Amendment #1
Update to the Guadalupe-Blanco River Authority Clean Rivers Program FY 2024/2025 QAPP

Prepared by the Guadalupe-Blanco River Authority in Cooperation with the Texas Commission on Environmental Quality (TCEQ)

Effective: Immediately upon approval by all parties

Questions concerning this QAPP Amendment should be directed to:
Elizabeth Malloy (Guadalupe-Blanco River Authority)
GBRA Quality Assurance Officer
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Justification

This document details the changes made to the basin wide QAPP to update language regarding limits of quantitation (LOQs) in sections A7 and B5, and updates to Appendix B for fiscal year 2025. New QAPP shell language updates were incorporated into sections A7 and B5. In addition, a list of sampling schedule changes was updated for FY25 in Appendix B, and Table B1.1 was updated to reflect sampling changes.

Red font = change by TCEQ CRP Project QA Specialist
Green highlight = change by Guadalupe-Blanco River Authority
~~Strikethrough font~~ = deletion of text from previous QAPP document (highlighted green for change by Guadalupe-Blanco River Authority/red text for change by TCEQ CRP Project QA Specialist)

Summary of Changes

Section	Sub-section/ Figure/Table	Page(s) in Basin-wide QAPP	Change	Justification	Affected Entity	Page(s) in this Amendment
A1	GBRA, Meadows Center, WA, and SPL subsections of A1	2–8	Replacement of Kristyn Armitage with Natalie Hickman. Replacement of Sandra Arismendez with Nicky Vermeersch. Replacement of Tracey Varvel with Kathryn Elliott.	Changes reflect staff turnover	GBRA, MCWE, WA, SPL	5–11
A3	Distribution List for GBRA, MCWE, WA, and SPL	12–13	Replacement of Kristyn Armitage with Natalie Hickman. Replacement of Sandra Arismendez with Nicky Vermeersch. Replacement of Tracey Varvel with Kathryn Elliott.	Changes reflect staff turnover	GBRA, MCWE, WA, SPL	12–13

A4	Project/Task Organizations, Description of Responsibilities	14–19	Replacement of Kristyn Armitage with Natalie Hickman. Replacement of Sandra Arismendez with Nicky Vermeersch. Replacement of Tracey Varvel with Kathryn Elliott.	Changes reflect staff turnover	GBRA, MCWE, WA, SPL	14–20
A4.1	Figure A4.1 Organization chart	20	Replacement of Kristyn Armitage with Natalie Hickman. Replacement of Sandra Arismendez with Nicky Vermeersch. Replacement of Tracey Varvel with Kathryn Elliott.	Changes reflect staff turnover	GBRA, MCWE, WA, SPL	21
A7	Ambient Water Reporting Limits (AWRLs)	23	Modified language concerning allowable LOQs.	To adjust language used in current CRP QAPPs that does not align with TCEQ CRP's stance on allowable LOQs.	GBRA, UGRA, SPL, SARA	22
B5	Quality Control or Acceptability Requirements, Deficiencies, and Corrective Actions	38–39	Modified language concerning allowable LOQs. Amendment specifies that GBRA QAO (not Project manager) is responsible for evaluating QC excursions for WA & MCWE.	To adjust language used in current CRP QAPPs that does not align with TCEQ CRP's stance on allowable LOQs. To adjust language to more accurately reflect existing review process for MCWE and WA data.	GBRA, UGRA, MCWE, WA, SPL, SARA	23
Appendix A	Tables A7.1a and A7.2a	59–85	Added asterisk next to parameter "Depth of bottom of water body at sample site" for GBRA and UGRA field data collection.	Update clarifies that GBRA and UGRA only measures this parameter if the flow severity=1. MC and WA collect this parameter at all flow severities, so no changes were needed to those tables.	GBRA. UGRA	23–49
Appendix B	Appendix B: Task 3 Work	87–88	Updated fiscal year throughout from 2024 to	Changes to Appendix B in this amendment are to	GBRA, UGRA,	50–52

	Plan & Sampling Process Design and Monitoring Schedule (Plan)		2025.	reflect FY 2025 monitoring, not FY 2024 monitoring.	MCWE, WA	
Appendix B	Sample Design Rationale FY 2025	87–88	Updated list of sampling changes in FY 2025	Changes to the monitoring schedule should be applicable for FY 2025 rather than FY 2024	GBRA, UGRA, MCWE, WA	50–51
Appendix B	Table B1.1	89–98	Updated Table B1.1 to reflect modifications to sampling design for the new fiscal year (2025).	Sampling design has changed from FY 2024 to FY 2025 to update planned ALM events and additional minor sampling changes	GBRA, UGRA, MCWE, WA	52–62
Appendix C	Appendix C	99–100	Updated Upper Guadalupe River map by removing FY24 ALM station	Big Joshua Creek was sampled in FY24 for biologicals. This station will not be sampled in FY25.	GBRA	63–64

Distribution

This QAPP amendment will be distributed by the Guadalupe-Blanco River Authority via email to all personnel on the distribution list (section A3 of the QAPP).

These changes will be incorporated into the QAPP document and TCEQ and the Guadalupe-Blanco River Authority will acknowledge and accept these changes by approving the final amendment draft electronically via email.

Replaces section A1 on pages 2–8 of the FY 2024–2025 CRP QAPP and serves as QAPP amendment signature page:

A1 Approval Page

Texas Commission on Environmental Quality

Water Quality Planning Division

Electronically Approved 9/4/2024

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

Electronically Approved 9/4/2024

Lawrence Grant Bassett Date
Project Quality Assurance Specialist
Clean Rivers Program

Electronically Approved 9/4/2024

Katrina Smith, Project Manager Date
Clean Rivers Program

Electronically Approved 9/4/2024

Cathy Anderson, Team Leader Date
Data Management and Analysis

Monitoring Division

Electronically Approved 9/5/2024

Jason Natho Date
Acting Lead CRP Quality Assurance Specialist

Guadalupe-Blanco River Authority (GBRA)

Electronically Approved 8/22/2024

Elizabeth Edgerton Date
GBRA CRP Project Manager

Electronically Approved 8/22/2024

Elizabeth Malloy Date
GBRA Field Technician, Quality Assurance Officer, and Backup Data Manager

Electronically Approved 8/22/2024

Natalie Hickman ~~Kristyn Armitage~~ Date
GBRA Field Technician and Data Manager

Electronically Approved 8/22/2024

Lee Gudgell Date
GBRA Backup Data Manager

Guadalupe-Blanco River Authority (GBRA) Laboratory

Electronically Approved 9/3/2024

Miliana Hernandez Date
GBRA Laboratory Lead Analyst

Electronically Approved 8/23/2024

Kylie Gudgell Date
Laboratory Quality Assurance Officer

Upper Guadalupe River Authority (UGRA)

Electronically Approved 8/22/2024

Shelby Taber Date
UGRA CRP Project Manager, Quality Assurance Officer, and Data Manager

Electronically Approved 8/26/2024

Travis Linscomb Date
UGRA Field Technician and Backup Data Manager

Electronically Approved 8/22/2024

Nicole Shepherd Date
UGRA Laboratory Manager and Laboratory Quality Assurance Officer

Electronically Approved 8/22/2024

Tara Bushnoe Date
UGRA Backup Data Manager

The Watershed Association (WA)

Electronically Approved	8/22/2024
David Baker WA CRP Project Manager	Date

Electronically Approved	8/22/2024
Nicky Vermeersch ~~Sandra Arismendez~~ WA CRP Quality Assurance Officer and Field Technician	Date

The Meadows Center for Water and the Environment (MCWE)

Electronically Approved	8/23/2024
Jenna Walker	Date
MCWE CRP Project Manager	

Electronically Approved	8/22/2024
Nicky Vermeersch ~~Sandra Arismendez~~	Date
MCWE CRP Quality Assurance Officer and Field Technician	

SPL, Inc – Kilgore Corporation Environmental Laboratory (SPL)

Electronically Approved	9/4/2024
William Peery SPL Technical Director	Date

Electronically Approved	8/23/2024
Kathryn Elliott ~~Tracey Varvel~~ SPL Quality Manager	Date

San Antonio River Authority – Regional Environmental Laboratory (SARA-REL)

Electronically Approved	8/22/2024	Electronically Approved	8/22/2024
Zachary Jendrusch	Date	Jeanette Hernandez	Date
SARA Laboratory Supervisor		SARA Laboratory Quality Assurance Officer	

Detail of Changes

Replaces section A3 on pages 12 and 13 of the FY 2024–2025 CRP QAPP:

A3 Distribution List

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Jeanette Hernandez, Laboratory Quality Assurance Officer
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The Guadalupe-Blanco River Authority (GBRA) will provide copies of this project plan and any amendments or appendices of this plan to each person on this list and to each sub-tier project participant, e.g., subcontractors, subparticipants, or other units of government. GBRA will document distribution of the plan and any amendments and appendices, maintain this documentation as part of the project's quality assurance records, and ensure the documentation is available for review.

Replaces section A4 on page 14–19 of the FY 2024–2025 CRP QAPP:

A4 PROJECT/TASK ORGANIZATION

Description of Responsibilities

TCEQ

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

Jason Natho
Acting CRP Lead Quality Assurance Specialist
Participates in the development, approval, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Assists program and project manager in developing and implementing quality system. Reviews and approves CRP QAPPs, QAPP amendments, and QAPP special appendices. Prepares and distributes annual audit plans. Conducts monitoring systems audits of Planning Agencies. Concurs with corrective actions. Conveys QA problems to appropriate management. Recommends that work be stopped in order to safeguard programmatic objectives, worker safety, public health, or environmental protection. Ensures maintenance of audit records for the CRP.

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

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

Scott Delgado
CRP Data Manager, DM&A Team
Responsible for coordination and tracking of CRP data sets from initial submittal through CRP Project Manager review and approval. Ensures that data are reported following instructions in the Data

Management Reference Guide, July 2019 or most current version (DMRG). Runs automated data validation checks in the Surface Water Quality Management Information System (SWQMIS) and coordinates data verification and error correction with CRP Project Managers. Generates SWQMIS summary reports to assist CRP Project Managers' data review. Identifies data anomalies and inconsistencies. Provides training and guidance to CRP and Planning Agencies on technical data issues to ensure that data are submitted according to documented procedures. Reviews QAPPs for valid stream monitoring stations. Checks validity of parameter codes, submitting entity code(s), collecting entity code(s), and monitoring type code(s). Develops and maintains data management-related SOPs for CRP data management. Coordinates and processes data correction requests. Participates in the development, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP).

Grant Bassett
CRP Project Quality Assurance Specialist
Serves as liaison between CRP management and TCEQ QA management. Participates in the development, approval, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Serves on planning team for CRP special projects. Reviews and approves CRP QAPPs in coordination with other CRP staff. Coordinates documentation and monitors implementation of corrective actions for the CRP.

Guadalupe-Blanco River Authority

Elizabeth Edgerton
Guadalupe-Blanco River Authority Project Manager
Responsible for implementing and monitoring CRP requirements in contracts, QAPPs, and QAPP amendments and appendices. Coordinates basin planning activities and work of basin partners. Ensures monitoring systems audits are conducted to ensure QAPPs are followed by basin planning agency participants and that projects are producing data of known quality. Ensures that subparticipants are qualified to perform contracted work. Ensures CRP project managers and/or QA Specialists are notified of deficiencies and corrective actions, and that issues are resolved. Responsible for validating that data collected are acceptable for reporting to TCEQ. The GBRA Quality Assurance Officer (QAO) will assist with completion of the job tasks of the GBRA Project Manager when delegated by the GBRA PM. The GBRA Project Manager will assist with completion of the job tasks of the GBRA Quality Assurance Officer, Data Manager, or Field Technician when requested by the primary GBRA QAO/DM/Field Technician.

