective action to address audit findings will be submitted to TCEQ within 30 days of receipt of audit report.

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

**Corrective Action Plans**
CAPs are designed to prevent recurrence of a deficiency and should specifically:

- Identify and describe the deficiency, problem, nonconformity, or undesirable situation.
- Identify the root cause(s) of the problem.
- Identify programmatic impact of the deficiency.
- Identify whether the problem is likely to recur or occur in other areas.
- Identify immediate remedial actions if possible.
- Include a description of the need for Corrective Action.
- Include a description of cause(s), determine solution, and propose an action plan.
- Establish timelines and provide a schedule.
- Identify personnel responsible for action.
- Document the corrective action and verify its effectiveness.

## C2 OVERSIGHT AND REPORTS TO MANAGEMENT

**Reports to TCEQ Project Management**
All reports detailed in this section are contract deliverables and are transferred to TCEQ in accordance with contract requirements and deliverable due dates.

Progress Report – Summarizes the TXST's activities for each task; reports monitoring status, problems, delays, and corrective actions; and outlines the status of each task's deliverables. Submitted quarterly.

Corrective Action Documentation – Records of all QA audits and associated corrective actions will be submitted to the TCEQ NPS Project Manager in a CAP within 30 days of the occurrence (or its discovery). The contractor will use the NPS Program CAP form (Appendix E). Any situation which, if not corrected by the TXST, may have a serious effect on validity or integrity of the data, should be reported verbally to the TCEQ NPS Project Manager immediately and followed up in writing.

Monitoring System Audit Response – The TXST will respond in writing to TCEQ within 30 days upon receipt of a monitoring system audit report to provide corrective actions addressing negative audit findings.

Project Final Report – Summarizes the TXST's activities for the entire project period including a description and documentation of major project activities, evaluation of the project results and environmental benefits, and a conclusion.

Data Activity Reports – Summarizes CS data submitted, number of trained CS, number of CS conducting monitoring, and number of monitoring events.

Watershed Summary Reports – Summarizes data for a monitoring site, water body, watershed, or region.

**Reports to TXST Project Management**
Monitoring Plans – TXST partner agencies submit annual (at minimum) monitoring plans documenting number of monitors, coordinators, monitoring sites, and parameters of interest. Information included in these reports is used for audits and resolving QA problems.

Partner Activity Reports – TXST partner agencies submit quarterly reports documenting number of trainings conducted, distance traveled, and time spent conducting program. Information included in these reports is used for in kind contribution reporting.

**Reports by TCEQ Project Management**
Contractor Evaluation – TXST participates in a Contractor Evaluation by 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 ENVIRONMENTAL INFORMATION REVIEW

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

All water quality and non-water quality data will be reviewed and verified upon submission by TXST QAO or their designee, the group training coordinator or partner for conformance to project requirements, and then validated against the data quality objectives (DQO) which are listed in Section A6. Data must also conform to specified monitoring procedures, QC protocols, and project specifications. The respective field, data management, and QAO data verification responsibilities and acceptability criteria are listed by task in Table D1.l.

Data review and verification will be performed using a Data Entry Checklist (See 3.2 Data Entry Checklist of the Core Manual in Appendix G) followed by automated database functions that will validate data as the information is entered into the WWDV. The data to be verified and evaluated against project specifications are checked for errors, especially errors in transcription, calculations, and data input. Potential errors are identified by examination of documentation and by manual and computer assisted examination of corollary or unreasonable data. If a question arises or a potential error or anomaly is identified, the CS or partner of the monitor responsible for generating the data is contacted to resolve the issue. Issues that can be corrected are corrected and documented. If there are errors in the calibration log, expired reagents used to generate the sampling data, or any other deviations from the field or bacteria data, the corresponding data are flagged in the database.

When one or more data entry does not meet the data verification procedures (Table D1.1), the data are flagged for review. TXST staff evaluate the flagged data submissions by first looking for typos, mis-recordings, or data boxes that were left blank. If during the review process a question about the validity or the level of detail about the data submitted is detected by TXST staff, the volunteer who submitted the data will be contacted for further clarification. If the issue is not resolved, the data will continue to be flagged for not meeting QA protocols.

A second element of the validation process is consideration of any findings identified during the assessments listed in Table C1.1. Any issues requiring corrective action must be addressed, and the potential impact of these issues on previously collected data will be assessed by the TXST QAO. The TXST Project Manager, with the concurrence of the QAO validates that the data meet the DQO of the project and are suitable for reporting to TCEQ.

**Table D1.1 Data Verification Procedures**

| Data to be Verified | Field Task | Database Task | QAO Task |
|---|---|---|---|
| Sample documentation complete (Monitoring Form); samples labeled; sites identified | Y | Y | Y |
| Sample preservation and handling acceptable | Y | N | N |
| Holding times not exceeded | Y | N | N |
| Collection, preparation, and analysis consistent with SOPs and QAPP | Y | N | N |
| Instrument calibration data complete | Y | Y | Y |
| Bacteriological records complete | Y | Y | Y |
| QC samples analyzed at required frequency | Y | Y | Y |
| QC results meet performance and program specifications | Y | Y | Y |
| Analytical sensitivity (Limit of Quantitation /AWRL) consistent with QAPP | Y | Y | Y |
| Results, calculations, transcriptions checked | Y | Y | Y |
| Nonconforming activities documented | Y | Y | Y |
| Outliers confirmed and documented; reasonableness check performed | Y | Y | Y |
| Dates formatted correctly and in correct units | Y | Y | Y |
| Depth reported correctly | Y | Y | Y |
| Time based on 24-hour clock | Y | Y | Y |
| Absence of transcription error confirmed | Y | Y | Y |
| Absence of electronic errors confirmed | N | Y | Y |
| Field instrument pre and post calibration results within limits | Y | N | N |
| 10% verification check of proper data verification procedures being followed | N | N | Y |

## D2 USEABILITY DETERMINATION

Data produced for this project will adhere to procedures outlined in Section D1. TXST will employ these procedures to ensure that all data included in the WWDV database can be used for educational purposes, local decision-making, research, screening, BMP effectiveness, problem identification, and other uses deemed appropriate by end users. TXST may choose to communicate data findings at targeted watershed stakeholder forums as well as at Clean Rivers Program annual basin-wide steering committee meetings, websites, newsletters, and Watershed Summary Reports.
The online Datamap allows anyone to access TXST data and use it for the above-mentioned purposes as well as a general understanding of where TXST CS are currently monitoring and have been in the past.

Data which do not meet requirements described in this QAPP will be flagged in the WWDV and may not be considered appropriate for the uses noted above. The purpose of flagged data is to note inconsistencies or what may be data. Data are analyzed using automated validations embedded in the WWDV and Survey123 form and supported by manual review by TXST partners and staff. The WWDV is designed to flag data that do not meet the QC checklist associated with each monitoring type (as outlined on the back of Monitoring Forms). Flagged data are retained in the WWDV but are clearly identified to prevent inappropriate use. These flags indicate inconsistencies, potential transcription errors, or results with excessive variability. If data anomalies or departures from planning assumptions are identified, the Data Manager and QAO will determine whether the data should be qualified, excluded, or otherwise limited in use. In such cases, corrective actions may include:

- Communicating limitations of flagged data to end users.
- Updating or clarifying measurement performance specifications.
- Providing feedback to CS or partners to reduce recurrence of issues.

The TXST Data Manager, in coordination with the TXST QAO, is responsible for reviewing compiled results against the measurement performance criteria established in this QAPP. Limitations on the use of data will be reported in Watershed Summary Reports, through annotations in the WWDV, and during stakeholder and partner meetings. In addition, findings and limitations may be communicated via the TXST website, newsletters, and other program reports to ensure transparency.

