

Quality Assurance Project Plan Rio Grande Basin Monitoring Program USIBWC Clean Rivers Program

***4191 N. Mesa St.
El Paso, Texas 79902***

Clean Rivers Program

Water Quality Planning Division

Texas Commission on Environmental Quality

P.O. Box 13087, MC 234

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Effective Period: FY 2020 to FY 2021

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A1 Approval Page

Texas Commission on Environmental Quality Water Quality Planning Division



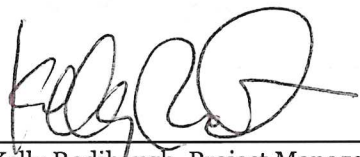
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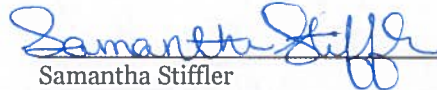
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Commission (USIBWC), Environmental Management Division**



Leslie Grijalva
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Samantha Stiffler
USIBWC CRP Quality Assurance Officer

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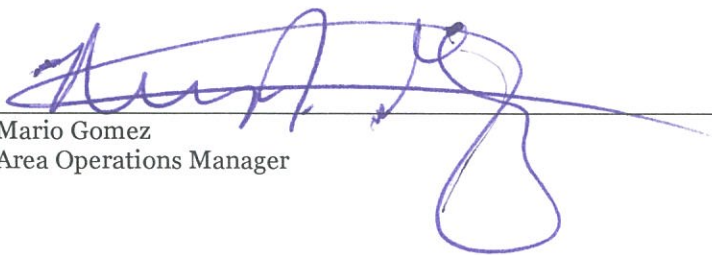
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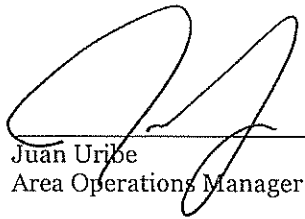
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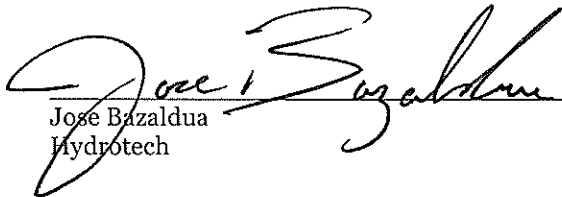
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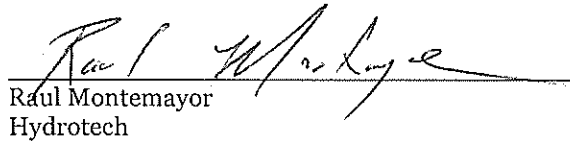
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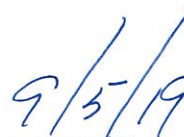
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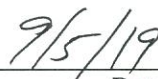
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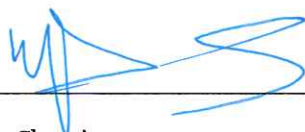
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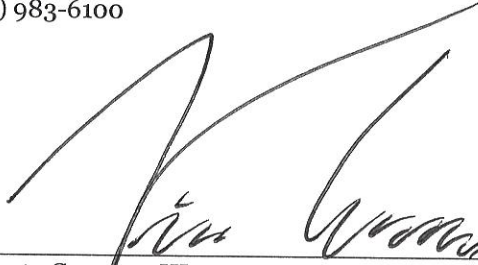
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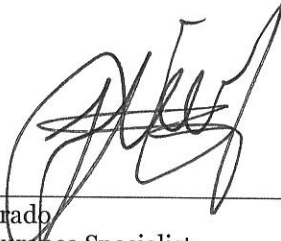
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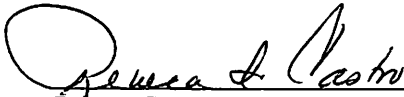


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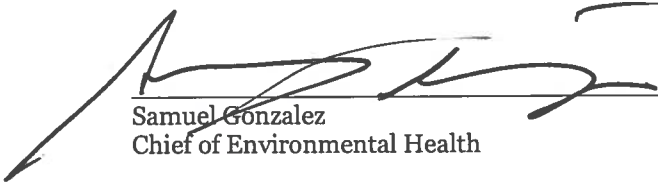
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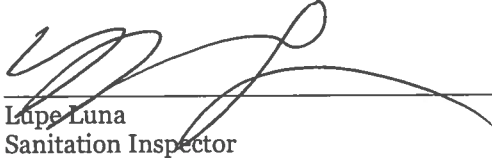
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List of Acronyms

AWRL	Ambient Water Reporting Limit
BBNP	Big Bend National Park
BBRSP	Big Bend Ranch State Park
BMP	Best Management Practices
BPUB	Brownsville Public Utilities Board
CAP	Corrective Action Plan
CE	Collecting Entity
COC	Chain of Custody
CRP	Clean Rivers Program
DHL	DHL Analytical Laboratory
DMRG	Data Management Reference Guide, most recent version
DM&A	Data Management and Analysis
EPW IWQL	El Paso Water Utilities International Water Quality Laboratory
EPA	United States Environmental Protection Agency
FY	Fiscal Year
GIS	Geographical Information System
GPS	Global Positioning System
LAN	Local Area Network
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LIMS	Laboratory Information Management System
LOD	Limit of Detection
LOQ	Limit of Quantitation
MC	Midland College
MT	Monitoring Type
NELAP	National Environmental Laboratory Accreditation Program
PM	Project Manager
QA	Quality Assurance
QAM	Quality Assurance Manual
QM	Quality Manual
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QAS	Quality Assurance Specialist
QC	Quality Control
QMP	Quality Management Plan
RGISC	Rio Grande International Study Center
RT	Routine Monitoring
SE	Submitting Entity
SLOC	Station Location
SOP	Standard Operating Procedure
SWQM	Surface Water Quality Monitoring
SWQMIS	Surface Water Quality Monitoring Information System
TMDL	Total Maximum Daily Load
TPWD	Texas Parks and Wildlife Department

TCEQ	Texas Commission on Environmental Quality
TNI	The NELAC Institute
TSWQS	Texas Surface Water Quality Standards
VOA	Volatile Organic Analytes
USIBWC	U.S. International Boundary and Water Commission
UTRGV	University of Texas Rio Grande Valley

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The USIBWC 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, sub-participants, or other units of government. The USIBWC 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.

A4 Project/Task Organization

Description of Responsibilities

TCEQ

Sarah Eagle

CRP Work Leader

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

Sharon Coleman

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. Serves on planning team for CRP special projects. Coordinates the review and approval of CRP QAPPs. Prepares and distributes annual audit plans. Conducts monitoring systems audits of Planning Agencies. Concurs with and monitors implementation of 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 QAPPs and audit records for the CRP.

Kelly Rodibaugh

CRP Project Manager

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

Cathy Anderson

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

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

Peter Bohls

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 SWQM Data Management Reference Guide (DMRG), most recent version. 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).

Kelly Rodibaugh
CRP Project Quality Assurance Specialist

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

United States Section, International Boundary and Water Commission (USIBWC)

Gilbert Anaya
USIBWC Environmental Management Division Chief

Responsible for oversight of the USIBWC El Paso Headquarters Program and Clean Rivers Program at the USIBWC. Performs evaluations of USIBWC El Paso Headquarters personnel. Cost Center Manager for the USIBWC El Paso Headquarters budget.

Daniel Avila
USIBWC Principal Engineer & Acting Operations & Maintenance Division Chief

Responsible for oversight of the USIBWC field offices that are considered Rio Grande Basin Clean Rivers Program partners.

Leslie Grijalva
USIBWC CRP 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 USIBWC participants and that projects are producing data of known quality. Ensures that sub participants are qualified to perform contracted work. Ensures CRP project managers and/or QA Specialists are notified of deficiencies and corrective actions, and that issues are resolved. Responsible for validating that data collected are acceptable for reporting to the TCEQ.

Samantha Stiffler
USIBWC CRP Quality Assurance Officer

Responsible for coordinating the implementation of the QA program. Responsible for writing and maintaining this 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 QAS to resolve QA-related issues. Notifies the USIBWC CRP 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.

Leslie Grijalva and Samantha Stiffler
USIBWC CRP Data Managers

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

DHL Analytical

John DuPont

DHL Analytical, Laboratory Manager

Responsible for project coordination at DHL Analytical, providing support to IBWC at each program stage: QAPP development, sampling, sample receipt and login, analyses, and data reporting. Responsible for quality assurance of reported analyses performed by DHL Analytical and performs validation and verification of data before the report is sent to USIBWC. Notifies the USIBWC CRP Project Manager and Quality Assurance Officer of circumstances which may adversely affect the quality of data. Responsible for coordinating with DHL Analytical and USIBWC CRP Project Manager to resolve QA-related issues. Implements or ensures implementation of corrective actions needed to resolve nonconformance's noted during assessments. Responsible for overseeing sub-contract laboratories and making sure they adhere to QAPP standards.

Sherri Herschmann

DHL Analytical, Quality Assurance Manager

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

Rio Grande Basin CRP Partners

US International Boundary and Water Commission, Field Offices

Manages data collection activities and generates the work orders for water quality monitoring at five field offices along the Texas portion of the Rio Grande. The area operations managers direct activities on the local level as follows: American Dam Field Office, Amistad Dam Field Office, Falcon Dam Field Office, Mercedes Field Office, and the Presidio Field Office. Samples collected by the Amistad Dam, Falcon Dam, Mercedes, and Presidio field offices are shipped to DHL Analytical for analysis. American Dam submits their samples to the El Paso Water Laboratory for analysis. All USIBWC Field Offices ensure that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

Vincente Guerrero III, Laboratory Manager

Brownsville Public Utilities Board (BPUB) Laboratory

Responsible for implementing and monitoring CRP requirements in contracts, QAPPs, and QAPP amendments and appendices. Responsible for water quality monitoring, analysis, and data review of Station 20449 in Brownsville, TX. Samples are collected and analyzed by the BPUB laboratory as part of their regular permit monitoring and provided to the USIBWC CRP.

Gabriel Coronado and Julian Alvarado, Quality Assurance Specialists

Brownsville Public Utilities Board (BPUB) Laboratory

Responsible for the review of laboratory data and laboratory techniques performed at the BPUB laboratory. Responsible for the overall quality control and quality assurance of analyses performed by the BPUB laboratory. Monitors implementation of the QM/QAPP within the laboratory to ensure complete compliance with QA data quality objectives, as defined by this QAPP. Conducts internal annual audits to ensure compliance with written SOPs, identify potential problems and initiate Corrective Action Reports and files. Responsible for supervising and verifying all aspects of QA/QC in the laboratory.

Richard Wilcox, Laboratory Manager

El Paso Water International Water Quality Laboratory (EPW IWQL)

Responsible for implementing and monitoring CRP requirements in contracts, QAPPs, and QAPP amendments and appendices. Responsible for water quality laboratory analysis and data review for samples collected by USIBWC American Dam Field Office. Responsible for sending data monthly to the USIBWC CRP.

***Miguel Venegas, Quality Assurance Chemist
El Paso Water International Water Quality Laboratory (EPW IWQL)***

Responsible for the review of laboratory data and laboratory techniques performed at the EPW IWQL laboratory. Responsible for the overall quality control and quality assurance of analyses performed by the EPW IWQL laboratory. Monitors implementation of this QM/QAPP within the laboratory to ensure complete compliance with QA data quality objectives, as defined by this QAPP. Conducts internal annual audits to ensure compliance with written SOPs, identify potential problems and initiate Corrective Action Reports and files. Responsible for supervising and verifying all aspects of QA/QC in the laboratory.

***Rebeca Castro, Technical Director/ Quality Assurance Officer
City of Laredo Health Department Laboratory***

Responsible for the review of laboratory data and laboratory techniques performed at the City of Laredo Health Department laboratory. Responsible for the overall quality control and quality assurance of analyses performed by the City of Laredo Health Department laboratory. Monitors implementation of this QM/QAPP within the laboratory to ensure complete compliance with QA data quality objectives, as defined by this QAPP. Conducts internal annual audits to ensure compliance with written SOPs, identify potential problems and initiate Corrective Action Reports and files. Responsible for supervising and verifying all aspects of QA/QC in the laboratory.

***Samuel Gonzalez, Chief of Environmental Health Services
City of Laredo Health Department***

Responsible for supervising water quality monitoring staff at the City of Laredo Health Department.

***Daniel Maldonado and Lupe Luna, Sanitation Inspectors
City of Laredo Health Department***

Responsible for water quality monitoring for samples collected in the Laredo area of the Rio Grande. Samples collected are submitted to the City of Laredo Health Department Laboratory for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

***John Porter, Director
City of Laredo Environmental Services Department***

Responsible for supervising water quality monitoring staff at the City of Laredo Environmental Services Department.

***Juan M. Vazquez and Carlos McMullen, Environmental Specialists
City of Laredo Environmental Services Department***

Responsible for water quality monitoring samples collected on Manadas Creek in the Laredo area. Samples collected are submitted to DHL Analytical for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

***Tricia Cortez
Rio Grande International Studies Center***

Responsible for water quality monitoring and data review in the Laredo area of the Rio Grande. Samples collected are submitted to DHL Analytical for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

***Nicolas Havlik
Texas Parks and Wildlife Department, Natural Resources Program***

Responsible for supervising water quality monitoring staff at TPWD Big Bend Ranch State Park.

***Price Rumbelow
Texas Parks and Wildlife Department, Natural Resources Program***

Responsible for water quality monitoring at stations in Big Bend Ranch State Park. Water samples collected are submitted to DHL Analytical for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

Tim Gibbs

Texas Parks and Wildlife Department, Barton Warnock Education Center

Responsible for water quality monitoring at stations in Big Bend Ranch State Park. Water samples collected are submitted to DHL Analytical for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

Meredith Dennis

Big Bend National Park

Responsible for water quality monitoring in the Big Bend National Park and Rio Grande Wild and Scenic River. Samples collected are submitted to DHL Analytical for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

Dr. Jungseok Ho

University of Texas Rio Grande Valley-Edinburg

Responsible for water quality monitoring samples collected at Arroyo Los Olmos, a tributary to the Rio Grande, and one site on the Rio Grande. Samples collected are submitted to DHL Analytical for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

***Greg Larson, Professor, Biology Department
Midland College***

Responsible for water quality monitoring at two stations in the Pecos sub-basin. Water samples collected are submitted to DHL Analytical for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

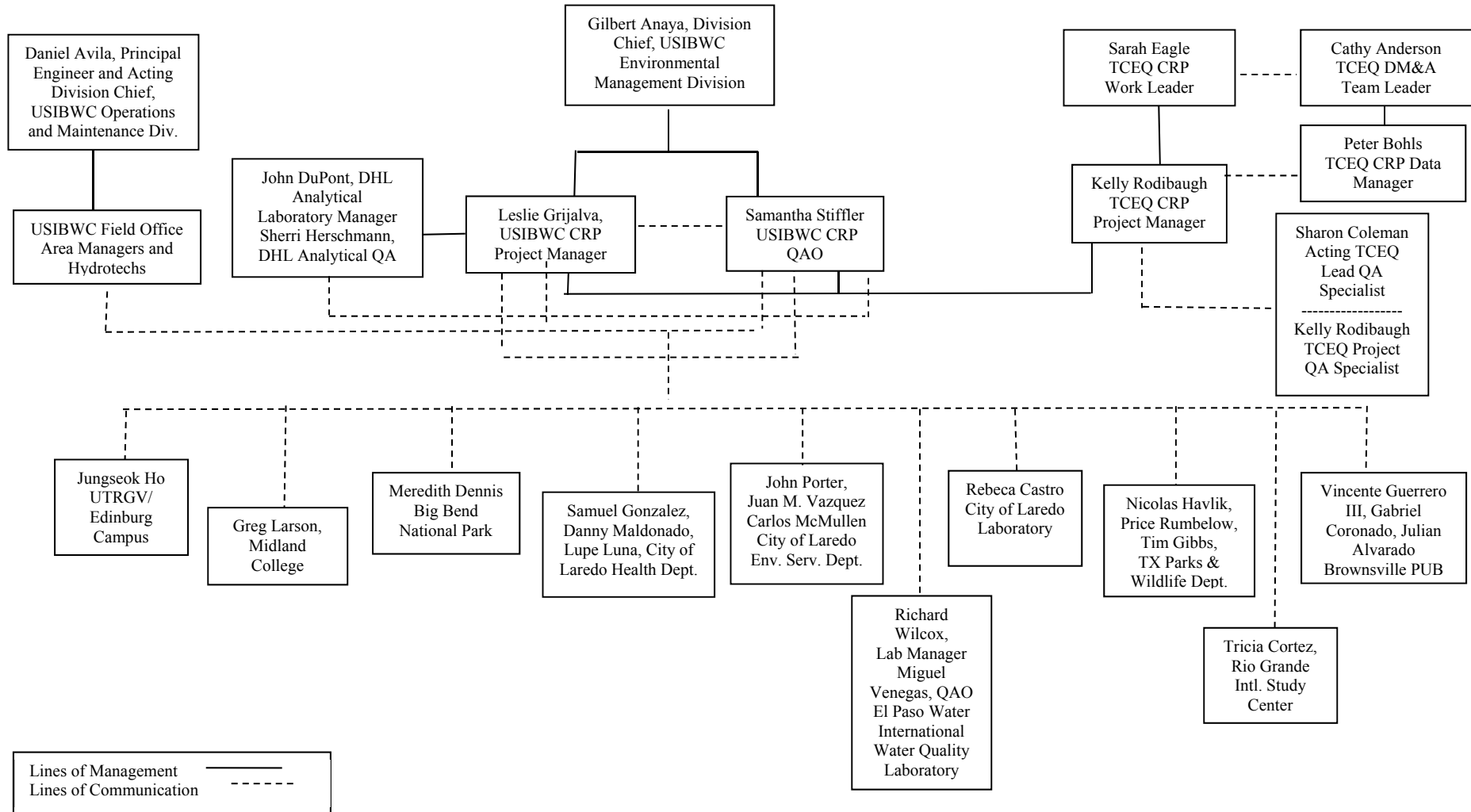
Terms of Agreement

The USIBWC Clean Rivers Program Sampling Partners agree to the long-term collection of water quality samples and environmental data at designated monitoring stations on a prescribed schedule. The types of samples and data collected by each partner may vary in time, commitment, and geography. A Sampling Partner's signature on the Section A1 Approval Page of the Rio Grande Basin Monitoring Program Quality Assurance Project Plan indicates acknowledgment that the Sampling Partner does not expect to be paid for his/her work, compensation for expenses associated with said in-kind work, and will abide by the Texas Commission on Environmental Quality procedures.

In Addition, USIBWC non-federal entity Sampling Partners release, waive, discharge and covenant not to sue the USIBWC, including its officers and employees, with respect to any and all liability, claims or causes of action whatsoever related to any damages or injury that they may sustain, whether caused by the negligence of the USIBWC or otherwise, while performing tasks under this QAPP. USIBWC Sampling Partners are aware and fully responsible for guarding against any risks involved with such activity and choose to participate voluntarily and at their own risk. They voluntarily assume full responsibility for any property damage or personal injury that they may sustain while participating in, or related to the above activity

Project Organization Chart

Figure A4.1. Organization Chart - Lines of Communication



City of Laredo Health Dept. uses the City of Laredo Health Dept. lab, BPUB analyzes their own data and the *enterococcus* samples for the Brownville area, and American Dam uses the El Paso Waterlab. All other partners use DHL Analytical.

A5 Problem Definition/Background

In 1991, the Texas Legislature passed the Texas Clean River Act (Senate Bill 818) in response to growing concerns that water resource issues were not being pursued in an integrated, systematic manner. The act requires that ongoing water quality assessments be conducted for each river basin in Texas, an approach that integrates water quality issues within the watershed. The CRP legislation mandates that each river authority (or local governing entity) shall submit quality-assured data collected in the river basin to the commission. Quality-assured data in the context of the legislation means data that comply with TCEQ rules for surface water quality monitoring (SWQM) programs, including rules governing the methods under which water samples are collected and analyzed and data from those samples are assessed and maintained. This QAPP addresses the program developed between the USIBWC CRP and the TCEQ to carry out the activities mandated by the legislation. The QAPP was developed and will be implemented in accordance with provisions of the TCEQ Quality Management Plan, January 2019 or most recent version (QMP).

The purpose of this QAPP is to clearly delineate USIBWC CRP QA policy, management structure, and procedures which will be used to implement the QA requirements necessary to verify and validate the surface water quality data collected. The QAPP is reviewed by the TCEQ to help ensure that data generated for the purposes described above are of known and documented quality, deemed acceptable for their intended use. This process will ensure that data collected under this QAPP and submitted to SWQMIS have been collected and managed in a way that guarantees its reliability and therefore can be used in water quality assessments, total maximum daily load (TMDL) and water quality standards development, permit decisions, and other program activities deemed appropriate by the TCEQ. Project results will be used to support the achievement of CRP objectives, as contained in the *Clean Rivers Program Guidance and Reference Guide FY 2020 -2021*.

The international reach of the Rio Grande (hereinafter Rio Grande Basin) encompasses an immense area from the arid Chihuahuan Desert region around El Paso, Texas, downstream to the subtropical coastal region near Brownsville, Texas. Therefore, for the purpose of coordination and planning, the Rio Grande has been divided into four sub-basins; the Upper Rio Grande Basin extending from the New Mexico/Texas State line downstream to the International Amistad Dam (including the Devils River); the Pecos River sub-basin that extends from the Red Bluff Reservoir at the New Mexico/Texas State line to the confluence with the Rio Grande; the Middle Rio Grande Basin that extends downstream of International Amistad Dam to International Falcon Dam; and the Lower Rio Grande Basin extending from downstream of International Falcon Dam to the Rio Grande Tidal area. The Rio Grande Basin, its tributaries, and associated bays are further partitioned into 14 stream segments: six segments in the Upper Rio Grande Basin, three segments in the Pecos River sub-basin, three segments in the Middle Rio Grande Basin, and two segments in the Lower Rio Grande Basin.

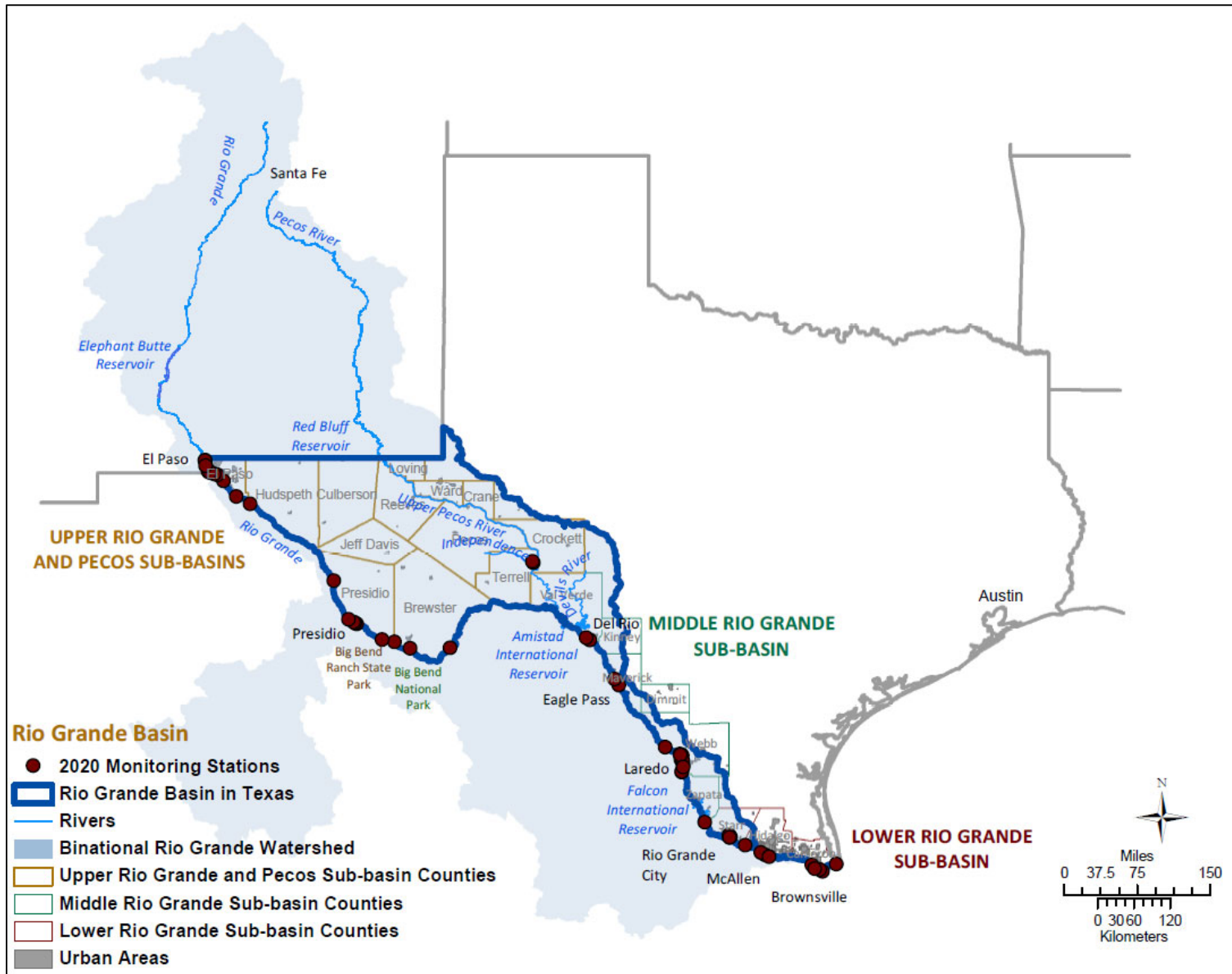
Figure A5.1 shows a map of the Rio Grande Basin in the context of the Texas Clean Rivers Program and identifies the Upper, Middle, and Lower Rio Grande and the Pecos River. The Upper Basin includes the main stem of the Rio Grande from the Texas-New Mexico state line in El Paso County downstream to the International Amistad Reservoir in Val Verde County to include the Devils River. The Upper Basin encompasses 16 west Texas counties; El Paso, Hudspeth, Culberson, Loving, Reeves, Ward, Winkler, Crane, Pecos, Upton, Crockett, Jeff Davis, Presidio, Brewster, Terrel, and Val Verde counties.

The Pecos River begins in the Sangre de Cristo Mountains of north-central New Mexico, travels through eastern New Mexico, crosses into Texas at the Red Bluff Reservoir, winds through west Texas, and then empties into the Rio Grande in Val Verde County above the International Amistad Dam.

The Middle Rio Grande Basin portion of the basin includes parts of Val Verde, Edwards, Kinney, Maverick, Dimmit, Webb, Zapata, Jim Hogg, and Starr Counties in Texas.

The study area in the Lower Rio Grande Basin includes parts of Starr, Hidalgo, and Cameron Counties in Texas.

Figure A5.1. Map of the Rio Grande Basin



A6 Project/Task Description

The USIBWC CRP in the Rio Grande basin coordinates monitoring efforts among a large number of partners to routinely collect surface water quality data from more than 52 sites throughout the basin. Partners in the Rio Grande basin include universities, municipalities, non-profit organizations, and other agencies which monitor water quality in the Rio Grande basin for their own purposes and also at the request of the Clean Rivers Program. The program was established to collect, store, and make available water quality data, which the participating partners require to carry out their assigned functions. The USIBWC CRP collects this data and uses it for assessments of water quality under the Clean Rivers Program. The data are also widely used by state water quality managers, cities, counties, consultants, students and the general public and is used to monitor water quality for use in assessment for the attainment of uses and numerical criteria. Smaller non-classified water bodies are also monitored in response to perceived risk for pollution and/or to define water quality. The USIBWC's Quality Assurance Project Plan is the mechanism for bringing this data into the statewide water quality database, the Surface Water Quality Monitoring Information System, or SWQMIS. A map showing the locations of all USIBWC CRP monitoring locations is included in Appendix C. (For a complete monitoring schedule of the Rio Grande Basin, see <http://cms.lcra.org>.)

Basin-wide monitoring efforts include sites sampled by USIBWC El Paso Headquarters staff and partners as listed in A4. The monitoring plan is determined at annual coordinated monitoring meetings held at five locations in the basin. For FY2020-2021, 52 stations will be monitored for field, flow, conventionals, and bacteriological samples. Metals in water and sediment will be collected at sites where they have historically been high and where stakeholders request continued collection. (For a more detailed description of the monitoring plan and how it is designed, please see Appendix B.)

The USIBWC CRP has leveraged a broad network of in-kind partners to collect samples throughout the Rio Grande Basin. The CRP monitoring partners in the Rio Grande basin are: USIBWC Field Offices (American Dam, Amistad Dam, Falcon Dam, Presidio, Mercedes), El Paso Water, Big Bend National Park, Texas Parks and Wildlife Department at Big Bend Ranch State Park, City of Laredo Health Department, City of Laredo Environmental Services, Midland College, University of Texas Rio Grande Valley (Edinburg campus), Rio Grande International Study Center (RGISC) and the Brownsville Public Utilities Board. All CRP partners in the Rio Grande basin monitoring program are required to be trained by the USIBWC CRP staff, and they must agree to follow this QAPP by signing this document. Various partners collect limited field and/or laboratory parameters due to issues such as remoteness of the site, shipping problems, accreditation, or to a standing Memorandum of Agreement/Understanding between the entity and the USIBWC. Only data meeting the specifications detailed in this QAPP are reported to TCEQ. For any partner reporting five parameters or less, the USIBWC El Paso Headquarters considers this as "limited conventionals analysis".

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

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

Amendments to the QAPP

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

Amendments will be incorporated into the QAPP by way of attachment and distributed to personnel on the USIBWC FY20-21 QAPP

Last revised on September 6, 2019

distribution list by the USIBWC CRP Project Manager. The USIBWC CRP will maintain this documentation as part of the project's QA records, and ensure that the documentation is available for review.

Special Project Appendices

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

A7 Quality Objectives and Criteria

The purpose of routine water quality monitoring is to collect surface water quality data that can be used to characterize water quality conditions, identify significant long-term water quality trends, support water quality standards development, support the permitting process, and conduct water quality assessments in accordance with TCEQ's [Guidance for Assessing and Reporting Surface Water Quality in Texas, June 2015](https://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/14txir/2014_guidance.pdf) or most recent version (https://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/14txir/2014_guidance.pdf). These water quality data, and data collected by other organizations (e.g., United States Geological Survey (USGS), TCEQ, etc.), will be subsequently reconciled for use and assessed by the TCEQ.