Elizabeth Malloy
Guadalupe-Blanco River Authority Quality Assurance Officer
Responsible for coordinating the implementation of the QA program. Responsible for writing and maintaining the QAPP and monitoring its implementation. Responsible for maintaining records of QAPP distribution, including appendices and amendments. Responsible for maintaining written records of sub-tier commitment to requirements specified in this QAPP. Responsible for identifying, receiving, and maintaining project QA records. Responsible for coordinating with the TCEQ CRP PM to resolve QA-related issues. Notifies the GBRA Project Manager of particular circumstances which may adversely affect the quality of data. Coordinates and monitors deficiencies and corrective action. Coordinates and maintains records of data verification and validation. Coordinates the research and review of technical QA material and data related to water quality monitoring system design and analytical techniques. Conducts monitoring systems audits on project participants to determine compliance with project and program specifications, issues written reports, and follows through on findings. Ensures that field staff is properly trained and that training records are maintained. The GBRA Data Manager will assist with completion of the job tasks of the GBRA QAO when delegated by the GBRA Quality Assurance Officer.

Natalie Hickman ~~***Kristyn Armitage***~~
Guadalupe-Blanco River Authority Data Manager
Responsible for ensuring that field data are properly reviewed and verified. Responsible for the transfer of basin quality-assured water quality data to TCEQ in a format compatible with SWQMIS. Maintains quality-assured data on GBRA internet sites.

Natalie Hickman ~~***Kristyn Armitage***~~
Guadalupe-Blanco River Authority Field Technician
Performs field data collections for project as specified in Appendix A. Ensures that field staff are properly trained. Notifies the GBRA Laboratory Quality Assurance Officer of particular circumstances, which may adversely affect the quality of data. Assists with the preparation of quarterly progress reports to the TCEQ CRP Project Manager. Will assist with UGRA duties when requested.

Elizabeth Malloy
Guadalupe-Blanco River Authority Field Technician
Performs field data collections for project as specified in Appendix A. Ensures that field staff are properly trained. Notifies the GBRA Laboratory Quality Assurance Officer of particular circumstances, which may adversely affect the quality of data. Assists with the preparation of quarterly progress reports to the TCEQ CRP Project Manager. Will assist with UGRA duties when requested.

Elizabeth Malloy
Guadalupe-Blanco River Authority Backup Data Manager
Serves as a backup for the duties of the GBRA data manager (DM) when delegated by the primary DM. The backup data manager responsibilities include assisting with the review and verification of laboratory and field data for integrity, continuity, reasonableness and conformance to project requirements, and validation of data against the measurement performance specifications listed in this QAPP. Assisting with the transfer of basin quality-assured water quality data to the TCEQ in a format compatible with SWQMIS. Assisting with upload of quality-assured data to the GBRA internet sites. The GBRA Backup Data Manager will assist with completion of other job tasks defined in this QAPP as requested by the GBRA Project Manager (PM).

Lee Gudgell
Guadalupe-Blanco River Authority Backup Data Manager
Serves as a backup for the duties of the GBRA data manager (DM) when delegated by the primary DM. The backup data manager responsibilities include assisting with the review and verification of laboratory and field data for integrity, continuity, reasonableness and conformance to project requirements, and validation of data against the measurement performance specifications listed in this QAPP. Assisting with the transfer of basin quality-assured water quality data to the TCEQ in a format compatible with SWQMIS. Assisting with upload of quality-assured data to the GBRA internet sites. The GBRA Backup Data Manager will assist with completion of other job tasks defined in this QAPP as requested by the GBRA Project Manager (PM).

Kylie Gudgell
Guadalupe-Blanco River Authority Laboratory Quality Assurance Officer
Responsible for the overall quality control and quality assurance of analyses performed by the GBRA laboratory. Responsible for identifying, receiving, and maintaining project QA records. Notifies the GBRA Project Manager of particular circumstances that may adversely affect the quality of laboratory data. Coordinates and monitors deficiencies and corrective actions associated with laboratory data. Responsible for conducting or hiring an outside

party to conduct internal audits annually in compliance with NELAP requirements. The GBRA Laboratory Lead Analyst will assist with completion of the job tasks of the GBRA Laboratory QAO when requested by the GBRA Laboratory QAO. Ensures that laboratory personnel have adequate training and a thorough knowledge of this QAPP and related SOPs. Ensures that all laboratory data generated for this project has received a review and verification for integrity, continuity, reasonableness and conformance to project requirements.

Miliana Hernandez
Guadalupe-Blanco River Authority Laboratory Lead Analyst
Responsible for overall performance, administration, and reporting of analyses performed by GBRA Laboratory. Responsible for supervision of laboratory personnel involved in generating analytical data for the project. The responsibilities of the GBRA laboratory lead analyst include supervision of laboratory, purchasing of equipment, and supervision of lab safety program. Trains laboratory analysts to validate data against measurement performance specifications listed in this QAPP. The GBRA Laboratory QAO will assist with completion of the job tasks of the GBRA Laboratory Lead Analyst when delegated by the GBRA Laboratory Lead Analyst.

Guadalupe-Blanco River Authority Laboratory Analysts/Technicians
Perform laboratory analysis and assist in collection of field data for project as specified in Appendix A. Notifies the GBRA Laboratory Quality Assurance Officer of particular circumstances, which may adversely affect the quality of data. Performs sample custodial duties. Review and verify laboratory data for integrity, continuity, reasonableness and conformance to project requirements, and validates the lab data against the measurement performance specifications listed in this QAPP.

Upper Guadalupe River Authority

Shelby Taber
Upper Guadalupe River Authority Project Manager
Responsible for directing CRP activities in the upper Guadalupe River Basin, in Kerr County, and for one CRP monitoring station in Kendall County. Assures strict compliance with the CRP requirements for project administration and quality assurance. Responsible for coordinating and conducting sampling events, including maintenance of sampling bottles, supplies, and equipment. Maintains records of field data collection and observations. The GBRA Project Manager will assist with completion of the job tasks of the UGRA Project Manager when requested by the UGRA PM. The UGRA Field Technician will assist the UGRA PM with completion of job tasks when delegated.

Shelby Taber
Upper Guadalupe River Authority Quality Assurance Officer
Maintains operating procedures that comply with this QAPP, amendments and appendices. Provides requested information and documentation regarding UGRA monitoring and analysis of CRP data to the GBRA during scheduled monitoring system audits. Ensures that field staff are properly trained and that training records are maintained. Additionally, the UGRA QAO will review and verify all field and laboratory data for integrity and continuity, reasonableness and conformance to project requirements, validating the field and lab data in accordance with the measurement performance specifications listed in this QAPP. The GBRA QAO will assist with completion of the job tasks of the UGRA QAO when requested by the UGRA PM.

Shelby Taber
Upper Guadalupe River Authority Data Manager

Responsible for ensuring that field and lab data are properly reviewed and verified. Responsible for the transfer of basin quality-assured water quality data to the TCEQ in a format compatible with the DMRG. Maintains link from the water monitoring section of the UGRA web page to the CRP Data Tool web page. The GBRA Data Manager will assist with completion of the job tasks of the UGRA Data Manager when requested by the UGRA PM

Travis Linscomb
Upper Guadalupe River Authority Field Technician
Performs field data collections for project as specified in Appendix A. Assists the UGRA QAO in ensuring that field staff are properly trained and that training records are maintained. Notifies the UGRA Quality Assurance Officer of particular circumstances, which may adversely affect the quality of data. Calibrates and maintains UGRA field instrumentation. Transfers CRP laboratory and field data to an electronic format for review, verification, and validation by the UGRA QAO. The UGRA Project Manager will assist with completion of the job tasks of the UGRA Field Technician when requested by the UGRA Field Technician.

Travis Linscomb
Upper Guadalupe River Authority Backup Data Manager
Serves as a backup for the duties of the UGRA data manager (DM) when delegated by the primary DM. The backup data manager responsibilities include assisting with the review and verification of laboratory and field data for integrity, continuity, reasonableness and conformance to project requirements, and validation of data against the measurement performance specifications listed in this QAPP. Assisting with the transfer of basin quality-assured water quality data to the TCEQ in a format compatible with SWQMIS. The UGRA Backup Data Manager will assist with completion of other job tasks defined in this QAPP as requested by the UGRA Project Manager (PM).

Tara Bushnoe
Upper Guadalupe River Authority Backup Data Manager
Serves as a backup for the duties of the UGRA data manager (DM) when delegated by the primary DM. The backup data manager responsibilities include assisting with the review and verification of laboratory and field data for integrity, continuity, reasonableness and conformance to project requirements, and validation of data against the measurement performance specifications listed in this QAPP. Assisting with the transfer of basin quality-assured water quality data to the TCEQ in a format compatible with SWQMIS. The UGRA Backup Data Manager will assist with completion of other job tasks defined in this QAPP as requested by the UGRA Project Manager (PM).

Nicole Shepherd
Upper Guadalupe River Authority Laboratory Manager and Laboratory Quality Assurance Officer
Responsible for overall performance, administration, quality control, quality assurance, and reporting of analyses performed by UGRA Laboratory. Responsible for supervision of laboratory personnel involved in generating analytical data for the project. Responsible for maintaining quality assurance manual for laboratory operations, maintaining project QA records, and supervision of lab safety program. Ensures that laboratory personnel have adequate training and a thorough knowledge of this QAPP and related SOPs. The lab manager will review and validate all laboratory data for integrity and continuity, reasonableness and conformance to project requirements in accordance with the measurement performance specifications listed in this QAPP. Notifies the UGRA Quality Assurance Officer of particular circumstances, which may adversely affect the quality of data. Coordinates and monitors deficiencies and corrective actions associated with laboratory data. Responsible for conducting or hiring an outside party to conduct internal audits annually in compliance with NELAP requirements.

Upper Guadalupe River Authority Laboratory Analysts and Sample Receipt Clerks
Perform laboratory analyses for this project as specified in Appendix A. Notifies the UGRA Laboratory Manager of particular circumstances, which may adversely affect the quality of data. Performs sample custodial duties at time of sample receipt, enters sample information in UGRA LIMS.

Meadows Center for Water and the Environment

Jenna Walker
Meadows Center for Water and the Environment Project Manager
Responsible for directing CRP activities for MCWE. Assures strict compliance with the CRP requirements for project administration and quality assurance.

Nicky Vermeersch ~~***Sandra Arismendez***~~
Meadows Center for Water and the Environment Quality Assurance Officer and Field Technician
Responsible for coordinating and conducting sampling events, including maintenance of sampling bottles, supplies, and equipment. Maintains operating procedures that comply with this QAPP. Maintains records of field data collection and observations. Responsible for ensuring that data for the MCWE are properly reviewed and verified. Provides information and documentation for partner monitoring systems audits by the GBRA. Responsible for the transfer of MCWE CRP field data to the GBRA Project Manager. Ensures that field staff is properly trained and that training records are maintained.

The Watershed Association

David Baker
The Watershed Association Project Manager
Responsible for directing CRP activities for the Watershed Association. Assures strict compliance with the CRP requirements for project administration and quality assurance.