**REFERENCES**

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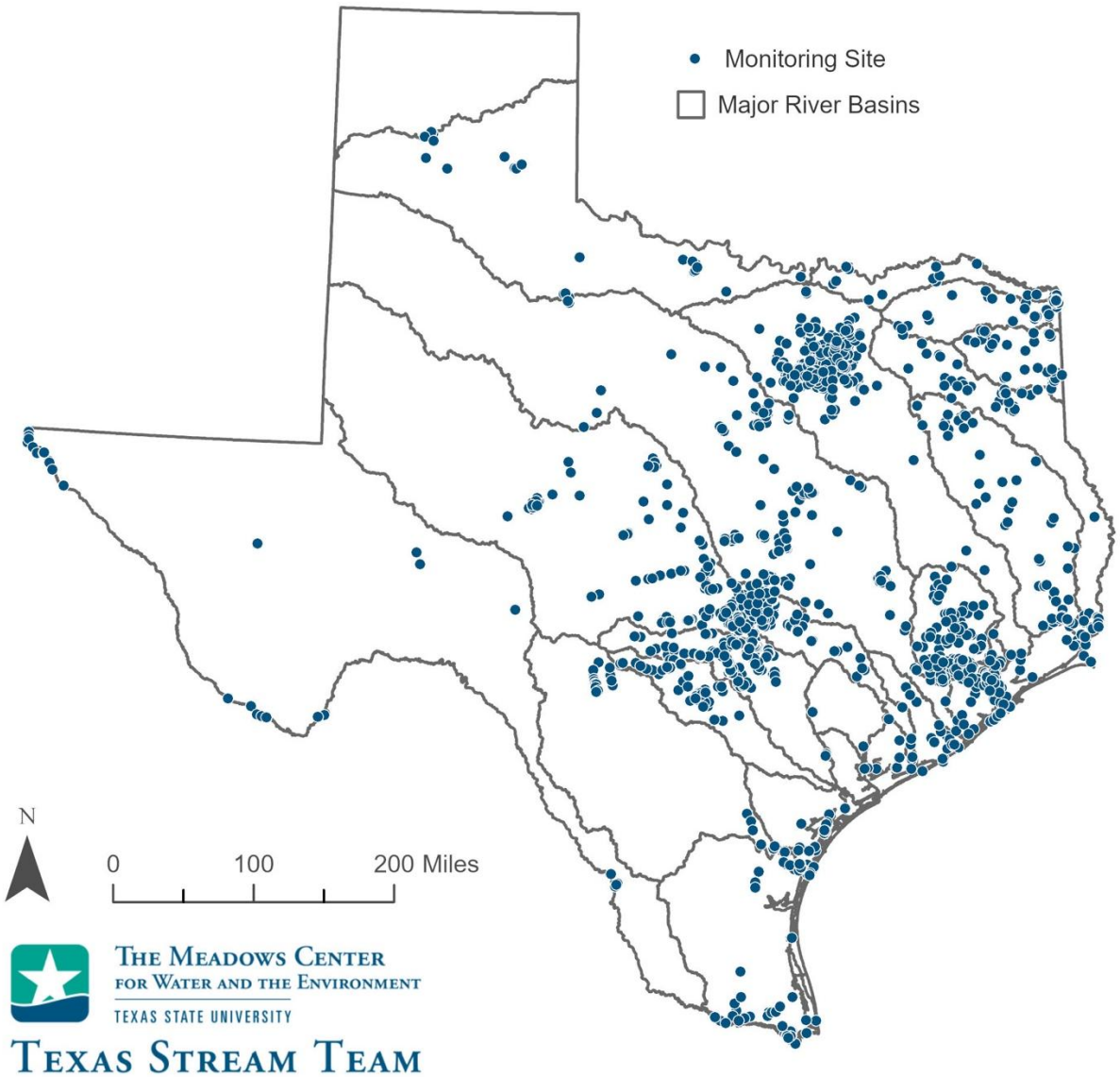
# APPENDIX A. AREA LOCATION MAP


Monitoring Site
Major River Basins
N
0
100
200 Miles
The Meadows Center
for Water and the Environment
Texas State University
Texas Stream Team

# APPENDIX B. CONTRACT SCOPE OF WORK AND DELIVERABLE DUE DATES

# SCOPE OF WORK (24-50135)

## Task 1: Project Administration

**Objective:** To effectively administer, coordinate, and monitor all work performed under this project including technical and financial supervision and preparation of status reports.

**Subtask 1.1: Project Oversight —** The Performing Party will provide technical and fiscal oversight of the staff and/or subgrantee(s)/subcontractor(s) to ensure Tasks and Deliverables are acceptable and completed as scheduled and within budget. Project oversight status will be provided to the TCEQ Project Manager with the quarterly Progress Reports.

**Subtask 1.2: Progress Reports (PRs) —** The Performing Party will submit PRs to the TCEQ Project Manager by the 15th of the month following the end of each quarter. PRs will include reporting on the status of Deliverables and proposed revisions to due dates, narrative description of progress by Task, and status of nonconformances/corrective actions. The TCEQ Project Manager will provide a PR template to the Performing Party.

**Subtask 1.3: Reimbursement Forms (Financial Status Reports) —** The Performing Party will submit reimbursement forms in accordance with the Special Terms and Conditions in the Contract.

**Subtask 1.4: Contract Communication —** The Performing Party will maintain regular telephone and/or email communication with the TCEQ Project Manager regarding the status and progress of the project and any matters that require attention between PRs. The Performing Party will participate in quarterly conference calls with the TCEQ Project Manager to discuss items such as project Tasks, financial status, Quality Assurance Project Plans (QAPPs), corrective actions, and any other matters that require attention. The TCEQ Project Manager may request additional information from the Performing Party prior to the call or meeting. The Performing Party will provide meeting notes and identify action items from the conference calls.

The first conference call held each fiscal year of the project will cover, as applicable, any staff changes, the previous year's performance, budget estimates, invoicing issues, quality assurance issues, corrective actions, and overall project progress.

Matters that must be communicated to the TCEQ Project Manager include, but are not limited to:

- Notification a minimum of 14 days before the Performing Party has scheduled public meetings or events, or other major Task activities.
- Notification within 48 hours following events or circumstances that may require changes to the Budget, Scope of Work, or Deliverable Due Dates.
- Requests for prior approval of activities or expenditures for which the Contract requires advance approval or that are not specifically included in the Scope of Work.

**Subtask 1.5: Contractor Evaluation —** The Performing Party will participate in an annual Contractor Evaluation at the end of each state fiscal year.

**Subtask 1.6: Contractor Workshop and Post Award Meeting —** The Performing Party will attend a contractor workshop hosted by TCEQ at the beginning of the project. The Performing Party will attend a post award meeting with the TCEQ Project Manager to discuss details of the project and due dates for deliverables. The Performing Party will provide meeting notes and identify action items from the post award meeting.

**Subtask 1.7: Coordination Call with EPA —** Upon request by TCEQ and EPA, the Performing Party will participate in a call with EPA to share progress on goals, measures of success, challenges, and draft documents.

**Subtask 1.8: Project Article —** Upon request by TCEQ, the Performing Party will provide a project article. The article will state the project's purpose, describe the activities of the past fiscal year, and include photographs of the project. The Performing Party will address TCEQ comments on the article and provide a final article.

**Subtask 1.9: Contract Budget Updates —** The Performing Party will discuss fiscal year budgets with the TCEQ Project Manager on a quarterly basis, at a minimum. These updates, recoded in PRs, will be revised when fiscal year spending projections change, or upon request by the TCEQ Project Manager. In the second year of the project, the Performing Party will provide an Annual Budget Update that details fiscal year spending projections associated with planned project activities. The update in the final year of the project will include a budget for all remaining project activities. The TCEQ Project Manager will provide a template for the Annual Budget Update.

**Deliverables:**
1.2 PRs (quarterly)
1.3 Reimbursement forms (see Special Terms and Conditions in the Contract)
1.4 Quarterly conference call meeting notes and action items (within five business days of the call)
1.5 Documentation of the Performing Party's participation in the Contractor Evaluation (annually, within five business days following request)
1.6 List of Performing Party attendees and date of contractor workshop (in PR)
1.6 Post award meeting notes and action items (within five business days of the meeting)
1.7 Coordination call with EPA (upon request)
1.8 Project Article and photographs (upon request)
1.9 Annual Budget Update (within two weeks following request)

**Task 2: Quality Assurance**

**Objective:** To refine, document, and implement data quality objectives (DQOs) and quality assurance/quality control (QA/QC) activities that ensure data of known and acceptable quality are generated by this project.