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

Ambient Water Reporting Limits (AWRLs)

For surface water to be evaluated for compliance with Texas Surface Water Quality Standards ("TSWQS") and screening levels, data must be reported at or below specified reporting limits. To ensure data are collected at or below these reporting limits, required ambient water reporting limits ("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 may be reported below the LOQ 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.

Precision

Precision is the degree to which a set of observations or measurements of the same property, obtained under USIBWC FY20-21 QAPP

similar conditions, conform to themselves. It is a measure of agreement among replicate measurements of the same property, under prescribed similar conditions, and is an indication of random error.

Laboratory precision is assessed by comparing replicate analyses of Laboratory Control Samples (LCS) in the sample matrix (e.g. deionized water, sand, commercially available tissue), Matrix Spike/Matrix Spike Duplicate (MS/MSD), or sample/duplicate (DUP) pairs, as applicable. Precision results are compared against measurement performance specifications and used during evaluation of analytical performance. Program-defined measurement performance specifications for precision are defined in Appendix A.

Bias

Bias is the systematic or persistent distortion of a measurement process, which causes errors in one direction (i.e., the expected sample measurement is different from the sample's true value). Bias is a statistical measurement of correctness and includes multiple components of systematic error. Bias is determined through the analysis of LCS and LOQ check samples prepared with verified and known amounts of all target analytes in the sample matrix (e.g. deionized water, sand, commercially available tissue) and by calculating percent recovery. Results are compared against measurement performance specifications and used during evaluation of analytical performance. Program-defined measurement performance specifications for bias are specified in Appendix A.

Representativeness

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

Comparability

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

Completeness

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

A8 Special Training/Certification

Before new field personnel independently conduct field work, the USIBWC CRP Project Manager or USIBWC CRP QAO trains him/her in proper instrument calibration, field sampling techniques, and field analysis procedures. The QA officer (or designee) will document the successful field demonstration. The QA Officer (or designee) will retain documentation of training and the successful field demonstration in the employee's personnel file and ensure that the documentation will be available during monitoring systems audits. Field personnel may request refresher training sessions, or additional training if new personnel is acquired, and the USIBWC El Paso Headquarters will accommodate their request. New personnel, volunteers, or students must be accompanied by USIBWC CRP trained personnel until such time as they can be trained by USIBWC CRP Project Manager or USIBWC QAO.

Contractors and subcontractors must ensure that laboratories analyzing samples under this QAPP meet the requirements contained in The NELAC Institute Standard (2009) Volume 1, Module 2, Section 4.5.5 (concerning Subcontracting of Environmental Tests).

A9 Documents and Records

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

Table A9.1 Project Documents and Records

Document/Record	Location	Retention (yrs)	Format
QAPPs, amendments and appendices	USIBWC CRP, DHL Analytical, Brownsville Public Utilities Board- Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory, USIBWC Field Offices, BBNP, BPUB, City of Laredo Health Department, TPWD, UTRGV, Midland College, and RGISC	7 yrs	Paper and electronic
Field SOPs	USIBWC CRP, USIBWC Field Offices, BBNP, BPUB, City of Laredo Health Department, TPWD, UTRGV, Midland College, and RGISC	7 yrs	Paper and electronic
Laboratory Quality Manuals	USIBWC CRP, DHL Analytical, Brownsville Public Utilities Board- Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory	7 yrs	Paper
Laboratory SOPs	USIBWC CRP, DHL Analytical, Brownsville Public Utilities Board- Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory	7 yrs	Paper
QAPP distribution documentation	USIBWC CRP	7 yrs	Paper and electronic
Field staff training records	USIBWC CRP	7 yrs	Paper and electronic
Field equipment calibration/maintenance logs/manuals	USIBWC CRP, USIBWC Field Offices, BBNP, BPUB, City of Laredo Health Department, TPWD, UTRGV, Midland College, and RGISC	7 yrs	Paper
Field notebooks or data sheets	USIBWC CRP, USIBWC Field Offices, BBNP, BPUB, City of Laredo Health Department, TPWD, UTRGV, Midland College, and RGISC	7 yrs	Paper and electronic
Chain of custody records	USIBWC CRP, DHL Analytical, Brownsville Public Utilities Board- Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory	7 yrs	Paper and electronic
Laboratory calibration records and instrument printouts (maintenance log, repair log, instrument log, quality control log, etc) *	DHL Analytical, Brownsville Public Utilities Board- Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory	7 yrs	Paper
Laboratory data reports/results	USIBWC CRP, DHL Analytical, Brownsville Public Utilities Board- Analytical Laboratory, El Paso Water Utilities Public Service Board	7 yrs	Paper and electronic

	International Water Quality Laboratory, City of Laredo Health Department Laboratory		
Corrective Action Documentation	USIBWC CRP, DHL Analytical, Brownsville Public Utilities Board- Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory	7 yrs	Paper and electronic

* Documentation available to USIBWC CRP upon request

Laboratory Test Reports

Test/data reports from the laboratory must document the test results clearly and accurately. Routine data reports should be consistent with the TNI Standard (2009), Volume 1, Module 2, Section 5.10 and include the information necessary for the interpretation and validation of data. The requirements for reporting data and the procedures are provided. The laboratory manager or technical director at each respective laboratory validates the analytical data by comparing the various quality control measurements and by recalculating a random selection of the results produced by each analyst submitting data. The TNI Standard provides for some flexibility in regard to the elements required in a test report. From the Clean Rivers Program perspective, it is important that data are reported unambiguously, are accurate, and that the necessary information for the review, verification, validation, and interpretation of data is included. At a minimum, test reports (regardless of whether they are hard copy or electronic) should include the following:

Parameter Code

Parameter Name

Sample results

Units of measurement

Sample matrix

Dry weight or wet weight (as applicable)

Station information

Collecting Entity

Date and time of collection

Dilution Factor

Lab Method

Prep Date/Time

Date Analyzed

Sample depth

Holding time for E. coli

LOQ and limit of detection (LOD) (formerly referred to as the reporting limit and the method detection limit, respectively), and qualification of results outside the working range (if applicable)

Certification of NELAP compliance

Electronic Data

Data will be submitted electronically to the TCEQ in the Event/Result file format described in the most current version of the SWQM DMRG, most recent version, which can be found at https://www.tceq.texas.gov/waterquality/data-management/dmrg_index.html. A completed Data Review Checklist and Data Summary (see Appendix F) will be submitted with each data submittal.

USIBWC CRP partners submit their field data by scanning field sheets and emailing the document to USIBWC CRP Project Manager and the USIBWC CRP Quality Assurance Officer.

Laboratories that analyze USIBWC CRP samples submit their results by emailing the document to USIBWC CRP Project Manager and the USIBWC CRP Quality Assurance Officer.

B1 Sampling Process Design

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

B2 Sampling Methods

Field Sampling Procedures

Field sampling will be conducted in accordance with the latest versions of the TCEQ Surface Water Quality Monitoring Procedures Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2012 (RG-415) and Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416), collectively referred to as “SWQM Procedures.” Updates to SWQM Procedures are posted to the Surface Water Quality Monitoring Procedures website (https://www.tceq.texas.gov/waterquality/monitoring/swqm_guides.html), and shall be incorporated into the USIBWC CRP’s procedures, QAPP, SOPs, etc., within 60 days of any final published update.

Field Data Reporting Forms (See Appendix D) are required for reporting field data. The first form, “Field Data Reporting Form”, is used when collecting grab samples. This form includes DO, temperature, pH, Specific conductance, Secchi disk, flow, flow severity, flow measurement method, stream width, stream depth, and days since significant precipitation. A second form, “Field Data Reporting Form Sediment Samples”, is used for composite sampling of sediment samples. For all water or sediment samples collected, the COC Form(s) are submitted to the laboratory with the sample(s).

Additional aspects outlined in Section B below reflect specific requirements for sampling under CRP and/or provide additional clarification.

Table B2.1 Sample Storage, Preservation and Handling Requirements, DHL Analytical, Inc.

Routine Conventional-in-Water Samples (8 containers: 4 unpreserved, 1 preserved with HNO₃, 1 preserved with H₂SO₄, 1 preserved with Na₂S₂O₃, and 1 (Set of 3) preserved with H₃PO₄)				
<i>Parameters</i>	<i>Containers</i>	<i>Minimum Sample Volume (ml)</i>	<i>Preservation</i>	<i>Maximum Holding Time</i>
CONTAINER 1 and 2				
TSS (00530)	1000 mL HDPE	1000	Cool to ≤ 6°C, but not frozen	7 days
Chloride (Cl) (00940)	250 mL HDPE	50	Cool to ≤ 6°C, but not frozen	28 days
Sulfate (SO ₄) (00945)	250 mL HDPE	50	Cool to ≤ 6°C, but not frozen	28 days
Fluoride (00951)	250 mL HDPE	50	Cool to ≤ 6°C, but not frozen	28 days
TDS (70300)	250 mL HDPE	100	Cool to ≤ 6°C, but not frozen	7 days
Bromide (71870)	250 mL HDPE	50	Cool to ≤ 6°C, but not frozen	28 days
Alkalinity (00410)	250 mL HDPE	50	Cool to ≤ 6°C, but not frozen	14 days
CONTAINER 3				
Calcium (00916)	250 mL HDPE	50	1:1 HNO ₃ to pH <2	180 days
Magnesium (00927)	250 mL HDPE	50	1:1 HNO ₃ to pH <2	180 days
Sodium (00929)	250 mL HDPE	50	1:1 HNO ₃ to pH <2	180 days

Potassium (00937)	250 mL HDPE	50	1:1 HNO ₃ to pH <2	180 days
Hardness (00900)	250 mL HDPE	50	1:1 HNO ₃ to pH <2	180 days
CONTAINER 4				
Ammonia (NH ₃) (00610)	250 mL HDPE	100	Conc. H ₂ SO ₄ to pH <2, Cool ≤ 6°C, but not frozen	28 days
Total Phosphorus (PO ₄) (00665)	250 mL HDPE	50	Conc. H ₂ SO ₄ to pH <2, Cool ≤ 6°C, but not frozen	28 days
Nitrate + Nitrite (00630) (NO ₃ + NO ₂)	250 mL HDPE	50	Conc. H ₂ SO ₄ to pH <2, and cool ≤ 6°C, but not frozen	28 days (48 hours if unpreserved)
CONTAINER 5				
Chlorophyll <i>a</i> (32211)	1000 mL Amber HDPE	500	Cool to ≤ 6°C but not frozen, dark	Filter within 48 hours. Filters may be stored frozen up to 28 days
CONTAINER 6				
E. coli bacteria (31699)	Sterilized Plastic container	120	Cool ≤ 6°C but not frozen, Sodium thiosulfate	*8 hours
CONTAINER 7				
Biological Oxygen Demand (BOD) (00310)	1000 mL HDPE	1000	Cool ≤ 6°C but not frozen	48 hours
CONTAINER 8 (Set of 3 VOA Vials)				
Total Organic Carbon (TOC) (00680)	3 x 40 mL VOA vials	120	1:1 H ₃ PO ₄ to pH <2, Cool ≤ 6°C but not frozen	28 days
Metals in Water				
Parameters	Containers	Minimum Sample Volume (ml)	Preservation	Maximum Holding Time
CONTAINER 1 and 2				
Total Metals Suite	500 mL HDPE	500	1:1 HNO ₃ to pH<2	180 days
CONTAINER 3				
Total Mercury (245.7)	500 mL clear glass	500	1:1 HCl to pH < 2	28 days
Routine Conventionals in Sediment Samples				
Parameters	Containers	Minimum Sample Volume (g)	Preservation	Maximum Holding Time
CONTAINER 1				
Percent Solids (81373)	4-oz glass jar	50 grams	Cool ≤ 6°C but not frozen	NA
CONTAINER 2				
Grain Size Analysis	1-L HDPE bottle	1000 grams	Cool ≤ 6°C but not frozen	NA
Metals in Sediment				
Parameters	Containers	Minimum Sample Volume (g)	Preservation	Maximum Holding Time
CONTAINER 1				
Metals	4-oz glass jar	5 grams	Cool ≤ 6°C but not frozen	180 days
Total Mercury	4-oz glass jar	5 grams	Dark and Cool < 6°C, but not frozen	28 days

*E. coli samples should always be processed as soon as possible and incubated no later than 8 hours from time of collection. When transport conditions necessitate sample incubation after 8 hours from time of collection, the holding time may be extended, and samples must be processed as soon as possible and within 30 hours.

Collecting entities that use this lab: USIBWC CRP, Amistad Dam FO, Falcon Dam FO, Presidio FO, Mercedes FO, BBNP, TPWD, City of Laredo Env. Services, RGISC, UTRGV-Edinburg, and Midland College

Table B2.2 Sample Storage, Preservation and Handling Requirements, City of Laredo Health Department Laboratory

E.Coli and Fecal Coliform Analysis- City of Laredo Health Department Laboratory (2 containers Preserved with Sodium Thiosulfate)				
<i>Parameters</i>	<i>Containers</i>	<i>Sample Volume (ml)</i>	<i>Preservation</i>	<i>Maximum Holding Time</i>
CONTAINER 1				
E. coli, Colilert, IDEXX Method (31699)	Polystyrene	120	Cool <6 C but not frozen Sodium Thiosulfate	8 hrs
CONTAINER 2				
Fecal Coliform (31616)	Polystyrene	120	Cool <6 C but not frozen Sodium Thiosulfate	8 hrs

Collecting entity that uses this lab: City of Laredo Health Department

Table B2.3 Sample Storage, Preservation and Handling Requirements, El Paso Water International Water Quality Laboratory

Routine Conventional-in-Water Samples				
<i>Parameters</i>	<i>Containers</i>	<i>Sample Volume (ml)</i>	<i>Preservation</i>	<i>Maximum Holding Time</i>
CONTAINER 1				
Turbidity (82079)	HDPE	100	Cool <6 C but not frozen	48 hours
CONTAINER 2				
BOD (00310)	HDPE	1000	Cool <6 C but not frozen	48 hours
CONTAINER 3				
E. coli bacteria (31699)	Sterilized plastic container	2X250	Cool <6 C but not frozen Sodium thiosulfate	8 hours
CONTAINER 4				
Chlorophyll <i>a</i> (32211)	Sterilized plastic amber container	1X500	Cool to <6 C but not frozen, dark	Filter within 48 hours. Filters may be stored frozen up to 24 days
CONTAINER 5				
Magnesium (00927)	HDPE	1000	Cool <6 C but not frozen	180 days
Sodium (00929)	HDPE	1000	Cool <6 C but not frozen	180 days
Potassium (00937)	HDPE	1000	Cool <6 C but not frozen	180 days

Collecting entity that uses this lab: USIBWC American Dam Field Office

Table B2.4 Sample Storage, Preservation and Handling Requirements, Brownsville PUB Laboratory

Routine Conventionals-in-Water Samples				
<i>Parameters</i>	<i>Containers</i>	<i>Sample Volume (mL)</i>	<i>Preservation</i>	<i>Maximum Holding Time</i>
CONTAINER 1				
TSS (00530)	HDPE	2000	Cool <6 C but not frozen	7 days
TDS (70300)	HDPE	250	Cool <6 C but not frozen	7 days
CONTAINER 2				
Ammonia (NH ₃) (00610)	HDPE	500	1-2 ml conc. H ₂ SO ₄ to pH <2 and Cool <6 C but not frozen	28 days
CONTAINER 3				
BOD (00310)	HDPE	2000	Cool <6 C but not frozen	48 hours
CONTAINER 4				
E. coli bacteria (31699)	Sterilized plastic container	290	Cool <6 C but not frozen Sodium thiosulfate	8 hours
CONTAINER 5				
Enterococcus (31701)	Sterilized plastic container	290	Cool <6 C but not frozen Sodium thiosulfate	8 hours

Collecting entity that uses this lab: BPUB

Sample Containers

Certificates from sample container manufacturers are maintained by the laboratory.

The analyzing laboratory adds the appropriate preservative to the proper sample containers and provides them to the partners. DHL Analytical provides sample containers for all CRP partners, with the exception of the City of Laredo Health Department, EPW IWQL, and the BPUB, which supply their own containers for samples analyzed by their laboratory.

DHL laboratory uses 1L, and 250 mL HDPE containers, 1L glass amber bottles, 40 mL VOA vials, and 120 mL sterilized plastic containers. For metals-in water, DHL uses one 500 mL pre-acidified plastic bottles and one 500 mL pre-acidified clear glass bottle. For metals in sediment, a 4-oz glass jar with a Teflon-lined lid is used.

The City of Laredo Health Department laboratory uses sterile, 120 mL polystyrene IDEXX bottles.

The EPW IWQL laboratory uses 1L and 100 mL HDPE containers, sterilized, 250mL plastic containers, and a 500 mL sterilized plastic amber container.

The BPUB laboratory uses 2L HDPE containers for TSS and BOD, 250 mL HDPE containers for TDS, 500 mL HDPE for Ammonia, and 290 mL IDEXX bottles with 1% sodium thiosulfate bottles for bacteria analysis.

Processes to Prevent Contamination

SWQM Procedures outline the necessary steps to prevent contamination of samples, including: direct collection into sample containers, when possible; use of certified containers for organics; and clean sampling techniques for metals. Field QC samples (identified in Section B5) are collected to verify that contamination has not occurred.

Documentation of Field Sampling Activities

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

Station ID
Sampling Date
Location
Sampling Depth
Sampling Time
Sample Collector's name
Values for all field parameters collected

Notes containing detailed observational data not captured by field parameters, including;

Water appearance
Weather
Biological activity
Unusual odors
Pertinent observations related to water quality or stream uses
Watershed or instream activities
Specific sample information
Missing parameters

Recording Data

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

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

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

Examples of sampling method requirements or sample design deficiencies include but are not limited to such things as inadequate sample volume due to spillage or container leaks, failure to preserve samples appropriately, contamination of a sample bottle during collection, storage temperature and holding time exceedance, sampling at the wrong site, etc. Any deviations from the QAPP, SWQM Procedures, or appropriate sampling procedures may invalidate data, and require documented corrective action. Corrective action may include for samples to be discarded and re-collected. It is the responsibility of the USIBWC CRP Project Manager, in consultation with the USIBWC CRP QAO, to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP. In addition, these actions and resolutions will be conveyed to the CRP Project Manager both verbally and in writing in the project progress reports and by completion of a CAP.

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

B3 Sample Handling and Custody

Sample Tracking

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

A sample is in custody if it is in actual physical possession or in a secured area that is restricted to authorized

personnel. The Chain of Custody (COC) form is a record that documents the possession of the samples from the time of collection to receipt in the laboratory. The following information concerning the sample is recorded on the COC form (See Appendix E). The following list of items matches the COC form in Appendix E.

Date and time of collection*
Site identification
Sample matrix
Number of containers
Preservative used
Analyses required
Name of collector
Custody transfer signatures and dates and time of transfer
Bill of lading, if applicable

*City of Laredo Health Department and BPUB record time of collection on their data sheets that are submitted to the USIBWC CRP.

Sample Labeling

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

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

Sample Handling

Handling procedures for water, sediment and biological samples are discussed in detail in the TCEQ SWQM Procedures. Proper sample handling is a joint effort of the sampling crew, the sample transporter, and laboratory staff. Sample integrity must be protected by preventing sample contamination after the sample is placed in a container. USIBWC CRP, USIBWC Field Offices (Amistad Dam, Falcon Dam, Presidio, Mercedes), Midland College, University of Texas Rio Grande Valley at Edinburg, Big Bend National Park, City of Laredo Environmental, Texas Parks and Wildlife Department at Big Bend Ranch State Park, and RGISC samples will be shipped to DHL-Analytical. USIBWC American Dam Field Office relinquishes their samples to the El Paso Water Laboratory. BPUB collects and analyzes their own samples. Please refer to the Chain of Custody section below for more details.

Chain of Custody forms are submitted with all water and/or sediment chemistry samples, as well as with all bacteria samples. If both water and sediment samples are collected, separate COC for the water samples and sediment samples will be submitted. Routine water chemistry and metals in water analyses are requested on the same form.

The receiving laboratory sample custodian will examine all arriving samples for proper documentation and preservation. Internal sample handling, custody, and storage procedures for laboratories are described in the laboratory quality assurance manual. It is assumed that samples in tape-sealed ice chests are secure whether being transported by staff vehicle, by common carrier, or by commercial package delivery.

Samples will be put in the ice chest with enough ice to fill to the top, and enough ice in the chest to keep the samples cold until they reach the laboratory. This is especially important in the warm months of the year. COC will be placed in an envelope and taped to the top of the ice chest or they may be sealed in a plastic bag and taped to the inside of the ice chest lid. Ice chests will then be sealed with tape before shipping.

Sample Tracking Procedure Deficiencies and Corrective Action

All deficiencies associated with COC procedures, as described in this QAPP, are immediately reported to the USIBWC CRP Project Manager. These include such items as delays in transfer resulting in holding time violations;

violations of sample preservation requirements; incomplete documentation, including signatures; possible tampering of samples; broken or spilled samples, etc. The USIBWC CRP Project Manager in consultation with the USIBWC CRP QAO will determine if the procedural violation may have compromised the validity of the resulting data. Any failures that have reasonable potential to compromise data validity will invalidate data and the sampling event should be repeated. The resolution of the situation will be reported to the TCEQ CRP Project Manager in the project progress report. CAPs will be prepared by the USIBWC CRP QAO and submitted to TCEQ CRP Project Manager along with project progress report.

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

B4 Analytical Methods

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

Laboratories collecting data under this QAPP must be NELAP-accredited in accordance with 30 TAC Chapter 25. Copies of laboratory QMs and SOPs shall be made available for review by the TCEQ.

Standards Traceability

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

Analytical Method Deficiencies and Corrective Actions

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

The TCEQ has determined that analyses associated with qualifier codes (e.g., “holding time exceedance,” “sample received unpreserved,” “estimated value”) may have unacceptable measurement uncertainty associated with them. This will immediately disqualify analyses from submittal to SWQMIS. Therefore, data with these types of problems should not be reported to the TCEQ. Additionally, any data collected or analyzed by means other than those stated in the QAPP, or data suspect for any reason should not be submitted for loading and storage in SWQMIS. However, when data is lost, its absence will be described in the data summary report submitted with the corresponding data set, and a corrective action plan (as described in section C1) may be necessary.

B5 Quality Control

Sampling Quality Control Requirements and Acceptability Criteria

The minimum field QC requirements, and program-specific laboratory QC requirements, are outlined in SWQM Procedures. Specific requirements are outlined below. Field QC sample results are submitted with the laboratory data report (see Section A9.).

Field blank

Field blanks are required for total metals-in-water samples when collected without sample equipment (i.e., as grab samples). For other types of samples, they are optional. A field blank is prepared in the field by filling a clean container with pure deionized water and appropriate preservative, if any, for the specific sampling activity being undertaken. Field blanks are used to assess contamination from field sources, such as airborne materials, containers, or preservatives. The minimum frequency requirement for field blanks for total metals-in-water samples is specified in the SWQM Procedures.

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

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

Laboratory Measurement Quality Control Requirements and Acceptability Criteria

Batch

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

Method Specific QC requirements

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

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

Comparison Counting

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

Limit of Quantitation (LOQ)

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

of the analytical method, or corrective action will be implemented.

LOQ Sediment and Tissue Samples – When considering LOQs for solid samples and how they apply to results, two aspects of the analysis are considered: (1) the LOQ of the sample, based on the real world in which moisture content and interferences affect the result, and (2) the LOQ in the QAPP, which is a value less than or equal to the AWRL based on an idealized sample with zero % moisture.

The LOQ for a solid sample is based on the lowest non-zero calibration standard (as are those for water samples), the moisture content of the solid sample, and any sample concentration or dilution factors resulting from sample preparation or clean-up.

To establish solid-phase LOQs to be listed in Appendix A of the QAPP, the laboratory will adjust the concentration of the lowest non-zero calibration standard for the amount of sample extracted, the final extract volume, and moisture content (assumed to be zero % moisture). Each calculated LOQ will be less than or equal to the AWRL on the dry-weight basis to satisfy the AWRL requirement for sediment and tissue analyses. When data are reviewed for consistency with the QAPP, they are evaluated based on this requirement. Results may not appear to meet the AWRL requirement due to high moisture content, high concentrations of non-target analytes necessitating sample dilution, etc. These sample results will be submitted to the TCEQ with an explanation on the data summary as to why results do not appear to meet the AWRL requirement.

LOQ Check Sample

An LOQ check sample consists of a sample matrix (e.g., deionized water, sand, commercially available tissue) free from the analytes of interest spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes. It is used to establish intra-laboratory bias to assess the performance of the measurement system at the lower limits of analysis. The LOQ check sample is spiked into the sample matrix at a level less than or equal to the LOQ published in Appendix A of this QAPP, for each analyte for each analytical batch of CRP samples run. If it is determined that samples have exceeded the high range of the calibration curve, samples should be diluted or run on another curve. For diluted or high concentration samples run on batches with calibration curves that do not include the LOQ published in Appendix A of this QAPP, a check sample will be run at the low end of the calibration curve.

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

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

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

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

Laboratory Control Sample (LCS)

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

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

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

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

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

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

Laboratory Duplicates

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

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

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

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

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

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

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

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

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

The components to be spiked shall be as specified by the mandated analytical method. The results from matrix spikes are primarily designed to assess the validity of analytical results in a given matrix, and are expressed as percent recovery (%R).

The percent recovery of the matrix spike is calculated using the following equation, where %R is percent recovery, S_{SR} is the concentration measured in the matrix spike, S_R is the concentration in the parent sample, and S_A is the concentration of analyte that was added:

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

Matrix spike recoveries are compared to the acceptance criteria published in the mandated test method. If the matrix spike results are outside established criteria, the data for the analyte that failed in the parent sample is not acceptable for use under this project and will not be reported to TCEQ. The result from the parent sample associated with that failed matrix spike will be considered to have excessive analytical variability and will be qualified by the laboratory as not meeting project QC requirements. Depending on the similarities in composition of the samples in the batch, the USIBWC CRP may consider excluding all of the results in the batch related to the analyte that failed recovery.

Method blank

A method blank is a sample of matrix similar to the batch of associated samples (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as the samples through all steps of the analytical procedures, and in which no target analytes or interferences are present at concentrations that impact the analytical results for sample analyses. The method blank is used to document contamination from the analytical process. The analysis of method blanks should yield values less than the LOQ. For very high-level analyses, the blank value should be less than 5% of the lowest value of the batch, or corrective action will be implemented. Samples associated with a contaminated blank shall be evaluated as to the best corrective action for the samples (e.g. reprocessing, data qualifying codes). In all cases the corrective action must be documented.

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

Quality Control or Acceptability Requirements Deficiencies and Corrective Actions

Sampling QC excursions are evaluated by the USIBWC CRP Project Manager, in consultation with the USIBWC CRP QAO. In that differences in sample results are used to assess the entire sampling process, including environmental variability, the arbitrary rejection of results based on pre-determined limits is not practical. Therefore, the professional judgment of the USIBWC CRP Project Manager and QAO will be relied upon in evaluating results. Field blanks for trace elements and trace organics are scrutinized very closely. Field blank values exceeding the acceptability criteria will automatically invalidate the sample. Notations of blank contamination are noted in the data summaries that accompany data deliverables. Equipment blanks for metals analysis are also scrutinized very closely.

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 USIBWC CRP Project Manager. If applicable, the USIBWC CRP 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 that the sub-contracting laboratory 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 the USIBWC CRP, 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 (USIBWC CRP) when requested.

B6 Instrument/Equipment Testing, Inspection, and Maintenance

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

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

B7 Instrument Calibration and Frequency

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

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

B8 Inspection/Acceptance of Supplies and Consumables

No special requirements for acceptance are specified for field sampling supplies and consumables. Reference to the laboratory QM may be appropriate for laboratory-related supplies and consumables.

B9 Acquired Data

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

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

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

B10 Data Management

Data Management Process

Data will be managed in accordance with the SWQM DMRG, most recent version, and applicable USIBWC information resource management policies.

Quantitative measurements are taken in the field by personnel using multi-parameter instruments. Qualitative measurements, which include observational data (i.e. weather conditions), are also taken in the field. Samples for laboratory analysis are also collected. The field investigator has prime responsibility to assure that all pertinent

information is recorded correctly and in the proper units. USIBWC CRP partners will check all COC forms prior to shipping the sample to the laboratory to verify that all the pertinent required information has been included. All laboratories will ensure that the COC forms are properly filled out, and that all samples received are acceptable. All hand-entered data must be recorded legibly and with special care to maintain the decimal in its proper location.

Field measurements and sample collection are performed according to procedures recorded or referenced in Sections B2 and B3. Field data will be reported on the required data forms and submitted to the USIBWC CRP by the partners, and laboratory results and chain of custody forms will be reported to the USIBWC CRP by the laboratories. The data is entered into the database by the USIBWC CRP Project Manager and QAO using Access software. The Access software database, which was designed specifically for the USIBWC CRP, is then used to query the data for outliers and incorrect data format. The database will only contain data described in Table A7, which is collected or acquired by USIBWC and partners participating under this QAPP. Data is verified using the TCEQ SWQMIS data loading validator report. Water quality monitoring data files are then submitted to the TCEQ CRP Project Manager. Both the TCEQ Project Manager and TCEQ Data Manager perform quality control checks on the data. The TCEQ Project Manager then approves the data and the TCEQ Data Manager loads the data into the SWQMIS database.

Water quality monitoring data added to the USIBWC CRP database undergoes the following quality control checks:

1. Each set of data forms received by USIBWC CRP are reviewed for the following:
 - a. valid and complete station number, date, time, and other applicable metadata;
 - b. comparison of station number to station description to ensure they both represent the same sampling point; and
 - c. that each value is represented by a valid parameter code.
2. The Data Review Checklist will be utilized to ensure that potential areas for error are addressed and reviewed prior to submission of data.

Even when accepted protocols are followed in collecting and analyzing environmental samples, data loss may occur. Data delivery and discussion between USIBWC and partners follows the lines of communication established in the organizational chart in Figure A4.1.

Data Dictionary

Terminology and field descriptions are included in the SWQM DMRG, most recent version. Table B10.1 describes entities that will submit data under this QAPP.