Nicky Vermeersch ~~***Sandra Arismendez***~~
The Watershed Association Quality Assurance Officer and Field Technician
Responsible for coordinating and conducting sampling events, including maintenance of sampling bottles, supplies, and equipment. Maintains operating procedures that comply with this QAPP. Maintains records of field data collection and observations. Responsible for ensuring that data for the WA are properly reviewed and verified. Provides information and documentation for partner monitoring systems audits by the GBRA. Responsible for the transfer of WA CRP field data to the GBRA Project Manager. Ensures that field staff is properly trained and that training records are maintained.

SPL, Inc – Kilgore Corporation Environmental Laboratory

William Peery
SPL Laboratory Technical Director
The responsibilities of the lab director include supervision of laboratory, purchasing of equipment, and supervision of lab safety program. The SPL, Inc – Kilgore lab director will review and verify all laboratory data for integrity and continuity, reasonableness and conformance to project requirements, and then validates against the measurement performance specifications listed in this QAPP.

Kathryn Elliott ~~Tracy Varvel~~
SPL Laboratory Quality Manager
Maintains quality assurance manual for laboratory operations, maintains operating procedures that are in compliance with this QAPP, amendments and appendices. Conducts in-house audits to ensure compliance with written SOPs, NELAP requirements and to identify potential problems. Responsible for the overall quality control and quality assurance of analyses performed by SPL laboratories. Reviews and verifies all laboratory data for integrity and continuity, reasonableness and conformance to project requirements, and then validates against the measurement performance specifications listed in this QAPP.

San Antonio River Authority – Regional Environmental Laboratory

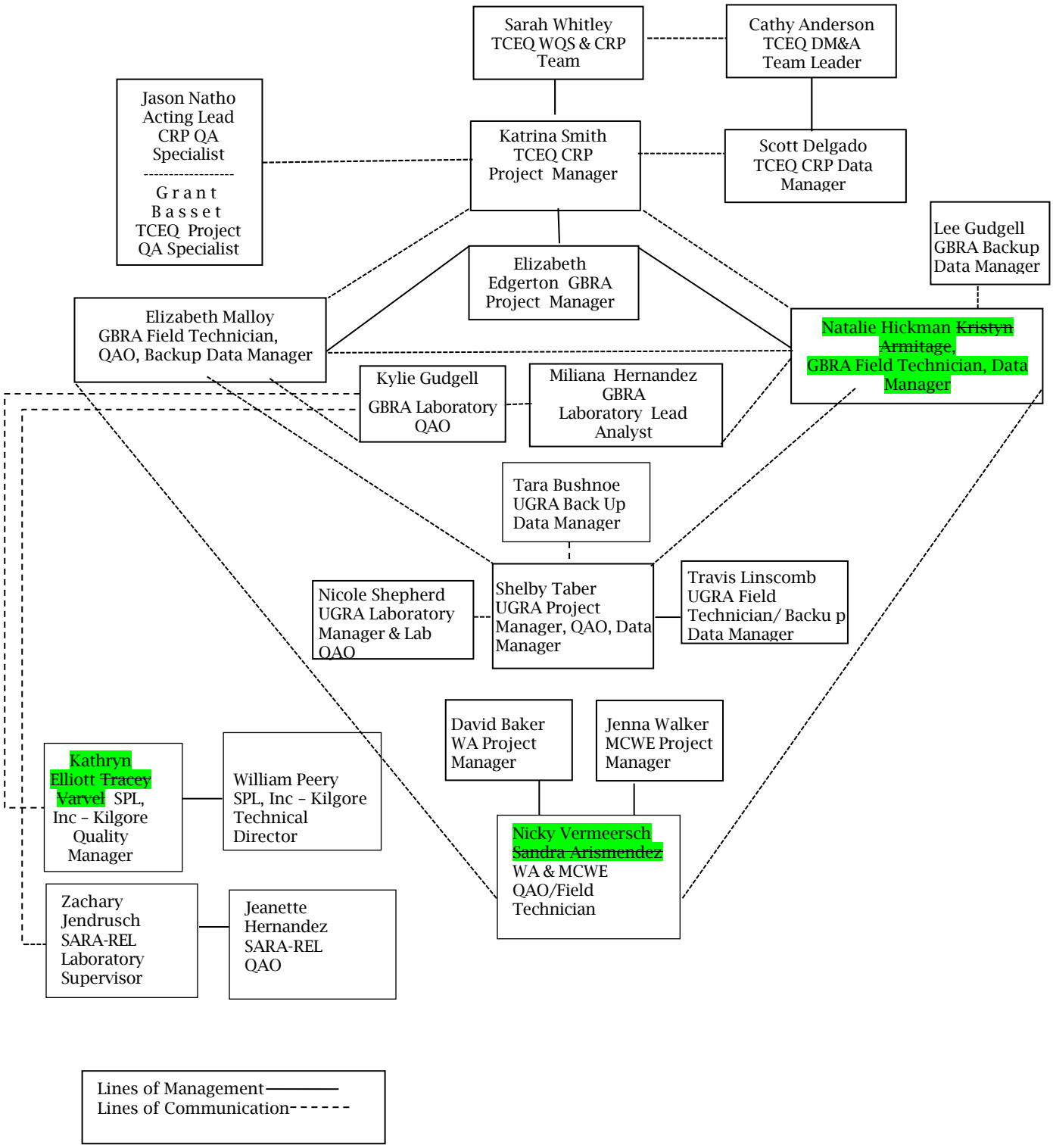
Zachary Jendrusch
San Antonio River Authority Laboratory Supervisor
Responsible for overall performance, administration, and reporting of analyses performed by SARA's Laboratory. Responsible for supervision of laboratory personnel involved in generating analytical data for the project. Ensures that laboratory personnel have adequate training and a thorough knowledge of this QAPP and related SOPs. Responsible for oversight of all laboratory operations ensuring that all QA/QC requirements are met, documentation is complete and adequately maintained, and results are reported accurately. Additionally, the lab director ensures that all laboratory data is reviewed and verified for integrity and continuity, reasonableness and conformance to project requirements, and then validated against the data quality objectives listed in Appendix A of this QAPP.

Jeanette Hernandez
San Antonio River Authority Laboratory Quality Assurance Officer
Maintains quality assurance manual for laboratory operations, maintains operating procedures that are in compliance with this QAPP, amendments and appendices. Conducts in-house audits to ensure compliance with written SOPs, NELAP requirements and to identify potential problems. Responsible for the overall quality control and quality assurance of analyses performed by SARA-REL. Reviews and verifies all laboratory data for integrity and continuity, reasonableness and conformance to project requirements, and then validates against the measurement performance specifications listed in this QAPP.

Replaces Figure A4.1 on page 20 of the FY 2024–2025 CRP QAPP:

Project Organization Chart

Figure A4.1. Organization Chart – Lines of Communication



Replaces specific text from page 23 of the FY 2024–2025 CRP QAPP:

A7 Quality Objectives and Criteria

Ambient Water Reporting Limits (AWRLs)

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

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

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

- The laboratory's LOQ for each analyte must be set at or below the AWRL.
- Once the LOQ is established in the QAPP, that is the reporting limit for that parameter until such time as the laboratory amends the QAPP and lists an updated LOQ.
- The laboratory must demonstrate its ability to quantitate at its LOQ for each analyte by running an LOQ check sample for each analytical batch of CRP samples analyzed.
- ~~When reporting data, no results~~ Under reasonable circumstances (e.g., the use of a subcontracted lab), data may be reported above or below the LOQ stated in this QAPP, so long as the LOQ remains at or below the AWRL stated in this QAPP.
- Measurement performance specifications for LOQ check samples are found in Appendix A.

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

Replaces specific text from pages 38–39 of the FY 2024–2025 CRP QAPP:

B5 Quality Control

Quality Control or Acceptability Requirements, Deficiencies, and Corrective Actions

Sampling QC excursions are evaluated by the GBRA or UGRA Project Manager, in consultation with the GBRA or UGRA QAO. The GBRA QAO ~~Project Manager~~ evaluates QC excursions for WA and MCWE~~as well.~~ In that differences in sample results are used to assess the entire sampling process, including environmental variability, the arbitrary rejection of results based on pre-determined limits is not practical. Therefore, the professional judgment of the GBRA or UGRA Project Manager and QAO will be relied upon in evaluating results.

Laboratory measurement quality control failures are evaluated by the laboratory staff. The disposition of such failures and the nature and disposition of the failure is reported to the Laboratory QAO. The Laboratory QAO will discuss the failure with the GBRA or UGRA Project Manager. If applicable, the GBRA or UGRA Project Manager will include this information in a CAP and submit with the Progress Report which is sent to the TCEQ CRP Project Manager.

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

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

Replaces section on pages 59–85 of the FY24–25 CRP QAPP

Appendix A: Measurement Performance Specifications (Table A7.1a–4d)

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

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

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

- analytical methodologies
- AWRLs
- limits of quantitation
- bias limits for LCSs
- precision limits for LCSDs
- completeness goals
- qualitative statements regarding representativeness and comparability

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

Table A7.1-4 reflects actual parameters, methods, etc. employed by the GBRA and its participants. Procedures for laboratory analysis are in accordance with the most recently published edition of Standard Methods for the Examination of Water and Wastewater, 40 CFR 136, or otherwise approved independently. Only data collected that have a valid TCEQ parameter code assigned in Table A7.1-4 are stored in SWQMIS. Any parameters listed in Table A7.1-4 that do not have a valid TCEQ parameter code assigned will not be stored in SWQMIS.

Table A7.1-3 - Measurement Performance Specifications

TABLE A7.1a Measurement Performance Specifications for GBRA					
Field Parameters					
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	GBRA Field
TRANSPARENCY, SECCHI DISC (METERS)	meters	water	TCEQ SOP V1	00078	GBRA Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)	us/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	GBRA Field
OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	GBRA Field
PH (STANDARD UNITS)	s.u	water	EPA 150.1 and TCEQ SOP V1	00400	GBRA Field
SALINITY - PARTS PER THOUSAND ***	PPT	water	SM 2520 and TCEQ SOP V1	00480	GBRA Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	GBRA Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE*	meters	water	TCEQ SOP V2	82903	GBRA Field
RESERVOIR STAGE (FEET ABOVE MEAN SEA LEVEL)**	FT ABOVE MSL	water	TWDB	00052	GBRA Field
RESERVOIR PERCENT FULL**	% RESERVOIR CAPACITY	water	TWDB	00053	GBRA Field

RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING	NS	other	TCEQ Drought Guidance	00051	GBRA Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)*	meters	other	TCEQ SOP V2	89864	GBRA Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)*	meters	other	TCEQ SOP V2	89865	GBRA Field
POOL LENGTH, METERS*	meters	other	TCEQ SOP V2	89869	GBRA Field
% POOL COVERAGE IN 500 METER REACH*	%	other	TCEQ SOP V2	89870	GBRA Field

*To be routinely reported when collecting data from perennial pools.
**As published by the Texas Water Development Board on their website https://www.waterdatafortexas.org/reservoirs/statewide
***Salinity only collected at tidally influenced stations

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA- 600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.1b Measurement Performance Specifications for GBRA

Flow Parameters

Parameter	Units	Matrix	Method	Parameter Code	Lab
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	GBRA Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	GBRA Field
STREAM FLOW ESTIMATE (CFS)	cfs	Water	TCEQ SOP V1	74069	GBRA Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	GBRA Field