**Subtask 2.1: QAPP Planning Meetings —** The Performing Party will schedule a QAPP planning meeting with the TCEQ Project Manager within 30 days of Contract execution, to implement a systematic planning process based on the elements in the applicable QAPP Shell, which will be provided by the TCEQ Project Manager. The information developed during this meeting will be incorporated into a QAPP by the Performing Party.

**Subtask 2.2: QAPP —** The Performing Party will develop and submit to TCEQ a QAPP with project-specific DQOs and other components consistent with the following documents:

TCEQ NPS QAPP Shell(s)
EPA Requirements for QAPPs (QA/R5)
EPA Guidance for Geospatial Data QAPPs (QA/G-5G)
EPA QAPP Requirements for Secondary Data Research Projects
TCEQ Surface Water Quality Monitoring (SWQM) Procedures

The Performing Party will develop the QAPP in consultation with the TCEQ Project Manager, QA staff, and contractors. The Performing Party will address comments and submit a final QAPP for review. The QAPP must be signed/fully approved by TCEQ before any environmental data operations begin.

**Subtask 2.3: QAPP Annual Reviews, Revisions, and Updates —** The Performing Party will submit documentation certifying its annual review or supporting the revision or reissuance of the QAPP at least 90 days prior to the QAPP anniversary date. Amendments approved since the

initial QAPP approval, or a subsequent certified annual review (if applicable) or revision must be submitted along with the certification. For multi-year QAPPs, if extensive changes to a QAPP are necessary, a full revision/update is required. No work described in a QAPP will be conducted outside the effective period of the QAPP.

**Subtask 2.4: Amendments —** The Performing Party will submit Draft QAPP Amendments for TCEQ review when changes to QAPPs are necessary. Draft QAPP Amendments should be submitted at least 90 days prior to the scheduled initiation of changes and must be accompanied by a justification, summary of changes, and detail of changes. The Performing Party will submit Final QAPP Amendments within 30 days of receipt of any comments provided by TCEQ. Final QAPP Amendments will be submitted to TCEQ with the Performing Party's signatures and responses to comments and circulated for appropriate TCEQ signatures. QAPP Amendments must be approved by TCEQ before any changes conveyed within Amendments are implemented.

**Subtask 2.5: Corrective Action Plans (CAPs) —** The Performing Party will provide CAPs, as needed, to document deviations from the approved QAPP, including, but not limited to sampling method requirements or sample design, failures associated with chain-of-custody procedures, or failures associated with field and laboratory measurement systems. Draft CAPs will be submitted to TCEQ for review by TCEQ's designated due date The Performing Party will address TCEQ's comments. The Performing Party will submit final CAPs to TCEQ by the designated due date.

**Deliverables:**

2.1 QAPP Planning Meeting and notes (meeting within 30 days of Contract execution, notes within five business days following meeting)
2.2 Draft QAPP (120 days prior to the scheduled initiation of environmental data operations)
2.2 Final QAPP (30 days prior to the scheduled initiation of environmental data operations)
2.3 QAPP Annual Reviews and Revisions (at least 90 days prior to the QAPP approval anniversary)
2.4 Draft QAPP Amendments (at least 90 days prior to the scheduled initiation of changes or additions to activities listed in the current QAPP)
2.4 Final QAPP Amendments (at least 30 days prior to the scheduled initiation of changes or additions to activities listed in the current QAPP)
2.5 Draft CAPs (as needed, within 14 business days after receiving request)
2.5 Final CAPs (within 14 business days of receiving comments)

**Task 3: Water Quality Data Reporting and Dataviewer Management**

**Objective:** To maintain and update the Database and Dataviewer, and to generate reports. All submitted data collected under the QAPP are entered into the Dataviewer.

**Subtask 3.1: Data Submittals —** The Performing Party will enter all data collected under the QAPP into their Database within 90 days of data submission by community scientists. Data from the Dataviewer will be transferred to an online publicly accessible Datamap within 60 days of data submission by community scientists. The Performing Party will submit quarterly Data Activity Reports to the TCEQ Project Manager that will communicate the number of community scientists trained, number of community scientists monitoring, and number of monitoring events. The Performing Party will also submit data to EPA Water Quality Exchange (WQX) semi-annually. The Performing Party will email the TCEQ Project Manager a confirmation of each data submittal to WQX.

**Subtask 3.2: Data Summary Reports —** The Performing Party will compile and distribute selected community science Data Summary Reports on a quarterly basis. The reports will contain the data collected under the QAPP for sites/segments/basins agreed upon by the

Performing Party, TCEQ, community scientist stakeholders, partners, and Clean Rivers Planning agencies. The Data Summary Reports will also contain maps that illustrate the community scientist water quality data collected for each respective watershed. The Performing Party will submit Draft Data Summary Reports and presentations to the TCEQ Project Manager for review and approval at least two weeks prior to the scheduled public release.

**Subtask 3.3: Water Quality Monitoring Optical Brightener Technique Study** — The Performing Party will conduct a study to evaluate water quality testing methods and tools targeting optical brighteners from human sources of sewage wastewater for cost effectiveness and efficiency. The Performing Party will submit a report summarizing the results of the water quality monitoring optical brightener study.

**Deliverables:**

3.1 Data Activity Reports (quarterly, with PRs)
3.1 Data Submittals to EPA (twice per year, documented in PRs and proof of submission emailed to TCEQ Project Manager)
3.2 Draft Data Summary Reports with watershed maps (quarterly, at least two weeks prior to the scheduled public release)
3.2 Final Data Summary Reports and watershed maps with response to comments (quarterly, with PRs)
3.3 Draft Water Quality Monitoring Optical Brightener Technique Study Report (quarter 5, with PR)
3.3 Final Water Quality Monitoring Optical Brightener Technique Study Report (quarter 7, month 1)

**Task 4: Community Science Activities**

**Objective:** To engage, manage, expand, and strengthen a minimum of 400 statewide water quality community scientists and associated partner networks in activities related to water quality. The Performing Party will provide water quality monitoring training to support existing and new groups performing volunteer monitoring.

**Subtask 4.1: Support Existing and New Community Scientists** —The Performing Party will engage a minimum of 400 community scientists annually in activities related to water quality. The Performing Party will maintain a limited supply of kits and replacement reagents to equip community scientists who do not currently have partner support or where partner funding is unavailable.

**Subtask 4.2: Establish New Partnerships and Groups** — The Performing Party will create at least three new partnerships and three new community science groups per year to recruit community scientists in areas developing and implementing WPPs, along with other areas in the state.

**Subtask 4.3: Annual Trainer Meeting** — The Performing Party will hold one Statewide Trainer Meeting per year with the primary objective of gathering input and feedback toward the Performing Party's advancement of program objectives, QAPP/protocol updates, and improvement of volunteer and support efforts. The Performing Party will submit the agenda to the TCEQ Project Manager for review and approval at least two weeks prior to the meeting.

**Subtask 4.4: Core Community Scientist Water Quality Monitoring Trainings** — The Performing Party will support water quality monitoring trainings which cover core parameters (dissolved oxygen, pH, conductivity, salinity, Secchi disk, transparency tube, field observations/comments) and methods addressed in the latest TCEQ-approved QAPP. Training will emphasize watershed awareness through discussion and demonstration of the relationship between monitoring tests and field observations to corresponding nonpoint source pollution

issues. The Performing Party's staff or certified trainers will conduct at least eight Core Trainings per year.

**Subtask 4.5: Advanced and E. coli Bacteria Community Scientist Water Quality Monitoring Trainings —** The Performing Party will support water quality monitoring trainings which cover the nonpoint source pollution suite (E. coli bacteria, nitrates, orthophosphates, flow, turbidity) parameters and methods addressed in the latest TCEQ-approved QAPP. Training will emphasize watershed awareness through discussion and demonstration of the relationship between monitoring tests and field observations to corresponding nonpoint source pollution issues. The Performing Party's staff or certified trainers will conduct at least four Advanced or E. coli Bacteria Trainings per year.