Table B10.1 Submitting and Collecting Entity Codes

Name of Monitoring Entity	Tag Prefix	Submitting Entity	Collecting Entity
USIBWC American Dam Field Office	BD	IB	IB
USIBWC Amistad Dam Field Office	BA	IB	IB
USIBWC Falcon Dam Field Office	BF	IB	IB
USIBWC Presidio Office	BP	IB	IB
USIBWC Mercedes Field Office	BM	IB	IB
USIBWC El Paso Headquarters	BH	IB	IB
Univ. of TX RGV – Edinburg	B	IB	PT
RGISC	B	IB	RN
Big Bend National Park	B	IB	BB

City of Laredo Health Serv.	B	IB	LA
City of Laredo Env. Services	B	IB	LE
Brownsville PUB	B	IB	BO
TX Parks and Wildlife Dept.	B	IB	PW
Midland College	B	IB	MC

Data Errors and Loss

When the USIBWC CRP receives laboratory data, the data is checked by the USIBWC CRP Project Manager to ensure all contract requirements were met by the laboratory for the analysis. Upon receipt of field and laboratory data, the USIBWC CRP QAO ensures that no errors are present. If any potential errors are observed, the USIBWC CRP QAO verifies the error with the source and makes corrections if needed. The data is then entered into the Access database. Prior to exporting the data from Access for submittal to TCEQ, the database is queried for any errors by comparing the data with another database containing known Monitoring Station ID codes, approved Parameter codes, the LOQ's established in Table A7 of this QAPP, and normal minimum and maximum values for each analysis. Any data errors confirmed, or data deemed incorrect or of questionable quality, is not submitted to TCEQ. Any errors discovered by the database are corrected and the data is exported from Access into pipe delimited file formats as described in the Surface Water Quality Monitoring Data Management Reference Guide, 2016 or most recent version.

entered

Record Keeping and Data Storage

All field data sheets and laboratory data received by the USIBWC CRP are recorded as received in a logbook by the USIBWC CRP QAO. Complete data sets are assigned a tag ID and logged into a spreadsheet by the USIBWC CRP QAO. Complete original data sets are archived in hard copy form and retained on-site by USIBWC CRP for a minimum of seven years. USIBWC CRP staff back up all electronic logs and datasets on external hard drives on at least a monthly basis. Additionally, IT personnel backup all network drives weekly at a separate location from the CRP. Data is submitted as required by the CRP guidance and all data that meets project performance specifications are stored in the SWQMIS database. All laboratories have separate data security measures as addressed by their procedures.

Data Handling, Hardware, and Software Requirements

The USIBWC CRP computer system is attached to a Local Area Network (LAN) consisting of multiple servers and backup servers on a 1GB Network. The LAN is comprised of workstation nodes plus networked and individual printers. All components communicate with each other through switches (1 GB) and routers. The switches give the user their Internet access through USIBWC's connection with a federally contracted communications provider via a T3 line. Details of hardware and software directly used to meet the requirements of this document are listed in the tables below:

Table B10.2 Personal Computer and Software Configuration

Configuration	Current		Anticipated	
Type	Hardware/Software	Date	Hardware/Software	Date
PC Workstation Hardware	Dell configured as follows: Intel Core i7-4790 CPU @ 3.6 GHz; 16 GB RAM; 18" LCD Color Monitor; NVIDIA Quadro K4000 Graphics; 150GB Hard Drive; CD-RW drives; DVD-ROM drive; Twisted Pair CAT 6 Ethernet;	Three systems currently installed. As of 5/2015	System upgrades	As Determined by the USIBWC IT Dept.

	104+ Keyboard; and MS IntelliMouse; Printer.			
PC Software	MS Windows 7 Professional; Microsoft Outlook; MS Office 2016	As of 1/2019	Software upgrades	As Determined by the USIBWC IT Dept.
Portable PC Hardware	Portable PC: Dell Precision M2400; Intel Core i7-3540M CPU @ 3 GHz, 8 GB RAM; 256 GB Hard Drive, CD and DVD-RW drive; Lithium Ion battery with battery gauge and AC pack; and EZ Pad Plus Pointing device	As of 5/2015	Hardware upgrades	As Determined by the USIBWC IT Dept.
Portable PC Software	Adobe Creative Suite 4 Master, Windows 7 Ultimate, MS Office 365	As of 5/2019	Software upgrades	As Determined by the USIBWC IT Dept.
Data Backup System	Each workstation contains a 16x rewritable drive.	As of 5/2015		As Determined by the USIBWC IT Dept.

Table B10.3 GIS Workstation Hardware and Software Configuration

Configuration	Current		Anticipated	
Type	Hardware/Software	Date	Hardware/Software	Date
PC Workstation Hardware	Dell configured as follows: Intel Xeon® CPU E5-2665 0 @ 2.4 GHz; 32 GB RAM; 18" LCD Color Monitor; NVIDIA Quadro K4000 Graphics; 150GB Hard Drive; CD-RW drives; DVD-ROM drive; Twisted Pair CAT6 Ethernet; 104+ Keyboard; and HID-compliant mouse; Printer.	Three systems currently installed. As of 5/2015	System upgrades	As Determined by the USIBWC IT Dept.
PC Software	MS Windows 7 Professional; Microsoft Outlook; MS Office 2016; Adobe Creative Suite 4 Master	As of 1/2019	Software upgrades	As Determined by the USIBWC IT Dept.
Data Backup System	Each workstation contains a 16x rewritable drive.	As of 5/2015		As Determined by the USIBWC IT Dept.

Information Resource Management Requirements

Data will be managed in accordance with the SWQM DMRG, most recent revision, and applicable USIBWC CRP information resource management policies.

GPS equipment may be used as a component of the information required by the Station Location (SLOC) request process for creating the certified positional data that will ultimately be entered into SWQMIS database. Positional data obtained by CRP grantees using a GPS will follow the TCEQ's OPP 8.11 and 8.12 policy regarding the collection and management of positional data. Positional data may be acquired with a GPS and verified with photo interpolation using a certified source, such as Google Earth or Google Maps. The verified coordinates and map interface can then be used to develop a new SLOC.

C1 Assessments and Response Actions

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

Table C1.1 Assessments and Response Requirements

Assessment Activity	Approximate Schedule	Responsible Party	Scope	Response Requirements
Status Monitoring Oversight, etc.	Continuous	USIBWC CRP	Monitoring of the project status and records to ensure requirements are being fulfilled	Report to TCEQ in Quarterly Report
Monitoring Systems Audit of USIBWC CRP	Dates to be determined by TCEQ	TCEQ	Field sampling, handling and measurement; facility review; and data management as they relate to CRP	30 days to respond in writing to the TCEQ to provide corrective actions
Monitoring Systems Audit of Program Subparticipants	Dates to be determined by the USIBWC CRP	USIBWC CRP	Field sampling, handling and measurement; facility review; and data management as they relate to CRP	30 days to respond in writing to the USIBWC El Paso Headquarters. PM will report problems to TCEQ in Progress Report.
Laboratory Assessment	Dates to be determined by TCEQ	TCEQ Laboratory Assessor	Analytical and quality control procedures employed at the laboratory and the contract laboratory	30 days to respond in writing to the TCEQ to provide corrective actions
Desk Audit/Data Traceability Review	Dates to be determined by the USIBWC	USIBWC CRP	Review of all calibration documentation, field sheet and chain of custody records. Data will be checked by selecting a date range and checking the data against USIBWC El Paso Headquarters records.	30 days to respond in writing to the USIBWC. PM will report problems to TCEQ in Progress Report.

Corrective Action Process for Deficiencies

Deficiencies are any deviation from the QAPP, SWQM Procedures, or other applicable guidance. Deficiencies may invalidate resulting data and require corrective action. Repeated deficiencies should initiate a CAP. Corrective action for deficiencies may include for samples to be discarded and re-collected. Deficiencies are documented in logbooks, field data sheets, etc. by field or laboratory staff, are communicated to the USIBWC CRP Project Manager (or other appropriate staff) and should be subject to periodic review so their responses can be uniform, and their frequency tracked. It is the responsibility of the USIBWC CRP Project Manager, in consultation with the USIBWC CRP QAO, to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP. In addition, these actions and resolutions will be conveyed to the CRP Project Manager both verbally and in writing in quarterly progress reports and by completion of a CAP.

The USIBWC CRP staff has developed an Excel spreadsheet to track any problems encountered by/with partners during the sampling process. This makes the process of tracking deficiencies with such a large number of partners much easier. When the USIBWC CRP Project Manager or QAO encounter an issue with a sampling event, such as late coolers, failure to meet temperature, calibration problems, etc., the event is logged into the spreadsheet. The information logged includes the partner, the stations affected, the sampling date, and what the problem was. The USIBWC CRP QAO works with the partner to correct the deficiency every time an entry is made into the spreadsheet. Once a partner accumulates three entries on the spreadsheet for the same deficiency, the USIBWC

CRP QAO issues a CAP and the partner is required to correct the deficiency and respond. However, based on the severity of the issue, the PM and QAO have discretion to issue a CAP on the first occurrence of a deficiency. This process allows the USIBWC CRP staff to quickly correct things such as YSI probe malfunctions, but also allows the PM and QAO to see bigger problems that may require more training or other means of intervention.

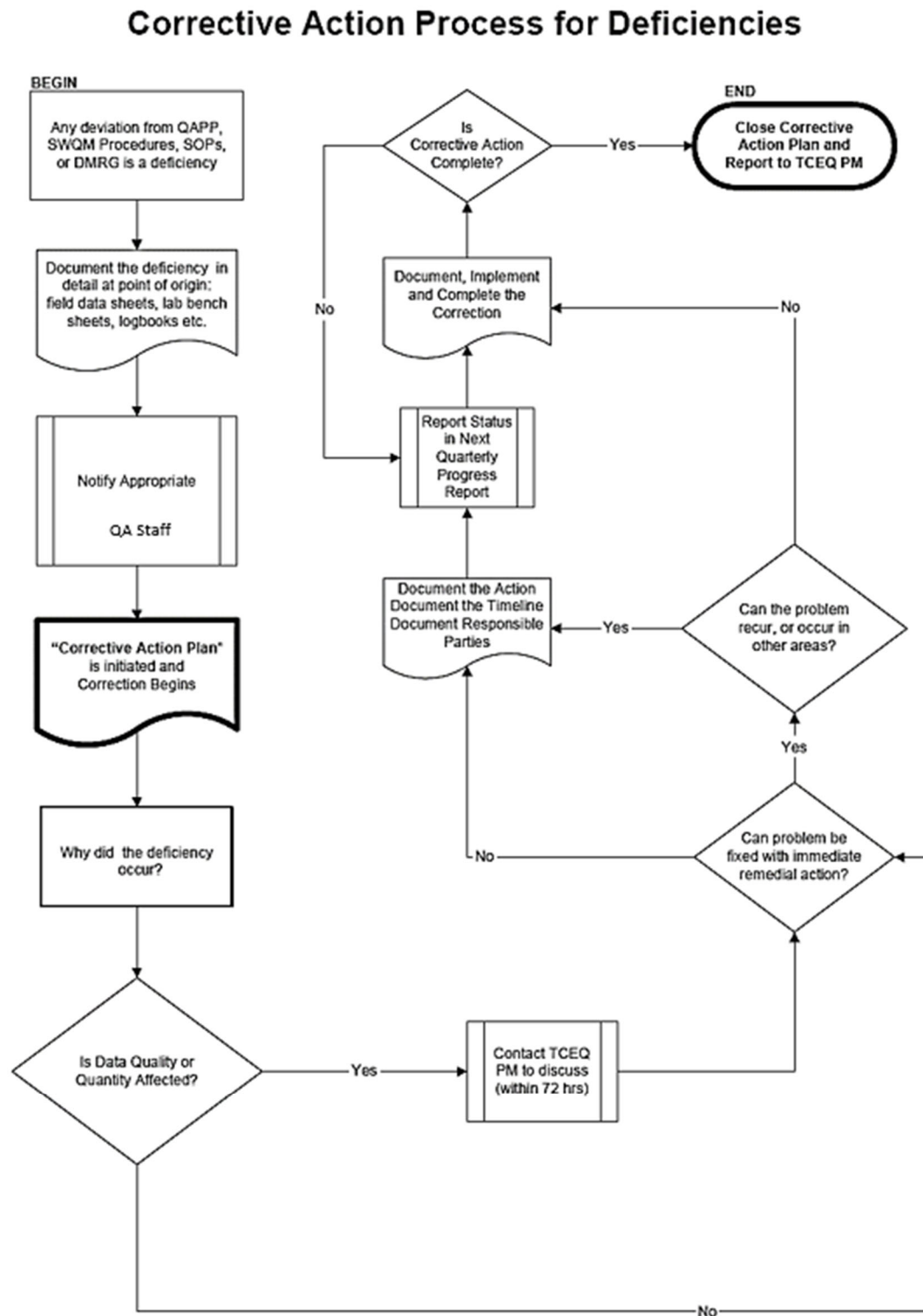
Corrective Action

CAPs should:

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

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

Figure C1.1 Corrective Action Process for Deficiencies



The status of CAPs will be included with quarterly progress reports. In addition, significant conditions which, if uncorrected, could have a serious effect on safety or on the validity or integrity of data will be reported to the TCEQ immediately.

The USIBWC CRP QAO is responsible for implementing corrective actions and tracking deficiencies and corrective actions in a pre-CAP log. Upon the recording of three deficiencies for the same issue by the same partner, a CAP will be produced and submitted to partner to acknowledge the deficiency and what corrections will be made to prevent future deficiencies. Records of audit findings and corrective actions are maintained by the USIBWC CRP Project Manager. Audit reports and associated corrective action documentation will be submitted to the TCEQ with the quarterly progress reports.

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

C2 Reports to Management

Table C2.1 QA Management Reports

Type of Report	Frequency (daily, weekly, monthly, quarterly, etc.)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation	Report Recipients
Non-Conformance Report	As Needed	As Needed	Field Staff Laboratory Staff	USIBWC CRP PM or QAO
CRP Progress Reports	Quarterly	December 15, 2019 March 15, 2020 June 15, 2020 September 15, 2020 December 15, 2020 March 15, 2021 June 15, 2021 August 31, 2021	USIBWC CRP Project Manager or QAO	TCEQ CRP Project Management
Corrective Action Plan	Quarterly until completed	30 days from the day USIBWC became aware of the deviation	USIBWC CRP QAO	USIBWC CRP Project Manager, TCEQ Project Manager
Non-compliance Reports	As needed	With lab results to document lab issues or late cooler arrivals	Lab QAO	USIBWC CRP Project Manager
Data Summary	As needed	With Data Submittals	USIBWC CRP Data Manager	TCEQ CRP Project Management
Monitoring Systems Audit Report and Response	As Needed	As Needed	USIBWC QAO	TCEQ CRP Project Management

Reports to USIBWC Project Management

Results of oversight activities, deficiencies, corrective action reports, and significant QA issues are reported to the USIBWC PM on an ongoing basis. They may or may not be written reports.

Reports to TCEQ Project Management

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

Progress Report

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

Monitoring Systems Audit Report and Response

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

Data Summary

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

Reports by TCEQ Project Management

Contractor Evaluation

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

D1 Data Review, Verification, and Validation

All field and laboratory data will be reviewed and verified for integrity and continuity, reasonableness, and conformance to project requirements, and then validated against the project objectives and measurement performance specifications which are listed in Section A7 of this QAPP. Only those data which are supported by appropriate quality control data and meet the measurement performance specifications defined for this project will be considered acceptable and will be reported to the TCEQ for entry into SWQMIS.

D2 Verification and Validation Methods

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

Data review, verification, and validation will be performed using self-assessments as well as peer and management review as appropriate to the project task. The data review tasks to be performed by field and laboratory staff are listed in the first two columns of Table D2.1, respectively. Potential errors are identified by examination of documentation and by manual examination of corollary or unreasonable data; this analysis may be computer-assisted. If a question arises or an error is identified, the manager of the task responsible for generating the data is contacted to resolve the issue. Issues which can be corrected are corrected and documented. If an issue cannot be corrected, the task manager consults with the higher-level project management to establish the appropriate course of action, or the data associated with the issue are rejected and not reported to the TCEQ for storage in SWQMIS. Field and laboratory reviews, verifications, and validations are documented.

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

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

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

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

Table D2.1: Data Review Tasks

Data to be Verified	Field Task	Laboratory Task	QA Task
Sample documentation complete; samples labeled, sites identified	Field Personnel	Lab QAO	
Field QC samples collected for all analytes as prescribed in the TCEQ SWQM Procedures Manual	Field Personnel		
Standards and reagents traceable	Field Personnel	Lab QAO	
Chain of custody complete/acceptable	Field Personnel	Lab QAO	USIBWC QAO
NELAP Accreditation is current		Lab QAO	USIBWC QAO
Sample preservation and handling acceptable	Field Personnel	Lab QAO	
Holding times not exceeded		Lab QAO	USIBWC QAO
Collection, preparation, and analysis consistent with SOPs and QAPP	Field Personnel	Lab QAO	USIBWC QAO
Field documentation (e.g., biological, stream habitat) complete	Field Personnel		
Instrument calibration data complete	Field Personnel	Lab QAO	USIBWC QAO
QC samples analyzed at required frequency	Field Personnel	Lab QAO	USIBWC QAO
QC results meet performance and program specifications		Lab QAO	USIBWC QAO
Analytical sensitivity (LOQ/AWRL) consistent with QAPP		Lab QAO	USIBWC QAO
Results, calculations, transcriptions checked	Field Personnel	Lab QAO	USIBWC QAO
Laboratory bench-level review performed		Lab QAO	
All laboratory samples analyzed for all scheduled parameters		Lab Manager*	USIBWC PM
Corollary data agree	Field Personnel		USIBWC PM and QAO
Nonconforming activities documented	Field Personnel	Lab QAO	USIBWC QAO
Outliers confirmed and documented; reasonableness check performed			USIBWC PM and QAO
Dates formatted correctly			USIBWC PM and QAO

Depth reported correctly and in correct units			USIBWC PM and QAO
TAG IDs correct			USIBWC PM and QAO
TCEQ Station ID number assigned			USIBWC PM and QAO
Valid parameter codes			USIBWC PM and QAO
Codes for submitting entity(ies), collecting entity(ies), and monitoring type(s) used correctly			USIBWC PM and QAO
Time based on 24-hour clock			USIBWC PM and QAO
Check for transcription errors	Field Personnel	Lab QAO	USIBWC QAO
Sampling and analytical data gaps checked (e.g., all sites for which data are reported are on the coordinated monitoring schedule)			USIBWC PM
Field instrument pre- and post-calibration results within limits	Field Personnel		USIBWC QAO
10% of data manually reviewed			USIBWC PM and QAO
*The term "Lab Manager" includes the Technical Director at the City of Laredo Health Dept. laboratory.			

D3 Reconciliation with User Requirements

Data produced in this project, and data collected by other organizations (e.g., USGS, TCEQ, etc.), will be analyzed and reconciled with project data quality requirements. Data which do not meet requirements will not be submitted to SWQMIS nor will be considered appropriate for any of the uses noted in Section A5.

Appendix A: Measurement Performance Specifications (Table A7.1-14)

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.

Procedures for laboratory analysis must be in accordance with the most recently published edition of Standard Methods for the Examination of Water and Wastewater, 40 CFR 136, or otherwise approved independently. Only data collected that have a valid TCEQ parameter code assigned in Tables A7 are stored in SWQMIS. Any parameters listed in Tables A7 that do not have a valid TCEQ parameter code assigned will not be stored in SWQMIS.

TABLE A7.1 Measurement Performance Specifications for USIBWC CRP

Field Parameters					
Parameter	Units	Matrix	Method	Parameter Code	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	TCEQ SOP V1	00020	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	us/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	Field
PH (STANDARD UNITS)*	s.u	water	EPA 150.1 and TCEQ SOP V1	00400	Field
TURBIDITY, FIELD NEPHELOMETRIC TURBIDITY UNITS, N	NTU	water	SM 2130-B	82078	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE (METERS)*	meters	water	TCEQ SOP V2	82903	Field
AVERAGE STREAM WIDTH (METERS)	meters	water	TCEQ SOP V1	89861	Field
RESERVOIR STAGE (FEET ABOVE MEAN SEA LEVEL)***	FT ABOVE MSL	water	TWDB	00052	Field
RESERVOIR PERCENT FULL***	% RESERVOIR CAPACITY	water	TWDB	00053	Field
RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING	NS	other	TCEQ Drought Guidance	00051	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	Field

POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	Field
WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD.,4=STRONG)	NU	other	NA	89965	Field
WIND DIRECTION (1=North, 2=South, 3=East, 4=West, 5=NE, 6=SE, 7=NW, 8=SW)	NU	other	NA	89010	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=C LDY,4=RAIN,5=OTHER)	NU	other	NA	89966	Field
<p>USIBWC CRP partners that use this table include: USIBWC CRP, USIBWC Field Offices, BBNP, TPWD, Midland College, City of Laredo Env. Services Dept., UTRGV, and RGISC</p> <p>* Reporting to be consistent with SWQM guidance and based on measurement capability.</p> <p>** To be routinely reported when collecting data from perennial pools.</p> <p>*** As published by the Texas Water Development Board on their website https://www.waterdatafortexas.org/reservoirs/statewide</p> <p>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, 23rd Edition, 2017. 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).</p>					

TABLE A7.2 Measurement Performance Specifications for USIBWC CRP

Flow Parameters					
Parameter	Units	Matrix	Method	Parameter Code	Lab
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	Field
STREAM FLOW ESTIMATE (CFS)	cfs	Water	TCEQ SOP V1	74069	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	Field
USIBWC CRP partners that use this table include: USIBWC CRP, USIBWC Field Offices, BBNP, TPWD, Midland College, City of Laredo Env. Services Dept., UTRGV, and RGISC 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, 23rd Edition, 2017. 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 A7.3 Measurement Performance Specifications for DHL Analytical, Inc.

Conventional Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C)	mg/L	water	SM 5210B	00310	2	2	NA	NA	NA	AQUA-TECH
ALKALINITY, TOTAL (MG/L AS CaCO₃)	mg/L	water	SM 2320B EPA 310.1	00410	20	20	NA	20	NA	DHL
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540D EPA 160.2	00530	5	2.5	NA	NA	NA	DHL
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM 4500-NH ₃ -D	00610	0.1	0.1	70-130	20	80-120	DHL
NITRITE PLUS NITRATE, TOTAL ONE LAB DETERMINED VALUE (MG/L AS N)	mg/L	water	EPA 300 EPA 9056	00630	0.05	0.05	70-130	20	80-120	DHL
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	SM 4500-P E EPA 365.2	00665	0.06	0.06	70-130	20	80-120	DHL
CARBON, TOTAL ORGANIC, NPOC (TOC), MG/L	mg/L	water	SM 5310C EPA 415.1 EPA 9060	00680	2	1	NA	NA	NA	DHL
HARDNESS, TOTAL (MG/L AS CaCO₃)*	mg/L	water	SM 2340B	00900	5	2	NA	20	80-120	DHL
CALCIUM, TOTAL (MG/L AS Ca)	mg/L	water	EPA 6020A EPA 200.8	00916	0.5	0.3	70-130	20	80-120	DHL
MAGNESIUM, TOTAL (MG/L AS Mg)	mg/L	water	EPA 6020A EPA 200.8	00927	0.5	0.3	70-130	20	80-120	DHL
SODIUM, TOTAL (MG/L AS Na)	mg/L	water	EPA 6020A EPA 200.8	00929	NA	0.3	70-130	20	80-120	DHL
POTASSIUM, TOTAL (MG/L AS K)	mg/L	water	EPA 6020A EPA 200.8	00937	NA	0.3	70-130	20	80-120	DHL
CHLORIDE (MG/L AS Cl)	mg/L	water	EPA 300 EPA 9056	00940	5	1	70-130	20	80-120	DHL
SULFATE (MG/L AS SO₄)	mg/L	water	EPA 300 EPA 9056	00945	5	3	70-130	20	80-120	DHL
FLUORIDE, TOTAL (MG/L AS F)	mg/L	water	EPA 300 EPA 9056	00951	0.5	0.4	70-130	20	80-120	DHL

CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	ug/L	water	EPA 446.0	32211	3	3	NA	NA	80-120	DHL
RESIDUE, TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540C EPA 160.1	70300	10	10	NA	20	80-120	DHL
<p>USIBWC CRP partners that use this table include: USIBWC CRP, Amistad Dam FO, Falcon Dam FO, Presidio FO, Mercedes FO, BBNP, TPWD, City of Laredo Env. Services, RGISC, UTRGV-Edinburg, and Midland College</p> <p>BOD analysis is subcontracted by DHL Analytical to AQUA-TECH, whose adherence letter is on file.</p> <p>*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).</p> <p>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, 23rd Edition, 2017. 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).</p>										

TABLE A7.4 Measurement Performance Specifications for DHL Analytical, Inc.

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-B**	31699	1	1	NA	0.50*	NA	ANALAB
E. COLI, COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	ANALAB
<p>USIBWC CRP partners that use this table include: USIBWC CRP, Amistad Dam FO, Falcon Dam FO, Presidio FO, Mercedes FO, BBNP, TPWD, Midland College, RGISC, City of Laredo Env. Services, and UTRGV-Edinburg</p> <p>E. coli analysis is subcontracted by DHL Analytical to AQUA-TECH, whose adherence letter is on file.</p> <p>* 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.</p> <p>** 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.</p> <p>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, 23rd Edition, 2017. 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).</p>										

TABLE A7.5 Measurement Performance Specifications for DHL Analytical, Inc.

Metals in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
ARSENIC, TOTAL (UG/L AS AS)	µg/L	water	EPA 200.8 EPA 6020	01002	NA	5	70-130	20	80-120	DHL
BARIUM, TOTAL (UG/L AS BA)	µg/L	water	EPA 200.8 EPA 6020	01007	NA	10	70-130	20	80-120	DHL
BERYLLIUM, TOTAL (UG/L AS BE)	µg/L	water	EPA 200.8 EPA 6020	01012	NA	1	70-130	20	80-120	DHL
CADMIUM, TOTAL (UG/L AS Cd)	µg/L	water	EPA 200.8 EPA 6020	01027	NA	1	70-130	20	80-120	DHL
CHROMIUM, TOTAL (UG/L AS CR)	µg/L	water	EPA 200.8 EPA 6020	01034	NA	5	70-130	20	80-120	DHL
COBALT, TOTAL (UG/L AS CO)	µg/L	water	EPA 200.8 EPA 6020	01037	NA	10	70-130	20	80-120	DHL
COPPER, TOTAL (UG/L AS CU)	µg/L	water	EPA 200.8 EPA 6020	01042	NA	10	70-130	20	80-120	DHL
IRON, TOTAL (UG/L AS FE)	µg/L	water	EPA 200.8 EPA 6020	01045	300	150	70-130	20	80-120	DHL
LEAD, TOTAL (UG/L AS Pb)	µg/L	water	EPA 200.8 EPA 6020	01051	NA	1	70-130	20	80-120	DHL
MANGANESE, TOTAL (UG/L AS MN)	µg/L	water	EPA 200.8 EPA 6020	01055	50	2	70-130	20	80-120	DHL
THALLIUM, TOTAL (UG/L AT TL)	µg/L	water	EPA 200.8 EPA 6020	01059	NA	1.5	70-130	20	80-120	DHL
MOLYBDENUM, TOTAL (UG/L AS MO)	µg/L	water	EPA 200.8 EPA 6020	01062	NA	5	70-130	20	80-120	DHL
NICKEL, TOTAL (UG/L AS NI)	µg/L	water	EPA 200.8 EPA 6020	01067	NA	10	70-130	20	80-120	DHL
SILVER, TOTAL (UG/L AS AG)	µg/L	water	EPA 200.8 EPA 6020	01077	NA	2	70-130	20	80-120	DHL
ZINC, TOTAL (UG/L AS ZN)	µg/L	water	EPA 200.8 EPA 6020	01092	NA	5	70-130	20	80-120	DHL

ANTIMONY, TOTAL (UG/L AS SB)	µg/L	water	EPA 200.8 EPA 6020	01097	NA	2.5	70-130	20	80-120	DHL
TIN, TOTAL, UG/L AS SN	µg/L	water	EPA 200.8 EPA 6020	01102	NA	10	70-130	20	80-120	DHL
ALUMINUM, TOTAL (UG/L AS AL)	ug/L	water	EPA 200.8 EPA 6020	01105	NA	30	70-130	20	80-120	DHL
SELENIUM, TOTAL (UG/L AS SE)	ug/L	water	EPA 200.8 EPA 6020	01147	2	2	70-130	20	80-120	DHL
MERCURY, TOTAL, (UG/L AS HG)	ug/L	water	EPA 245.7	71900	0.006	0.004	70-130	20	80-120	ANALAB
<p>USIBWC CRP partners that use this table include: Presidio FO, Mercedes FO, BBNP, TPWD, City of Laredo Env. Services</p> <p>Mercury analysis is subcontracted by DHL Analytical to ANALAB, whose adherence letter is on file.</p> <p>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, 23rd Edition, 2017. 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).</p>										

TABLE A7.6 Measurement Performance Specifications for DHL Analytical, Inc.