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.1c Measurement Performance Specifications for GBRA										
Conventional Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540D	00530	5	1**	NA	NA	NA	GBRA, SPL, SARA-REL***
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610	0.1	0.1	70–130	20	80–120	GBRA and SPL ***
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM4500 NH3D	00610	0.1	0.1	70–130	20	80–120	SARA-REL***
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.05	70–130	20	80–120	GBRA, SPL, SARA-REL***
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00615	0.05	0.05	70–130	20	80–120	GBRA, SPL, SARA-REL ***
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2 Rev. 2 (1993)	00625	0.2	0.2	70–130	20	80–120	GBRA, SPL, SARA-REL ***
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.3	00665	0.06	0.02	70–130	20	80–120	GBRA, SPL, ,SARA-REL ***
HARDNESS, TOTAL (MG/L AS CACO3)*	mg/L	water	SM 2340 C	00900	5	5	NA	20	80–120	GBRA, SPL, SARA-REL ***
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	1	70–130	20	80–120	GBRA and SPL ***
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	5	70–130	20	80–120	SARA-REL***

SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	1	70–130	20	80–120	GBRA and SPL ***
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	5	70–130	20	80–120	SARA-REL***
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	ug/L	water	SM 10200-H4	32211	3	1	NA	20	80–120	GBRA***
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	ug/L	water	SM 10200-H	32211	3	1	NA	20	80–120	SARA-REL***
CHLOROPHYLL-A, FLUOROMETRIC METHOD, UG/L	µg/L	water	EPA 445.0	70953	3	1	NA	20	80–120	SPL ***
PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH.	µg/L	water	SM 10200-H4	32218	3	1	NA	NA	NA	GBRA***
PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH.	µg/L	water	SM 10200-H	32218	3	1	NA	NA	NA	SARA-REL***
PHEOPHYTIN-A UG/L FLUOROMETRIC METHOD	µg/L	water	EPA 445	32213	3	1	NA	NA	NA	SPL ***
TURBIDITY,LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	SM 2130B	82079	0.5	0.5	NA	NA	NA	GBRA and SPL ***
TURBIDITY,LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	EPA 180.1	82079	0.5	0.5	NA	NA	NA	SARA-REL***

*Hardness is not used for regulatory purposes but is used to assess metals in water at inland sites (estuarine sites do not require hardness analysis).
**TSS LOQ is based on the volume of sample used.
*** SPL or SARA-REL will be used in the event of an equipment failure and the need to meet holding times.

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.1d Measurement Performance Specifications for GBRA										
Bacteriological Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Log Difference of Duplicates	Bias %Rec. of LCS	Lab
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	IDEXX Laboratories Colilert®-18**	31699	1	1	NA	0.50*	NA	GBRA ***
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-IDEXX**	31699	1	1	NA	0.50*	NA	SPL, SARA-REL***
E.COLI, COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	GBRA, SPL, SARA-REL***

* This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B5.
** *E. coli* samples analyzed by these methods should always be processed as soon as possible and within 8 hours. When transport conditions necessitate delays in delivery longer than 6 hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.
*** SPL or SARA-REL Laboratories will be used in the event of an equipment failure and the need to meet holding times.

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.1e Measurement Performance Specifications for GBRA					
24 Hour Parameters in Water					
Parameter	Units	Matrix	Method	Parameter Code	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE), 24HR AVG	DEG C	Water	TCEQ SOP V1	00209	GBRA field
WATER TEMPERATURE, DEGREES CENTIGRADE, 24HR MAX	DEG C	Water	TCEQ SOP V1	00210	GBRA field
TEMPERATURE, WATER (DEGREES CENTIGRADE) 24HR MIN	DEG C	Water	TCEQ SOP V1	00211	GBRA field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR AVG	uS/cm	Water	TCEQ SOP V1	00212	GBRA field

SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MAX	uS/cm	Water	TCEQ SOP V1	00213	GBRA field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MIN	uS/cm	Water	TCEQ SOP V1	00214	GBRA field
PH, S.U., 24HR MAXIMUM VALUE	std. units	Water	TCEQ SOP V1	00215	GBRA field
PH, S.U., 24HR, MINIMUM VALUE	std. units	Water	TCEQ SOP V1	00216	GBRA field
SALINITY, 24-HR, MAXIMUM, PPT	ppt	Water	TCEQ SOP V1	00217	GBRA field
SALINITY, 24-HR, AVERAGE, PPT	ppt	Water	TCEQ SOP V1	00218	GBRA field
SALINITY, 24-HR, MINIMUM, PPT	ppt	Water	TCEQ SOP V1	00219	GBRA field
SALINITY, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00220	GBRA field
WATER TEMPERATURE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00221	GBRA field
SPECIFIC CONDUCTANCE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00222	GBRA field
pH, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00223	GBRA field
DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89855	GBRA field
DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89856	GBRA field
DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89857	GBRA field
DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	89858	GBRA field

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.1f Measurement Performance Specifications for GBRA					
Biological - Habitat					
Parameter	Units	Matrix	Method	Parameter Code	Lab
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	Water	TCEQ SOP V2	00061	GBRA
BIOLOGICAL DATA	NS	Other	NA/Calculation	89888	GBRA
STREAM TYPE; 1=PERENNIAL 2=INTERMITTENT S/PERENNIAL POOLS 3=INTERMITTENT 4=UNKNOWN	NU	Water	NA/Calculation	89821	GBRA
STREAMBED SLOPE (M/KM)	M/KM	Other	NA/Calculation	72051	GBRA
AVERAGE PERCENTAGE INSTREAM COVER	%	Other	TCEQ SOP V2	84159	GBRA
STREAM ORDER	NU	Water	TCEQ SOP V2	84161	GBRA
NUMBER OF LATERAL TRANSECTS MADE	NU	Other	TCEQ SOP V2	89832	GBRA
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	Other	TCEQ SOP V2	89835	GBRA
TOTAL NUMBER OF STREAM BENDS	NU	Other	TCEQ SOP V2	89839	GBRA
NUMBER OF WELL DEFINED STREAM BENDS	NU	Other	TCEQ SOP V2	89840	GBRA
NUMBER OF MODERATELY DEFINED STREAM BENDS	NU	Other	TCEQ SOP V2	89841	GBRA
NUMBER OF POORLY DEFINED STREAM BENDS	NU	Other	TCEQ SOP V2	89842	GBRA
TOTAL NUMBER OF RIFFLES	NU	Other	TCEQ SOP V2	89843	GBRA
DOMINANT SUBSTRATE TYPE(1=CLAY, 2=SILT, 3=SAND, 4=GRAVEL, 5=COBBLE, 6=BOULDER, 7=BEDROCK, 8=OTHER)	NU	Sediment	TCEQ SOP V2	89844	GBRA
AVERAGE PERCENT OF SUBSTRATE GRAVEL SIZE OR LARGER	%	Other	TCEQ SOP V2	89845	GBRA
AVERAGE STREAM BANK EROSION (%)	%	Other	TCEQ SOP V2	89846	GBRA
AVERAGE STREAM BANK SLOPE (DEGREES)	deg	Other	TCEQ SOP V2	89847	GBRA
HABITAT FLOW STATUS, 1=NO FLOW, 2=LOW,3=MOD,4=HIGH	NU	Other	TCEQ SOP V2	89848	GBRA
AVERAGE PERCENT TREES AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89849	GBRA
AVERAGE PERCENT SHRUBS AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89850	GBRA
AVERAGE PERCENT GRASS AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89851	GBRA

AVERAGE PERCENT CULTIVATED FIELDS AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89852	GBRA
AVERAGE PERCENT OTHER AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89853	GBRA
AVERAGE PERCENTAGE OF TREE CANOPY COVERAGE	%	Other	TCEQ SOP V2	89854	GBRA
DRAINAGE AREA ABOVE MOST DOWNSTREAM TRANSECT*	km2	Other	TCEQ SOP V2	89859	GBRA
REACH LENGTH OF STREAM EVALUATED (M)	m	Other	NA/Calculation	89884	GBRA
AVERAGE STREAM WIDTH (METERS)	M	Other	TCEQ SOP V2	89861	GBRA
AVERAGE STREAM DEPTH (METERS)	M	Other	TCEQ SOP V2	89862	GBRA
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)	M	Other	TCEQ SOP V2	89864	GBRA
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)	M	Other	TCEQ SOP V2	89865	GBRA
AVERAGE WIDTH OF NATURAL RIPARIAN VEGETATION (M)	M	Other	TCEQ SOP V2	89866	GBRA
AVERAGE WIDTH OF NATURAL RIPARIAN BUFFER ON LEFT BANK (M)	M	Other	NA/Calculation	89872	GBRA
AVERAGE WIDTH OF NATURAL RIPARIAN BUFFER ON RIGHT BANK (M)	m	Other	NA/Calculation	89873	GBRA
AESTHETICS OF REACH(1=WILD 2=NAT. 3=COMM. 4=OFF.)	NU	Other	TCEQ SOP V2	89867	GBRA
NUMBER OF STREAM COVER TYPES	NU	Other	TCEQ SOP V2	89929	GBRA
LAND DEVELOP IMPACT (1=UNIMP,2=LOW,3=MOD,4=HIGH)	NU	Other	TCEQ SOP V2	89962	GBRA
RIPARIAN VEGETATION %; LEFT BANK - TREES	%	Other	NA/Calculation	89822	GBRA
RIPARIAN VEGETATION %; RIGHT BANK - TREES	%	Other	NA/Calculation	89823	GBRA
RIPARIAN VEGETATION %; LEFT BANK SHRUBS	%	Other	NA/Calculation	89824	GBRA
RIPARIAN VEGETATION %; RIGHT BANK - SHRUBS	%	Other	NA/Calculation	89825	GBRA
RIPARIAN VEGETATION %: LEFT BANK - GRASSES OR FORBS	%	Other	NA/Calculation	89826	GBRA
RIPARIAN VEGETATION %; RIGHT BANK - GRASSES OR FORBS	%	Other	NA/Calculation	89827	GBRA
RIPARIAN VEGETATION %: LEFT BANK - CULTIVATED FIELDS	%	Other	NA/Calculation	89828	GBRA
RIPARIAN VEGETATION %: RIGHT BANK - CULTIVATED FIELDS	%	Other	NA/Calculation	89829	GBRA
RIPARIAN VEGETATION %: LEFT BANK - OTHER	%	Other	NA/Calculation	89830	GBRA

RIPARIAN VEGETATION %: RIGHT BANK - OTHER	%	Other	NA/Calculation	89871	GBRA
AVAILABLE INSTREAM COVER HQI SCORE: 4=ABUNDANT 3=COMMON 2=RARE 1=ABSENT	NU	Other	NA/Calculation	89874	GBRA
BOTTOM SUBSTRATE STABILITY HQI SCORE: 4=STABLE 3=MODERATELY STABLE 2=MODERATELY UNSTABLE 1=UNSTABLE	NU	Other	NA/Calculation	89875	GBRA
NUMBER OF RIFFLES HQI SCORE: 4=ABUNDANT 3=COMMON 2=RARE 1=ABSENT	NS	Other	NA/Calculation	89876	GBRA
DIMENSIONS OF LARGEST POOL HQI SCORE: 4=LARGE 3=MODERATE 2=SMALL 1=ABSENT	NU	Other	NA/Calculation	89877	GBRA
CHANNEL FLOW STATUS HQI SCORE: 3=HIGH 2=MODERATE 1=LOW 0=NO FLOW	NU	Other	NA/Calculation	89878	GBRA
BANK STABILITY HQI SCORE: 3=STABLE 2=MODERATELY STABLE 1=MODERATELY UNSTABLE 0=UNSTABLE	NU	Other	NA/Calculation	89879	GBRA
CHANNEL SINUOSITY HQI SCORE: 3=HIGH 2=MODERATE 1=LOW 0=NONE	NU	Other	NA/Calculation	89880	GBRA
RIPARIAN BUFFER VEGETATION HQI SCORE: 3=EXTENSIVE 2=WIDE 1=MODERATE 0=NARROW	NU	Other	NA/Calculation	89881	GBRA
AESTHETICS OF REACH HQI SCORE: 3=WILDERNESS 2=NATURAL AREA 1=COMMON SETTING 0=OFFENSIVE	NU	Other	NA/Calculation	89882	GBRA
HQI TOTAL SCORE	NU	Other	NA/Calculation	89883	GBRA
LENGTH OF STREAM EVALUATED (KM)	KM	Other	NA/Calculation	89860	GBRA
STREAMBED SLOPE (FT/FT)	FT/FT	Other	NA/Calculation	72052	GBRA
NO FLOW ISOLATED POOL: LARGEST POOL MAX WIDTH (M	M	Other	NA/Calculation	89908	GBRA
NO FLOW ISOLATED POOL: LARGEST POOL MAX LENGTH (	M	Other	NA/Calculation	89909	GBRA
NO FLOW ISOLATED POOL: LARGEST POOL MAX DEPTH (M	M	Other	NA/Calculation	89910	GBRA
NO FLOW ISOLATED POOL: SMALLEST POOL MAX DEPTH (	M	Other	NA/Calculation	89911	GBRA
NO FLOW ISOLATED POOL: SMALLEST POOL MAX WIDTH (	M	Other	NA/Calculation	89912	GBRA
NO FLOW ISOLATED POOL: SMALLEST POOL MAX LENGTH	M	Other	NA/Calculation	89913	GBRA
NO FLOW ISOLATED POOLS: NUMBER OF POOLS EVALUATED	NU	Other	NA/Calculation	89914	GBRA

* From USGS map.