**Subtask 4.6: Certify Community Scientists as a Trainer —** The Performing Party will train and certify community scientists to provide Texas Stream Team Trainings, including watershed and nonpoint source pollution education. The Performing Party's staff or certified trainers will train at least three certified community scientists per year to become Texas Stream Team trainers.

**Subtask 4.7: Bioassessment and Riparian Evaluation Program —** The Performing Party will develop and support new community scientists and groups/partners in the adoption of Bioassessment and Riparian Evaluation activities. The Performing Party staff or certified trainers will conduct at least one Bioassessment or Riparian Evaluation trainings per year.

**Subtask 4.8: Community Science Tasks Report —** The Performing Party will produce a Draft and Final Community Scientist Tasks Report that describes project activities completed under this Task. The report will identify and discuss the extent to which goals and purposes have been achieved. The report will emphasize successes, failures, and lessons learned. The Draft Community Scientist Tasks Report will be submitted to the TCEQ Project Manager for review. The Final Community Scientist Tasks Report will address TCEQ comments. If the TCEQ Project Manager determines that the Draft Task Report requires no edits by the Performing Party, the Draft Task Report will also serve as the Final Task Report.

**Deliverables:**

4.1 Documentation of progress toward the goal of engaging 400 community scientists per year (quarterly, with PRs)
4.2 Documentation of new community scientist groups and new partnerships established, minimum of three new groups and three new partnerships per year (quarterly, with PRs)
4.3 Draft Annual Statewide Trainer Meeting agenda (annually, at least two weeks prior to Annual Trainer Meeting)
4.3 Documentation of Annual Statewide Trainer Meeting, minimum of two (quarters 3 and 7, with PRs)
4.4 Documentation of core community scientist water quality monitoring trainings, minimum of eight per year (quarterly, with PRs)
4.5 Documentation of Advanced or E. coli bacteria community scientist water quality monitoring trainings, minimum of four per year (quarterly, with PRs)
4.6 Documentation of trainer certifications, minimum of three per year (quarters 3 and 7, with PRs)
4.7 Documentation of trainings for Bioassessment/Riparian program, minimum of one per year (quarters 3 and 7, with PRs)
4.8 Draft Community Science Tasks Report (quarter 8, month 1)
4.8 Final Community Science Tasks Report (within 15 business days of receiving comments)

### Task 5: Watershed Services

**Objective:** To offer and provide services that contribute to the successful implementation of accepted WPPs across Texas. The Performing Party will achieve this by working with Watershed

Coordinators to engage stakeholders in watersheds approved by the TCEQ Project Manager and assess the alignment of watershed/WPP needs with capabilities of the Performing Party.

**Subtask 5.1: Outreach to Watershed Coordinators —** The Performing Party will correspond with a minimum of eight Watershed Coordinators or project leads per year and offer services to support implementation of WPPs. Services may include:

- Providing information regarding matching/in-kind funds.
- Assisting with water quality and data collection.
- Assisting with analyses of monitoring data.
- Providing community science programming and curricula.

**Subtask 5.2: Watershed Services Task Report —** The Performing Party will provide a Draft and Final Watershed Services Task Report summarizing all activities covered by this Task. The Draft Watershed Services Task Report will be submitted to the TCEQ Project Manager for review. The Final Watershed Services Task Report will address TCEQ comments. If the TCEQ Project Manager determines that the Draft Task Report requires no edits by the Performing Party, the Draft Task Report will also serve as the Final Task Report.

**Deliverables:**

5.1 Documentation of correspondence with Watershed Coordinators or project leads, minimum of 8 per year (quarterly, in PRs)
5.2 Draft Watershed Services Task Report (quarter 8, month 1)
5.2 Final Watershed Services Task Report (within 15 business days of receiving comments)

**Task 6: Water Resource Education and Outreach**

**Objective**: To provide watershed education to a minimum of 2,500 people annually on nonpoint source pollution and activities that support water conservation and management.

**Subtask 6.1: Texas Stream Team Curriculum, Spring Lake Education Program —** The Performing Party will incorporate Texas Stream Team activities into the Meadows Center's existing Spring Lake education program to reach a targeted portion of the 125,000 annual expected visitors.

The Performing Party will use the Spring Lake education program to:

- Promote/hold one teacher workshop per year.
- Conduct four Enviroscape watershed model demonstrations or watershed activities per year.
- Provide four water quality monitoring certifications for all grade levels per year.

**Subtask 6.2: Newsletters —** The Performing Party will produce and distribute four online newsletters to community scientists, partners, and other interested parties per year. Information in the newsletters will target new potential partners and users of the Performing Party's data and services. Draft newsletters will be submitted to the TCEQ Project Manager for review and approval at least two weeks prior to distribution or release. The final newsletters will address TCEQ comments.

**Subtask 6.3: Research Publication Submission —** The Performing Party will submit an article regarding the evaluation of the effectiveness of water resource community science to a research journal and will present the findings at a scientific conference(s). The Performing Party will provide the abstract and presentation to the TCEQ Project Manager for review and approval at least 14 days prior to deadlines for submission to scientific conference(s).

**Subtask 6.4: Watershed Education and Outreach Task Report —** The Performing Party will produce a Draft and Final Watershed Education and Outreach Task Report that describes project activities under this Task and discusses the extent to which goals have been achieved. The report will emphasize successes, failures, and lessons learned. The Draft Watershed

Education and Outreach Task Report will be submitted to the TCEQ Project Manager for review. The Final Watershed Education and Outreach Task Report will address TCEQ comments. If the TCEQ Project Manager determines that the Draft Task Report requires no edits by the Performing Party, the Draft Task Report will also serve as the Final Task Report.

**Deliverables:**
6.1 Documentation of teacher workshops, including agenda, sign-in sheets, and presentation materials, minimum of one per year (quarters 4 and 8, with PRs)
6.1 Documentation of Enviroscape watershed model demonstrations, minimum of four per year (quarters 4 and 8, with PRs)
6.1 Documentation of providing water quality monitoring certifications, minimum of four per year (quarters 4 and 8)
6.2 Draft online newsletters, minimum of eight (at least two weeks prior to distribution or release)
6.2 Final online newsletters, minimum of eight (quarterly, with PRs)
6.3 Draft research publication (quarter 7, month 2)
6.3 Documentation of research publication submission (quarter 8, month 1)
6.3 Draft abstract and presentation for scientific conference(s) (at least 14 business days before submission)
6.3 Documentation of presentation at scientific conference(s) (quarter 8, month 1)
6.4 Draft Watershed Education and Outreach Task Report (quarter 8, month 1)
6.4 Final Watershed Education and Outreach Task Report (within 15 business days of receiving comments)

**Task 7: Final Report**

**Objective:** To produce a Final Report that summarizes all activities completed and conclusions reached during the project. The Final Report will discuss the extent to which project goals and purposes have been achieved and information about methods used. The Final Report should emphasize successes, failures, lessons learned. The Final Report should include analyses estimating the project's water quality improvements and/or load reductions, if applicable. The Final Report will summarize all the Task Reports either in the text or as appendices.

**Subtask 7.1: Draft Final Report —** At least 30 days prior to submitting the Final Report, the Performing Party will provide a Draft Final Report. The comprehensive report should document all Deliverables under this Scope of Work. The Draft Final Report will be structured per the following outline:

- Title
- Table of Contents
- Project Description and Purpose
- Study Area (including maps)
- Summary of all Tasks
- Amount of project funding and amount spent
- Discussion: include deliverables not completed and lessons learned
- Water quality results achieved and estimated load reductions (if applicable to project)
- Appendices (if needed)

**Subtask 7.2: Final Report —** The Performing Party will revise the Draft Final Report to address comments provided by the TCEQ Project Manager. At least two weeks before the expiration of the Contract, the Performing Party will submit the Final Report to the TCEQ Project Manager.