Metals in Sediment										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
ARSENIC, BOTTOM DEPOSITS (MG/KG AS AS DRY WT)	mg/kg	sediment	6020A EPA 200.8	01003	16.5	1	60-140	30	60-140	DHL
BARIUM, BOTTOM DEPOSITS (MG/KG AS BA DRY WT)	mg/kg	sediment	6020A EPA 200.8	01008	NA	2	60-140	30	60-140	DHL
CADMIUM, TOTAL, BOTTOM DEPOSITS (MG/KG, DRY WT)	mg/kg	sediment	6020A EPA 200.8	01028	2.49	0.3	60-140	30	60-140	DHL
CHROMIUM, TOTAL, BOTTOM DEPOSITS (MG/KG, DRY WT)	mg/kg	sediment	6020A EPA 200.8	01029	55.5	2	60-140	30	60-140	DHL
COPPER, BOTTOM DEPOSITS (MG/KG AS CU DRY WT)	mg/kg	sediment	6020A EPA 200.8	01043	74.5	2	60-140	30	60-140	DHL
LEAD, BOTTOM DEPOSITS (MG/KG AS PB DRY WT)	mg/kg	sediment	6020A EPA 200.8	01052	64	0.3	60-140	30	60-140	DHL
MANGANESE, BOTTOM DEPOSITS (MG/KG AS MN DRY WG)	mg/kg	sediment	6020A EPA 200.8	01053	550	2	60-140	30	60-140	DHL
NICKEL, TOTAL, BOTTOM DEPOSITS (MG/KG, DRY WT)	mg/kg	sediment	6020A EPA 200.8	01068	24.3	2	60-140	30	60-140	DHL
SILVER, BOTTOM DEPOSITS (MG/KG AS AG DRY WT)	mg/kg	sediment	6020A EPA 200.8	01078	1.1	0.2	60-140	30	60-140	DHL
ZINC, BOTTOM DEPOSITS (MG/KG AS ZN DRY WT)	mg/kg	sediment	6020A EPA 200.8	01093	205	2.5	60-140	30	60-140	DHL
ANTIMONY, BOTTOM DEPOSITS (MG/KG AS SB DRY WT)	mg/kg	sediment	6020A EPA 200.8	01098	12.5	1	60-140	30	60-140	DHL
ALUMINUM, BOTTOM DEPOSITS (MG/KG AS AL DRY WT)	mg/kg	sediment	6020A EPA 200.8	01108	NA	37.5	60-140	30	60-140	DHL

SELENIUM, BOTTOM DEPOSITS (MG/KG AS SE DRY WT)	mg/kg	sediment	6020A EPA 200.8	01148	NA	0.5	60-140	30	60-140	DHL
MERCURY, TOT. IN BOT. DEPOS. (MG/KG) AS HG DRY WG	mg/kg	sediment	EPA 7471 EPA 7470	71921	0.355	0.04	60-140	30	60-140	DHL
SEDIMENT PRCTL.SIZE CLASS >2.0MM GRAVEL %DRY WT*	% DRY WT	sediment	Gravel Retention #10 Sieve	80256	NA	NA	NA	% gravel- 20	NA	ANALAB
SOLIDS IN SEDIMENT, PERCENT BY WEIGHT (DRY)	% BY WT	sediment	ASTM D2216	81373	NA	NA	NA	20	NA	DHL
PARTICLE SIZE, 0.05-0.002mm SILT, DRYWT, SEDIMENT*	%	sediment	ASTM D422	49906	NA	NA	NA	%silt - 20	NA	ANALAB
SEDIMENT PRCTL.SIZE CLASS.0039-.0625 SILT %DRY W*	% DRY WT	sediment	ASTM D422	82008	NA	NA	NA	%silt - 20	NA	ANALAB
PARTICLE SIZE, CLAY0.002- 0.0002mm DRYWT, SEDIMENT%*	%	sediment	ASTM D422	49900	NA	NA	NA	%clay - 20	NA	ANALAB
SEDIMENT PRCTL.SIZE CLASS <.0039 CLAY %DRY WT*	%	sediment	ASTM D422	82009	NA	NA	NA	%clay - 20	NA	ANALAB
SEDIMENT PRCTL.SIZE CLASS, SAND .0625-2mm %DRYWT*	%	sediment	ASTM D422	89991	NA	NA	NA	%sand - 20	NA	ANALAB

USIBWC CRP partners that use this table include: City of Laredo Env. Services Dept.

Particle size analysis is subcontracted by DHL Analytical to ANALAB, whose adherence letter is on file

*Sediment conventionals are not used for regulatory purposes but are extremely important in determining the availability of sediment toxics. Sediment grain size and TOC are recommended when analyzing metals and/or organics in sediment.

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, 23rd Edition, 2017.
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 A7.7 Measurement Performance Specifications for El Paso Water International Water Quality Laboratory

Conventional Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C)	mg/L	water	SM 5210B	00310	2	2	NA	NA	NA	IWQL
MAGNESIUM, TOTAL (MG/L AS MG)	mg/L	water	EPA 200.7	00927	0.5	0.5	70-130	20	80-120	IWQL
SODIUM, TOTAL (MG/L AS NA)	mg/L	water	EPA 200.7	00929	NA	10	70-130	20	80-120	IWQL
POTASSIUM, TOTAL (MG/L AS K)	mg/L	water	EPA 200.7	00937	NA	2	70-130	20	80-120	IWQL
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	µg/L	water	SM 10200 H	32211	3	3	NA	20	80-120	IWQL
TURBIDITY, LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	SM 2130B	82079	0.5	0.1	NA	NA	NA	IWQL
<p>The IWQL lab analyzes samples collected by the USIBWC American Dam field office.</p> <p>References:</p> <p>United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020</p> <p>American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)</p> <p>TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).</p> <p>TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416)</p>										

**TABLE A7.8 Measurement Performance Specifications for El Paso Water
International Water Quality Laboratory**

Metals in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
ARSENIC, TOTAL (UG/L AS AS)	µg/L	water	EPA 200.7	01002	NA	100	70-130	20	80-120	IWQL
BARIUM, TOTAL (UG/L AS BA)	µg/L	water	EPA 200.7	01007	NA	100	70-130	20	80-120	IWQL
BERYLLIUM, TOTAL (UG/L AS BE)	µg/L	water	EPA 200.7	01012	NA	20	70-130	20	80-120	IWQL
CADMIUM, TOTAL (UG/L AS Cd)	µg/L	water	EPA 200.7	01027	NA	60	70-130	20	80-120	IWQL
CHROMIUM, TOTAL (UG/L AS CR)	µg/L	water	EPA 200.7	01034	NA	45	70-130	20	80-120	IWQL
COPPER, TOTAL (UG/L AS CU)	µg/L	water	EPA 200.7	01042	NA	100	70-130	20	80-120	IWQL
IRON, TOTAL (UG/L AS FE)	µg/L	water	EPA 200.7	01045	300	100	70-130	20	80-120	IWQL
LEAD, TOTAL (UG/L AS Pb)	µg/L	water	EPA 200.7	01051	NA	100	70-130	20	80-120	IWQL
MANGANESE, TOTAL (UG/L AS MN)	µg/L	water	EPA 200.7	01055	50	40	70-130	20	80-120	IWQL
THALLIUM, TOTAL (UG/L AT TL)	µg/L	water	EPA 200.7	01059	NA	100	70-130	20	80-120	IWQL
MOLYBDENUM, TOTAL (UG/L AS MO)	µg/L	water	EPA 200.7	01062	NA	20	70-130	20	80-120	IWQL
NICKEL, TOTAL (UG/L AS NI)	µg/L	water	EPA 200.7	01067	NA	40	70-130	20	80-120	IWQL
SILVER, TOTAL (UG/L AS AG)	µg/L	water	EPA 200.8	01077	NA	0.5	70-130	20	80-120	IWQL
ZINC, TOTAL (UG/L AS ZN)	µg/L	water	EPA 200.7	01092	NA	60	70-130	20	80-120	IWQL
ANTIMONY, TOTAL (UG/L AS SB)	µg/L	water	EPA 200.7	01097	NA	100	70-130	20	80-120	IWQL

ALUMINUM, TOTAL (UG/L AS AL)	ug/L	water	EPA 200.7	01105	NA	100	70-130	20	80-120	IWQL
<p>The IWQL lab analyzes samples collected by the USIBWC American Dam field office.</p> <p>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, 23rd Edition, 2017. 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).</p>										

TABLE A7.9 Measurement Performance Specifications for El Paso Water International Water Quality Laboratory

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-B	31699	1	1	NA	0.50*	NA	IWQL
<p>The IWQL lab analyzes samples collected by the USIBWC American Dam field office.</p> <p>* 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.</p> <p>References:</p> <p>United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020</p> <p>American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)</p> <p>TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, 2012 (RG-415).</p> <p>TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416)</p>										

TABLE A7.10 Measurement Performance Specifications for City of Laredo Health Department Lab

Field Parameters					
Parameter	Units	Matrix	Method	Parameter Code	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)	us/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2520 and TCEQ SOP V1	00020	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	Field
AVERAGE STREAM WIDTH (METERS)	meters	water	TCEQ SOP V1	89861	Field
WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD., 4=STRONG)	NU	other	NA	89965	Field
WIND DIRECTION (1= North, 2= South, 3= East, 4=West, 5= NE, 6= SE, 7= NW, 8= SW)	NU	other	NA	89010	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN, 5=OTHER)	NU	other	NA	89966	Field
<p>USIBWC CRP partners that use this table include: The City of Laredo Health Department</p> <p>Reporting to be consistent with SWQM guidance and based on measurement capability.</p> <p>References:</p> <p>Quality Control Lab documents from City of Laredo Health Department Laboratory and NELAP certification.</p> <p>United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020</p> <p>American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)</p> <p>TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).</p> <p>TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416)</p>					

TABLE A7.11 Measurement Performance Specifications for City of Laredo Health Department Lab

Bacteriological Parameters in Water									
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	Log Difference of Duplicates	Bias %Rec. of LCS	Lab
FECAL COLIFORM, MEMBR FILTER, M-FC BROTH, #/100ML	#/100ML	water	SM 9222 D	31616	1	1	0.50*	NA	Laredo
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-B, IDEXX Colilert	31699	1	1	0.50*	NA	Laredo
<p>USIBWC CRP partners that use this table include: The City of Laredo Health Department</p> <p>* 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.</p> <p>References:</p> <p>United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020</p> <p>American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 21st Edition, 2005.</p> <p>TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).</p> <p>TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416)</p>									

TABLE A7.12 Measurement Performance Specifications for City of Laredo Health Department

Flow Parameters					
Parameter	Units	Matrix	Method	Parameter Code	Lab
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	Field
STREAM FLOW ESTIMATE (CFS)	cfs	Water	TCEQ SOP V1	74069	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	Field
<p>USIBWC CRP partners that use this table include: The City of Laredo Health Department</p> <p>References:</p> <p>United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020</p> <p>American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard</p> <p>Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)</p> <p>TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).</p> <p>TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416)</p>					

TABLE A7.13 Measurement Performance Specifications for BPUB

Conventional Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Verification Sample %Rec (Method defined)	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C	mg/L	water	SM 5210B	00310	2	1	NA	NA	NA	BPUB
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	EPA 160.2, SM 2540D	00530	5	2	NA	NA	NA	BPUB
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.3, SM 4500 NH ₃ D	00610	0.1	0.1	70-130	20	80-120	BPUB
RESIDUE, TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540C	70300	10	2	NA	20	80-120	BPUB
TURBIDITY, LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	EPA 180.1	82079	0.5	0.1	NA	NA	NA	BPUB
<p>USIBWC CRP partners that use this table include: BPUB</p> <p>The BPUB analyzes their own data and does not collect field parameters.</p> <p>References:</p> <p>Quality Control Lab documents from Brownsville PUB and NELAP certification.</p> <p>United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020</p> <p>American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd Edition, 2011.</p> <p>TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).</p> <p>TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416)</p>										

TABLE A7. 14 Measurement Performance Specifications for BPUB

Bacteriological Parameters in Water									
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	Log Difference of Duplicates	Bias %Rec. of LCS	Lab
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-B	31699	1	1	0.50*	NA	BPUB
ENTEROCOCCI, ENTEROLERT, IDEXX, (MPN/100 ML)	MPN/100 mL	water	IDEXX Enterolert	31701	1**	1	0.50*	NA	BPUB
<p>USIBWC CRP partners that use this table include: BPUB and UTRGV-Edinburg.</p> <p>The BPUB analyzes their own data, as well as the Enterococcus samples submitted to them by UTRGV-Edinburg.</p> <p>* 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.</p> <p>**Enterococcus Samples should be diluted 1:10 for all waters.</p> <p>References:</p> <p>United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020</p> <p>American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd Edition, 2011.</p> <p>TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, 2012 (RG-415).</p> <p>TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416)</p>									

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

TASK 3: WATER QUALITY MONITORING

Objectives: Water quality monitoring will focus on collecting information to characterize water quality in a variety of locations and conditions. These efforts will include a combination of:

- planning and coordinating basin-wide monitoring;
- routine, regularly-scheduled monitoring to collect long-term information and support statewide assessment of water quality; and
- systematic, regularly-scheduled short-term monitoring to screen water bodies for issues.

Task Description: The study area encompasses the Rio Grande River from the Texas-New Mexico border upstream of El Paso, Texas downstream to the Gulf of Mexico, including 1,255 miles of the international border with Mexico. For planning purposes the basin has been divided into 4 sub-basins as follows: the Upper Rio Grande Sub-Basin from El Paso to Amistad Dam; the Pecos River Sub-Basin from Red Bluff Reservoir to the confluence with the Rio Grande; the Middle Rio Grande Sub-Basin extending from below Amistad Dam downstream to Falcon Dam; and the Lower Rio Grande Sub-Basin from below Falcon Dam to the Gulf of Mexico.

The Performing Party will complete the following subtasks described below:

Monitoring Description – In FY 2020, the Performing Party CRP, Performing Party field offices, and participating partner agencies will collect water quality data at a minimum of 52 stations throughout the basin. **The actual number of sites, location, frequency and parameters collected for FY 2018 will be based on priorities identified at the Basin Advisory Committee (BAC) Meetings and Coordinated Monitoring Meetings and included in the amended Appendix B schedule of this QAPP.**

Parameter groups and frequencies planned for FY 2020 include but are not limited to:

- 52 stations monitored monthly for field, conventionals, bacteria and flow (when possible);
- One station will be sampled quarterly for metals in sediment;
- One station will be monitored for metals in water; and
- Ten stations will be monitored monthly for field and bacteria only.

For FY 2021, the Performing Party will monitor at a similar level of effort as FY 2020.

All monitoring procedures and methods will follow the guidelines prescribed in the Performing Party QAPP, the TCEQ Surface Water Quality Monitoring (SWQM) Procedures, Volume 1: Physical and Chemical Monitoring Methods (RG-415) and the TCEQ SWQM Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data (RG-416).

Coordinated Monitoring Meeting (CMM) - The Performing Party will hold annual coordinated monitoring meetings as described in the CRP Guidance. The Performing Party will hold CMMs for the Upper (split into two different meetings), Middle and Lower Rio Grande Sub-Basins (two meetings), and the Pecos River Sub-Basin for a total of 5 CMM meetings. Additional CMMs may be added to facilitate attendance of partners covering a large geographical area. Qualified monitoring organizations will be invited to attend the working meeting in which monitoring needs and purposes will be discussed segment-by-segment and station-by-station. Information from participants and stakeholders will be used to select stations and parameters that will enhance overall water quality monitoring coverage, eliminate duplication of effort, and address basin priorities. A summary of the changes to the monitoring schedule will be provided to the participants within two weeks of the meeting. The changes to the monitoring schedule will be entered into the statewide database on the Internet (<http://cms.lcra.org>) and communicated to meeting attendees. Changes to monitoring schedules that occur during the course of the year will be entered into the statewide database on the Internet and communicated to meeting attendees.

Monitoring Activities Report - Each QPR (Task 1) will include a Monitoring Activities Report with all types of monitoring and indicate the number of sampling events and the types of monitoring conducted in the quarter.

Deliverables and Dues Dates:

September 1, 2019 through August 31, 2020

- A. Conduct water quality monitoring, summarize activities in the Monitoring Activities Report, and submit with QPR - September 15 and December 15, 2019; March 15 and June 15, 2020
- B. CMMS - between March 15 and April 30, 2020
- C. CMMS Summary of Changes - within 2 weeks of the meetings
- D. Email notification that CMS updates are complete - May 31, 2020

September 1, 2020 through August 31, 2021

- A. Conduct water quality monitoring, summarize activities in the Monitoring Activities Report, and submit with QPR - September 15 and December 15, 2020; March 15 and June 15 and August 31, 2021
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Appendix B Sampling Process Design and Monitoring Schedule (plan)

Sample Design Rationale FY 2020

The sample design is based on the legislative intent of CRP. Under the legislation, the Basin Planning Agencies have been tasked with providing data to characterize water quality conditions in support of the Texas Water Quality Integrated Report, and to identify significant long-term water quality trends. Based on Steering Committee input, achievable water quality objectives and priorities and the identification of water quality issues are used to develop work plans which are in accord with available resources. As part of the Steering Committee process, the USIBWC CRP coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed. A discussion of past or ongoing water quality issues should be provided here to justify the monitoring schedule.

The following changes or additions have been made to the monitoring schedule. These changes have come about because of concerns or requests of steering committee members or monitoring entities.

- Upper:
 - New station at Rio Grande at Ft. Quitman will be added to the schedule in FY20. A SLOC will be done.
 - Stations 20624, 20627, 20630, 13223, 13224, 13225, 13226, 13722, 20619, 20623, 20625, 20626, 20628, 20629, 20631, and 20632, Wild and Scenic stations within Big Bend National Park, will be removed from the schedule due to staff turnover within the park; may be picked back up later.
 - USIBWC Headquarters will be monitoring stations 13272, 14465, 15529, and 15528 for USIBWC American Dam until they fill their hydrologic technician position, at which time the stations will be transferred back to USIBWC American Dam.
- Middle:
 - Sediment samples will no longer be collected at station 20997.
- Lower: No changes with CRP partners.
- Pecos: No changes with CRP partners.

Appendix B.1, shown below, contains groups of analytes and which analytes are typically analyzed by each lab. The groups are arranged similarly to Table A7 found in Appendix A. An “X” in the column indicates that the analyte is analyzed by the entity shown.

Analyte Groups Analyzed by Laboratory

Analyte Group and Analyte	DHL	EPW IWQL	BPUB	Laredo Health
Conventional				
TSS	X		X	
Ammonia N	X	X	X	
Nitrite plus Nitrate N	X			
Total Phosphorus P	X			
Chloride	X			
Sulfate	X			
TDS	X		X	
Chlorophyll a	X	X		
Total Alkalinity	X			
Turbidity		X	X	
Biological Oxygen Demand	X	X	X	
Total Organic Carbon	X			
Hardness	X			
Calcium	X			
Magnesium	X			
Sodium	X			
Potassium	X			
Fluoride	X			
Bromide	X			
Bacteria				
<i>E. Coli</i>	X	X	X	X
<i>E. Coli</i> holding time	X			
Enterococcus			X	
Fecal Coliform				X
Metals in Water	X			
Metals in Sediment	X			

Appendix B.2, shown below, specifies which lab each CRP partners sends their samples to for analysis. The groups are arranged similarly to Table A7 found in Appendix A.

CRP Partners and their Affiliated Lab

Partner	DHL	EPWU IWQL	BPUB	Laredo Health
USIBWC American Dam Field Office		Bacteria Conventionals		
USIBWC Amistad Dam Field Office	Conventionals Bacteria			
USIBWC Falcon Dam Field Office	Conventionals Bacteria			
USIBWC Presidio Field Office	Conventionals Bacteria Metals in Water			
USIBWC Mercedes Field Office	Conventionals Bacteria			
Big Bend National Park	Conventionals Bacteria Metals in Water			
Brownsville Public Utilities Board			Bacteria Conventionals	
Rio Grande International Study Center	Conventionals Bacteria			
City of Laredo Environmental Services	Conventionals Bacteria Metals in Water Metals in Sediment			
City of Laredo Health Department				Bacteria
TX Parks and Wildlife Department	Conventionals Bacteria Metals in Water			
University of Texas RGV – Edinburg	Conventionals Bacteria			
Midland College	Conventionals Bacteria			
USIBWC CRP	Conventionals Bacteria			

Appendix B.3, shown below, contains the CRP partners and what field sheets each partner uses. An “X” in the column indicates that the partner uses that particular field sheet(s). Numbers listed below field sheet type may be found on their corresponding field sheet in Appendix D.

CRP Partners and their Field Sheets

Partner	Field Form ①	Sediment Sample Field Form ②	Partial Field Form ③
USIBWC American Dam Field Office	X		
USIBWC Amistad Dam Field Office	X		
USIBWC Falcon Dam Field Office	X		
USIBWC Presidio Field Office	X		
USIBWC Mercedes Field Office	X		
Big Bend National Park	X		
Brownsville Public Utilities Board			
RGISC	X		
City of Laredo Environmental Services	X	X	
City of Laredo Health Department			X
TX Parks and Wildlife Department	X		
University of Texas RGV – Edinburg	X		
Midland College	X		
USIBWC CRP	X		

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 the TCEQ. The site selection criteria specified are those the TCEQ would like considered to produce data which is complementary to that collected by the state and which may be used in assessments, etc.

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

Monitoring Sites for FY 2020

Table B1.1 Sample Design and Schedule, FY 2020

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
Segment 2301 Rio Grande Tidal Map																						
RIO GRANDE RIVER TIDAL AT THE END OF QUICKSILVER AVE 375 METERS SOUTH FROM THE INTERSECTION OF BOCA CHICA BLVD AND QUICKSILVER AVE Map	13176	2301	15	IB	PT	RT									4			4			4	Entero analyzed by BPUB. Conventional analyzed by DHL.
RIO GRANDE RIVER AT SABAL PALM SANCTUARY 370 METERS SOUTH AND 310 METERS EAST FROM THE INTERSECTION OF DAKOTA AVE AND SABAL PALM GROVE ROAD Map	16288	2301	15	IB	PT	RT									4			4			4	Entero analyzed by BPUB. Conventional analyzed by DHL.
Segment 2302 Rio Grande Below Falcon Reservoir Map																						
RIO GRANDE RIVER AT RIVER BEND GOLF COURSE BOAT RAMP WEST OF BROWNSVILLE Map	13179	2302	15	IB	PT	RT									4			4			4	

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE AT EL JARDIN PUMP STATION LOCATED 350 METERS WEST OF INTERSECTION OF MONSEES ROAD AND CALLE MILPA VERDE Map</u>	13177	2302	15	IB	IB	RT									8			8	8		8	
<u>RIO GRANDE RIVER AT HWY 281/INTERNATIONAL BLVD IN HIDALGO Map</u>	13181	2302	15	IB	IB	RT									8			8	8		8	
<u>RIO GRANDE AT FM 886 NEAR LOS EBANOS Map</u>	13184	2302	15	IB	IB	RT									7			7	7		7	
<u>RIO GRANDE AT FORT RINGGOLD 1 MI DOWNSTREAM OF RIO GRANDE CITY Map</u>	13185	2302	15	IB	IB	RT									12			12	12		12	
<u>RIO GRANDE 0.5 MI DOWNSTREAM ANZALDUAS DAM 12.2 MI FROM HIDALGO Map</u>	13664	2302	15	IB	IB	RT									8			8	8		8	
<u>RIO GRANDE 300M UPSTREAM OF PHARR INTERNATIONAL BRIDGE/US 281 Map</u>	15808	2302	15	IB	IB	RT									8			8	8		8	

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE RIVER AT BROWNSVILLE PUB WATER TREATMENT PLANT NUMBER 1 INTAKE BETWEEN WTP RESERVOIR AND RIO GRANDE LEVEE 910 METERS WEST AND 335 METERS SOUTH TO THE INTERSECTION OF WEST ELIZABETH STREET AND SOUTH MILITARY ROAD</u> Map	20449	2302	15	IB	BO	RT									12			12				E. coli and limited conventionals
<u>RIO GRANDE APPROX 380 METERS DOWNSTREAM OF CONFLUENCE WITH LOS OLMOS CREEK</u> Map	21749	2302	15	IB	PT	RT									4			4	4		4	New site; added FY16
<u>LOS OLMOS CREEK AT US 83/EAST 2ND STREET SOUTH OF RIO GRANDE CITY</u> Map	13103	2302A	15	IB	IB	RT									4			4	4		4	
<u>LOS OLMOS CREEK AT US 83/EAST 2ND STREET SOUTH OF RIO GRANDE CITY</u> Map	13103	2302A	15	IB	PT	RT									4			4	4		4	Added FY16.
<u>ARROYO LOS OLMOS AT SH 755 NW OF RIO GRANDE CITY</u> Map	13104	2302A	15	IB	PT	RT									4			4	4		4	Added FY16.
<u>ARROYO LOS OLMOS 400M UPSTREAM OF CONFLUENCE WITH RIO GRANDE NEAR RIO GRANDE CITY</u> Map	21591	2302A	15	IB	PT	RT									4			4	4		4	Added FY16.

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
Segment 2303 International Falcon Reservoir Map																						
FALCON LAKE AT INTERNATIONAL BOUNDARY MONUMENT Map	13189	2303	16	IB	IB	RT									4			4			4	
Segment 2304 Rio Grande Below Amistad Reservoir Map																						
RIO GRANDE AT PIPELINE CROSSING 8.7 MI DOWNSTREAM LAREDO Map	13196	2304	16	IB	RN	RT									4			4			4	Site added to capture effluent from NLIWWTP
RIO GRANDE 50 YD UPSTREAM OF CONFLUENCE OF ZACATA CREEK AND RIO GRANDE Map	13200	2304	16	IB	LA	RT												12			12	
RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE Map	13202	2304	16	IB	LA	RT												12			12	E. coli and FC, and field
RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE Map	13202	2304	16	IB	RN	RT									4			4	4		4	
RIO GRANDE 12.8 MI DOWNSTREAM AMISTAD DAM NEAR GAGE 340 M UPSTREAM OF US 277 BRIDGE IN DEL RIO Map	13208	2304	16	IB	IB	RT									2			2	2		2	

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
RIO GRANDE 4.5 MI DOWNSTREAM OF DEL RIO AT MOODY RANCH Map	13560	2304	16	IB	IB	RT									4			4	4		4	Frequency reduced FY12 to add another station in Eagle Pass (20997)
RIO GRANDE AT JUAREZ-LINCOLN INTERNATIONAL BRIDGE / BRIDGE #2 IN LAREDO Map	15814	2304	16	IB	LA	RT												12	12		12	E. coli and fecal coliform, and field data
RIO GRANDE AT JUAREZ-LINCOLN INTERNATIONAL BRIDGE / BRIDGE #2 IN LAREDO Map	15814	2304	16	IB	RN	RT									4			4	4		4	
RIO GRANDE AT MASTERSON RD IN LAREDO 9.9KM DOWNSTREAM INTL BRIDGE #1/WEST BRIDGE DOWNSTREAM SOUTHSIDE WWTP AND UPSTREAM NUEVO LAREDO WWTP Map	15815	2304	16	IB	LA	RT												12			12	E. coli and fecal coliform, and field data
RIO GRANDE AT RIO BRAVO 0.5KM DOWNSTREAM OF THE COMMUNITY OF EL CENIZO Map	15816	2304	16	IB	RN	RT									4			4			4	Reactivated for FY 2015.
RIO GRANDE AT THE COLOMBIA BRIDGE 2.7KM UPSTREAM OF THE DOLORES PUMP STATION 45.1KM UPSTREAM OF THE LAREDO WTP INTAKE Map	15839	2304	16	IB	LA	RT												12	12		12	E. coli and FC; flow from IBWC gage; field data

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE AT THE COLOMBIA BRIDGE 2.7KM UPSTREAM OF THE DOLORES PUMP STATION 45.1KM UPSTREAM OF THE LAREDO W TP INTAKE</u> Map	15839	2304	16	IB	RN	RT									4			4	4		4	Flow from IBW C gage.
<u>RIO GRANDE AT WORLD TRADE BRIDGE ON FM 3484</u> Map	17410	2304	16	IB	RN	RT									4			4	4		4	
<u>RIO GRANDE 115 METERS SOUTH AND 304 METERS WEST FROM THE INTERSECTION OF RANCHO VIEJO DRIVE/ZEBU COURT AND RIENDA DRIVE IN FATHER MCNABOE CITY PARK IN LAREDO</u> Map	20650	2304	16	IB	LA	RT												12			12	E. coli and fecal

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE AT MAIN STREET BOAT RAMP APPROX 400 METERS UPSTREAM OF US 57/INTERNATIONAL BRIDGE IN EAGLE PASS</u> Map	20997	2304	16	IB	IB	RT									4			4	4		4	New station FY12 to fill data gap in AU2304_08
<u>RIO GRANDE AT EL CENIZO PARK 220 METERS WEST OF INTERSECTION OF CADENA AND JIMENEZ</u> Map	21542	2304	16	IB	RN	RT									8			8			8	
<u>RIO GRANDE AT KICKAPOO CASINO BOAT RAMP SOUTH OF EAGLE PASS</u> Map	20999	2304	16	IB	IB	RT									8			8	8		8	Replaces 18795 and 18792; removal of metals in sediment FY17.
<u>MANADAS CREEK AT FM 1472 NORTH OF LAREDO</u> Map	13116	2304B	16	IB	LE	RT					4		4		4			4			4	Total Metals in Water and Dissolved Metals in Water are both being analyzed. The Total Metals are submitted to TCEQ and the Dissolved Metals are not, due to when the sample is filtered. Dissolved Metals in water data can be found on IBWC website.