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA- 600/4-79-020
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.1g Measurement Performance Specifications for GBRA

Biological - Benthics (Qualitative)

Parameter	Units	Matrix	Method	Parameter Code	Lab
STREAM ORDER	NU	Water	TCEQ SOP, V1	84161	GBRA
BIOLOGICAL DATA	NS	Other	NA/Calculation	89888	GBRA
RAPID BIOASSESSMENT PROTOCOLS REGIONAL BENTHIC MACROINVERTEBRATE IBI SCORE	NS	Other	NA/Calculation	90082	GBRA
BENTHIC DATA REPORTING UNITS (1=NUMBER OF INDIVIDUALS IN SUB-SAMPLE, 2=NUMBER OF INDIVIDUALS/FT2, 3=NUMBER OF INDIVIDUALS/M2, 4=TOTAL NUMBER OF INDIVIDUALS IN SAMPLE)	NU	Other	TCEQ SOP V2	89899	GBRA
DIP NET EFFORT,AREA SWEPT (SQ.METER)	m2	Other	TCEQ SOP V2	89902	GBRA
KICKNET EFFORT,AREA KICKED (SQ.METER)	m2	Other	TCEQ SOP V2	89903	GBRA
KICKNET EFFORT,MINUTES KICKED (MIN.)	min.	Other	TCEQ SOP V2	89904	GBRA
DEBRIS/SHORELINE SAMPLING EFFORT, MINUTES	min.	Other	TCEQ SOP V2	89905	GBRA
NUMBER OF INDIVIDUALS IN BENTHIC SAMPLE	NU	Other	TCEQ SOP V2	89906	GBRA
UNDERCUT BANK AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89921	GBRA
OVERHANGING BRUSH AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89922	GBRA
GRAVEL BOTTOM AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89923	GBRA
SAND BOTTOM AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89924	GBRA
SOFT BOTTOM AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89925	GBRA
MACROPHYTE BED AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89926	GBRA

SNAGS AND BRUSH AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89927	GBRA
BEDROCK STREAMBED AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89928	GBRA
PETERSEN SAMPLER EFFORT, AREA SAMPLED (SQ. MTR.)	m2	Other	TCEQ SOP V2	89934	GBRA
EKMAN SAMPLER EFFORT, AREA SAMPLED (SQ.METER)	m2	Other	TCEQ SOP V2	89935	GBRA
MESH SIZE, ANY NET OR SIEVE, AVERAGE BAR (CM)	cm	Other	TCEQ SOP V2	89946	GBRA
BENTHIC SAMPLE COLLECTION METHOD (1=SURBER, 2=EKMAN, 3=KICKNET, 4=PETERSON, 5=HESTER DENDY, 6=SNAG, 7=HESS)	NU	Other	TCEQ SOP V2	89950	GBRA
ECOREGION LEVEL III (TEXAS ECOREGION CODE)	NU	Other	TCEQ SOP V1	89961	GBRA
BENTHOS ORGANISMS -NONE PRESENT (0=NONE PRESENT)	NS	Other	TCEQ SOP V2	90005	GBRA
HILSENHOFF BIOTIC INDEX (HBI)	NU	Other	TCEQ SOP V2	90007	GBRA
NUMBER OF EPT INDEX	NU	Other	TCEQ SOP V2	90008	GBRA
DOMINANT BENTHIC FUNCTIONAL FEEDING GRP, % OF INDIVIDUALS	%	Other	TCEQ SOP V2	90010	GBRA
BENTHIC GATHERERS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90025	GBRA
BENTHIC PREDATORS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90036	GBRA
DOMINANT TAXON, BENTHOS PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90042	GBRA
RATIO OF INTOLERANT TO TOLERANT TAXA, BENTHOS	NU	Other	TCEQ SOP V2	90050	GBRA
NUMBER OF NON-INSECT TAXA	NU	Other	TCEQ SOP V2	90052	GBRA
ELMIDAE, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90054	GBRA
TOTAL TAXA RICHNESS, BENTHOS	NU	Other	TCEQ SOP V2	90055	GBRA
CHIRONOMIDAE, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90062	GBRA
PERCENT OF TOTAL TRICHOPTERA INDIVIDUALS AS HYDROPSYCHIDAE	%	Other	TCEQ SOP V2	90069	GBRA
PERCENT EPHEMEROPTERA	%	Other	TCEQ SOP V2	91818	GBRA
PERCENT DIPTERA AND NON-INSECT TAXA	%	Other	TCEQ SOP V2	91814	GBRA
TOLERANT BENTHOS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90066	GBRA

NUMBER OF EPHEMEROPTERA TAXA	%	Other	TCEQ SOP V2	90057	GBRA
TOTAL NUMBER OF INTOLERANT TAXA, BENTHOS	%	Other	TCEQ SOP V2	90058	GBRA
BENTHIC SCRAPERS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	91815	GBRA
TOTAL # OF BENTHIC GENERA IN SAMPLE	NU	Other	TCEQ SOP V2	90011	GBRA
BENTHIC SHREDDERS (% OF COMMUNITY)	%	Other	TCEQ SOP V2	90035	GBRA
HESS SAMPLER EFFORT, AREA SAMPLED (SQ. METER)	m2	Other	TCEQ SOP V2	89956	GBRA

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020 American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415). TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.1h Measurement Performance Specifications for GBRA

Biological - Nekton

Parameter	Units	Matrix	Method	Parameter Code	Lab
STREAM ORDER	NU	Water	TCEQ SOP V1	84161	GBRA
NEKTON TEXAS REGIONAL IBI SCORE	NS	Other	NA/Calculation	98123	GBRA
BIOLOGICAL DATA	NS	Other	NA/Calculation	89888	GBRA
SEINE, MINIMUM MESH SIZE, AVERAGE BAR, NEKTON,IN	IN	Other	TCEQ SOP V2	89930	GBRA
SEINE, MAXIMUM MESH SIZE, AVG BAR, NEKTON,INCH	IN	Other	TCEQ SOP V2	89931	GBRA
NET LENGTH (METERS)	M	Other	TCEQ SOP V2	89941	GBRA
ELECTROFISHING METHOD 1=BOAT 2=BACKPACK 3=TOTEBARGE	NU	Other	TCEQ SOP V2	89943	GBRA
ELECTROFISH EFFORT, DURATION OF SHOCKING (SEC)	SEC	Other	TCEQ SOP V2	89944	GBRA
SEINING EFFORT (# OF SEINE HAULS)	NU	Other	TCEQ SOP V2	89947	GBRA

COMBINED LENGTH OF SEINE HAULS (METERS)	M	Other	TCEQ SOP V2	89948	GBRA
SEINING EFFORT, DURATION (MINUTES)	MIN	Other	TCEQ SOP V2	89949	GBRA
ECOREGION LEVEL III (TEXAS ECOREGION CODE)	NU	Other	TCEQ SOP V1	89961	GBRA
AREA SEINED (SQ METERS)	M2	Other	TCEQ SOP V2	89976	GBRA
NUMBER OF SPECIES, FISH	NU	Other	TCEQ SOP V2	98003	GBRA
NEKTON ORGANISMS-NONE PRESENT (0=NONE PRESENT)	NS	Other	TCEQ SOP V2	98005	GBRA
TOTAL NUMBER OF SUNFISH SPECIES	NU	Other	TCEQ SOP V2	98008	GBRA
TOTAL NUMBER OF INTOLERANT SPECIES, FISH	NU	Other	TCEQ SOP V2	98010	GBRA
PERCENT OF INDIVIDUALS AS OMNIVORES, FISH	%	Other	TCEQ SOP V2	98017	GBRA
PERCENT OF INDIVIDUALS AS INVERTIVORES, FISH	%	Other	TCEQ SOP V2	98021	GBRA
PERCENT OF INDIVIDUALS AS PISCIVORES, FISH	%	Other	TCEQ SOP V2	98022	GBRA
PERCENT OF INDIVIDUALS WITH DISEASE OR ANOMALY	%	Other	TCEQ SOP V2	98030	GBRA
TOTAL NUMBER OF NATIVE CYPRINID SPECIES	NU	Other	TCEQ SOP V2	98032	GBRA
PERCENT INDIVIDUALS AS NON-NATIVE FISH SPECIES (% OF COMMUNITY)	%	Other	TCEQ SOP V2	98033	GBRA
TOTAL NUMBER OF INDIVIDUALS SEINING	NU	Other	TCEQ SOP V2	98039	GBRA
TOTAL NUMBER OF INDIVIDUALS ELECTROFISHING	NU	Other	TCEQ SOP V2	98040	GBRA
TOTAL NUMBER OF BENTHIC INVERTIVORE SPECIES	NU	Other	TCEQ SOP V2	98052	GBRA
NUMBER OF INDIVIDUALS PER SEINE HAUL	NU	Other	TCEQ SOP V2	98062	GBRA
NUMBER OF INDIVIDUALS PER MINUTE ELECTROFISHING	NU	Other	TCEQ SOP V2	98069	GBRA
PERCENT INDIVIDUALS AS TOLERANT FISH SPECIES (EXCLUDING WESTERN MOSQUITOFISH)	%	Other	TCEQ SOP V2	98070	GBRA
TOTAL NUMBER OF INDIVIDUALS IN SAMPLE, FISH	NU	Other	TCEQ SOP V2	98023	GBRA
PERCENT OF INDIVIDUALS AS INVERTIVORES, FISH	%	Other	TCEQ SOP V2	98021	GBRA
PERCENT OF INDIVIDUALS AS TOLERANTS, FISH	%	Other	TCEQ SOP V2	98016	GBRA

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415). TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.2a Measurement Performance Specifications for UGRA