**Deliverables:**
7.1 Draft Final Report (quarter 8, month 1)
7.2 Final Report (at least two weeks prior to end of contract)

# SCOPE OF WORK (25-00061)

## Task 1: Project Administration

**Objective:** To effectively administer, coordinate, and monitor all work performed under this project including technical and financial supervision and submittal of Progress Reports.

**Subtask 1.1: Project Oversight** — The Performing Party will provide technical and fiscal oversight of the staff and/or subgrantee(s)/subcontractor(s) to ensure Tasks and Deliverables are acceptable and completed as scheduled and within budget. Project oversight status will be provided to the TCEQ Project Manager with the quarterly Progress Reports.

**Subtask 1.2: Progress Reports (PRs)** — The Performing Party will submit PRs to the TCEQ Project Manager by the 15th of the month following the end of each quarter. PRs will include reporting on the status of Deliverables and proposed revisions to due dates, narrative description of progress by Task, and status of nonconformances/corrective actions. The TCEQ Project Manager will provide a PR template to the Performing Party.

**Subtask 1.3: Reimbursement Forms (Financial Status Reports)** — The Performing Party will submit reimbursement forms in accordance with the Special Terms and Conditions in the Contract.

**Subtask 1.4: Contract Communication** — The Performing Party will maintain regular telephone and/or email communication with the TCEQ Project Manager regarding the status and progress of the project and any matters that require attention between PRs. The Performing Party will participate in project meetings (in person or virtual) with the TCEQ Project Manager to discuss items such as Tasks, financial status, Quality Assurance Project Plans (QAPPs), and corrective actions. The TCEQ Project Manager may request additional information from the Performing Party prior to the project meetings. The Performing Party will provide meeting notes and identify action items within seven days of each project meeting.

The Performing Party will attend a contractor workshop hosted by TCEQ and a project specific post award meeting with the TCEQ Project Manager to discuss details of the project and due dates for Deliverables at the beginning of the project. The post award meeting will serve as the first project meeting.

Project related matters that are not specifically included in the Scope of Work or require additional notification must be communicated to the TCEQ Project Manager. These communications may include, but are not limited to:

- Notification of non-contractual events or circumstances that may require changes to the Budget, Scope of Work, or Deliverable Due Dates.
- Requests for prior approval of activities or expenditures for which the Contract requires advance approval.

**Subtask 1.5: Contractor Evaluation** — The Performing Party will participate in an annual Contractor Evaluation at the end of each state fiscal year. The TCEQ Project Manager will provide a draft annual evaluation to the Performing Party for comment before a final evaluation is completed.

**Subtask 1.6: Coordination Call with EPA** — Upon request by TCEQ and EPA, the Performing Party will participate in a call with EPA to share progress on goals, measures of success, challenges, and draft documents.

**Subtask 1.7: Project Article** — The Performing Party, upon request by TCEQ, will provide a project article that will state the project's purpose, describe the activities of the past fiscal year,

and include photographs of the project. The Performing Party will address TCEQ comments on the draft version and provide a final article.

**Subtask 1.8: Contract Budget Updates** — The Performing Party will provide updated budget estimates on a quarterly basis. These updates, recorded in PRs, will be revised when fiscal year spending projections change, or upon request by the TCEQ Project Manager. In the second year of the Contract, the Performing Party will provide an Annual Budget Update for the current state fiscal year detailing spending projections associated with planned project activities. The TCEQ Project Manager will provide a template for the Annual Budget Update.

**Deliverables:**

1.2 PRs (quarterly)
1.3 Reimbursement forms (see Special Terms and Conditions in the Contract)
1.4 Project meeting notes and action items (quarterly, within seven days following the meeting)
1.4 Post award meeting notes and action items (within seven days following the meeting)
1.5 Documentation of the Performing Party's participation in the Contractor Evaluation (annually, within seven days following request)
1.6 Coordination call with EPA (upon request)
1.7 Project Article and photographs (upon request)
1.8 Annual Budget Update (within two weeks following request)

**Task 2: Community Science Activities**

**Objective:** To engage, manage, expand, and strengthen Texas Stream Team groups and associated partner networks in activities related to water quality with a focus on inclusivity and extended reach. The Performing Party will provide water quality monitoring guidance, supplies, and translated materials to support existing and new groups performing volunteer monitoring, thereby enhancing accessibility and inclusivity across diverse communities.

**Subtask 2.1: Establish New Groups** — The Performing Party will create at least three new community science groups to recruit community scientists in areas implementing watershed protection plans, along with other areas in the state.

**Subtask 2.2: Translations** — The Performing Party will translate program training and monitoring documents into Spanish and/or Vietnamese.

**Deliverables:**

2.1 Documentation of new community scientist groups established, minimum of three (with PRs).
2.2 Draft program document translations (final quarter, month 1)
2.2 Final program document translations (final quarter, month 3)

**Task 3: Final Report**

**Objective:** To produce a Final Report that summarizes all completed Task activities and conclusions reached during the project. The Final Report will discuss the extent to which project goals and purposes have been achieved and information about methods used. The Final Report should emphasize successes, failures, and lessons learned.

**Subtask 3.1: Draft Final Report** — At least 45 days prior to submitting the Final Report, the Performing Party will provide a Draft Final Report. This comprehensive report should document all Deliverables under this Scope of Work. The Draft Final Report will be structured per the following outline:

- Title

- Table of Contents
- Executive Summary
- Introduction
- Project Description and Purpose
- Methods
- Study Area (including maps)
- Summary of work completed in all Tasks
- Amount of project funding and amount spent
- Discussion: include deliverables not completed, lessons learned, and recommendations
- References
- Appendices (if needed)

**Subtask 3.2: Final Report** — The Performing Party will revise the Draft Final Report to address comments provided by the TCEQ Project Manager. At least 14 days before the expiration of the Contract, the Performing Party will submit the Final Report to the TCEQ Project Manager.

**Deliverables:**

3.1 Draft Final Report (final quarter, month 1)
3.2 Final Report (at least 14 days prior to end of Contract)

# SCOPE OF WORK (26-00046)

## Task 1: Project Administration

**Objective:** To effectively administer, coordinate, and monitor all work performed under this project including contractual, technical and financial supervision and submittal of Progress Reports. This project is expected to be completed in two years (eight quarters).

**Subtask 1.1: Project Oversight** — The Performing Party will provide contractual, technical and fiscal oversight of work performed by project staff and/or any subgrantee(s)/subcontractor(s) to ensure Tasks and Deliverables are acceptable and completed as scheduled and within budget. Project oversight status will be provided to the TCEQ Project Manager with the quarterly Progress Reports.

**Subtask 1.2: Progress Reports (PRs)** — The Performing Party will submit PRs to the TCEQ Project Manager by the 15th of the month following the end of the quarter. If the 15th is not a business day, the PR is due on the next business day. PRs will include reporting on the status of Deliverables and proposed revisions to due dates, narrative descriptions of progress made on each Task, including Subtasks, and status of nonconformances/corrective actions. The TCEQ Project Manager will provide a PR template to the Performing Party.

**Subtask 1.3: Reimbursement Forms (Financial Status Reports)** — The Performing Party will submit reimbursement forms at quarterly intervals. Reimbursement Forms will follow the Financial Status Report template provided by TCEQ. The reporting periods will correspond to the State of Texas fiscal year (September-November, December-February, March-May, and June-August). Requests for reimbursement must be submitted within 30 days after the close of each quarter with the exception of the last fiscal quarter of the Contract, when the final invoice will be due within 45 days after the close of the Contract.

**Subtask 1.4: Contract Communication** — The Performing Party will maintain regular telephone and/or email communication with the TCEQ Project Manager regarding the status and progress of the project and any matters that require attention between PRs. The Performing Party will participate in project meetings (in person or virtual) with the TCEQ Project Manager to discuss items such as Tasks, financial status, Quality Assurance Project Plans (QAPPs), and corrective actions. The Performing Party will provide meeting notes to the TCEQ Project Manager and identify action items within seven days of each project meeting.