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
Segment 2306 Rio Grande Above Amistad Reservoir Map																						
RIO GRANDE AT THE MOUTH OF SANTA ELENA CANYON Map	13228	2306	6	IB	BB	RT					2				8			8	8		8	Metals - Total Mercury sampled FY12
RIO GRANDE 449 METERS WEST AND 121 METERS SOUTH FROM THE INTERSECTION OF RANCH ROAD 170 AND RANCH ROAD 169 IN PRESIDIO COUNTY CAMS 758 Map	13229	2306	6	IB	IB	RT					2				8			8	8		8	Metals - Total Mercury sampled FY12
RIO GRANDE AT BOAT RAMP AT RIO GRANDE VILLAGE IN BIG BEND NATIONAL PARK Map	16730	2306	6	IB	BB	RT					2				8			8	8		8	Metals - Total Mercury sampled FY12
RIO GRANDE RIVER AT COLORADO CANYON APPROX 30KM SE OF REDFORD ON RR170 IN PRESIDIO COUNTY Map	16862	2306	6	IB	PW	RT					2				4			4			4	Metals - Total Mercury sampled FY12; sampling frequency reduced to quarterly
RIO GRANDE AT PRESIDIO RAILROAD BRIDGE 3.25KM DOWNSTREAM OF US67 SOUTH OF PRESIDIO Map	17000	2306	6	IB	IB	RT												8	8		8	

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
RIO GRANDE AT PRESIDIO/OJINAGA TOLL BRIDGE/INTERNATIONAL 0.75KM DOWNSTREAM OF US67 IN PRESIDIO Map	17001	2306	6	IB	IB	RT												8	8		8	
RIO GRANDE AT LAJITAS RESORT/FM 170 BOAT RAMP 240 M UPSTREAM OF BLACK HILLS CREEK CONFLUENCE NEAR LAJITAS Map	18441	2306	6	IB	PW	RT					2				4			4			4	Metals - Total Mercury sampled FY12
Segment 2307 Rio Grande Below Riverside Diversion Dam Map																						
RIO GRANDE 3.38 KILOMETERS UPSTREAM FROM THE CONFLUENCE WITH THE RIO CONCHOS 6.72 KILOMETERS WEST AND 2.445 KILOMETERS NORTH FROM THE INTERSECTION OF RANCH ROAD 170 AND RODRIQUEZ ROAD IN PRESIDIO COUNTY CAMS 757 Map	13230	2307	6	IB	IB	RT					2				8			8	8		8	Metals - Total Mercury sampled FY12

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE AT RIVERSIDE CANAL 1.8 KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE</u> Map	14465	2307	16	IB	IB	RT									12			12	12		12	Monitored by IBWC American Dam FO. Partial conventional analysis due to lab accreditation. Additional non- accredited data for metals, organics and other conventionals available thru IBWC.
<u>RIO GRANDE UPSTREAM OF CANDELARIA 0.5 KM UPSTREAM OF CAPOTE CREEK CONFLUENCE</u> Map	17407	2307	6	IB	IB	RT									4			4	4		4	Added FY17. Due to shipping issues and remoteness, will test to see if 30 hr HT can be met.
<u>RIO GRANDE AT GUADALUPE POINT OF ENTRY BRIDGE AT FM 1109 WEST OF TORNILLO</u> Map	15704	2307	6	IB	IB	RT									4			4	4		4	Metals in water removed FY16.
<u>RIO GRANDE AT ALAMO CONTROL STRUCTURE 9.7KM UPSTREAM OF FT HANCOCK PORT OF ENTRY</u> Map	15795	2307	6	IB	IB	RT									4			4			4	

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
Segment 2308 Rio Grande Below International Dam Map																						
RIO GRANDE 1.3 KM DOWNSTREAM FROM HASKELL ST WWTP OUTFALL Map	15528	2308	6	IB	IB	RT									12			12	12		12	Monitored by IBWC American Dam FO. Partial conventional analysis due to lab accreditation. Additional non- accredited data for metals, organics and other conventionals available thru IBWC.
RIO GRANDE 2.4 KM UPSTREAM FROM HASKELL ST WWTP OUTFALL SOUTH OF BOWIE HIGH SCHOOL FOOTBALL STADIUM IN EL PASO Map	15529	2308	6	IB	IB	RT									12			12	12		12	Monitored by IBWC American Dam FO. Partial conventional analysis due to limited lab accreditation. Additional non- accredited data for metals, organics and other conventionals available thru IBWC.
Segment 2310 Lower Pecos River Map																						
PECOS RIVER APPROX 355 METERS DOWNSTREAM FROM THE CONFLUENCE WITH INDEPENDENCE CREEK Map	14163	2310	7	IB	MC	RT									3			3	6		6	Collecting conv, bacteria, flow, field 3x/yr; field and flow only 3 additional times/yr

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
Segment 2311 Upper Pecos River Map																						
PECOS RIVER APPROXIMATELY 2.98 KM UPSTREAM OF THE CONFLUENCE WITH INDEPENDENCE CREEK Map	14164	2311	7	IB	MC	RT									3				6		6	Collecting conv, field, flow 3x/yr; field and flow only 3 additional times/yr
Segment 2314 Rio Grande Above International Dam Map																						
RIO GRANDE AT COURCHESNE BRIDGE 1.7 MI UPSTREAM FROM AMERICAN DAM CAMS 718 Map	13272	2314	6	IB	IB	RT									12			12	12		12	Monitored by IBWC American Dam FO. Partial conventional analysis due to lab accreditation. Additional non- accredited data for metals, organics and other conventionals available thru IBWC.
RIO GRANDE AT BORDERLAND RD NW OF EL PASO Map	13274	2314	6	IB	IB	RT									4			4	4		4	In support of Paso del Norte Watershed Councils 319h grant and for stakeholder concerns for bacteria. Total Mercury removed FY16.

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE 40M SOUTH OF VINTON BRIDGE APPROXIMATELY 4 KM S OF ANTHONY</u> Map	13275	2314	6	IB	IB	RT									4			4	4		4	In support of Paso del Norte Watershed Councils 319h grant and for stakeholder concerns for bacteria. Total Mercury removed FY16.
<u>RIO GRANDE IMMEDIATELY UPSTREAM OF THE CONFL WITH ANTHONY DRAIN WEST OF LA TUNA PRISON NEAR THE STATE LINE</u> Map	13276	2314	6	IB	IB	RT									4			4	8		8	In support of Paso del Norte Watershed Councils 319h grant and for stakeholder recreation concerns. Total Mercury removed FY16. 4x/yr field data only.
<u>RIO GRANDE RIVER AT AMERICAN EAGLE BRICK FACTORY BRIDGE ABANDONED RR 0.1 MI DOWNSTREAM FROM SOUTHERN PACIFIC RR AT SMELTERTOWN</u> Map	15089	2314	6	IB	IB	RT									4			6	6		6	Metals in water removed FY16.
<u>RIO GRANDE AT ANAPRA BRIDGE ON SUNLAND PARK DRIVE 4.2 KM UPSTREAM OF AMERICAN DAM IN NEW MEXICO</u> Map	17040	2314	6	IB	IB	RT									4			4			6	Total metals in water removed FY16.

Appendix C: Station Location Maps

Station Location Maps

Maps of stations monitored by the USIBWC CRP are provided below. The maps were generated by the USIBWC CRP. 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 USIBWC CRP Project Manager, Leslie Grijalva, at 915-832-4770

Figure Appendix C.1: Map of the Upper Rio Grande Basin, Northern Half

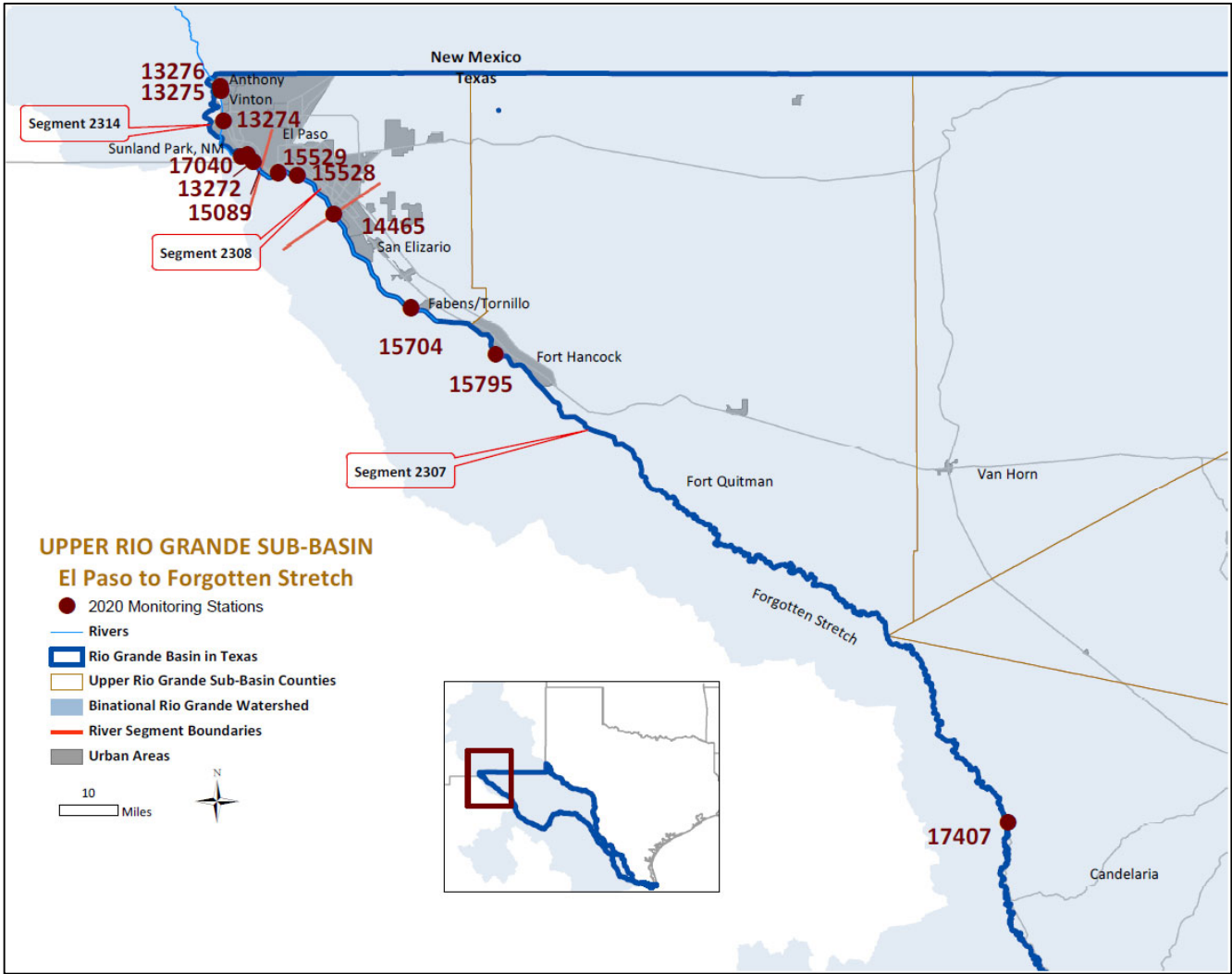


Figure Appendix C.2: Map of the Upper Rio Grande Basin, Southern Half

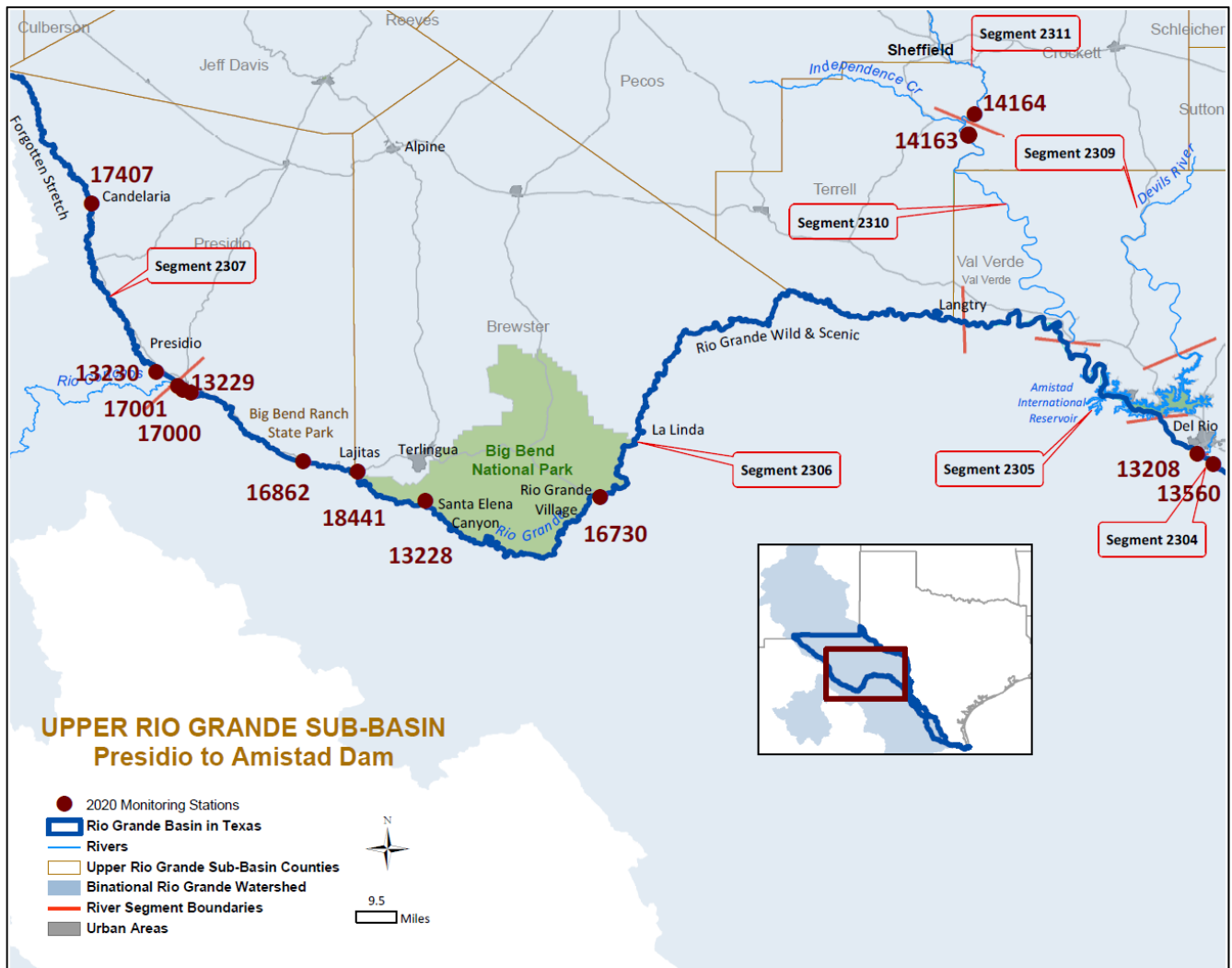


Figure Appendix C.3. Map of the Middle Rio Grande Basin

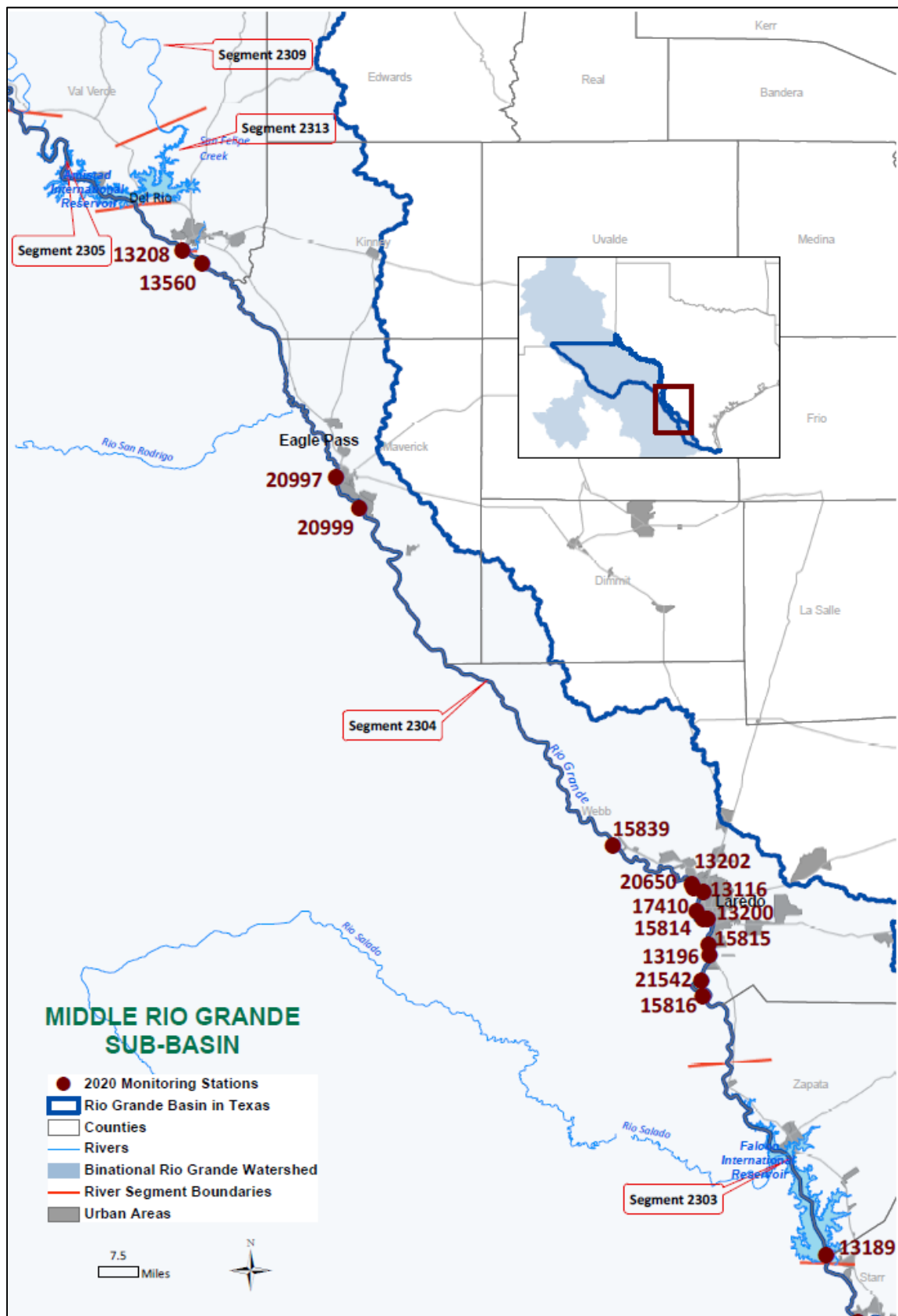
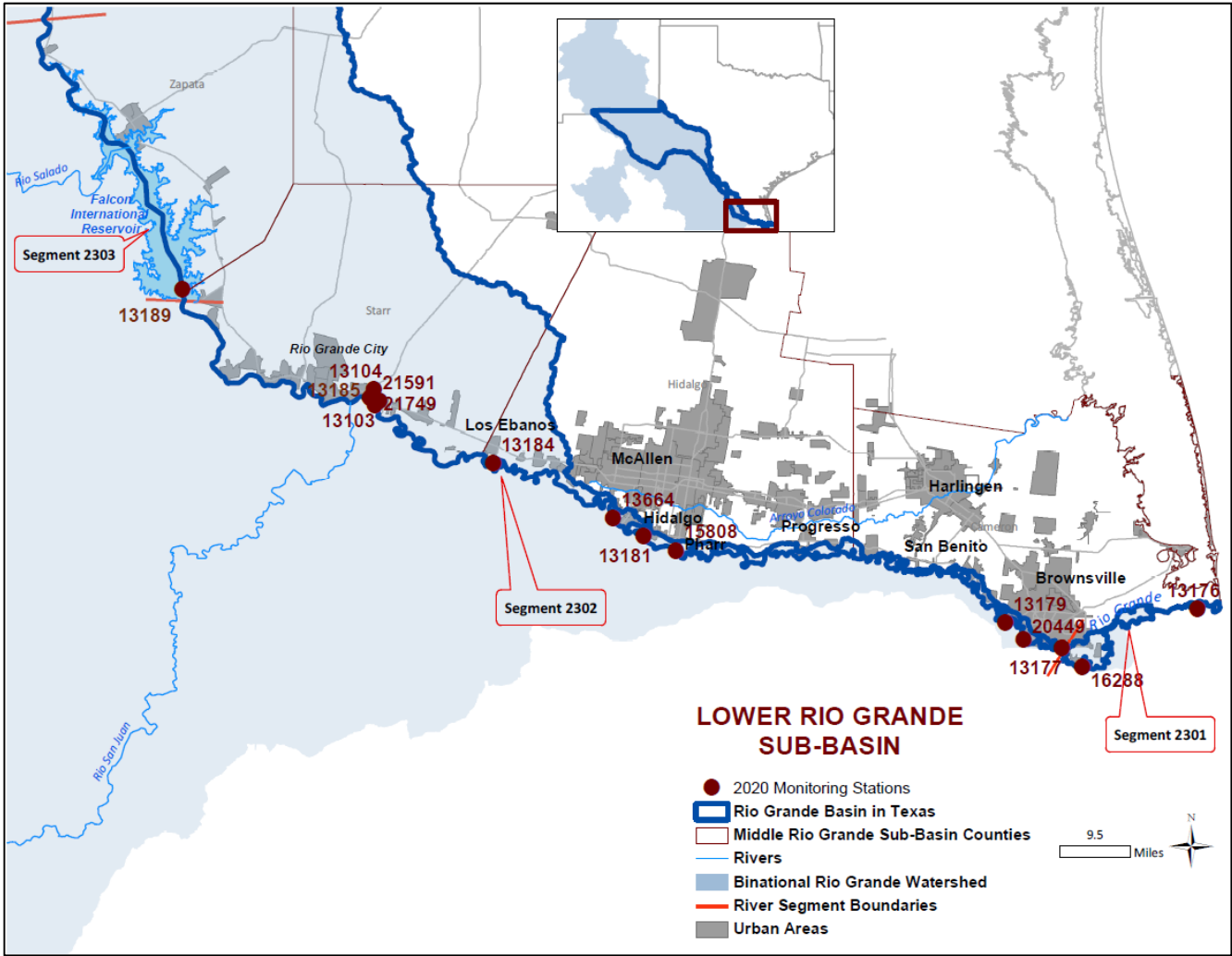


Figure Appendix C.4. Map of the Lower Rio Grande Basin



Appendix D: Field Data Sheets

**UNITED STATES INTERNATIONAL BOUNDARY AND WATER COMMISSION
TEXAS CLEAN RIVERS PROGRAM
RIO GRANDE BASIN**

3

Laredo Health Department
FIELD DATA REPORTING FORM

<div style="border: 1px solid black; display: inline-block; width: 100px; height: 20px;"></div> TAG#	<div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> SET #	<div style="border: 1px solid black; display: inline-block; width: 200px; height: 20px;"></div> COLLECTOR(printed)		
<div style="border: 1px solid black; display: inline-block; width: 60px; height: 20px;"></div> TCEQ STATION ID	<div style="border: 1px solid black; display: inline-block; width: 60px; height: 20px;"></div> SEGMENT	<div style="border: 1px solid black; display: inline-block; width: 80px; height: 20px;"></div> SE/SC1	<div style="border: 1px solid black; display: inline-block; width: 60px; height: 20px;"></div> CE/SC2	<div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> MT/ PC

Station Description: _____

GRAB SAMPLE															
<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> M	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> M	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> D	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> D	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> Y	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> Y	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> Y	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> Y	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> H	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> H	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> M	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> M	<div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> <div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div> M			
DATE								TIME				SAMPLE DEPTH			

00010		WATER TEMP (deg C only)		89966		WEATHER	1-clear 3-overcast	2-cloudy 4-rain
00020		AIR TEMP (deg C only)		89965		WIND INTENSITY	1-calm 3-moderate	2-slight 4-strong
00094		SPECIFIC CONDUCTANCE (uS/cm)		89010		WIND DIRECTION	1-north 3-east 5 - NE 6 - SE 7 - NW	2-south 4-west 8 - SW
72053		DAYS SINCE LAST SIGNIFICANT PRECIPITATION		31616		FECAL COLIFORM (CFU/100 ml)		
01351		FLOW SEVERITY	1-no flow 2-low 3-normal 4-flood 5-high 6-dry	31699		E. coli (MPN/100 ml)		

Measurement Comments and Field Observations:

Signature of Collector: _____
Rev. 02/14/2019

Appendix E: Chain of Custody Forms

**UNITED STATES INTERNATIONAL BOUNDARY AND WATER COMMISSION
TEXAS CLEAN RIVERS PROGRAM
RIO GRANDE BASIN PARTNER
WATER QUALITY CHAIN OF CUSTODY/REQUEST FOR ANALYSIS FORM**

--	--	--	--	--	--	--

TAG#

DHL Analytical

LABORATORY

--

COC/LAB #

CHAIN OF CUSTODY

(To be filled out by CRP partner)

Relinquished by (printed): _____

Signature: _____

Date/Time: _____

No. Of Containers: _____

Type of Containers: _____

Preservative used: _____

Turnaround Time: Standard

(To be filled out by Laboratory)

Received by (printed): _____

Signature: _____

Date/Time: _____

Cooler Temperature: _____

Matrix Type: H2O

CLIENT INFORMATION

(To be filled out by CRP partner)

Requested by: USIBWC Clean Rivers Program

Sample TCEQ Station No.: _____

Sample Location Description: _____

Segment/Sequence: _____

Collecting Entity Code: _____

Collected by: _____

Signature: _____

Collection Date: _____

Collection Time: _____

Conventional			
Storet Code	Analyze if checked	Contract line no.	Parameter
70300	✓		TDS, dried at 180 deg C (mg/L)
00530	✓		TSS (mg/L)
00940	✓		Chloride (mg/L)
00945	✓		Sulfate (mg/L)
00680	✓		TOC (mg/L as C)
00610	✓		Ammonia (mg/L as N)
00665	✓		Total Phosphorus (mg/L as P)
00956	✓		Silica (mg/L)
32211	✓		Chlorophyll-a (ug/L)

Conventional			
Storet Code	Analyze if checked	Contract line no.	Parameter
00929	✓		Sodium (mg/L)
00916	✓		Calcium (mg/L)
00927	✓		Magnesium (mg/L)
00937	✓		Potassium (mg/L)
00951	✓		Fluoride (mg/L)
00630	✓		Nitrate + Nitrite (mg/L)
00900	✓		Total Hardness (mg CaCO ₃ /L)
00310	✓		BOD (mg/L)
00410	✓		Total Alkalinity (mg/L)

*All sample containers are provided with appropriate preservative.

Send samples to:

DHL Analytical
2300 Double Creek Drive
Round Rock, TX 78664
(P) 512-388-8222, (F) 512-388-8229

Submit report to:

Texas Clean Rivers Program
USIBWC
4191 N. Mesa
El Paso, TX 79902

Rev. 2/14/2019

**UNITED STATES INTERNATIONAL BOUNDARY AND WATER COMMISSION TEXAS CLEAN
RIVERS PROGRAM
RIO GRANDE BASIN PARTNER
WATER QUALITY CHAIN OF CUSTODY/REQUEST FOR ANALYSIS FORM**

								DHL Analytical							
TAG#								LABORATORY	COC/LAB/WORK ORDER #						

CHAIN OF CUSTODY

(To be filled out by CRP partner)

Relinquished by (printed): _____

Signature: _____

Date/Time: _____

No. Of Containers: _____

Type of containers: _____

Preservative used: _____

Turnaround Time: Standard

(To be filled out by Laboratory)

Received by (printed): _____

Signature: _____

Date/Time: _____

Cooler Temperature _____

Matrix Type: Sediment

CLIENT INFORMATION

(To be filled out by CRP partner)

Requested by: USIBWC Clean Rivers Program

Sample TCEQ Station No.: _____

Sample Location Description: _____

Segment/Sequence: _____

Collecting Entity Code: _____

Collected by: _____

Signature: _____

Collection Date: _____

Collection Time: _____

Metals in sediment (EPA 6020)			
Storet Code	Analyze if checked	Contract line no.	Parameter
01108	✓		Aluminum (mg/kg)
01098	✓		Antimony (mg/kg)
01003	✓		Arsenic (mg/kg)
01008	✓		Barium (mg/kg)
01028	✓		Cadmium (mg/kg)
01029	✓		Chromium (mg/kg)
01043	✓		Copper (mg/kg)
01052	✓		Lead (mg/kg)
01068	✓		Nickel (mg/kg)
01148	✓		Selenium (mg/kg)
01093	✓		Zinc (mg/kg)
71921	✓		Mercury (mg/kg) (EPA 7471)
01053	✓		Manganese (mg/kg)
01078	✓		Silver (mg/kg)

Metals in sediment (EPA 6020)			
Storet Code	Analyze if checked	Contract line no.	Parameter
81373	✓		Solids in Sediment, Percent by weight (Dry)
80256	✓		Sediment Particle Size Class >2.0mm Gravel (% Dry Wt)
89991	✓		Sediment Particle Size Class 0.0625-2mm Sand (% Dry Wt)
49906	✓		Sediment Particle Size Class 0.05-0.002mm Silt (% Dry Wt)
82008	✓		Sediment Particle Size Class 0.0039-0.0625 Silt (% Dry Wt)
49900	✓		Sediment Particle Size Class 0.002-0.0002mm Clay (% Dry Wt)
82009	✓		Sediment Particle Size Class <0.0039 Clay (% Dry Wt)

Send samples to:	Submit report to:
DHL Analytical 2300 Double Creek Drive Round Rock, TX 78664 (P) 512-388-8222, (F) 512-388-8229	Texas Clean Rivers Program USIBWC 4191 N. Mesa El Paso, TX 79902

Non-compliance items should be addressed on an attached NCR by the lab.

Rev. 9/24/2018

TAG#			
LABORATORY			
COC/LAB/WORK ORDER #			

Turnaround Time: Standard

Collecting Entity Code: _____

Matrix Type: H2O

Collection Time: _____

<p>Send samples to:</p> <p>DHL Analytical 2300 Double Creek Drive Round Rock, TX 78664 (P) 512-388-8222, (F) 512-388-8229</p>	<p>Submit report to:</p> <p>Texas Clean Rivers Program USIBWC 4191 N. Mesa El Paso, TX 79902</p>
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Water Bacteriology Custody Form

BROWNSVILLE
PUBLIC UTILITIES BOARD

Name: Brownsville Public Utilities Board
Address: 1385 PUB Dr. or PO Box 3270
City: Brownsville Texas 78521
Contact: Jose Ramon Saenz

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fy2021_crp_qapp_final

BPUBAL		MICROBIAL MONITORING FORM											
Public/Private Wastewater System Identification & Sample Collection Information (Please type or use block print)													
Segment / TCEQ Station ID#		2		3		0		1		/		2 0 4 4 9	
River (Texas Clean Water Program) Name:		Rio Grande at PUB Station ID #20449											
County:		Cameron											
Name:		Leslie Grijalva, Texas Clean River Program, IBWC											
Address:		4171 N Mesa, C-100											
City:		El Paso											
State:		Texas		Zip:		7		0		0		2 -	
Phone #:		915-832-4701		Fax #:		915-832-4166							
Sampler Name:		Joshua Sierra / Roscoe Rodriguez											
Sampler Contact #:		956-983-6355											
System Type: ()		Public <input type="checkbox"/>		Private <input type="checkbox"/>		Water Source: ()							
Sample Identification/Location		Surface Water <input type="checkbox"/>		Groundwater with Surface Water Influence <input type="checkbox"/>		Non Potable Water <input type="checkbox"/>		Groundwater <input type="checkbox"/>					
Use Specific Sample ID Location		Date		Time		Chlorine Residual		Sample Type					
Rio Grande River at PUBStation ID# 20449		Month		Day		Please circle AM or PM		Units mg/L		Composite		Grab	
Rio Grande River at PUBStation ID# 20449 DUP.		8		6		19		am		N/A		<input type="checkbox"/>	
BPUBAL WW-Micro 003 Revised 4/2011		8		6		19		am		N/A		<input type="checkbox"/>	
Rejection Criteria # Definitions		<div style="display: flex; justify-content: space-between;"> <div>1) Sample Too old. Sample not receipt at laboratory within 6 hours of collection</div> <div>3) Excessive Chlorine Residual (>10mg/L)</div> </div> <div style="display: flex; justify-content: space-between;"> <div>2) Quantity insufficient for analysis (100mL required)</div> <div>5) Samples NOT in ice / Ice Packs or received within 2 hours of sample collection.</div> </div>											
Sampler Comments:													
Laboratory Comments:													

These analytical results relate to the sample analyzed. This report may NOT be reproduced EXCEPT in FULL without written approval of Brownsville PUB Analytical Laboratory. Unless specified, these results meet the requirements of National Environmental Laboratory Accreditation Program (NELAP).