Field Parameters

Parameter	Units	Matrix	Method	Parameter Code	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	UGRA Field
TRANSPARENCY, SECCHI DISC (METERS)	meters	water	TCEQ SOP V1	00078	UGRA Field
SPECIFIC CONDUCTANCE,FIELD (US/CM @ 25C)	us/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	UGRA Field
OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	UGRA Field
PH (STANDARD UNITS)	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400	UGRA Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	UGRA Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE*	meters	water	TCEQ SOP V2	82903	UGRA Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)*	meters	other	TCEQ SOP V2	89864	UGRA Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)*	meters	other	TCEQ SOP V2	89865	UGRA Field
POOL LENGTH, METERS*	meters	other	TCEQ SOP V2	89869	UGRA Field
% POOL COVERAGE IN 500 METER REACH*	%	other	TCEQ SOP V2	89870	UGRA Field

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

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.2b Measurement Performance Specifications for UGRA

Flow Parameters

Parameter	Units	Matrix	Method	Parameter Code	Lab
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	UGRA Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	UGRA Field
STREAM FLOW ESTIMATE (CFS)	cfs	Water	TCEQ SOP V1	74069	UGRA Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	UGRA Field

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.2c Measurement Performance Specifications for UGRA										
Conventional Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540D	00530	5	1*	NA	NA	NA	UGRA, GBRA, and SPL, and SARA-REL**
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	Water	SM 4500-NH3 D	00610	0.1	0.1	70–130	20	80–120	UGRA and SARA-REL**
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610	0.1	0.1	70–130	20	80–120	GBRA and SPL **
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.04	70–130	20	80–120	UGRA**
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.05	70–130	20	80–120	GBRA, SPL, SARA-REL**
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2 Rev. 2 (1993)	00625	0.2	0.2	70–130	20	80–120	GBRA, SPL, SARA-REL**
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	SM 4500-P E.	00665	0.06	0.05	70–130	20	80–120	UGRA**
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.3	00665	0.06	0.02	70–130	20	80–120	GBRA, SPL , SARA-REL**
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	0.2	70–130	20	80–120	UGRA**
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	1	70–130	20	80–120	GBRA, SPL **
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	5	70–130	20	80–120	SARA-REL**
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	0.2	70–130	20	80–120	UGRA**

SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	1	70–130	20	80–120	GBRA, SPL **
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	5	70–130	20	80–120	SARA-REL**
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	ug/L	water	SM 10200-H4	32211	3	1	NA	20	80–120	GBRA***
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	ug/L	water	SM 10200- H	32211	3	1	NA	20	80–120	SARA-REL***
CHLOROPHYLL-A, FLUOROMETRIC METHOD, UG/L	µg/L	water	EPA 445.0	70953	3	1	NA	20	80–120	SPL ***
PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH.	µg/L	water	SM 10200- H4	32218	3	1	NA	NA	NA	GBRA***
PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH.	µg/L	water	SM 10200- H	32218	3	1	NA	NA	NA	SARA-REL***
PHEOPHYTIN-A UG/L FLUOROMETRIC METHOD	µg/L	Water	EPA 445	32213	3	1	NA	NA	NA	SPL ***
TURBIDITY,LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	SM 2130B	82079	0.5	0.5	NA	NA	NA	UGRA, GBRA, SPL **
TURBIDITY,LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	EPA 180.1	82079	0.5	0.5	NA	NA	NA	SARA-REL**

*TSS LOQ is based on the volume of sample used.
**GBRA, SPL, or SARA-REL will be used in the event of an equipment failure and the need to meet holding times.
***SARA-REL Laboratory or SPL will be used in the event of an equipment failure and the need to meet holding times.

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.2d Measurement Performance Specifications for UGRA

Bacteriological Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Log Difference of Duplicates	Bias %Rec. of LCS	Lab
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	IDEXX Laboratories Colilert®-18**	31699	1	1	NA	0.50*	NA	GBRA***

E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-B**	31699	1	1	NA	0.50*	NA	UGRA, SPL, SARA-REL ***
E.COLI, COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	UGRA, GBRA, SPL, SARA-REL ***

* This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B5.
** *E.coli* samples analyzed by these methods should always be processed as soon as possible and within 8 hours. When transport conditions necessitate delays in delivery longer than 6 hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.
***GBRA Laboratory, SPL, or SARA-REL will be used in the event of an equipment failure and the need to meet holding times.

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.2e Measurement Performance Specifications for UGRA

24 Hour Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE), 24HR AVG	DEG C	Water	TCEQ SOP V1	00209	UGRA field
WATER TEMPERATURE, DEGREES CENTIGRADE, 24HR MAX	DEG C	Water	TCEQ SOP V1	00210	UGRA field
TEMPERATURE, WATER (DEGREES CENTIGRADE) 24HR MIN	DEG C	Water	TCEQ SOP V1	00211	UGRA field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR AVG	uS/cm	Water	TCEQ SOP V1	00212	UGRA field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MAX	uS/cm	Water	TCEQ SOP V1	00213	UGRA field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MIN	uS/cm	Water	TCEQ SOP V1	00214	UGRA field
PH, S.U., 24HR MAXIMUM VALUE	std. units	Water	TCEQ SOP V1	00215	UGRA field
PH, S.U., 24HR, MINIMUM VALUE	std. units	Water	TCEQ SOP V1	00216	UGRA field
WATER TEMPERATURE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00221	UGRA field
SPECIFIC CONDUCTANCE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00222	UGRA field
pH, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00223	UGRA field
DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89855	UGRA field

DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89856	UGRA field
DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89857	UGRA field
DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	89858	UGRA field

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.3a Measurement Performance Specifications for MCWE

Field Parameters

Parameter	Units	Matrix	Method	Parameter Code	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	WA/MCWE Field
TRANSPARENCY, SECCHI DISC (METERS)	meters	water	TCEQ SOP V1	00078	WA/MCWE Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)	us/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	WA/MCWE Field
OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	WA/MCWE Field
PH (STANDARD UNITS)	s.u	water	EPA 150.1 and TCEQ SOP V1	00400	WA/MCWE Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	WA/MCWE Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	WA/MCWE Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)*	meters	other	TCEQ SOP V2	89864	WA/MCWE Field
	meters	other	TCEQ SOP V2	89865	WA/MCWE Field

MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)*					
POOL LENGTH, METERS*	meters	other	TCEQ SOP V2	89869	WA/MCWE Field
% POOL COVERAGE IN 500 METER REACH*	%	other	TCEQ SOP V2	89870	WA/MCWE Field

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

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.3b Measurement Performance Specifications for MCWE

Flow Parameters

Parameter	Units	Matrix	Method	Parameter Code	Lab
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	WA/MCWE Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	WA/MCWE Field
STREAM FLOW ESTIMATE (CFS)	cfs	Water	TCEQ SOP V1	74069	WA/MCWE Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	WA/MCWE Field

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard
Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.3c Measurement Performance Specifications for MCWE

Conventional Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540D	00530	5	1*	NA	NA	NA	GBRA, SPL, SARA-REL**
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610	0.1	0.1	70–130	20	80–120	GBRA and SPL **
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM 4500 NH3D	00610	0.1	0.1	70–130	20	80–120	SARA-REL **
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.05	70–130	20	80–120	GBRA, SPL, and SARA-REL **
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.3	00665	0.06	0.02	70–130	20	80–120	GBRA, SPL, SARA-REL **

*TSS LOQ is based on the volume of sample used.
** SPL or SARA-REL will be used in the event of an equipment failure and the need to meet holding times.

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.3d Measurement Performance Specifications for MCWE

Bacteriological Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Log Difference of Duplicates	Bias %Rec. of LCS	Lab
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-IDEXX**	31699	1	1	NA	0.50*	NA	SPL, SARA-REL***

E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	IDEXX Laboratories Colilert®-18**	31699	1	1	NA	0.50*	NA	GBRA ***
E.COLI, COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	GBRA, SPL, and SARA-REL***

* This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B5.
** *E.coli* samples analyzed by these methods should always be processed as soon as possible and within 8 hours. When transport conditions necessitate delays in delivery longer than 6 hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.
*** SPL or SARA-REL will be used in the event of an equipment failure and the need to meet holding times.

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.3e Measurement Performance Specifications for MCWE

24 Hour Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE), 24HR AVG	DEG C	Water	TCEQ SOP V1	00209	MCWE field
WATER TEMPERATURE, DEGREES CENTIGRADE, 24HR MAX	DEG C	Water	TCEQ SOP V1	00210	MCWE field
TEMPERATURE, WATER (DEGREES CENTIGRADE) 24HR MIN	DEG C	Water	TCEQ SOP V1	00211	MCWE field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR AVG	uS/cm	Water	TCEQ SOP V1	00212	MCWE field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MAX	uS/cm	Water	TCEQ SOP V1	00213	MCWE field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MIN	uS/cm	Water	TCEQ SOP V1	00214	MCWE field

PH, S.U., 24HR MAXIMUM VALUE	std. units	Water	TCEQ SOP V1	00215	MCWE field
PH, S.U., 24HR, MINIMUM VALUE	std. units	Water	TCEQ SOP V1	00216	MCWE field
WATER TEMPERATURE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00221	MCWE field
SPECIFIC CONDUCTANCE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00222	MCWE field
pH, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00223	MCWE field
DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89855	MCWE field
DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89856	MCWE field
DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89857	MCWE field
DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24- HRS	NU	Water	TCEQ SOP V1	89858	MCWE field

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA- 600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.4a Measurement Performance Specifications for WA

Field Parameters

Parameter	Units	Matrix	Method	Parameter Code	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	WA/MCWE Field

TRANSPARENCY, SECCHI DISC (METERS)	meters	water	TCEQ SOP V1	00078	WA/MCWE Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)	us/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	WA/MCWE Field
OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	WA/MCWE Field
PH (STANDARD UNITS)	s.u	water	EPA 150.1 and TCEQ SOP V1	00400	WA/MCWE Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	WA/MCWE Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	WA/MCWE Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)*	meters	other	TCEQ SOP V2	89864	WA/MCWE Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)*	meters	other	TCEQ SOP V2	89865	WA/MCWE Field
POOL LENGTH, METERS*	meters	other	TCEQ SOP V2	89869	WA/MCWE Field
% POOL COVERAGE IN 500 METER REACH*	%	other	TCEQ SOP V2	89870	WA/MCWE Field

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

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.4b Measurement Performance Specifications for WA

Flow Parameters

Parameter	Units	Matrix	Method	Parameter Code	Lab
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	WA/MCWE Field

FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	WA/MCWE Field
STREAM FLOW ESTIMATE (CFS)	cfs	Water	TCEQ SOP V1	74069	WA/MCWE Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	WA/MCWE Field

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard
Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.4c Measurement Performance Specifications for WA

Conventional Parameters in Water

Parameter	Units	Matrix		Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540D	00530	5	1*	NA	NA	NA	GBRA, SPL, SARA-REL**
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610	0.1	0.1	70–130	20	80–120	GBRA and SPL **
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM 4500 NH3D	00610	0.1	0.1	70–130	20	80–120	SARA-REL **
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.05	70–130	20	80–120	GBRA, SPL, SARA-REL**
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2 Rev. 2 (1993)	00625	0.2	0.2	70–130	20	80–120	GBRA, SPL, SARA-REL **

PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.3	00665	0.06	0.02	70–130	20	80–120	GBRA, SPL, SARA-REL**

*TSS LOQ is based on the volume of sample used.
** SPL or SARA-REL will be used in the event of an equipment failure and the need to meet holding times.

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415). TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.4d Measurement Performance Specifications for WA

Bacteriological Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Log Difference of Duplicates	Bias %Rec. of LCS	Lab
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-IDEXX **	31699	1	1	NA	0.50*	NA	SPL, SARA-REL ***
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	IDEXX Laboratories Colilert ®-18**	31699	1	1	NA	0.50*	NA	GBRA ***
E. COLI, COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	GBRA, SPL, SARA-REL ***

* This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B5.
** *E.coli* samples analyzed by these methods should always be processed as soon as possible and within 8 hours. When transport conditions necessitate delays in delivery longer than 6 hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.
*** SPL or SARA-REL will be used in the event of an equipment failure and the need to meet holding times.