The Performing Party will attend a workshop hosted by TCEQ and a project-specific post award meeting with the TCEQ Project Manager to discuss details of the project and due dates for Deliverables at the beginning of the project. The post award meeting will serve as the first project meeting.

**Subtask 1.5: Performing Party Evaluation** — The Performing Party will participate in an annual performance evaluation at the end of each state fiscal year. The TCEQ Project Manager will provide a draft evaluation to the Performing Party for comment before a final evaluation is completed.

**Subtask 1.6: Coordination Call with EPA** — Upon request by TCEQ, the Performing Party will participate in a call with EPA to share progress on goals, measures of success, challenges, and draft documents.

**Subtask 1.7: Project Article** — The Performing Party, upon request by TCEQ, will provide a project article that will state the project's purpose and describe the activities of the past fiscal year and include photographs of the project. The Performing Party will address TCEQ comments on the draft version and provide a Final Article.

**Subtask 1.8: Contract Budget Updates** — The Performing Party will provide updated budget estimates on a quarterly basis. These updates, recorded in the PRs, will be revised when fiscal year spending projections change, or upon request by the TCEQ Project Manager. In the second year of the Contract, the Performing Party will provide an Annual Budget Update for the current State of Texas fiscal year detailing spending projections associated with planned project activities. The TCEQ Project Manager will provide a template for the Annual Budget Update.

**Deliverables:**

1.2 PRs (quarterly) until project finished
1.3 Reimbursement forms (quarterly) until project finished
1.4 Project meeting notes and action items (quarterly, within seven days following the meeting)
1.4 Post award meeting notes and action items (within seven days following the meeting)
1.5 Documentation of the Performing Party's participation in the performance evaluation (annually, within seven days following request)
1.6 Coordination call with EPA (upon request)
1.7 Project Article and photographs (upon request)
1.8 Annual Budget Update (within 14 days following receipt of written request)

**Task 2: Quality Assurance**

**Objective:** To refine, document, and implement Data Quality Objectives (DQOs) and Quality Assurance (QA)/Quality Control (QC) activities that ensure data of known and acceptable quality are generated by this project.

**Subtask 2.1: QAPP Planning Meetings** — The Performing Party will schedule a Quality Assurance Project Plan (QAPP) planning meeting with the TCEQ Project Manager within 30 days of Contract execution, to discuss project activities and the elements in the applicable QAPP Shell. The information developed during this meeting will be incorporated into a QAPP by the Performing Party. The TCEQ Project Manager will provide the appropriate shell(s) to the Performing Party.

**Subtask 2.2: QAPP** — The Performing Party will develop and submit to TCEQ a QAPP with project specific DQOs and other components consistent with the following documents:

TCEQ QAPP Shell(s)/example(s) – provided by TCEQ Project Manager
EPA Quality Assurance Project Plan Standard (CIO 2105-S-02.0)

The Performing Party will develop the QAPP in consultation with the TCEQ Project Manager, QA staff, and subgrantees/subcontractors (if any). The Performing Party will address comments and submit a final QAPP for review. The QAPP must be signed by TCEQ before the Performing Party and its subcontractors(s)/subgrantees(s) can initiate environmental data operations.

**Subtask 2.3: QAPP Annual Reviews and Revisions** — The Performing Party will submit documentation certifying its annual review or supporting the revision of the QAPP at least 90 days prior to the QAPP anniversary or expiration date. QAPP Amendments approved since the initial QAPP was approval or a subsequent certified annual review (if applicable) must be submitted along with the certification. For multi-year QAPPs, if extensive changes are necessary, a full revision is required. No work described in a QAPP will be conducted outside the effective QAPP period.

**Subtask 2.4: QAPP Amendments** — The Performing Party will submit Draft QAPP Amendments for TCEQ review when changes to the QAPP are necessary. The TCEQ Project Manager will provide a QAPP Amendment Shell. Draft QAPP Amendments should be submitted at least 90 days prior to the scheduled initiation of changes and must be accompanied by a justification, summary of changes, and detail of changes. The Performing Party will submit Final QAPP Amendments within 30 days of receipt of any comments provided by TCEQ. Final QAPP Amendments will be submitted to TCEQ with the Performing Party's signatures and responses to comments and circulated for appropriate TCEQ signatures. QAPP Amendments must be approved by TCEQ before the Performing Party and its subcontractors(s)/subgrantees(s) can implement any changes conveyed within those QAPP Amendments.

**Subtask 2.5: Corrective Action Plans (CAPs)** — The Performing Party will provide CAPs, as needed, to document deviations from the approved QAPP, including, but not limited to deviations from sampling method requirements, sample design, failures associated with chain-of-custody procedures, or failures associated with field and laboratory measurement systems. Draft CAPs will be submitted to TCEQ for review by TCEQ's designated due date. The Performing Party will address TCEQ's comments and will submit final CAPs to TCEQ by the designated due date.

**Subtask 2.6: Quality Assurance Audits** — The Performing Party will participate in quality assurance-related auditing activities conducted by TCEQ as described in the QAPP. The Performing Party will provide responses to any audit findings or deficiencies within a timeframe designated by TCEQ.

**Deliverables:**

2.1 QAPP Planning Meeting and notes (meeting within 30 days of following Contract execution, notes due within seven days following the meeting)
2.2 Draft QAPP (120 days prior to the scheduled initiation of environmental data operations)
2.2 Final QAPP (60 days prior to the scheduled initiation of environmental data operations)
2.3 QAPP Annual Reviews and Revisions (at least 90 days prior to the QAPP approval anniversary)
2.4 Draft QAPP Amendments (at least 90 days prior to the scheduled initiation of changes or additions to activities listed in the current QAPP)
2.4 Final QAPP Amendments (at least 30 days prior to the scheduled initiation of changes or additions to activities listed in the current QAPP)
2.5 Draft CAPs (as needed, within 14 days after receiving request)
2.5 Final CAPs (within 14 days of receiving comments)
2.6 Documentation of participation in Quality Assurance Audits, including dates audits were conducted (as needed, in PRs)

**Task 3: Data Reporting and Management**

**Objective**: To maintain and update water quality data within the Datamap and Dataviewer database platforms, ensuring that all submitted data collected under the QAPP are accurately entered. This task also aims to generate comprehensive reports to enhance transparency, stakeholder engagement, and accessibility of water quality information.

**Subtask 3.1: Data Submittals** — The Performing Party will enter all data collected under the QAPP into their Database within 90 days of data submission by community scientists. Data from the Dataviewer will be transferred to an online publicly accessible Datamap within 60 days of data submission by community scientists. The Performing Party will submit quarterly Data Activity Reports, detailing the number of community scientists trained, the number of active monitors, and the number of monitoring events. Additionally, the Performing Party will submit data to the EPA Water Quality Exchange (WQX) twice per year and provide confirmation of each data submittal to TCEQ, until the project closes.

**Subtask 3.2: Watershed Summary Reports** — The Performing Party will compile and distribute selected community science Watershed Summary Reports on a quarterly basis. These reports will include community science data collected under the QAPP agreed upon by the Performing Party, TCEQ, stakeholders, partners, and Clean Rivers Program agencies. The reports will feature data analyses to evaluate water quality data and compare results to state water quality standards, as well as watershed characteristics, spatial mapping, and demographic data for each respective watershed. The Performing Party will submit Draft Watershed Summary Reports to the TCEQ Project Manager for review and approval at least 14 days prior to the scheduled public release.

**Deliverables:**
3.1 Data Activity Reports (quarterly, with PRs)
3.1 Confirmation of Data Submittal to EPA (twice per year, with PRs)
3.2 Draft Watershed Summary Reports (with PRs)
3.2 Final Watershed Summary Reports (at least 14 days prior to distribution)

**Task 4: Community Science Activities**

**Objective:** To engage, manage, expand, and strengthen a minimum of 300 statewide water quality community scientists and associated partner networks in activities related to water quality. The Performing Party will provide water quality monitoring guidance, training, multilingual resources, and supplies to support existing and new groups performing volunteer monitoring. The Performing Party will translate public outreach materials and provide a translator for public meetings, as needed.