BPUBAL		MICROBIAL MONITORING FORM											
Public/Private Wastewater System Identification & Sample Collection Information (Please type or use block print)													
Segment / TCEQ Station ID#		2		3		0		1		/		2 0 4 4 9	
River (Texas Clean Water Program) Name:		Rio Grande at PUB Station ID #20449											
County:		Cameron											
Name:		Leslie Grijalva, Texas Clean River Program, IBWC											
Address:		4171 N Mesa, C-100											
City:		El Paso											
State:		Texas		Zip:		7		9		0		2 -	
Phone #:		915-832-4701		Fax #:		915-832-4166							
Sampler Name:		Joshua Sierra / Roscoe Rodriguez											
Sampler Contact #:		956-983-6355											
System Type: (N)		<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private											
Sample Identification/Location		<input checked="" type="checkbox"/> Surface Water <input type="checkbox"/> Groundwater with Surface Water Influence <input type="checkbox"/> Non Potable Water <input type="checkbox"/> Water Source: (N)											
Use Specific Sample ID Location		<input type="checkbox"/> Surface Water <input type="checkbox"/> Groundwater <input type="checkbox"/> Non Potable Water <input type="checkbox"/> Chlorine Residual <input type="checkbox"/> Groundwater											
Date		Month		Day		Year		Time		Please circle AM or PM		Sample Type	
Rio Grande River at PUB Station ID# 20449		8		6		19		am		pm		N/A	
Rio Grande River at PUB Station ID# 20449 DUP.		8		6		19		am		pm		N/A	
BPUBAL WW-Micro 003 Revised 4/2011		1) Sample Too old. Sample not receipt at laboratory within 6 hours of collection 2) Quantity insufficient for analysis (100mL required) 3) Excessive Chlorine Residual (>10mg/L) 4) Form Incomplete / Date Discrepancy (Errors Circled) 5) Samples NOT in Ice / Ice Packs or received within 2 hours of sample collection. 6) Other:											

Brownsville Public Utilities Board Analytical Laboratory 1385 PUB Dr. P.O. Box 3270 Brownsville, Texas 77821 Phone: 956-983-6355		 EPA Lab ID: TX01425		 NELAC Certificate #: T104704357-19-14 Enterococci Quanti-Tray 2000 MPN	
LABORATORY USE ONLY - DO NOT MARK TO THE RIGHT OF THE BOLD CENTER LINE					
Sample Inoculated?		Received By:		Date / Time Received:	
Yes <input type="checkbox"/> No <input type="checkbox"/>		If no, temperature receipt?		Date / Time Tested:	
Thermometer SN: _____ °C		Reported By:		Date / Time Reported:	
Report Approval Signature:			Date		
Idexx Enterolent Media		Lot No:		Lab Equipment:	
Exp. Date:		Idexx Sealer #11 - SN: QTP13184604475		Incubator # 10 - SIN#: 207609035424	
Idexx Enterolent Media		Enterococci			
Positive Wells		NELAP Method Code: 60030208			
Unsuitable Sample - Please Resubmit*		IDEXX MPN			
Rejection Criteria #		Generator Value			
Large		Small			
MPN/100mL		MPN/100mL			
MPN/100mL		MPN/100mL			

Sampler Comments:

Laboratory Comments: 290ml sample vessel is used for the collection of river sample (lab duplicate for bacteriological sample collected will be performed by laboratory personnel)

These analytical results relate to the sample analyzed. This report may NOT be reproduced EXCEPT in FULL without written approval of Brownsville PUB Analytical Laboratory. Unless specified, these results meet the requirements of National Environmental Laboratory Accreditation Program (NELAP).

Appendix F: Data Review Checklist and Summary Shells

Data Review Checklist

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

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

Data Summary

Data Set Information

Data Source: _____

Date Submitted: _____

Tag_id Range: _____

Date Range: _____

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

Planning Agency Data Manager: _____ Date: _____

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

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

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

Discrepancies or missing data for the listed tag ID:

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

Data Loss:

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

Amendment # 1 Update to the Rio Grande Basin Clean Rivers Program FY 2020/2021 QAPP

***Prepared by the U.S. International
Boundary and Water Commission in
Cooperation with the Texas
Commission on Environmental
Quality (TCEQ)***

Effective: Immediately upon approval by all parties

Questions concerning this QAPP should be
directed to: Samantha Stiffler
USIBWC CRP Quality Assurance Officer
4191 N. Mesa St.
El Paso, TX 79902
(915) 832-4779
Samantha.Stiffler@ibwc.gov

Justification

This document details the removal of individuals from the QAPP, substituting individuals from TCEQ roles, the creation of a new station, removing unanalyzed parameters, change in the number of monitoring events per year at one monitoring station, and updating chain of custody forms.

Summary of Changes

The following information in Amendment 1 is amended to reflect changes to:

- Signatory Page
- A4 Project/Task Organization
- A4.1 Project Organization Chart
- Table B2.1
- Table A7.5 and A7.8
- Appendix B Sampling Process Design and Monitoring Schedule (plan)
- Appendix B.1
- Table B1.1, Coordinated Monitoring Schedule
- Appendix C Station Location Maps
 - Figure 6: Map of the Upper Rio Grande Basin
- Appendix E: Chain of Custody Forms

Detail of Changes

Section/Figure/Table	Page	Change	Justification
Approval Page	2,6	Replacing Sharon Coleman with Dana Squires as Lead CRP Quality Assurance Specialist Removed Larry Curtis from Amistad Field Office Signatory Page	Ms. Squires is now the Lead CRP Quality Assurance Specialist. Mr. Curtis left the agency
A3 Distribution List	24	Replacing Sharon Coleman with Dana Squires as Lead CRP Quality Assurance Specialist Updating Dana Squires phone number	Ms. Squires is now the Lead CRP Quality Assurance Specialist.
A4 Project/Task Organization	28	Replacing Sharon Coleman with Dana Squires as Lead CRP Quality Assurance Specialist Replacing Peter Bohls with Sarah Kirkland as Data Manager	Ms. Squires is now the Lead CRP Quality Assurance Specialist Ms. Kirkland is now the Data Manager
A4.1 Project Organization Chart	33	Replacing Sharon Coleman with Dana Squires as Lead CRP Quality Assurance Specialist Replacing Peter Bohls with Sarah Kirkland as Data Manager	Ms. Squires is now the Lead CRP Quality Assurance Specialist. Ms. Kirkland is now the Data Manager.
Table B2.1 Sample Storage, Preservation, and Handling Requirements	41	Removed Bromide	Bromide is not analyzed.
Table A7.5	71	Removed multiple metals: Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Thallium, Molybdenum, Nickel, Silver, Zinc, Antimony, Tin,	Removed metals that are not analyzed.

Section/Figure/Table	Page	Change	Justification
		and Aluminum	
Table A7.8	76	Removing table	Total Metals are not analyzed.
Appendix B Sampling Process Design and Monitoring Schedule (plan)	86	Adding station 22193 at Fort Quitman.	Updating monitoring schedule.
Appendix B Sampling Process Design and Monitoring Schedule (plan)	86	Increasing the number of monitoring events at station 13184 from 7 times a year to 8 times a year	Making monitoring schedule more uniform; all other stations monitored by the Mercedes Field Office are monitored 8 times per year
Appendix B.1 Analyte Groups Analyzed by Laboratory	87	Removing Bromide	Bromide is not analyzed.
Table B1.1 Coordinated Monitoring Schedule	91-103	Increasing the number of monitoring events at station 13184 from 7 times a year to 8 times a year	Making monitoring schedule more uniform; all other stations monitored by the Mercedes Field Office are monitored 8 times per year.
Table B1.1 Coordinated Monitoring Schedule	91-103	Adding station 22193 at Fort Quitman	Station 22193 is a new station added to fill a data gap between Fort Hancock and Candelaria.
Table B1.1 Coordinated Monitoring Schedule	91-103	Changing region for station 14465 from 16 to 6	Typo. Region should be 6
Appendix C Figure 6: Map of the Middle Rio Grande Basin	106	Adding station 22193 at Fort Quitman to Upper Rio Grande Map	Station 22193 is a new station added to fill a data gap between Fort Hancock and Candelaria.
Appendix E: Chain of Custody Forms	114-117	Adding COC used by Laredo Environmental	Laredo Environmental collects for total metals and this was not reflected in the COC section.
Appendix E: Chain of Custody Forms	114-117	Updating BPUB's COC's	BPUB underwent an audit just after the QAPP was approved and they updated their COC's.

Distribution

QAPP Amendments and Revisions to Appendices will be distributed to all personnel on the distribution list maintained by the Planning Agency.

These changes will be incorporated into the QAPP document and TCEQ and the USIBWC will acknowledge and accept these changes by signing this amendment.

A1 Approval Page

Texas Commission on Environmental Quality *Water Quality Planning Division*

Electronically Approved 2/24/2020

Kelly Rodibaugh Project Manager Clean Rivers Program Kelly.Rodibaugh@tceq.texas.gov	Date
--	------

Electronically Approved 2/4/2020

Sarah Eagle, Work Leader Clean Rivers Program Sarah.Eagle@tceq.texas.gov	Date
--	------

Electronically Approved 2/24/2020

Kelly Rodibaugh Project Quality Assurance Specialist Clean Rivers Program Kelly.Rodibaugh@tceq.texas.gov	Date
---	------

Electronically Approved 2/4/2020

Cathy Anderson, Team Leader Data Management and Analysis Cathy.Anderson@tceq.texas.gov	Date
---	------

Monitoring Division

Electronically Approved 3/4/2020

Sharon Coleman TCEQ Quality Assurance Manager	Date
--	------

Electronically Approved 2/25/2019

Sharon Coleman Lead CRP Quality Assurance Specialist	Date
--	------

United States Section, International Boundary and Water Commission (USIBWC)

Environmental Management Division

Electronically Approved 2/24/2020

Leslie Grijalva	Date
USIBWC CRP Project Manager	

Electronically Approved 2/5/2020

Samantha Stiffler	Date
USIBWC CRP Quality Assurance Officer	

DHL Analytical, Inc.

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Electronically Approved 2/4/2020

Electronically Approved 2/4/2020

John DuPont
DHL Analytical Laboratory Manager

Date

Sherri Herschmann
DHL Analytical Quality Assurance Office

Date

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Electronically Approved 2/11/2020

_____ Elsayyid Ibrahim Area Operations Manager	_____ Date
--	---------------

Electronically Approved 2/12/2020

_____ Escequiél Bustamante Hydrotech	_____ Date
--	---------------

_____ Larry Curtis, Jr. Hydrotech	_____ Date
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El Paso Water, International Water Quality Laboratory

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Electronically Approved 2/4/2020

Richard Wilcox
Laboratory Manager

Date

Electronically Approved 2/5/2020

Miguel Venegas
Quality Assurance Chemist

Date

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Electronically Approved 3/4/2020

Vincente Guerrero III	Date
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Julian Alvarado	Date
Quality Assurance Specialist	

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Gabriel Coronado	Date
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A3 Distribution List

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A4 Project/Task Organization

Description of Responsibilities

TCEQ

Sarah Eagle

CRP Work Leader

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

Dana Squires Sharon Coleman

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. Serves on planning team for CRP special projects. Coordinates the review and approval of CRP QAPPs. Prepares and distributes annual audit plans. Conducts monitoring systems audits of Planning Agencies. Concurs with and monitors implementation of 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 QAPPs and audit records for the CRP.

Kelly Rodibaugh

CRP Project Manager

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

Cathy Anderson

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

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

~~Peter Bohls~~ **Sarah Kirkland**

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 SWQM Data Management Reference Guide (DMRG), most recent version. 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).

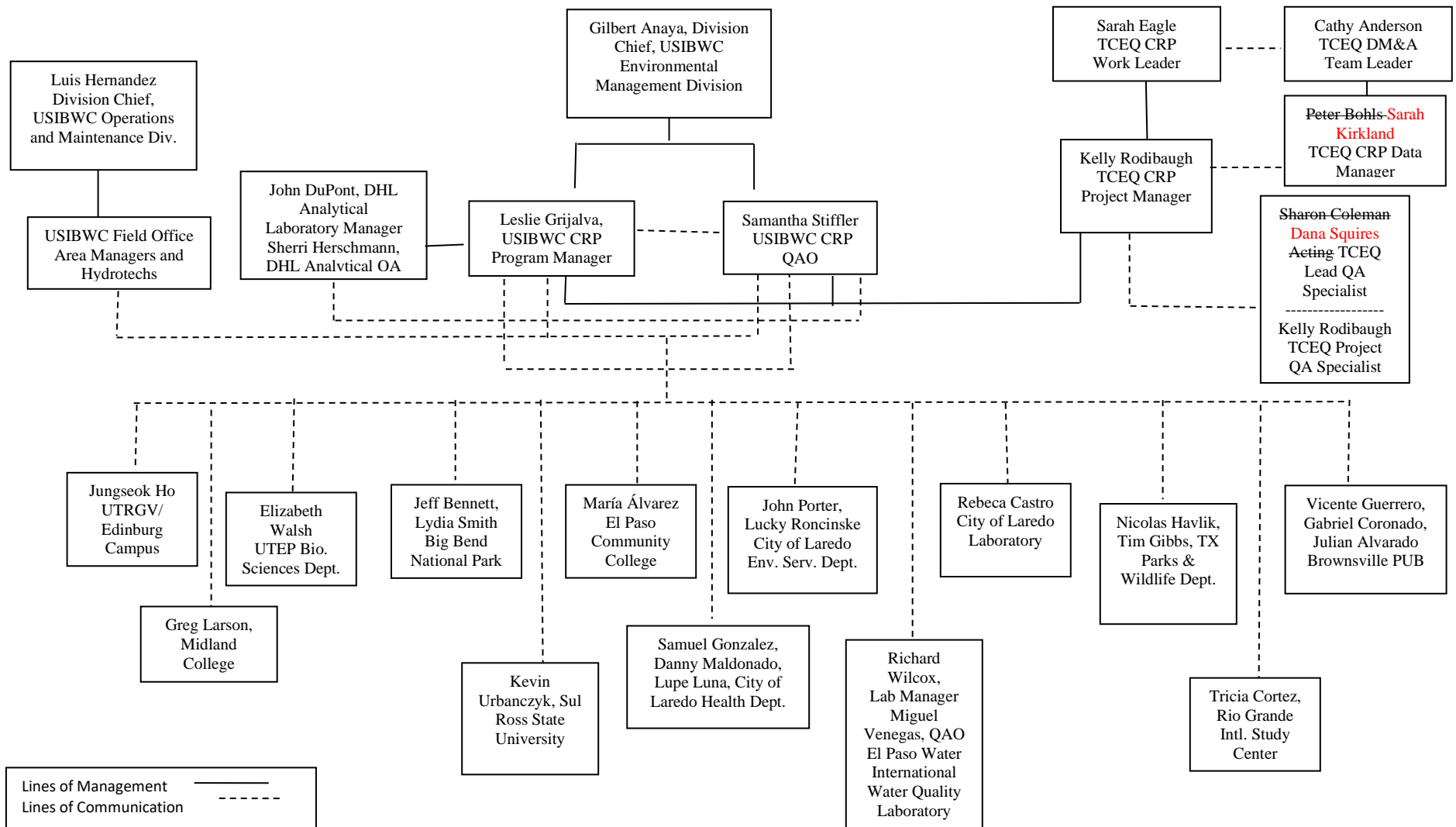
Kelly Rodibaugh

CRP Project Quality Assurance Specialist

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

Project Organization Chart

Figure A4.1. Organization Chart - Lines of Communication



City of Laredo Health Dept. uses the City of Laredo Health Dept. lab, BPUB analyzes their own data and the *enterococcus* samples for the Brownville area, and American Dam uses the El Paso Waterlab. All other partners use DHL Analytical.

Table B2.1 Sample Storage, Preservation and Handling Requirements, DHL Analytical, Inc.

Routine Conventionals-in-Water Samples (8 containers: 4 unpreserved, 1 preserved with HNO₃, 1 preserved with H₂SO₄, 1 preserved with Na₂S₂O₃, and 1 (Set of 3) preserved with H₃PO₄)				
<i>Parameters</i>	<i>Containers</i>	<i>Minimum Sample Volume (ml)</i>	<i>Preservation</i>	<i>Maximum Holding Time</i>
CONTAINER 1 and 2				
TSS (00530)	1000 mL HDPE	1000	Cool to ≤ 6°C, but not frozen	7 days
Chloride (Cl) (00940)	250 mL HDPE	50	Cool to ≤ 6°C, but not frozen	28 days
Sulfate (SO ₄) (00945)	250 mL HDPE	50	Cool to ≤ 6°C, but not frozen	28 days
Fluoride (00951)	250 mL HDPE	50	Cool to ≤ 6°C, but not frozen	28 days
TDS (70300)	250 mL HDPE	100	Cool to ≤ 6°C, but not frozen	7 days
Bromide (71870)	250 mL HDPE	50	Cool to ≤ 6°C, but not frozen	28 days
Alkalinity (00410)	250 mL HDPE	50	Cool to ≤ 6°C, but not frozen	14 days
CONTAINER 3				
Calcium (00916)	250 mL HDPE	50	1:1 HNO ₃ to pH <2	180 days
Magnesium (00927)	250 mL HDPE	50	1:1 HNO ₃ to pH <2	180 days
Sodium (00929)	250 mL HDPE	50	1:1 HNO ₃ to pH <2	180 days
Potassium (00937)	250 mL HDPE	50	1:1 HNO ₃ to pH <2	180 days
Hardness (00900)	250 mL HDPE	50	1:1 HNO ₃ to pH <2	180 days
CONTAINER 4				
Ammonia (NH ₃) (00610)	250 mL HDPE	100	Conc. H ₂ SO ₄ to pH <2, Cool ≤ 6°C, but not frozen	28 days
Total Phosphorus (PO ₄) (00665)	250 mL HDPE	50	Conc. H ₂ SO ₄ to pH <2, Cool ≤ 6°C, but not frozen	28 days
Nitrate + Nitrite (00630) (NO ₃ + NO ₂)	250 mL HDPE	50	Conc. H ₂ SO ₄ to pH <2, and cool ≤ 6°C, but not frozen	28 days (48 hours if unpreserved)
CONTAINER 5				
Chlorophyll <i>a</i> (32211)	1000 mL Amber HDPE	500	Cool to ≤ 6°C but not frozen, dark	Filter within 48 hours. Filters may be stored frozen up to 28 days
CONTAINER 6				
E. coli bacteria (31699)	Sterilized Plastic container	120	Cool ≤ 6°C but not frozen, Sodium thiosulfate	*8 hours
CONTAINER 7				
Biological Oxygen Demand (BOD) (00310)	1000 mL HDPE	1000	Cool ≤ 6°C but not frozen	48 hours
CONTAINER 8 (Set of 3 VOA Vials)				

Total Organic Carbon (TOC) (00680)	3 x 40 mL VOA vials	120	1:1 H ₃ PO ₄ to pH <2, Cool ≤ 6°C but not frozen	28 days
Metals in Water				
<i>Parameters</i>	<i>Containers</i>	<i>Minimum Sample Volume (ml)</i>	<i>Preservation</i>	<i>Maximum Holding Time</i>
CONTAINER 1 and 2				
Total Metals Suite	500 mL HDPE	500	1:1 HNO ₃ to pH<2	180 days
CONTAINER 3				
Total Mercury (245.7)	500 mL clear glass	500	1:1 HCl to pH < 2	28 days
Routine Conventionals in Sediment Samples				
<i>Parameters</i>	<i>Containers</i>	<i>Minimum Sample Volume (g)</i>	<i>Preservation</i>	<i>Maximum Holding Time</i>
CONTAINER 1				
Percent Solids (81373)	4-oz glass jar	50 grams	Cool ≤ 6°C but not frozen	NA
CONTAINER 2				
Grain Size Analysis	1-L HDPE bottle	1000 grams	Cool ≤ 6°C but not frozen	NA
Metals in Sediment				
<i>Parameters</i>	<i>Containers</i>	<i>Minimum Sample Volume (g)</i>	<i>Preservation</i>	<i>Maximum Holding Time</i>
CONTAINER 1				
Metals	4-oz glass jar	5 grams	Cool ≤ 6°C but not frozen	180 days
Total Mercury	4-oz glass jar	5 grams	Dark and Cool < 6°C, but not frozen	28 days

*E. coli samples should always be processed as soon as possible and incubated no later than 8 hours from time of collection. When transport conditions necessitate sample incubation after 8 hours from time of collection, the holding time may be extended, and samples must be processed as soon as possible and within-30 hours.

Collecting entities that use this lab: USIBWC CRP, Amistad Dam FO, Falcon Dam FO, Presidio FO, Mercedes FO, BBNP, TPWD, City of Laredo Env. Services, RGISC, UTRGV-Edinburg, and Midland College

TABLE A7.5 Measurement Performance Specifications for DHL Analytical, Inc.

Metals in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
ARSENIC, TOTAL (UG/L AS AS)	µg/L	water	EPA 200.8 EPA 6020	01002	NA	5	70-130	20	80-120	DHL
BARIUM, TOTAL (UG/L AS BA)	µg/L	water	EPA 200.8 EPA 6020	01007	NA	10	70-130	20	80-120	DHL
BERYLLIUM, TOTAL (UG/L AS BE)	µg/L	water	EPA 200.8 EPA 6020	01012	NA	1	70-130	20	80-120	DHL
CADMIUM, TOTAL (UG/L AS Cd)	µg/L	water	EPA 200.8 EPA 6020	01027	NA	1	70-130	20	80-120	DHL
CHROMIUM, TOTAL (UG/L AS CR)	µg/L	water	EPA 200.8 EPA 6020	01034	NA	5	70-130	20	80-120	DHL
COBALT, TOTAL (UG/L AS CO)	µg/L	water	EPA 200.8 EPA 6020	01037	NA	10	70-130	20	80-120	DHL
COPPER, TOTAL (UG/L AS CU)	µg/L	water	EPA 200.8 EPA 6020	01042	NA	10	70-130	20	80-120	DHL
IRON, TOTAL (UG/L AS FE)	µg/L	water	EPA 200.8 EPA 6020	01045	300	150	70-130	20	80-120	DHL
LEAD, TOTAL (UG/L AS Pb)	µg/L	water	EPA 200.8 EPA 6020	01051	NA	1	70-130	20	80-120	DHL
MANGANESE, TOTAL (UG/L AS MN)	µg/L	water	EPA 200.8 EPA 6020	01055	50	2	70-130	20	80-120	DHL
THALLIUM, TOTAL (UG/L AT TL)	µg/L	water	EPA 200.8 EPA 6020	01059	NA	1.5	70-130	20	80-120	DHL
MOLYBDENUM, TOTAL (UG/L AS MO)	µg/L	water	EPA 200.8 EPA 6020	01062	NA	5	70-130	20	80-120	DHL
NICKEL, TOTAL (UG/L AS NI)	µg/L	water	EPA 200.8 EPA 6020	01067	NA	10	70-130	20	80-120	DHL
SILVER, TOTAL (UG/L AS AG)	µg/L	water	EPA 200.8 EPA 6020	01077	NA	2	70-130	20	80-120	DHL
ZINC, TOTAL (UG/L AS ZN)	µg/L	water	EPA 200.8 EPA 6020	01092	NA	5	70-130	20	80-120	DHL

ANTIMONY, TOTAL (UG/L AS SB)	µg/L	water	EPA 200.8 EPA 6020	01097	NA	2.5	70-130	20	80-120	DHL
TIN, TOTAL, UG/L AS SN	µg/L	water	EPA 200.8 EPA 6020	01102	NA	10	70-130	20	80-120	DHL
ALUMINUM, TOTAL (UG/L AS AL)	µg/L	water	EPA 200.8 EPA 6020	01105	NA	30	70-130	20	80-120	DHL
SELENIUM, TOTAL (UG/L AS SE)	µg/L	water	EPA 200.8 EPA 6020	01147	2	2	70-130	20	80-120	DHL
MERCURY, TOTAL, (UG/L AS HG)	µg/L	water	EPA 245.7	71900	0.006	0.004	70-130	20	80-120	ANALAB

USIBWC CRP partners that use this table include: Presidio FO, Mercedes FO, BBNP, TPWD, City of Laredo Env. Services

Mercury analysis is subcontracted by DHL Analytical to ANALAB, whose adherence letter is on file.

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, 23rd Edition, 2017.

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 A7.8 Measurement Performance Specifications for El Paso Water
International Water Quality Laboratory**

Metals in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ-AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec of LCS	Lab
ARSENIC, TOTAL (UG/L AS-AS)	µg/L	water	EPA 200.7	01002	NA	100	70-130	20	80-120	IWQL
BARIUM, TOTAL (UG/L AS-BA)	µg/L	water	EPA 200.7	01007	NA	100	70-130	20	80-120	IWQL
BERYLLIUM, TOTAL (UG/L AS-BE)	µg/L	water	EPA 200.7	01012	NA	20	70-130	20	80-120	IWQL
CADMIUM, TOTAL (UG/L AS-Cd)	µg/L	water	EPA 200.7	01027	NA	60	70-130	20	80-120	IWQL
CHROMIUM, TOTAL (UG/L AS-CR)	µg/L	water	EPA 200.7	01034	NA	45	70-130	20	80-120	IWQL
COPPER, TOTAL (UG/L AS-CU)	µg/L	water	EPA 200.7	01042	NA	100	70-130	20	80-120	IWQL
IRON, TOTAL (UG/L AS-Fe)	µg/L	water	EPA 200.7	01045	300	100	70-130	20	80-120	IWQL
LEAD, TOTAL (UG/L AS-Pb)	µg/L	water	EPA 200.7	01051	NA	100	70-130	20	80-120	IWQL
MANGANESE, TOTAL (UG/L AS-MN)	µg/L	water	EPA 200.7	01055	50	40	70-130	20	80-120	IWQL
THALLIUM, TOTAL (UG/L AT-Tl)	µg/L	water	EPA 200.7	01059	NA	100	70-130	20	80-120	IWQL
MOLYBDENUM, TOTAL (UG/L AS-MO)	µg/L	water	EPA 200.7	01062	NA	20	70-130	20	80-120	IWQL
NICKEL, TOTAL (UG/L AS-Ni)	µg/L	water	EPA 200.7	01067	NA	40	70-130	20	80-120	IWQL
SILVER, TOTAL (UG/L AS-AG)	µg/L	water	EPA 200.8	01077	NA	0.5	70-130	20	80-120	IWQL
ZINC, TOTAL (UG/L AS-Zn)	µg/L	water	EPA 200.7	01092	NA	60	70-130	20	80-120	IWQL

ANTIMONY, TOTAL (UG/L AS SB)	µg/L	water	EPA 200.7	01097	NA	100	70-130	20	80-120	IWQL
ALUMINUM, TOTAL (UG/L AS AL)	µg/L	water	EPA 200.7	01105	NA	100	70-130	20	80-120	IWQL
<p>The IWQL lab analyzes samples collected by the USIBWC American Dam field office.</p> <p>References:</p> <p>United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020</p> <p>U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136</p> <p>American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.</p> <p>TCEQ SOP, V1—TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG 415).</p> <p>TCEQ SOP, V2—TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG 416).</p>										

Appendix B Sampling Process Design and Monitoring Schedule (plan)

Sample Design Rationale FY 2020

The sample design is based on the legislative intent of CRP. Under the legislation, the Basin Planning Agencies have been tasked with providing data to characterize water quality conditions in support of the Texas Water Quality Integrated Report, and to identify significant long-term water quality trends. Based on Steering Committee input, achievable water quality objectives and priorities and the identification of water quality issues are used to develop work plans which are in accord with available resources. As part of the Steering Committee process, the USIBWC CRP coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed. A discussion of past or ongoing water quality issues should be provided here to justify the monitoring schedule.

The following changes or additions have been made to the monitoring schedule. These changes have come about because of concerns or requests of steering committee members or monitoring entities.

- Upper:
 - New station at Rio Grande at Ft. Quitman will be added to the schedule in FY20. A SLOC will be done.
 - Stations 20624, 20627, 20630, 13223, 13224, 13225, 13226, 13722, 20619, 20623, 20625, 20626, 20628, 20629, 20631, and 20632, Wild and Scenic stations within Big Bend National Park, will be removed from the schedule due to staff turnover within the park; may be picked back up later.
 - USIBWC Headquarters will be monitoring stations 13272, 14465, 15529, and 15528 for USIBWC American Dam until they fill their hydrologic technician position, at which time the stations will be transferred back to USIBWC American Dam.
 - Adding station 22193 at Fort Quitman to fill a data gap between Fort Hancock and Candelaria.
- Middle:
 - Sediment samples will no longer be collected at station 20997.
 - Station 13184 will be monitored 8 times per year instead of 7 times per year.
- Lower: No changes with CRP partners.
- Pecos: No changes with CRP partners.

Appendix B.1, shown below, contains groups of analytes and which analytes are typically analyzed by each lab. The groups are arranged similarly to Table A7 found in Appendix A. An “X” in the column indicates that the analyte is analyzed by the entity shown.