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

Replaces sections on pages 87–98 of the FY 2024–2025 CRP QAPP:

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

Sample Design Rationale FY 2025

The sample design is based on the legislative intent of CRP. Under the legislation, the Basin Planning Agencies have been tasked with providing data to characterize water quality conditions in support of the Texas Water Quality Integrated Report, and to identify significant long-term water quality trends. Based on Steering Committee input, achievable water quality objectives and priorities and the identification of water quality issues are used to develop work plans which are in accord with available resources. As part of the Steering Committee process, GBRA coordinates closely with TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed. Although the Guadalupe River basin has overall good water quality, impacts from urbanization, agricultural runoff, and other factors may degrade water quality. Comprehensive water quality monitoring is therefore critical for identifying water quality problems and monitoring known issues. In addition, water quality monitoring is more critical than ever as this river basin experiences rapid population growth.

The following changes have been proposed to the monitoring schedule for FY2025. These changes have come about because of concerns or requests of steering committee members or monitoring entities at the annual Guadalupe River Basin Coordinated Monitoring Meeting.

1. GBRA to remove aquatic monitoring event at station 18665 (Big Joshua Creek 430 meters downstream of IH 10 4.8 kilometers Northwest of Nelson City) on segment 1806H in FY25.
2. GBRA to remove aquatic monitoring event and associated UGRA 24-hr DO at station 12682 (North Fork Guadalupe at river gaging station near Camp Waldemar) on segment 1817 in FY25.
3. GBRA to remove aquatic monitoring event at station 15399 (Honey Creek Approximately 1.2 km upstream of confluence with Guadalupe River at unimproved road crossing) on segment 1806I in FY25.
4. GBRA will conduct aquatic life monitoring at station 12678 (Johnson Creek at SH 39 in Ingram) on segment 1816. This will consist of Aquatic Habitat, Benthic, Nekton, Field and Flow monitoring at a frequency of two times per year in FY25. In addition, UGRA will collect 24 hour DO during these events.
5. GBRA to remove aquatic monitoring event and associated UGRA 24-hr DO monitoring at station 12685(South Fork Guadalupe Adjacent to Camp Arrowhead) on segment 1818 in FY25.
6. TCEQ will begin sampling station 17528 (Blanco River Upstream of River Run and Pany Drive) on a quarterly basis. WA will reduce sampling at this station to cover the other 8 months of the year.

Site Selection Criteria

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

1. Locate stream sites so that samples can be safely collected from the centroid of flow. Centroid is defined as the midpoint of that portion of stream width which contains 50 percent of the total

flow. If multiple potential sites on a stream segment are appropriate for monitoring, choose one that would best represent the water body, and not a site that displays unusual conditions or contaminant source(s). Avoid backwater areas or eddies when selecting a stream site.

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

Monitoring Sites for FY 2025

Table B1.1 Sample Design and Schedule, FY 2025

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
GUADALUPE RIVER AT LOWER GUADALUPE DIVERSION DAM AND SALT WATER BARRIER	12578	1802	14	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimon
GUADALUPE RIVER AT FM 447 WEST OF NURSERY AND UPSTREAM OF SOUTH TEXAS ELECTRIC	12590	1803	14	GB	GB	RT									4			4	4		4	
GUADALUPE RIVER AT OLD SAN ANTONIO ROAD/FM766 WEST OF CUERO	12592	1803	14	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimon
GUADALUPE RIVER AT US 183 IN HOCHHEIM IN DEWITT COUNTY	20470	1803	14	GB	GB	RT									4			4	4		4	
ELM CREEK ON LAZY F RANCH 515 METERS UPSTREAM OF OLD US 87 BRIDGE	17894	1803A	14	GB	GB	RT									4			4	4		4	Routine Monitoring Added in FY20 to Confirm DO Impairment
SANDIES CREEK 100 FT DOWNSTREAM OF COUNTY HIGHWAY 1.9 MI UPSTREAM FROM BIRDS CREEK 2.0 MI NE OF WESTHOFF	13657	1803B	14	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimon;
PEACH CREEK AT GONZALES CR 353 14.0KM EAST OF GONZALES	14937	1803C	14	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimon
GUADALUPE RIVER 200 METERS DOWNSTREAM OF H-4 DAM AT LAKE GONZALES	21736	1804	14	GB	GB	RT									4			4	4		4	Station added in FY16

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
GUADALUPE RIVER AT FM 1117 RIVER CROSSING 2.1 MILES SOUTH OF SH 90A 5.2 MILES EAST OF SEGUIN	17134	1804	13	GB	GB	RT									4			4	4		4	Dropped by TCEQ R in FY16
GUADALUPE RIVER IMMEDIATELY DOWNSTREAM OF H-5 DAM AT WOOD LAKE SW OF GONZALES TX	15110	1804	14	GB	GB	RT									4			4	4		4	
LAKE DUNLAP-GUADALUPE RIVER NORTH BANK AT ACS PLACE AT MID POINT OF LONE STAR DRIVE	12596	1804	13	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimon
WEST BANK OF LAKE MCQUEENEY AT LAKE BREEZE SKI LODGE BOAT RAMP 1.20 KILOMETERS UPSTREAM OF FM 78	22189	1804	13	GB	GB	RT									12			12	12		12	Replaced Station 15149 in FY20 - NH3 and TKN will be done bimon
GERONIMO CREEK AT HABERLE ROAD/CR 1103 MILES SOUTH OF GERONIMO	12576	1804A	13	GB	GB	RT									12			12	12		12	ecoregion reference site NH3 and TKN will be done bimonthly
CANYON LAKE SOUTH OF JACOBS CREEK PARK 500 YARDS EAST OF PENINSULA	12598	1805	13	GB	GB	RT									12			12			12	NH3 and TKN will be done bimon

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
GUADALUPE RIVER 20 METERS UPSTREAM OF FM 1376 AND 2.5 KILOMETERS SOUTH OF SISTERDALE	22082	1806	13	GB	GB	RT									4			4	4		4	Quarterly Routine Station Added in FY19 Due to Elevated E. coli Concentrations Downstream at Station 17404.
GUADALUPE RIVER AT FM 474 AT AMMANS CROSSING NE OF BOERNE	17404	1806	13	GB	GB	RT									4			4	4		4	
GUADALUPE RIVER AT FOOTBRIDGE IN LOUISE HAYS PARK APPROX 100M UPSTREAM OF SH16	16244	1806	13	GB	UG	RT												12			12	
GUADALUPE RIVER AT G STREET/FORMERLY OLD MEDINA RD IN KERRVILLE SEGMENT KM 177.9	12616	1806	13	GB	UG	RT									4			4	4		4	VSS removed from conventional in FY22
GUADALUPE RIVER AT HERMANN SONS RD ADJACENT TO HERMANN SONS HOME WEST OF COMFORT	12605	1806	13	GB	UG	RT									4			4	4		4	VSS removed from conventional in FY22
GUADALUPE RIVER AT KERRVILLE STATE PARK SEGMENT KM 174.4	12615	1806	13	GB	UG	RT									4			12	12		12	VSS removed from conventional in FY22

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
GUADALUPE RIVER AT LOUISE HAYS PARK DAM APPROX 50M DOWNSTREAM OF SH16	16243	1806	13	GB	UG	RT												12			12	
GUADALUPE RIVER AT RIVERVIEW RD IN INGRAM TX	15111	1806	13	GB	UG	RT									4			4	4		4	VSS removed from conventional in FY22
GUADALUPE RIVER AT RR 311 1.9 MI SE OF SPRING BRANCH 7.5 MI DOWNSTREAM FROM CURRY CREEK	13700	1806	13	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimon
GUADALUPE RIVER AT SAN ANTONIO RD/FM1621 IN WARING	12602	1806	13	GB	UG	RT									4			4	4		4	VSS removed from conventional in FY22
GUADALUPE RIVER AT SH 16 IN KERRVILLE	12617	1806	13	GB	UG	RT												12			12	
GUADALUPE RIVER AT SPLIT ROCK RD OFF SH 27 2.6 KM DOWNSTREAM OF FLATROCK DAM	15113	1806	13	GB	UG	RT									4			4	4		4	VSS removed from conventional in FY22. NH3 added in FY22
GUADALUPE RIVER AT UGRA LAKE DAM	12618	1806	13	GB	UG	RT									4			4	4		4	VSS removed from conventional in FY22
GUADALUPE RIVER CENTER POINT LAKE	12608	1806	13	GB	UG	RT									4			4	4		4	VSS removed from conventionals in FY22

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
HONEY CREEK APPROXIMATELY 1.2 KM UPSTREAM OF CONFLUENCE WITH GUADALUPE RIVER AT UNIMPROVED ROAD CROSSING	15399	1806	13	GB	GB	RT									4			4	4		4	Routine Quarterly Monitoring Added for FY21
~~HONEY CREEK APPROXIMATELY 1.2 KM UPSTREAM OF CONFLUENCE WITH GUADALUPE RIVER AT UNIMPROVED ROAD CROSSING~~	~~15399~~	~~1806~~	~~13~~	~~GB~~	~~GB~~	~~BS~~	~~1~~	~~1~~	~~1~~	~~1~~									~~1~~		~~1~~	~~ALM to be performed in FY24 only if unable to complete in FY23~~
CAMP MEETING CREEK 0.1 KM UPSTREAM CONFLUENCE WITH GUADALUPE IN KERRVILLE	12546	1806A	13	GB	UG	RT									4			12	12		12	Monthly bacteria, flow, field added in FY22 VSS removed from conventional in FY22
QUINLAN CREEK AT TRAVIS STREET IN KERRVILLE	12541	1806D	13	GB	UG	RT												12	12		12	
TOWN CREEK AT HAMILTON STREET IN KERRVILLE	12549	1806E	13	GB	UG	RT												12	12		12	
~~BIG JOSHUA CREEK AT IH 10~~	~~18665~~	~~1806H~~	~~13~~	~~GB~~	~~GB~~	~~BS~~	~~2~~	~~2~~	~~2~~	~~2~~					~~2~~				~~2~~		~~2~~	~~ALM added for FY24~~

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
COLETO CREEK RESERVOIR AT MID POINT OF DAM ON COLETO CREEK PARK ROAD	20827	1807	14	GB	GB	RT									12			12			12	depth profiles will be completed quarterly; nh3 and tkn bimonthly
LOWER SAN MARCOS RIVER AT SH 80 SOUTH OF LULING	12626	1808	11	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimon
SAN MARCOS RIVER AT US90A 3.3KM WEST OF INTERSECTION OF US90A AND US183 IN GONZALES 7KM UPSTREAM OF CONFL. WITH GUADALUPE RIVER	16578	1808	14	GB	GB	RT									4			4	4		4	
PLUM CREEK AT CR 202 SE OF LOCKHART	12647	1810	11	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimon
PLUM CREEK AT OLD WOODEN BRIDGE ON CALDWELL CR 135 SE OF LULING	12640	1810	11	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimon
PLUM CREEK AT PLUM CREEK ROAD NORTH OF UHLAND	17406	1810	11	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimon
COMAL RIVER AT LANDA PARK AREA 16 2.45 MI UPSTREAM FROM CONFLUENCE WITH GUADALUPE RIVER IN NEW BRAUNFELS	15082	1811	13	GB	GB	RT									12			12	12		12	TKN and NH3 done bimonthly
COMAL RIVER DOWNSTREAM CLEMONS DAM IN NEW BRAUNFELS	12653	1811	13	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimon

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
DRY COMAL CREEK AT MISSOURI-KANSAS-TEXAS RAILROAD CROSSING IN NEW BRAUNFELS	12570	1811A	13	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimon
GUADALUPE RIVER AT RIVER RD 2ND CROSSING UPSTREAM OF NEW BRAUNFELS	12658	1812	13	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimon
GUADALUPE RIVER AT THE BEGINNING OF CYPRESS BEND PARK IN NEW BRAUNFELS	12656	1812	13	GB	GB	RT									4			4	4		4	
BLANCO RIVER AT BLANCO STATE PARK PR 23	12669	1813	11	GB	WV	RT									8			8	8		8	conventionals-Total P, NO3-N, NH3-N, TSS &; TKN
BLANCO RIVER IMMEDIATELY UPSTREAM OF RIVER RUN AND PANY DR 0.3 MI EAST OF RR 1623 AT HINES BRANCH IN BLANCO	17528	1813	11	GB	WV	RT									8 ~~12~~			8 ~~12~~	8 ~~12~~		8 ~~12~~	conventionals-Total P, NO3-N, NH3-N, TSS &; TKN. WV to sample during months when FO does not complete quarterly sampling
BLANCO RIVER AT BRIDGE ON SH 12 AT WIMBERLEY	12661	1813	11	GB	WV	RT									4			4	4		4	conventionals-Total P, NO3-N, NH3-N, TSS &; TKN

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
BLANCO RIVER AT FM 165 1/2 MILE EAST OF BLANCO	12668	1813	11	GB	WV	RT									8			8	8		8	conventionals-Total P, NO3-N, NH3-N, TSS &; TKN. Not collecting chlorophyll-a.
BLANCO RIVER AT LOW WATER CROSSING AT CR 174/FULTON RANCH RD	12660	1813	11	GB	WV	RT									4			4	4		4	conventionals-Total P, NO3-N, NH3-N, TSS, & TKN
BLANCO RIVER AT LOW WATER CROSSING CR1492 AT PIONEER TOWN	12663	1813	11	GB	WV	RT									4			4	4		4	conventionals-Total P, NO3-N, NH3-N, TSS
BLANCO RIVER AT PLEASANT VALLEY CROSSING ON FISHER STORE RD	12665	1813	11	GB	WV	RT									4			4	4		4	conventionals-Total P, NO3-N, NH3-N, TSS
UPPER SAN MARCOS RIVER IMMEDIATELY UPSTREAM OF IH 35 BRIDGE AT SAN MARCOS	12672	1814	11	GB	GB	RT									4			4	4		4	
CYPRESS CREEK AT CAMP YOUNG JUDAEA 830 METERS DOWNSTREAM OF JACOBS WELLS ROAD IN THE CITY OF WOODCREEK IN HAYS COUNTY	22109	1815	11	GB	TI	RT									4			4	4		4	Conventionals-Total P, NO3-N, NH3-N, TSS
CYPRESS CREEK AT CONFLUENCE WITH THE BLANCO RIVER	12673	1815	11	GB	TI	BS	2												2			24 Hour DO & Streamflow CRP Monitoring

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
CYPRESS CREEK AT CONFLUENCE WITH THE BLANCO RIVER	12673	1815	11	GB	TI	RT									4			4	4		4	Conventionals-Total P, NO3-N, NH3-N, TSS
CYPRESS CREEK AT DOWNSTREAM END IN BLUE HOLE CAMPGROUND	12675	1815	11	GB	TI	BS	2												2			24 Hour DO & Streamflow CRP Monitoring
CYPRESS CREEK AT DOWNSTREAM END IN BLUE HOLE CAMPGROUND	12675	1815	11	GB	TI	RT									4			4	4		4	Conventionals-Total P, NO3-N, NH3-N, TSS
CYPRESS CREEK AT FM 12 AT WIMBERLEY	12674	1815	11	GB	GB	RT									4			4	4		4	
CYPRESS CREEK AT JACOBS WELL SPRING APPROXIMATELY 670 METERS UPSTREAM OF HAYS CR 220/JACOBS WELL ROAD NORTH OF WIMBERLEY CAMS 0745	12677	1815	11	GB	TI	RT									4			4	4		4	Conventionals-Total P, NO3-N, NH3-N, TSS
CYPRESS CREEK AT RR 12 1 MILE NORTH OF WIMBERLEY	12676	1815	11	GB	TI	RT									4			4	4		4	Conventionals-Total P, NO3-N, NH3-N, TSS
CYPRESS CREEK AT WOODCREEK DRIVE DAM IN HAYS COUNTY	22110	1815	11	GB	TI	RT									4			4	4		4	Conventionals-Total P, NO3-N, NH3-N, TSS

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
JOHNSON CREEK AT SH 39 IN INGRAM	12678	1816	13	GB	UG	RT									4			4	4		4	VSS removed from conventional in FY22
JOHNSON CREEK AT SH 39 IN INGRAM	12678	1816	13	GB	GB	BS		2	2	2									2		2	ALM added for FY25
JOHNSON CREEK AT SH 39 IN INGRAM	12678	1816	13	GB	UG	BS	2															24 hr DO in support of GBRA ALM Event
NORTH FORK GUADALUPE AT RIVER GAGING STATION NEAR CAMP WALDEMAR	12682	1817	13	GB	UG	RT									4			4	4		4	NH3 removed FY24
~~NORTH FORK GUADALUPE AT RIVER GAGING STATION NEAR CAMP WALDEMAR~~	~~12682~~	~~1817~~	~~13~~	~~GB~~	~~GB~~	~~BS~~		~~2~~	~~2~~	~~2~~									~~2~~		~~2~~	~~ALM added for FY24~~
~~NORTH FORK GUADALUPE AT RIVER GAGING STATION NEAR CAMP WALDEMAR~~	~~12682~~	~~1817~~	~~13~~	~~GB~~	~~UG~~	~~BS~~	~~2~~															~~24 hr DO in support of GBRA ALM Event~~
~~SOUTH FORK GUADALUPE ADJACENT TO CAMP ARROWHEAD~~	~~12685~~	~~1818~~	~~13~~	~~GB~~	~~UG~~	~~BS~~	~~1~~															~~24hr monitoring connected with ALM will be performed in FY24 only if unable to complete in FY23~~

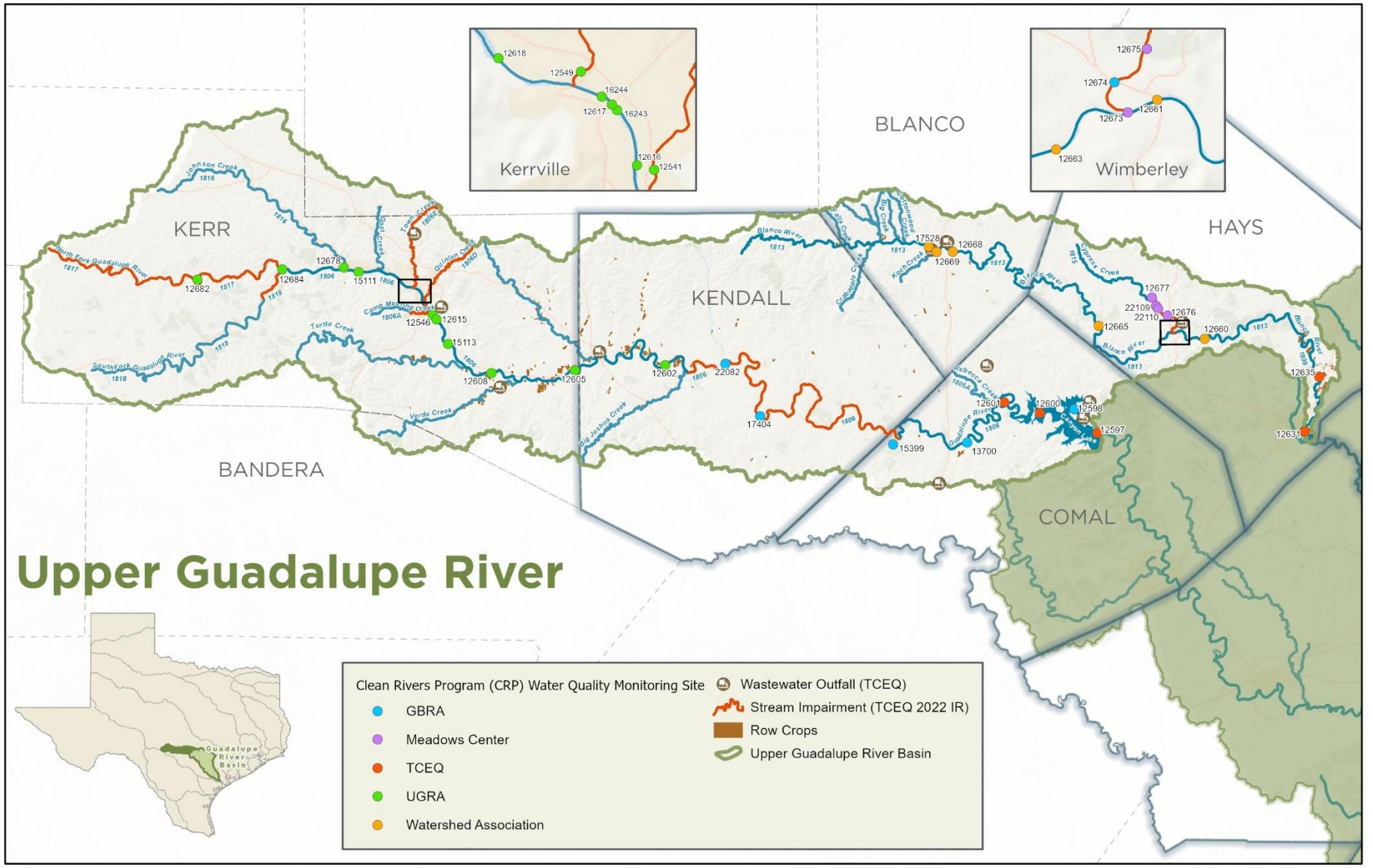
Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Water	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
~~SOUTH FORK GUADALUPE ADJACENT TO CAMP ARROWHEAD~~	~~12685~~	~~1818~~	~~13~~	~~GB~~	~~GB~~	~~BS~~		~~1~~	~~1~~	~~1~~									~~1~~		~~1~~	~~ALM to be performed in FY24 only if unable to complete in FY23~~
SOUTH FORK GUADALUPE ADJACENT TO HUNT LIONS PARK	12684	1818	13	GB	UG	RT									4			4	4		4	NH3 added for FY24/25
SAN ANTONIO RIVER FM 2506 EAST OF FANNIN	12790	1901	14	GB	GB	RT									12			12	12		12	NH3 and TKN will be done bimonthly

Replaces section on pages 99–100 of the FY 2024–2025 CRP QAPP:

Appendix C: Station Location Maps

Station Location Maps

Maps of stations monitored by GBRA are provided below. The maps were generated by GBRA. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact the Project Manager at 830-379-5822.


Upper Guadalupe River
KERR
BANDERA
KENDALL
BLANCO
HAYS
COMAL
Kerrville
Wimberley
Clean Rivers Program (CRP) Water Quality Monitoring Site
GBRA
Meadows Center
TCEQ
UGRA
Watershed Association
Wastewater Outfall (TCEQ)
Stream Impairment (TCEQ 2022 IR)
Row Crops
Upper Guadalupe River Basin
Guadalupe River Basin