**Subtask 4.1: Support Community Scientists** — The Performing Party will engage a minimum of 300 existing and new community scientists annually in activities related to water quality. The Performing Party will maintain a limited supply of kits and replacement reagents to equip community scientists who do not currently have partner support or where partner funding is unavailable.

**Subtask 4.2: Establish New Partnerships and Groups** — The Performing Party will create at least three new partnerships and three new community science groups per year (two-year period) to recruit community scientists in areas implementing watershed protection plans, along with other areas in the state.

**Subtask 4.3: Annual Trainer Meeting** — The Performing Party will hold two annual statewide Annual Trainer Meetings with the primary objective of gathering input and feedback toward the Performing Party's advancement of program objectives, QAPP/protocol updates, and improvement of volunteer and support efforts. The Performing Party will submit the agenda and presentation to the TCEQ Project Manager for review and approval at least 14 days prior to the meeting.

**Subtask 4.4: Community Scientist Trainings** — The Performing Party will support and conduct various water quality monitoring trainings. The trainings will cover parameters and methods addressed in the approved QAPP, as well as field audits. Emphasizing watershed awareness, these trainings will demonstrate the relationship between monitoring tests and nonpoint source pollution issues. The Performing Party's staff or certified trainers will conduct at least 9 trainings or field audits per project year (18 total).

**Subtask 4.5: Certify Trainers** — The Performing Party will train and certify community scientists to provide Texas Stream Team trainings, including watershed and nonpoint source pollution education. The Performing Party's staff or certified trainers will train at least three certified community scientists annually for a two-year period to become Texas Stream Team trainers.

**Deliverables:**

4.1 Documentation of progress toward the goal of engaging 300 community scientists per year (quarterly, with PRs)
4.2 Documentation of new community scientist groups established, minimum of three per year (quarters 4 and 8, with PRs)
4.2 Documentation of new partnerships established, minimum of three per year (quarters 4 and 8, with PRs)
4.3 Draft Annual Statewide Trainer Meeting agenda and presentation, minimum of two (at least 14 days prior to the Annual Trainer Meeting)
4.3 Documentation of Annual Statewide Trainer Meeting, minimum of two (quarters 4 and 8, with PRs)
4.4 Documentation of community scientist water quality monitoring trainings or audits, minimum of nine per year (quarters 4 and 8, with PRs)
4.5 Documentation of trainer certifications, minimum of three per year (quarters 4 and 8, with PRs)

**Task 5: Watershed Services**

**Objective:** To offer and provide services that contribute to the successful implementation of accepted Watershed Protection Plans (WPPs) across Texas. The Performing Party will achieve this by working with Watershed Coordinators to engage stakeholders in watersheds approved by the TCEQ Project Manager and assess the alignment of watershed/WPP needs with capabilities of the Performing Party.

**Subtask 5.1: Watershed Coordinator Outreach** — The Performing Party will correspond with a minimum of eight Watershed Coordinators or project leads and offer services to support implementation of WPPs. Services may include:

- Providing information regarding matching/in-kind funds.
- Assisting with water quality and data collection.
- Assisting with analyses of monitoring data.
- Providing community science programming and curricula.

**Deliverables:**

5.1 Documentation of correspondence and support provided with Watershed Coordinators or project leads, minimum of 8 per year for a two-year period (quarters 4 and 8, with PRs)

**Task 6: Education and Outreach**

**Objective:** To provide multilingual watershed education to a minimum of 2,500 people annually on nonpoint source pollution and activities that support water conservation and management. The Performing Party will translate public outreach materials into Spanish and provide a translator for public meetings, as needed.

**Subtask 6.1: Texas Stream Team Integration at Spring Lake** — The Performing Party will incorporate Texas Stream Team activities into the Meadows Center's existing Spring Lake Education program to reach a targeted portion of the 125,000 annual visitors. The Performing Party will use the Spring Lake program to:

- Conduct four Enviroscape watershed model demonstrations or watershed activities per year of the project.
- Provide one water quality monitoring training for all grade levels per year of the project.

**Subtask 6.2: Newsletters** — The Performing Party will produce and distribute four online newsletters to community scientists, partners, and other stakeholders per year. Information in the newsletters will target new potential partners and users of the Performing Party's data and services. Draft Newsletters will be submitted to the TCEQ Project Manager for review and approval at least 14 days prior to distribution or release.

**Deliverables:**

6.1 Documentation of Enviroscape watershed model demonstrations, minimum of four per year (quarters 4 and 8, with PRs)
6.1 Documentation of providing water quality monitoring training, minimum of one (quarter8, with PR)
6.2 Draft online newsletters, minimum of eight (quarterly, with PRs)
6.2 Final online newsletters, minimum of eight (at least 14 days prior to distribution)

**Task 7: Final Report**

**Objective:** To produce a Final Report that summarizes all completed Task activities and conclusions reached during the project. The Final Report will discuss the extent to which project goals and purposes have been achieved and information about methods used, Standard Operation Procedures. The Final Report should emphasize successes, failures, and lessons learned. The Final Report should include analyses estimating the project's water quality improvements and/or load reductions, if applicable.

**Subtask 7.1: Draft Final Report** — At least 45 days prior to submitting the Final Report, the Performing Party will provide a Draft Final Report. The comprehensive report should document all Deliverables under this Scope of Work. The Draft Final Report should be structured per the following outline:

- Title
- Table of Contents
- Executive Summary
- Introduction
- Project Description and Purpose
- Methods
- Study Area/maps (maps subject to TCEQ approval)
- Summary of work completed in all Tasks
- Results and Observations
- Amount of federal project funding and amount spent, unspent
- Discussion: include deliverables not completed, lessons learned, and recommendations
- Water quality results achieved/estimated load reductions (if applicable to project)
- References
- Appendices (if needed)

**Subtask 7.2: Final Report** — The Performing Party will revise the Draft Final Report to address comments provided by the TCEQ Project Manager. At least 14 days before the expiration of the Contract, the Performing Party will submit the Final Report to the TCEQ Project Manager.

**Deliverables:**

7.1 Draft Final Report (at least 45 days prior to end of quarter eight)
7.2 Final Report (at least 14 days prior to end of quarter eight)

# APPENDIX C. MONITORING FORMS AND QUALITY CONTROL CHECKLISTS

Observations monitoring form and field quality control checklist

Core environmental monitoring form and field quality control checklist (for Standard Core and Probe Core)