Analyte Groups Analyzed by Laboratory

Analyte Group and Analyte	DHL	EPW IWQL	BPUB	Laredo Health
Conventional				
TSS	X		X	
Ammonia N	X	X	X	
Nitrite plus Nitrate N	X			
Total Phosphorus P	X			
Chloride	X			
Sulfate	X			
TDS	X		X	
Chlorophyll a	X	X		
Total Alkalinity	X			
Turbidity		X	X	
Biological Oxygen Demand	X	X	X	
Total Organic Carbon	X			
Hardness	X			
Calcium	X			
Magnesium	X			
Sodium	X			
Potassium	X			
Fluoride	X			
Bromide	X			
Bacteria				
<i>E. Coli</i>	X	X	X	X
<i>E. Coli</i> holding time	X			
Enterococcus			X	
Fecal Coliform				X
Metals in Water	X			
Metals in Sediment	X			

Monitoring Sites for FY 2020

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

Table B1.1 Sample Design and Schedule, FY 2020

Monitoring Site	Site ID	Sample Size	Frequency	Season	Time of Day	Flow	Depth	Width	Length	Area	Volume	Mass	Concentration	Flow Rate	Volume Rate	Mass Rate	Concentration Rate	Flow Rate	Volume Rate	Mass Rate	Concentration Rate
2020																					
RIO GRANDE RIVER TIDAL AT THE END OF QUICKSILVER AVE 375 METERS SOUTH FROM THE INTERSECTION OF BOCA CHICA BLVD AND QUICKSILVER AVE M	13176	2301	15	IB	PT	RT								4			4			4	Entero analyzed by BPUB. Conventional analyzed by DHL.
RIO GRANDE RIVER AT SABAL PALM SANCTUARY 370 METERS SOUTH AND 310 METERS EAST FROM THE INTERSECTION OF DAKOTA AVE AND SABAL PALM GROVE ROAD M	16288	2301	15	IB	PT	RT								4			4			4	Entero analyzed by BPUB. Conventional analyzed by DHL.
2020																					
RIO GRANDE RIVER AT RIVER BEND GOLF COURSE BOAT RAMP WEST OF BROWNSVILLE M	13179	2302	15	IB	PT	RT								4			4			4	

RIO GRANDE AT EL JARDIN PUMP STATION LOCATED 350 METERS WEST OF INTERSECTION OF MONSEES ROAD AND CALLE MILPA VERDE M	13177	2302	15	IB	IB	RT								8			8	8		8	
RIO GRANDE RIVER AT HWY 281/INTERNATIONAL BLVD IN HIDALGO M	13181	2302	15	IB	IB	RT								8			8	8		8	
RIO GRANDE AT FM 886 NEAR LOS EBANOS M	13184	2302	15	IB	IB	RT								7 8			78	78		78	
RIO GRANDE AT FORT RINGGOLD 1 MI DOWNSTREAM OF RIO GRANDE CITY M	13185	2302	15	IB	IB	RT								12			12	12		12	
RIO GRANDE 0.5 MI DOWNSTREAM ANZALDUAS DAM 12.2 MI FROM HIDALGO M	13664	2302	15	IB	IB	RT								8			8	8		8	
RIO GRANDE 300M UPSTREAM OF PHARR INTERNATIONAL BRIDGE/US 281 M	15808	2302	15	IB	IB	RT								8			8	8		8	

RIO GRANDE RIVER AT BROWNSVILLE PUB WATER TREATMENT PLANT NUMBER 1 INTAKE BETWEEN WTP RESERVOIR AND RIO GRANDE LEVEE 910 METERS WEST AND 335 METERS SOUTH TO THE INTERSECTION OF WEST ELIZABETH STREET AND SOUTH MILITARY ROAD Map	20449	2302	15	IB	BO	RT							12			12				E. coli and limited conventionals
RIO GRANDE APPROX 380 METERS DOWNSTREAM OF CONFLUENCE WITH LOS OLMOS CREEK Map	21749	2302	15	IB	PT	RT							4			4	4		4	New site, added FY16
LOS OLMOS CREEK AT US 83/EAST 2ND STREET SOUTH OF RIO GRANDE CITY Map	13103	2302A	15	IB	IB	RT							3			3	3		3	
LOS OLMOS CREEK AT US 83/EAST 2ND STREET SOUTH OF RIO GRANDE CITY Map	13103	2302A	15	IB	PT	RT							3			3	3		3	Added FY16.
ARROYO LOS OLMOS AT SH 755 NW OF RIO GRANDE CITY Map	13104	2302A	15	IB	PT	RT							4			4	4		4	Added FY16.
ARROYO LOS OLMOS 400M UPSTREAM OF CONFLUENCE WITH RIO GRANDE NEAR RIO GRANDE CITY Map	21591	2302A	15	IB	PT	RT							4			4	4		4	Added FY16.

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RIO GRANDE 4.5 MI DOWNSTREAM OF DEL RIO AT MOODY RANCH M	13560	2304	16	IB	IB	RT								4			4	4		4	Frequency reduced FY12 to add another station in Eagle Pass (20997)
RIO GRANDE AT JUAREZ-LINCOLN INTERNATIONAL BRIDGE / BRIDGE #2 IN LAREDO M	15814	2304	16	IB	LA	RT											12	12		12	E. coli and FC; flow from IBWC gage; field data
RIO GRANDE AT JUAREZ-LINCOLN INTERNATIONAL BRIDGE / BRIDGE #2 IN LAREDO M	15814	2304	16	IB	RN	RT								4			4	4		4	
RIO GRANDE AT MASTERSON RD IN LAREDO 9.9KM DWNSTR INTL BRIDGE #1/WEST BRIDGE DWNSTR SOUTHSIDE WWTP AND UPSTREAM NUEVO LAREDO WWTP M	15815	2304	16	IB	LA	RT											12			12	E. coli and fecal coliform, and field data
RIO GRANDE AT RIO BRAVO 0.5KM DWNSTR OF THE COMMUNITY OF EL CENIZO M	15816	2304	16	IB	RN	RT								4			4			4	Reactivated for FY 2015.

RIO GRANDE AT THE COLOMBIA BRIDGE 2.7KM UPSTREAM OF THE DOLORES PUMP STATION 45.1KM UPSTREAM OF THE LAREDO WTP INTAKE M00	15839	2304	16	IB	LA	RT											12	12		12	E. coli and FC; flow from IBWC gage; field data
RIO GRANDE AT THE COLOMBIA BRIDGE 2.7KM UPSTREAM OF THE DOLORES PUMP STATION 45.1KM UPSTREAM OF THE LAREDO WTP INTAKE M00	15839	2304	16	IB	RN	RT							4				4	4		4	Flow from IBWC gage.
RIO GRANDE AT WORLD TRADE BRIDGE ON FM 3484 M00	17410	2304	16	IB	RN	RT							4				4	4		4	
RIO GRANDE 115 METERS SOUTH AND 304 METERS WEST FROM THE INTERSECTION OF RANCHO VIEJO DRIVE/ZEBU COURT AND RIENDA DRIVE IN FATHER McNABOE CITY PARK IN LAREDO M00	20650	2304	16	IB	LA	RT											12			12	E. coli and fecal

RIO GRANDE AT MAIN STREET BOAT RAMP APPROX 400 METERS UPSTREAM OF US 57/INTERNATIONAL BRIDGE IN EAGLE PASS Map	20997	2304	16	IB	IB	RT							4		4			4	4		4	New station FY12 to fill data gap in AU 2304_08; quarterly sampling of metals in sediment added FY17.
RIO GRANDE AT EL CENIZO PARK 220 METERS W EST OF INTERSECTION OF CADENA AND JIMENEZ Map	21542	2304	16	IB	RN	RT									4			4			4	
RIO GRANDE AT KICKAPOO CASINO BOAT RAMP SOUTH OF EAGLE PASS Map	20999	2304	16	IB	IB	RT									8			8	8		8	Replaces 18795 and 18792; removal of metals in sediment FY17.

<div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></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RIO GRANDE AT BOQUILLAS CROSSING IN BIG BEND NATIONAL PARK M	20619	2306	6	IB	BB	RT														1	Field data collected by canoe on even numbered fiscal years.
RIO GRANDE AT TAYLORS FARM SOUTHWEST OF SANDERSON M	20623	2306	6	IB	BB	RT														1	Field data collected by canoe on even numbered fiscal years.
RIO GRANDE 50 METERS UPSTREAM OF SILBER CANYON SOUTH OF SANDERSON IN BREWSTER COUNTY M	20625	2306	6	IB	BB	RT														1	Field data collected by canoe on even numbered fiscal years.
RIO GRANDE DOWNSTREAM OF RODEO RAPIDS SOUTH OF SANDERSON IN BREWSTER COUNTY M	20626	2306	6	IB	BB	RT														1	Field data collected by canoe on even numbered fiscal years.
RIO GRANDE 1.3 KILOMETERS DOWNSTREAM OF BEAR CANYON AND APPROXIMATELY 9.3 KILOMETERS DOWNSTREAM OF COOK CREEK IN TERRELL COUNTY M	20628	2306	7	IB	BB	RT														1	Field data collected by canoe on odd numbered fiscal years.

<div>RIO GRANDE</div>	<div>COUNTY</div>	<div>FISCAL YEAR</div>	<div>SAMPLE NO.</div>	<div>PRIORITY</div>	<div>METHOD</div>	<div>EQUIPMENT</div>	<div>ANALYST</div>	<div>LABEL</div>	<div>DATE COLLECTED</div>	<div>LOCATION</div>	<div>COORDINATES</div>	<div>DEPTH</div>	<div>VOLUME</div>	<div>PH</div>	<div>TEMPERATURE</div>	<div>DURATION</div>	<div>WIND SPEED</div>	<div>WAVE HEIGHT</div>	<div>TIDE</div>	<div>MOON PHASE</div>	<div>WEATHER</div>
RIO GRANDE 570 METERS NORTH AND 605 METERS WEST FROM THE SOUTH END OF SHAFTER CROSSING ROAD AND 1.90 KILOMETERS DOWNSTREAM OF BRITTON CANYON IN TERRELL COUNTY M01		20629	2306	7	IB	BB	RT													1	Field data collected by canoe on even numbered fiscal years.
RIO GRANDE AT THE CONFLUENCE WITH INDIAN CREEK IN TERRELL COUNTY M02		20631	2306	7	IB	BB	RT													1	Field data collected by canoe on odd numbered fiscal years.
RIO GRANDE 7.5 KILOMETERS UPSTREAM FROM THE CONFLUENCE WITH SAN FRANCISCO CREEK IN BREWSTER COUNTY M03		20632	2306	6	IB	BB	RT													1	Field data collected by canoe on even numbered fiscal years.
<div>2:07 PM R01D01 R02D01 R03D01 M04</div>																					
RIO GRANDE 3.38 KILOMETERS UPSTREAM FROM THE CONFLUENCE WITH THE RIO CONCHOS 6.72 KILOMETERS WEST AND 2.445 KILOMETERS NORTH FROM THE INTERSECTION OF RANCH ROAD 170 AND RODRIQUEZ ROAD IN PRESIDIO COUNTY CAMS 757 M05	13230	2307	6	IB	IB	RT				2				8				8	8	8	Metals - Total Mercury sampled FY12

<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><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RIO GRANDE 1.3 KM DOWNSTREAM FROM HASKELL ST WWTP OUTFALL M	15528	2308	6	IB	IB	RT								12				12	12		12	Monitored by IBWC American Dam FO. Partial conventional analysis due to lab accreditation. Additional non-accredited data for metals, organics and other conventionals available thru IBWC.
RIO GRANDE 2.4 KM UPSTREAM FROM HASKELL ST WWTP OUTFALL SOUTH OF BOWIE HIGH SCHOOL FOOTBALL STADIUM IN EL PASO M	15529	2308	6	IB	IB	RT								12				12	12		12	Monitored by IBWC American Dam FO. Partial conventional analysis due to limited lab accreditation. Additional non-accredited data for metals, organics and other conventionals available thru IBWC.

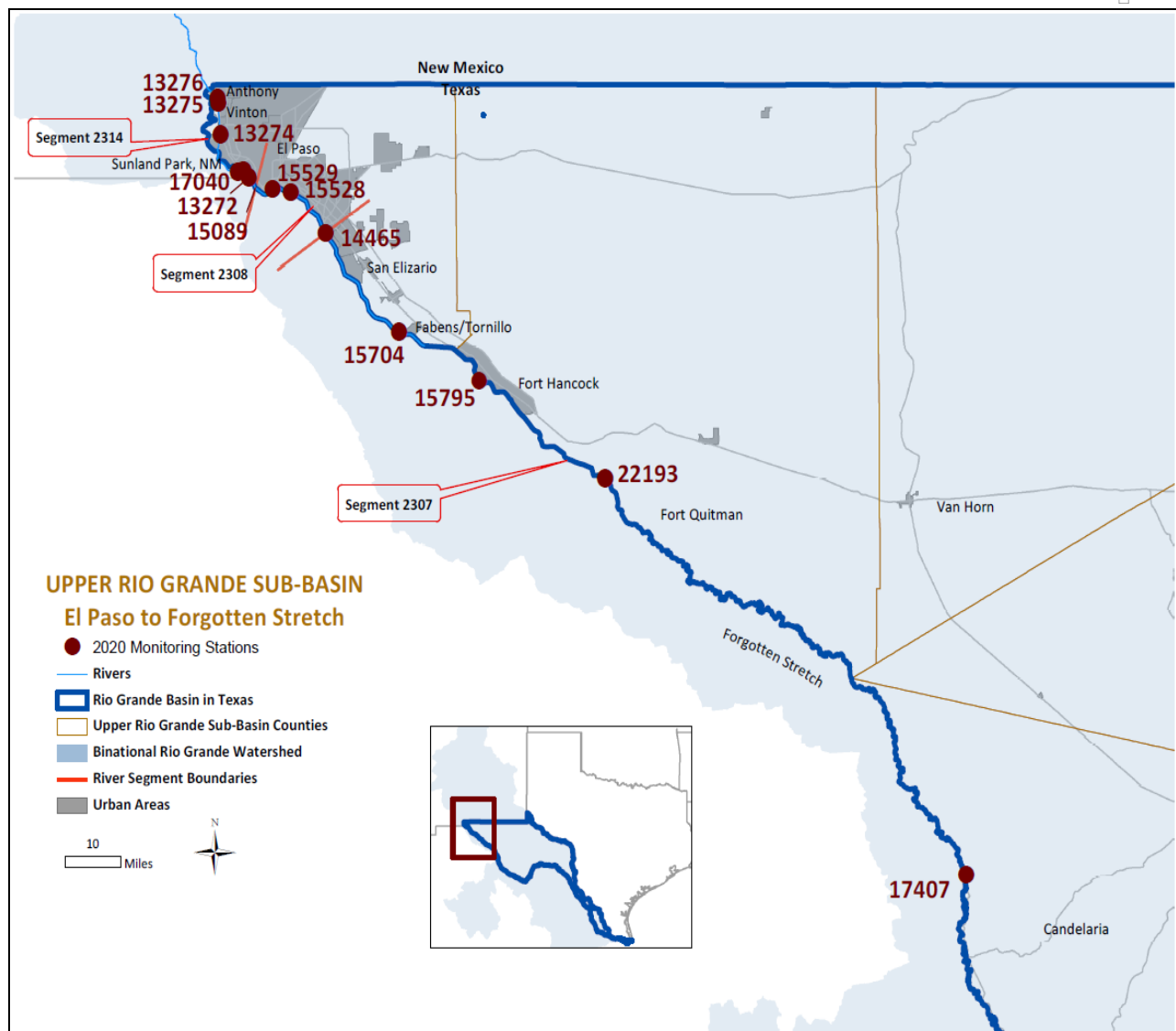
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RIO GRANDE AT BORDERLAND RD NW OF EL PASO M	13274	2314	6	IB	IB	RT								4			4	4	4	In support of Paso del Norte Watershed Councils 319h grant and for stakeholder concerns for bacteria. Total Mercury removed FY16. USIBWC Hdqrs with EPCC, CE may be EP.
RIO GRANDE 40M SOUTH OF VINTON BRIDGE APPROXIMATELY 4 KM S OF ANTHONY M	13275	2314	6	IB	IB	RT								4			4	4	4	In support of Paso del Norte Watershed Councils 319h grant and for stakeholder concerns for bacteria. Total Mercury removed FY16. USIBWC Hdqrs with EPCC, CE may be EP.
RIO GRANDE IMMEDIATE UPSTREAM OF THE CONFLUENCE WITH ANTHONY DRAIN WEST OF LA TUNA PRISON NEAR THE STATE LINE M	13276	2314	6	IB	IB	RT								4			4	8	8	In support of Paso del Norte Watershed Councils 319h grant and for stakeholder recreation concerns. Total Mercury removed FY16. 4x/yr field data only. USIBWC Hdqrs with EPCC, CE may be EP.
RIO GRANDE RIVER AT AMERICAN EAGLE BRICK FACTORY BRIDGE ABANDONED RR 0.1 MI DOWNSTREAM FROM SOUTHERN PACIFIC RR AT SMELTERTOWN M	15089	2314	6	IB	IB	RT								3			5		5	Metals in water removed FY16. 2x/yr bacteria and field data only. USIBWC Hdqrs with UTEP, CE may be UE

<div>Project Name</div>	<div>Project ID</div>	<div>Project Number</div>	<div>Project Type</div>	<div>Project Status</div>	<div>Project Phase</div>	<div>Project Location</div>	<div>Project Description</div>	<div>Project Funding</div>	<div>Project Budget</div>	<div>Project Timeline</div>	<div>Project Impact</div>	<div>Project Risks</div>	<div>Project Mitigation</div>	<div>Project Monitoring</div>	<div>Project Evaluation</div>	<div>Project Reporting</div>	<div>Project Communication</div>	<div>Project Documentation</div>	<div>Project Management</div>	<div>Project Oversight</div>	
<div>RIO GRANDE AT BORDERLAND RD NW OF EL PASO <div>M</div></div>	13274	2314	6	IB	IB	RT									4					4	In support of Paso del Norte Watershed Councils 319h grant and for stakeholder concerns for bacteria. Total Mercury removed FY16. USIBWC Hdqrts with EPCC, CE may be EP.
<div>RIO GRANDE AT ANAPRA BRIDGE ON SUNLAND PARK DRIVE 4.2 KM UPSTREAM OF AMERICAN DAM IN NEW MEXICO <div>M</div></div>	17040	2314	6	IB	IB	RT									4					4	Total metals in water removed FY16. 2x/yr field only. USIBWC Hdqrts with EPCC, CE may be EP.

Appendix C: Station Location Maps

Figure Appendix C.1: Map of the Upper Rio Grande Basin, Northern Half



Appendix E: Chain of Custody Forms

								DHL Analytical							
TAG#				LABORATORY				COC/LAB/WORK ORDER #							

Matrix Type: H2O

Collecting Entity Code: LE

Collection Time:

Analysis Requested			
Storet Code	Analyze if checked	Contract line no.	Parameter
Dissolved Metals (lab filtered, preserved)			
01106	✓		Aluminum (ug/L)
01095	✓		Antimony (ug/L)
01000	✓		Arsenic (ug/L)
01005	✓		Barium (ug/L)
01010	✓		Beryllium (ug/L)
01020	✓		Boron (ug/L)
01025	✓		Cadmium (ug/L)
01030	✓		Chromium (ug/L)
01040	✓		Copper (ug/L)
01046	✓		Iron (ug/L)
01049	✓		Lead (ug/L)
01056	✓		Manganese (ug/L)
01065	✓		Nickel (ug/L)
01145	✓		Selenium (ug/L)
01075	✓		Silver (ug/L)
01057	✓		Thallium (ug/L)
01090	✓		Zinc (ug/L)
Total Metals (preserved)			
01147	✓		Selenium (ug/L)
01045	✓		Iron (ug/L)
01055	✓		Manganese (ug/L)

*All sample containers are provided with appropriate preservative.

<p>Send samples to:</p> <p>DHL Analytical 2300 Double Creek Drive Round Rock, TX 78664 (P) 512-388-8222, (F) 512-388-8229</p>	<p>Submit report to:</p> <p>Texas Clean Rivers Program USIBWC 4171 N. Mesa, Suite C-100 El Paso, TX 79902</p>
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**BROWNVILLE
PUBLIC UTILITIES BOARD**

Analysis Request and Chain of Custody Record

Name: Brownsville Public Utilities Board
Address: 1385 PUB Dr. or PO Box 3270
City: Brownsville Texas 78521
Contact: Jose Ramon Saenz

Project #: # 20449				TEXAS CLEAN RIVERS PROGRAM													
Laboratory Sample Identification				Field Identification	Date	Time	Grab	Composite	Sample Container and Volume	Sample Matrix	Preservative	Immediate Analyses <small>See Attached Field Data Reporting Form</small>	Analysis Requested				Laboratory Remarks
Collection Date YYYY MMDD	Sample Site	ID #	Ammonia N										BOD	TDS	F. COLI		
2019 0903	S#20449	001	Station # 20449				X		1 HDPE / 500ml	Water	H ₂ SO ₄ & 4° C		X				* See below
2019 0903	S#20449	002	Station # 20449 Dup.				X		1 HDPE / 500ml	Water	H ₂ SO ₄ & 4° C		X				
2019 0903	S#20449	003	Station # 20449				X		1 HDPE / 2000ml	Water	4° C			X			
2019 0903	S#20449	004	Station # 20449 Dup.				X		1 HDPE / 2000ml	Water	4° C			X			
2019 0903	S#20449	005	Station # 20449				X		1 HDPE / 250ml	Water	4° C				X		
2019 0903	S#20449	006	Station # 20449 Dup.				X		1 HDPE / 250ml	Water	4° C				X		
2019 0903	S#20449	007	Station # 20449				X		1 HDPE / 2000ml	Water	4° C					X	
2019 0903	S#20449	008	Station # 20449 Dup.				X		1 HDPE / 2000ml	Water	4° C					X	
Sampler Name and Signature:																	
Relinquished by:																	
Signature:																	
Date:																	
Time:																	
Received by:																	
Signature:																	
Date:																	
Time:																	
Relinquished by:																	
Signature:																	
Date:																	
Time:																	
Technician Comments:																	

Remarks:	Submit report to:	Texas Clean Rivers Program	Thermometer#	
	USIBWC	4171 N. Mesa, Suite C-100	Serial #	
	El Paso, TX 79902	Temp. Observed (°C)	Factor °C	
		Temp. Corrected (°C)		
Laboratory Location:		Laboratory #:		
1385 PUB Drive		EPA - TX01425		
P.O. Box 3270		TCEQ #:		
Brownsville, Texas 78521		T104704357-19-14		

BPUBAL		MICROBIAL MONITORING FORM											
Public/Private Wastewater System Identification & Sample Collection Information (Please type or use block print)													
Segment / TCEQ Station ID#		2	3	0	1	/	2	0	4	4	9		
River (Texas Clean Water Program) Name:		Rio Grande at PUB Station ID #20449											
County:		Cameron											
Name:		Leslie Grijalva, Texas Clean River Program, IBWC											
Address:		4191 North Mesa											
City:		El Paso											
State:		Texas											
Zip:		7 9 9 0 2 -											
Phone #:		915-832-4701											
Fax #:		915-832-4166											
Sampler Name:													
Sampler Contact #:		915-832-6355											
System Type: ()		<input type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Surface Water <input type="checkbox"/> Groundwater with Surface Water Influence <input type="checkbox"/> Non Potable Water <input type="checkbox"/> Water Source: () <input type="checkbox"/> owner <input type="checkbox"/> operator <input type="checkbox"/> Other: Laboratory Tech											
Sample Identification/Location		Date: <input type="text"/> / <input type="text"/> / <input type="text"/> Time: <input type="text"/> AM or PM Month: <input type="text"/> Day: <input type="text"/> Year: <input type="text"/>											
Use Specific Sample ID Location		Date: <input type="text"/> / <input type="text"/> / <input type="text"/> Time: <input type="text"/> AM or PM Month: <input type="text"/> Day: <input type="text"/> Year: <input type="text"/>											
Rio Grande River at PUB Station ID# 20449		Date: <input type="text"/> / <input type="text"/> / <input type="text"/> Time: <input type="text"/> AM or PM Month: <input type="text"/> Day: <input type="text"/> Year: <input type="text"/>											
BPUBAL WW-Micro 012 Revised 12/2019		1) Sample Too old. Sample not receipt at laboratory within 6 hours of collection 2) Quantity insufficient for analysis (100mL required) 3) Excessive Chlorine Residual (>10mg/L) 4) Form Incomplete / Date Discrepancy (Errors Circled) 5) Samples NOT in Ice / Ice Packs or received within 2 hours of sample collection. 6) Other:											

Sampler Comments:

Laboratory Comments:

Verification of monthly counts - second analyst (See Back Page)

These analytical results relate to the sample analyzed. This report may NOT be reproduced EXCEPT in FULL without written approval of Brownsville PUB Analytical Laboratory. Unless specified, these results meet the requirements of National Environmental Laboratory Accreditation Program (NELAP).

J:\QA Specialist\Projects\2020 Projects\TOWP Amendment -1\1E. Coli Chain of Custody
WW-MICRO-012

Chlorine Test Strip Check: ()	
Lot #	Exp:
Control #	
Absent <input type="checkbox"/>	Present <input type="checkbox"/>

BPUBAL		MICROBIAL MONITORING FORM									
Public/Private Wastewater System Identification & Sample Collection Information (Please type or use block print)											
Segment / TCEQ Station ID#		2	3	0	1	/	2	0	4	4	9
River (Texas Clean Water Program) Name:		Rio Grande at PUB Station ID #20449									
County:		Cameron									
Name:		Leslie Grijalva, Texas Clean River Program, IBWC									
Address:		4191 North Mesa									
City:		El Paso									
State:		Texas		Zip:		7	9	9	0	2	-
Phone #:		915-832-4701		Fax #:		915-832-4166					
Sampler Name:											
Sampler Contact #:		956-983-6355		<input type="checkbox"/> Owner <input type="checkbox"/> Operator <input type="checkbox"/> Other: Laboratory Tech.							
System Type: (V)		<input type="checkbox"/> Public <input type="checkbox"/> Private		Water Source: (V)		<input type="checkbox"/> Surface Water <input type="checkbox"/> Non Potable Water <input type="checkbox"/> Groundwater with Surface Water Influence <input type="checkbox"/> Groundwater					
Sample Identification/Location		<input type="checkbox"/> Surface Water <input type="checkbox"/> Groundwater		Collected		Time		Chlorine Residual		Sample Type	
Use Specific Sample ID Location		Date		Please circle AM or PM		Units mg/L		Composite		Grab	
Rio Grande River at PUB Station ID# 20449		Month		Day		Year		am pm		N/A	
BPUBAL WW-Micro 003 Revised 12/2019		1) Sample Too old. Sample not receipt at laboratory within 6 hours of collection		2) Quantity insufficient for analysis (100mL required)		3) Excessive Chlorine Residual (>10mg/L)		4) Form Incomplete / Date Discrepancy (Errors Circled)		5) Other:	

Sampler Comments:

Laboratory Comments:

Verification of monthly counts - second analyst (See Back Page)

These analytical results relate to the sample analyzed. This report may NOT be reproduced EXCEPT in FULL without written approval of Brownsville PUB Analytical Laboratory. Unless specified, these results meet the requirements of National Environmental Laboratory Accreditation Program (NELAP).

Chlorine Test Strip Check: (V)	
Lot #	Exp:
Control #	
Absent <input type="checkbox"/>	Present <input type="checkbox"/>

Amendment # 2 Update to the Rio Grande Basin Clean Rivers Program FY 2020/2021 QAPP

***Prepared by the U.S. International Boundary
and Water Commission in Cooperation with
the Texas Commission on Environmental
Quality (TCEQ)***

Effective: Immediately upon approval by all parties

Questions concerning this QAPP should be directed to:

Leslie Grijalva
USIBWC Program Manager
4191 N. Mesa St.
El Paso, TX 79902
(915) 832-4770
Leslie.Grijalva@ibwc.gov

Justification

This document details the changes made to the basin-wide Quality Assurance Project Plan to update Appendix B for fiscal year 2021. This document also updates personnel changes, updates versions of referenced documentation, adds clarifying language about frequency of blank collection, and addresses any other changes made to the quality program since the last amendment.