Advanced environmental monitoring form and field quality control checklist

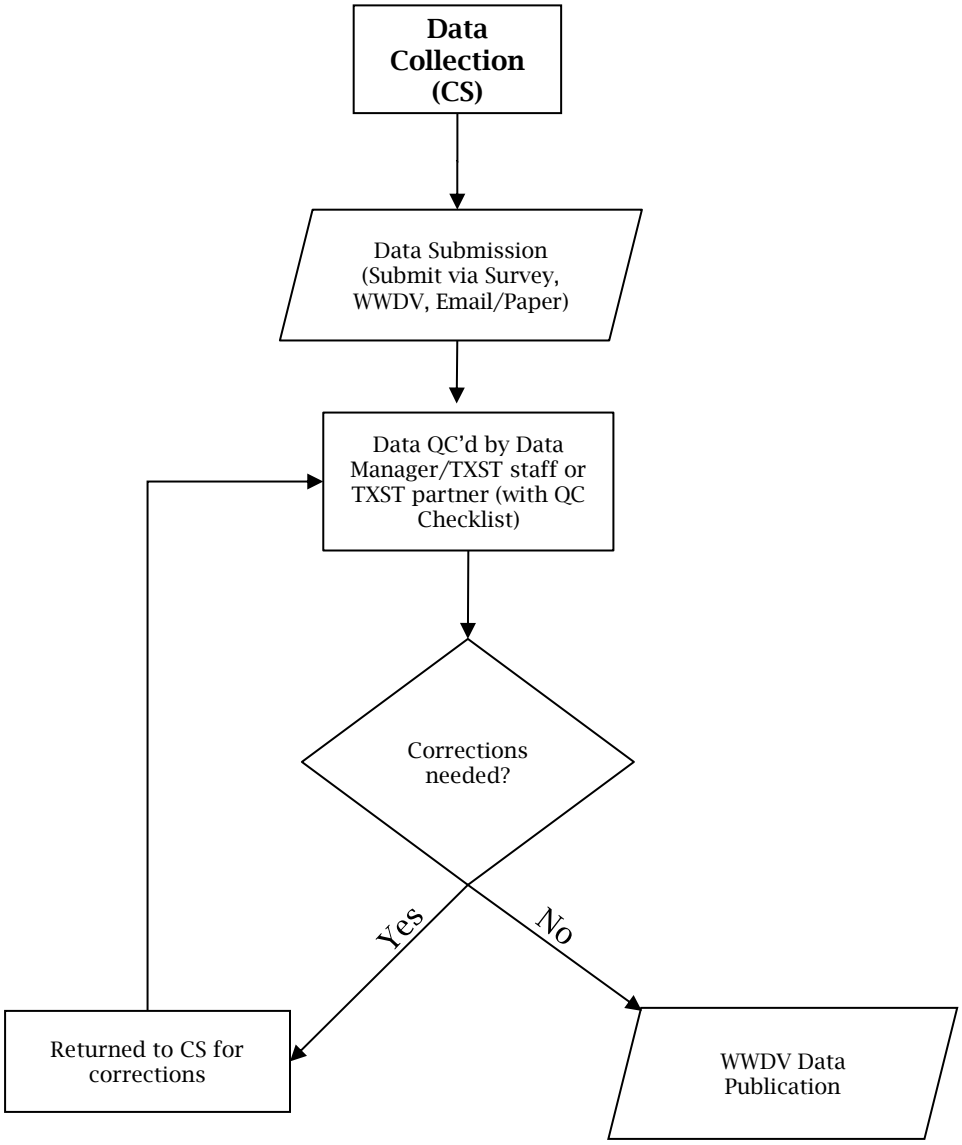
Optical Brightener monitoring form and field quality control checklist

*E. coli* bacteria environmental monitoring form and field quality control checklist

Riparian environmental monitoring form and field quality control checklist

# APPENDIX D. DATA MANAGEMENT PROCESS FLOW CHART

## TXST Data Management Process Flow Chart



# APPENDIX E. CORRECTIVE ACTION STATUS TABLE

## Corrective Action Status Table

| Corrective Action # | Date Issued | Description of Deficiency | Action Taken | Date Closed |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## Corrective Action Status Table Example

| Corrective Action # | Date Issued | Description of Deficiency | Action Taken | Date Closed |
|---|---|---|---|---|
| 1 | 7/25/2014 | Runoff measured at pavement was greater than total area runoff. | The area is being surveyed to ensure the catchment area size is correct. The monitoring station location is being modified to ensure runoff flows through properly. | |
| 2 | 8/1/2014 | Sample residual insufficient for analysis of TSS. | Data estimated but questionable, not will not be submitted to TCEQ. | 8/8/2014 |
| | | | | |
| | | | | |
| | | | | |

# APPENDIX F. CORRECTIVE ACTION PLAN FORM

## Corrective Action Plan Form

| Deficiency Report and Corrective Action Plan | | | |
|---|---|---|---|
| QAPP Title: | | | |
| QAPP Contractor: | | Date of deficiency: | |
| CAP Number: | | Date deficiency reported to TCEQ: | |
| CAP submitted by: | | Date CAP submitted: | |
| TCEQ Project Manager: | | Date CAP closed: | |
| | | | |
| Description of deficiency: | | | |
| Root cause of deficiency: | | | |
| Programmatic impact of deficiency: | | | |
| Corrective Action to address the deficiency and prevent its recurrence: | | | |
| Proposed Completion Date for Each Action: | | | |
| Individual(s) Responsible for Each Action: | | | |
| Method of Verification: | | | |

## Example Corrective Action Plan Form

| Deficiency Report and Corrective Action Plan | | | |
|---|---|---|---|
| QAPP Title: | WPP Implementation – LID BMP Monitoring QAPP | | |
| QAPP Contractor: | River Authority | Date of deficiency: | 9/25/2023 |
| CAP Number: | 1 *(# sequentially)* | Date deficiency reported to TCEQ: | 9/25/2023 |
| CAP submitted by: | Jane Doe | Date CAP submitted: | 10/9/2023 |
| TCEQ Project Manager: | John Doe | Date CAP closed: | *Added by TCEQ PM when CAP approved.* |
| | | | |
| Description of deficiency: | The pavement monitoring station at the university is measuring a larger runoff volume than is estimated possible. Runoff measured is higher than the total precipitation volume calculated by multiplying the catchment area by the precipitation measured at the site. | | |
| Root cause of deficiency: | (1) It is possible that the drainage area was not measured accurately, it may be larger.<br>(2) The outfall of the monitoring station might not adequately allow runoff to flow through causing pooling around the flow-measuring point. The accumulation of non-flowing water could be confounding the flow meter since its physical principal of measurement is hydrostatic pressure caused by water depth. | | |
| Programmatic impact of deficiency: | The illogical results of the pavement runoff measurement indicate that further calibration of the equipment is necessary. Data collected at this event are not able to be used in analysis or results. | | |
| Corrective Action to address the deficiency and prevent its recurrence: | A survey will be conducted on the site to determine the ridge of the catchment area.<br>A wider and deeper channel will be dug out at the monitoring point outfall to ensure all the flow drains away from the measuring point.<br>Storm event runoff will not be measured at this site until this work has been completed. | | |
| Proposed Completion Date for Each Action: | 11/30/2023 | | |
| Individual(s) Responsible for Each Action: | Joe Schmo, River Authority Project Manager | | |
| Method of Verification | Results of the catchment area survey will be emailed to the TCEQ Project Manager.<br>Photos of the modified measurement site will be emailed to the TCEQ Project Manager. | | |

# APPENDIX G. TEXAS STREAM TEAM MANUALS, FIELD GUIDES, TRAINER ENROLLMENT FORM, AND MAINTENANCE GUIDES

**Manuals**
2023 Texas Stream Team Core Water Quality Community Scientist Manual (Updated 2/2025)
2023 *E. coli* Bacteria Water Quality Community Scientist Manual (Updated 5/2025)
Texas Stream Advanced Water Quality Community Scientist Manual (Updated 7/2023)
Texas Stream Team Riparian Evaluation Citizen Scientist Manual (Updated 2/2025)
2025 Optical Brightener Water Quality Community Scientist Manual (December 2024)

**Field Guides**
Standard Core Field Guide
Standard Core Salinity Field Guide
Probe Core Field Guide
*E. coli* Bacteria Field Guide
Advanced Field Guide – Streamflow & Turbidity
Advanced Field Guide – Nitrate-Nitrogen & Phosphate
Optical Brightener Field Guide

**Enrollment Forms**
Training Enrollment Form
Trainer Enrollment Form

**Maintenance Guides**
Standard Core Equipment Maintenance Guide
Probe Kit Maintenance Guide

# APPENDIX H. LCRA, CRWN WATER QUALITY MONITROIRING MANUAL

Lower Colorado River Authority
CRWN Water Quality Monitoring Manual Ninth Edition:
https://www.lcra.org/download/crwn-water-quality-monitoring-manual/?wpdmdl=29698

## ATTACHMENT 1
## Example Letter to Document Adherence to the QAPP

TO: (name)
(organization)

FROM: (name)
(organization)

RE: The Medows Center, Texas Stream Team Program Surface Water Quality Monitoring Project QAPP, Revision 2

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

(address)

I acknowledge receipt of the "Texas Stream Team Program Surface Water Quality Monitoring Project QAPP, Revision 2". I understand that the document describes quality assurance, quality control, data management and reporting, and other technical activities that must be implemented to ensure the results of work performed will satisfy stated performance criteria.

My signature on this document signifies that I have read and approved the document contents. Furthermore, I will ensure that all staff members participating in activities covered under this QAPP will be required to familiarize themselves with the document contents and adhere to the contents as prescribed.

_____

Signature Date