Summary of Changes

Section/Figure/Table	Page	Change	Justification
Section A1		Replaced USIBWC Acting Chief of Operations and Maintenance Daniel Avila with Francisco Martinez, USIBWC Water Accounting Division Replaced “Samantha Stiffler” with “Lisa Torres” as USIBWC CRP QAO.	Personnel changes at USIBWC
		Replaced David Larson of Big Bend National Park with Thomas Athens	Personnel changes at BBNP
		Removed signature page for Tim Gibbs at BBRSP Barton Warnock Center	The state park is still a partner. The overall supervisor is Nicolas Havlik at TPWD, who oversaw Tim Gibbs at the BBRSP Barton Warnock Center. Tim’s duties were transferred to Price Rumbelow. Both Nicolas and Price are still signatories, as is the TPWD (which oversees the state park).
		Removed Sarah Eagle as CRP Work Lead	Rebecca DuPont added as the CRP Work Lead
		Removed Quality Assurance Manager Signature block.	The Quality Assurance Manager is not required by the QMP to sign amendments for projects not funded by EPA.
		Replaced “Kelly Rodibaugh” with “Chase Carpenter” as Project Manager, Clean Rivers Program and replaced “Kelly Rodibaugh” with “Rebecca DuPont” as Project Quality Assurance Specialist, Clean Rivers Program	Personnel changes at TCEQ, Clean Rivers Program

Section/Figure/Table	Page	Change	Justification
Section A3		<p>Replaced USIBWC Acting Chief of Operations and Maintenance Daniel Avila with Francisco Martinez, USIBWC Water Accounting Division</p> <p>Replaced “Samantha Stiffler” with “Lisa Torres” as USIBWC CRP QAO.</p>	<p>Personnel changes at USIBWC</p>
		<p>Replaced David Larson of Big Bend National Park with Thomas Athens</p>	<p>Personnel changes at BBNP</p>
		<p>Replaced “Kelly Rodibaugh” with “Chase Carpenter” as Project Manager, Clean Rivers Program</p>	<p>Personnel changes at TCEQ Clean Rivers Program</p>
Section A4		<p>Removed Sarah Eagle as CRP Work Lead</p>	<p>Rebecca DuPont added as the CRP Work Lead</p>
		<p>Replaced USIBWC Acting Chief of Operations and Maintenance Daniel Avila with Francisco Martinez, USIBWC Water Accounting Division</p> <p>Replaced “Samantha Stiffler” with “Lisa Torres” as USIBWC CRP QAO.</p>	<p>Personnel changes at USIBWC</p>
		<p>Replaced David Larson of Big Bend National Park with Thomas Athens</p>	<p>Personnel changes at BBNP</p>
		<p>Replaced “Kelly Rodibaugh” with “Chase Carpenter” as Project Manager, Clean Rivers Program and replaced “Kelly Rodibaugh” with “Rebecca DuPont” as Project Quality Assurance Specialist, Clean Rivers Program</p>	<p>Personnel changes at TCEQ Clean Rivers Program.</p>
Figure A4.1		<p>Replaced USIBWC Acting Chief of Operations and Maintenance</p>	<p>Personnel changes at USIBWC</p>

Section/Figure/Table	Page	Change	Justification
		<p>Daniel Avila with Francisco Martinez, USIBWC Water Accounting Division</p> <p>Replaced David Larson of Big Bend National Park with Thomas Athens</p> <p>Org. Chart revision</p> <p>Org. Chart Revision</p>	<p>Personnel changes at BBNP</p> <p>Broke American Dam and linked them to EPW and linked Laredo Health Dept. to the Laredo Health Dept. lab. Footnote was revised to reference table in QAPP for lab affiliation.</p> <p>Replaced “Kelly Rodibaugh” with “Chase Carpenter” as Project Manager, Clean Rivers Program and replaced “Kelly Rodibaugh” with “Rebecca DuPont” as Project Quality Assurance Specialist, Clean Rivers Program</p>
Section A8		Changed referenced version of TNI Standard from 2009 version to 2016 version.	The 2016 TNI ELS Standard was adopted on June 18, 2018. The implementation date was set as January 31, 2020 by vote of the NELAP Accreditation Council on January 7, 2019.
Section A9		Changed referenced version of TNI Standard from 2009 version to 2016 version.	The 2016 TNI ELS Standard was adopted on June 18, 2018. The implementation date was set as January 31, 2020 by vote of the NELAP Accreditation Council on January 7, 2019.
Table B2.3		Updated table to reflect changes made by EPW lab	Delete entries for Magnesium, Sodium, and Potassium. Add information for Ammonia.
Section B5		Updated language for blank collection frequency	To clarify frequency with which field and equipment blanks are collected for Clean Rivers Program water quality samples.
Appendix A		<p>Update table names following removal of Table A7.8 in Amendment 1.</p> <p>The removal of table A7.8, resulted in changes to the numbering of the tables following (not all tables have been reproduced in this amendment because the change occurred in Amendment 1 but</p>	<p>TABLE A7.8 Measurement Performance Specifications for El Paso Water International Water Quality Laboratory</p> <p>TABLE A7.9 Measurement Performance Specifications for City of Laredo Health Department Lab</p> <p>TABLE A7.10 Measurement Performance Specifications for</p>

Section/Figure/Table	Page	Change	Justification
		we include it here for documentation per TCEQ request).	City of Laredo Health Department Lab TABLE A7.11 Measurement Performance Specifications for City of Laredo Health Department TABLE A7.12 Measurement Performance Specifications for BPUB TABLE A7. 13 Measurement Performance Specifications for BPUB
		DHL Tables A7.3	Table A7.3 after discussion with TCEQ CRP PM and DHL previous discussed changes will not be included. Therefore, the table will remain the same no changes were made.
		Table A7.4	Table A7.4 updated to reflect the change in sub-contracted lab; DHL now sending <i>E. coli</i> to AQUA-TECH.
		Table A7.5	Table A7.5 mercury in water sub-contracted by DHL to ANA-LAB, now ANA-LAB/GCO Labs. Footnote referencing Mercedes FO removed because Mercedes FO does not collect metals.
		Table A7.6	Method change for Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Manganese, Nickel, Silver, Zinc, Antimony, Aluminum, and Selenium. Change in sub-contractor name.
		EPW IWQL Table A7.7	Table A7.7 updated to remove Magnesium, Sodium and Potassium, and added Ammonia.
		Laredo Health Lab Table A7.10	Table A7.10 Updated parameter description, updated parameter code.
		BPUB Table A7.12	Table A7.12 updated to reflect changes to LOQ Check, Precision

Section/Figure/Table	Page	Change	Justification
		BPUB Table A7.13	<p>and Bias for BOD, TSS and TDS. Changes in LOQ, Precision and bias for Turbidity.</p> <p>Table A7.13 Updated methodology for Enterococcus analysis When determining the analytical method limits for enterococcus samples, a common misconception is that the saline matrix is interfering due in part to the IDEXX instructions regarding dilution in “marine” water. This is not the case. The interference is caused by competing bacillus bacteria. Therefore, enterococcus samples should be diluted 1/10 as a routine practice. The AWRL is changed to 10 MPN/100 mL and the LOQ will remain 1 MPN/100 mL in this amendment.</p>
Appendix B		Updated Task 3 in the work plan from contract	Task 3 in the work plan was updated when the USIBWC CRP contract amendment was executed on 8/16/2019.
Appendix B		Updated sample design rationale for FY2021	Describes changes to monitoring design for FY2021 based on the FY2020 Coordinated Monitoring Meetings
Appendix B		Updated Table B1.1	Describes changes to monitoring design for FY2021 based on the FY2020 Coordinated Monitoring Meetings
Appendix C		Updated maps of monitoring stations	Describes changes to monitoring design for FY2021 based on the FY2020 Coordinated Monitoring Meetings

A1 Approval Page

Texas Commission on Environmental Quality

Water Quality Planning Division

ELECTRONICALLY APPROVED 9/25/2020

Rebecca DuPont, Work Leader Date
Clean Rivers Program

ELECTRONICALLY APPROVED 9/25/2020

Rebecca DuPont Date
Acting Project Quality Assurance Specialist
Clean Rivers Program

ELECTRONICALLY APPROVED 10/06/2020

Chase Carpenter, Project Manager Date
Clean Rivers Program

ELECTRONICALLY APPROVED 9/25/2020

Cathy Anderson, Team Leader Date
Data Management and Analysis

Monitoring Division

ELECTRONICALLY APPROVED 9/29/2020

Dana Squires Date
Lead CRP Quality Assurance Specialist

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Environmental Management Division***

ELECTRONICALLY APPROVED 9/25/2020

Leslie Grijalva Date
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leslie.grijalva@ibwc.gov

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Lisa Torres Date
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***United States Section, International Boundary and Water Commission (USIBWC)
Water Accounting Division***

ELECTRONICALLY APPROVED 9/30/2020

Francisco Martinez Date
Supervisory Hydrologic Technician
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The USIBWC will secure written documentation from each sub-tier project participant (e.g., subcontractors, sub participants, or other units of government) stating the organization's awareness of and commitment to requirements contained in this quality assurance project plan and any amendments or added appendices of this plan. Alternatively, additional signature blocks for sub-tier participants may be added to section A1. Signatures in section A1 will eliminate the need for adherence letter maintenance. The USIBWC will maintain this documentation as part of the project's quality assurance records and will ensure the documentation is available for review.

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ELECTRONICALLY APPROVED 9/25/2020

John DuPont	Date
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<u>dupont@dhlanalytical.com</u>	

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Sherri Herschmann	Date
Quality Assurance Manager	
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9/30/2020

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Laboratory Manager

Date

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Miguel Venegas
Quality Assurance Chemist

Date

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9/25/2020

Daniel Maldonado
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Lupe Luna
Sanitation Inspector

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Executive Director

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Region 1 Natural Resources Coordinator

Date

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USIBWC CRP Amendment #2
Last revised on September 30, 2020

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The USIBWC CRP 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, sub-participant, or other units of government. The USIBWC Headquarters will document distribution of the plan and any amendments and appendices, maintain this documentation as part of the project's quality assurance records, and will ensure the documentation is available for review.

A4 Project Task/Organization

Description of Responsibilities

TCEQ

Rebecca DuPont ***CRP Work Leader***

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

Dana Squires

Lead CRP Quality Assurance Specialist

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

Chase Carpenter

CRP Project Manager

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

Cathy Anderson

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

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

Sarah Kirkland

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, December 2018 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).

Rebecca DuPont

Acting CRP Project Quality Assurance Specialist

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

United States Section, International Boundary and Water Commission (USIBWC)

Gilbert Anaya

USIBWC Environmental Management Division Chief

Responsible for oversight of the USIBWC El Paso Headquarters Program and Clean Rivers Program at the USIBWC. Performs evaluations of USIBWC El Paso Headquarters personnel. Cost Center Manager for the USIBWC El Paso Headquarters budget.

Leslie Grijalva

USIBWC CRP Program 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 USIBWC participants and that projects are producing data of known quality. Ensures that sub participants are qualified to perform contracted work. Ensures CRP project managers and/or QA Specialists are notified of deficiencies and corrective actions, and that issues are resolved. Responsible for validating that data collected are acceptable for reporting to the TCEQ. Responsible for validating that data collected are acceptable for reporting to the TCEQ. Responsible for ensuring that field data are properly reviewed and verified. Responsible for the transfer of basin quality-assured water quality data to the TCEQ in a format compatible with the instructions in the SWQM Data Management Reference Guide (DMRG), December 2016 or most recent. Maintain quality-assured data on USIBWC internal sites. Responsible for monitoring at USIBWC American Dam stations until the American Dam hydrotech is hired and trained,

Lisa Torres

USIBWC CRP Quality Assurance Officer

Responsible for coordinating the implementation of the QA program. Responsible for writing and maintaining this 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 QAS to resolve QA-related issues. Notifies the USIBWC CRP Program 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. Responsible for ensuring that field data are properly reviewed and verified. Responsible for the

transfer of basin quality-assured water quality data to the TCEQ in the TCEQ required format. Maintain quality-assured data on USIBWC internet sites.

Leslie Grijalva

USIBWC CRP Data Manager

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

DHL Analytical

John DuPont

DHL Analytical, Laboratory Manager

Responsible for project coordination at DHL Analytical, providing support to IBWC at each program stage: QAPP development, sampling, sample receipt and login, analyses, and data reporting. Responsible for quality assurance of reported analyses performed by DHL Analytical and performs validation and verification of data before the report is sent to USIBWC. Notifies the USIBWC CRP Program Manager and Quality Assurance Officer of circumstances which may adversely affect the quality of data. Responsible for coordinating with DHL Analytical and USIBWC CRP Program Manager to resolve QA-related issues. Implements or ensures implementation of corrective actions needed to resolve nonconformance's noted during assessments. Responsible for overseeing sub-contract laboratories and making sure they adhere to QAPP standards.

Sherri Herschmann

DHL Analytical, Quality Assurance Manager

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

RIO GRANDE BASIN CRP PARTNERS

The Program Manager, QAO, and Data Manager for all the below listed partners are the same as listed above for USIBWC, unless otherwise noted.

Francisco Martinez, Supervisory Hydrologic Technician, USIBWC Field Offices

Manages data collection activities and generates the work orders for water quality monitoring at five field offices along the Texas portion of the Rio Grande. Directs activities on the local level as follows: American Dam Field Office, Amistad Dam Field Office, Falcon Dam Field Office, Mercedes Field Office, and the Presidio Field Office. Samples collected by the Amistad Dam, Falcon Dam, Mercedes, and Presidio field offices are shipped to DHL Analytical for analysis. American Dam submits their samples to the El Paso Water Laboratory for analysis. All USIBWC Field Offices ensure that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

Vicente Guerrero, Laboratory Manager

Brownsville Public Utilities Board (BPUB) Laboratory

Responsible for implementing and monitoring CRP requirements in contracts, QAPPs, and QAPP amendments and appendices. Responsible for water quality monitoring, analysis, and data review of Station 20449 in Brownsville, TX. Samples are collected and analyzed by the BPUB laboratory as part of their regular permit monitoring and provided to the USIBWC CRP.

Gabriel Coronado and Julian Alvarado, Quality Assurance Specialists

Brownsville Public Utilities Board (BPUB) Laboratory

Responsible for the review of laboratory data and laboratory techniques performed at the BPUB laboratory. Responsible for the overall quality control and quality assurance of analyses performed by the BPUB laboratory. Monitors implementation of the QM/QAPP within the laboratory to ensure complete compliance with QA data quality objectives, as defined by this QAPP. Conducts internal annual audits to ensure compliance with written SOPs, identify potential problems and initiate Corrective Action Reports and files. Responsible for supervising and verifying all aspects of QA/QC in the laboratory.

Richard Wilcox, Laboratory Manager

El Paso Water International Water Quality Laboratory (EPW IWQL)

Responsible for implementing and monitoring CRP requirements in contracts, QAPPs, and QAPP amendments and appendices. Responsible for water quality laboratory analysis and data review for samples collected by USIBWC American Dam Field Office. Responsible for sending data monthly to the USIBWC CRP.

Miguel Venegas, Quality Assurance Chemist

El Paso Water International Water Quality Laboratory (EPW IWQL)

Responsible for the review of laboratory data and laboratory techniques performed at the EPW IWQL laboratory. Responsible for the overall quality control and quality assurance of analyses performed by the EPW IWQL laboratory. Monitors implementation of this QM/QAPP within the laboratory to ensure complete compliance with QA data quality objectives, as defined by this QAPP. Conducts internal annual audits to ensure compliance with written SOPs, identify potential problems and initiate Corrective Action Reports and files. Responsible for supervising and verifying all aspects of QA/QC in the laboratory.

Rebeca Castro, Technical Director/ Quality Assurance Officer

City of Laredo Health Department Laboratory

Responsible for the review of laboratory data and laboratory techniques performed at the City of Laredo Health Department laboratory. Responsible for the overall quality control and quality assurance of analyses performed by the City of Laredo Health Department laboratory. Monitors implementation of this QM/QAPP within the laboratory to ensure complete compliance with QA data quality objectives, as defined by this QAPP. Conducts internal annual audits to ensure compliance with written SOPs, identify potential problems and initiate Corrective Action Reports and files. Responsible for supervising and verifying all aspects of QA/QC in the laboratory.

Samuel Gonzalez, Chief of Environmental Health Services

City of Laredo Health Department

Responsible for supervising water quality monitoring staff at the City of Laredo Health Department.

Daniel Maldonado and Lupe Luna, Sanitation Inspectors

City of Laredo Health Department

Responsible for water quality monitoring for samples collected in the Laredo area of the Rio Grande. Samples collected are submitted to the City of Laredo Health Department Laboratory for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

John Porter, Director

City of Laredo Environmental Services Department

Responsible for supervising water quality monitoring staff at the City of Laredo Environmental Services Department.

Juan M. Vazquez and Carlos McMullen, Environmental Specialists
City of Laredo Environmental Services Department

Responsible for water quality monitoring samples collected on Manadas Creek in the Laredo area. Samples collected are submitted to DHL Analytical for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

Tricia Cortez
Rio Grande International Studies Center

Responsible for water quality monitoring and data review in the Laredo area of the Rio Grande. Samples collected are submitted to DHL Analytical for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

Nicolas Havlik
Texas Parks and Wildlife Department, Natural Resources Program

Responsible for supervising water quality monitoring staff at TPWD Big Bend Ranch State Park.

Price Rumbelow
Texas Parks and Wildlife Department, Natural Resources Program

Responsible for water quality monitoring at stations in Big Bend Ranch State Park. Water samples collected are submitted to DHL Analytical for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

Thomas Athens
Big Bend National Park

Responsible for water quality monitoring in the Big Bend National Park and Rio Grande Wild and Scenic River. Samples collected are submitted to DHL Analytical for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

Dr. Jungseok Ho
University of Texas Rio Grande Valley- Edinburg

Responsible for water quality monitoring samples collected at Arroyo Los Olmos, a tributary to the Rio Grande, and one site on the Rio Grande. Samples collected are submitted to DHL Analytical for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

Greg Larson, Professor, Biology Department
Midland College

Responsible for water quality monitoring at two stations in the Pecos sub-basin. Water samples collected are submitted to DHL Analytical for analysis. Ensures that samples are collected according to methods specified in this QAPP and the latest version of the SWQM Procedures.

Terms of Agreement

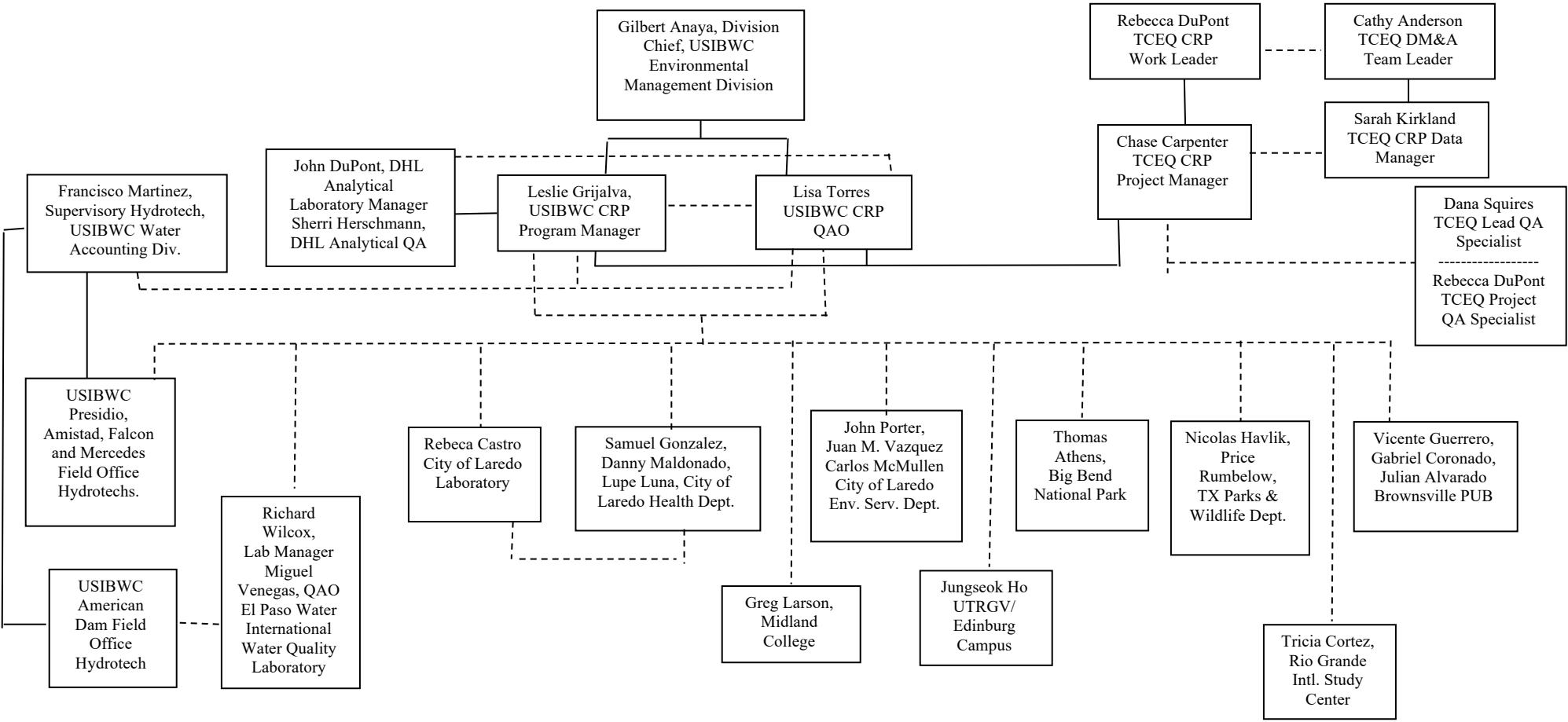
The USIBWC Clean Rivers Program Sampling Partners agree to the long-term collection of water quality samples and environmental data at designated monitoring stations on a prescribed schedule. The types of samples and data collected by each partner may vary in time, commitment, and geography. A Sampling Partner's signature on the Section A1 Approval Page of the Rio Grande Basin Monitoring Program Quality Assurance Project Plan or on a Letter of Adherence (see Attachment 1) indicates acknowledgment that the Sampling Partner does not expect to be paid for his/her work, compensation for expenses associated with said in-kind work, and will abide by the Texas Commission on Environmental Quality procedures.

In Addition, USIBWC non-federal entity Sampling Partners release, waive, discharge and covenant not to sue the USIBWC, including its officers and employees, with respect to any and all liability, claims or causes of action whatsoever related to any damages or injury that they may sustain, whether caused by the negligence of the USIBWC or otherwise, while performing tasks under this QAPP. USIBWC Sampling Partners are aware and fully responsible for guarding against any risks involved with such

activity and choose to participate voluntarily and at their own risk. They voluntarily assume full responsibility for any property damage or personal injury that they may sustain while participating in, or related to the above activity

Project Organization Chart

Figure 1: A4.1. Project Organization Chart - Lines of Communication



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

Reference Appendix B.2, for CRP Partners and their affiliated lab.

A8 Special Training/Certification

Before new field personnel independently conduct field work, the USIBWC CRP Project Manager or USIBWC CRP QAO trains him/her in proper instrument calibration, field sampling techniques, and field analysis procedures. The QA officer (or designee) will document the successful field demonstration. The QA Officer (or designee) will retain documentation of training and the successful field demonstration in the employee's personnel file and ensure that the documentation will be available during monitoring systems audits. Field personnel may request refresher training sessions, or additional training if new personnel is acquired, and the USIBWC El Paso Headquarters will accommodate their request. New personnel, volunteers, or students must be accompanied by USIBWC CRP trained personnel until such time as they can be trained by USIBWC CRP Project Manager or USIBWC QAO.

Contractors and subcontractors must ensure that laboratories analyzing samples under this QAPP meet the requirements contained in The NELAC Institute Standard (2016) Volume 1, Module 2, Section 4.5.5 (concerning Subcontracting of Environmental Tests).

Sampling Quality Control Requirements and Acceptability Criteria

Table A9.1 Project Documents and Records

Document/Record	Location	Retention (yrs)	Format
QAPPs, amendments and appendices	USIBWC CRP, DHL Analytical, Brownsville Public Utilities Board-Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory, USIBWC Field Offices, BBNP, BPUB, City of Laredo Health Department, TPWD, UTRGV, Midland College, and RGISC	7 years	Paper and electronic
Field SOPs	USIBWC CRP, USIBWC Field Offices, BBNP, BPUB, City of Laredo Health Department, TPWD, UTRGV, Midland College, and RGISC	7 years	Paper and electronic
Laboratory Quality Manuals	USIBWC CRP, DHL Analytical, Brownsville Public Utilities Board-Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory	7 years	Paper and electronic
Laboratory SOPs	USIBWC CRP, DHL Analytical, Brownsville Public Utilities Board-Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health	7 years	Paper and electronic

Document/Record	Location	Retention (yrs)	Format
	Department Laboratory		
QAPP distribution documentation	USIBWC CRP	7 years	Paper and electronic
Field staff training records	USIBWC CRP	7 years	Paper and electronic
Field equipment calibration/maintenance logs	USIBWC CRP, USIBWC Field Offices, BBNP, BPUB, City of Laredo Health Department, TPWD, UTRGV, Midland College, and RGISC	7 years	Paper and electronic
Field instrument printouts	USIBWC CRP	7 years	Paper and electronic
Field notebooks or data sheets	USIBWC CRP, USIBWC Field Offices, BBNP, BPUB, City of Laredo Health Department, TPWD, UTRGV, Midland College, and RGISC	7 years	Paper and electronic
Chain of custody records	USIBWC CRP, DHL Analytical, Brownsville Public Utilities Board-Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory	7 years	Paper and electronic
Laboratory calibration records	DHL Analytical, Brownsville Public Utilities Board- Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory	7 years	Paper and electronic
Laboratory instrument printouts	DHL Analytical, Brownsville Public Utilities Board- Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory	7 years	Paper and electronic
Laboratory data reports/results	USIBWC CRP, DHL Analytical, Brownsville Public Utilities Board-Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory	7 years	Paper and electronic
Laboratory equipment maintenance logs	DHL Analytical, Brownsville Public Utilities Board- Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory	7 years	Paper and electronic
Corrective Action Documentation	USIBWC CRP, DHL Analytical, Brownsville Public Utilities Board-	7 years	Paper and electronic

Document/Record	Location	Retention (yrs)	Format
	Analytical Laboratory, El Paso Water Utilities Public Service Board International Water Quality Laboratory, City of Laredo Health Department Laboratory		

Laboratory Test Reports

Test/data reports from the laboratory must document the test results clearly and accurately. Routine data reports should be consistent with the TNI Standard (2016), Volume 1, Module 2, Section 5.10 and include the information necessary for the interpretation and validation of data. The requirements for reporting data and the procedures are provided.

B2 Sampling Methods

Field Sampling Procedures

Table B2.2 Sample Storage, Preservation and Handling Requirements, City of Laredo Health Department Laboratory

E.Coli and Fecal Coliform Analysis- City of Laredo Health Department Laboratory (2 containers Preserved with Sodium Thiosulfate)				
<i>Parameters</i>	<i>Containers</i>	<i>Sample Volume (ml)</i>	<i>Preservation</i>	<i>Maximum Holding Time</i>
CONTAINER 1				
E. coli, Colilert, IDEXX Method (31699)	Polystyrene	120	Cool <6 C but not frozen Sodium Thiosulfate	8 hrs
CONTAINER 2				
FECAL COLIFORM, MEMBR FILTER, MFC AGAR PLATE,)	Polystyrene	120	Cool <6 C but not frozen Sodium Thiosulfate	8 hrs

Collecting entity that uses this lab: City of Laredo Health Department.

Table B2.3 Sample Storage, Preservation and Handling Requirements, El Paso Water International Water Quality Laboratory

Routine Conventional-in-Water Samples				
<i>Parameters</i>	<i>Containers</i>	<i>Sample Volume (ml)</i>	<i>Preservation</i>	<i>Maximum Holding Time</i>
CONTAINER 1				
Turbidity (82079)	HDPE	100	Cool <6 C but not frozen	48 hours
CONTAINER 2				
BOD (00310)	HDPE	1000	Cool <6 C but not frozen	48 hours
CONTAINER 3				
E. coli bacteria (31699)	Sterilized plastic container	2X250	Cool <6 C but not frozen Sodium thiosulfate	8 hours
CONTAINER 4				
Chlorophyll <i>a</i> (32211)	Sterilized plastic amber container	1X500	Cool to <6 C but not frozen, dark	Filter within 48 hours. Filters may be stored frozen up to 24 days
CONTAINER 5				
Ammonia (00630)	HDPE	500	H2SO4 to pH<2	28 days

Collecting entity that uses this lab: USIBWC American Dam Field Office

B5 Quality Control

Sampling Quality Control Requirements and Acceptability Criteria

The minimum field QC requirements, and program-specific laboratory QC requirements, are outlined in SWQM Procedures. Specific requirements are outlined below. Field QC sample results are submitted with the laboratory data report (see Section A9.).

Field blank

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

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

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

Appendix A: Measurement Performance Specifications (Table A7.1-X)

TABLE A7.4 Measurement Performance Specifications for DHL Analytical, Inc.										
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-B**	31699	1	1	NA	0.50*	NA	AQUA-TECH
E. COLI, COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	AQUA-TECH

USIBWC CRP partners that use this table include: USIBWC CRP, Amistad Dam FO, Falcon Dam FO, Presidio FO, Mercedes FO, BBNP, TPWD, Midland College, RGISC, City of Laredo Env. Services, and UTRGV-Edinburg

E. coli analysis is subcontracted by DHL Analytical to AQUA-TECH, whose adherence letter is on file.

* 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.

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, 23rd Edition, 2017.
 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 A7.5 Measurement Performance Specifications for DHL Analytical, Inc.

Metals in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
IRON, TOTAL (UG/L AS FE)	µg/L	water	EPA 200.8 EPA 6020	01045	300	150	70-130	20	80-120	DHL
MANGANESE, TOTAL (UG/L AS MN)	µg/L	water	EPA 200.8 EPA 6020	01055	50	2	70-130	20	80-120	DHL
SELENIUM, TOTAL (UG/L AS SE)	ug/L	water	EPA 200.8 EPA 6020	01147	2	2	70-130	20	80-120	DHL
MERCURY, TOTAL, (UG/L AS HG)	ug/L	water	EPA 245.7	71900	0.006	0.004	70-130	20	80-120	ANALAB
<p>USIBWC CRP partners that use this table include: Presidio FO, BBNP, TPWD, City of Laredo Env. Services</p> <p>Mercury analysis is subcontracted by DHL Analytical to ANALAB, whose adherence letter is on file.</p> <p>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, 23rd Edition, 2017. 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).</p>										

TABLE A7.6 Measurement Performance Specifications for DHL Analytical, Inc.										
Metals in Sediment										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
ARSENIC, BOTTOM DEPOSITS (MG/KG AS AS DRY WT)	mg/kg	sediment	EPA 6020 EPA 200.8	01003	16.5	1	60-140	30	60-140	DHL
BARIUM, BOTTOM DEPOSITS (MG/KG AS BA DRY WT)	mg/kg	sediment	EPA 6020 EPA 200.8	01008	NA	2	60-140	30	60-140	DHL
CADMIUM, TOTAL, BOTTOM DEPOSITS (MG/KG, DRY WT)	mg/kg	sediment	EPA 6020 EPA 200.8	01028	2.49	0.3	60-140	30	60-140	DHL
CHROMIUM, TOTAL, BOTTOM DEPOSITS (MG/KG, DRY WT)	mg/kg	sediment	EPA 6020 EPA 200.8	01029	55.5	2	60-140	30	60-140	DHL
COPPER, BOTTOM DEPOSITS (MG/KG AS CU DRY WT)	mg/kg	sediment	EPA 6020 EPA 200.8	01043	74.5	2	60-140	30	60-140	DHL
LEAD, BOTTOM DEPOSITS (MG/KG AS PB DRY WT)	mg/kg	sediment	EPA 6020 EPA 200.8	01052	64	0.3	60-140	30	60-140	DHL
MANGANESE, BOTTOM DEPOSITS (MG/KG AS MN DRY WG)	mg/kg	sediment	EPA 6020 EPA 200.8	01053	550	2	60-140	30	60-140	DHL
NICKEL, TOTAL, BOTTOM DEPOSITS (MG/KG, DRY WT)	mg/kg	sediment	EPA 6020 EPA 200.8	01068	24.3	2	60-140	30	60-140	DHL
SILVER, BOTTOM DEPOSITS (MG/KG AS AG DRY WT)	mg/kg	sediment	EPA 6020 EPA 200.8	01078	1.1	0.2	60-140	30	60-140	DHL

Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
ZINC, BOTTOM DEPOSITS (MG/KG AS ZN DRY WT)	mg/kg	sediment	EPA 6020 EPA 200.8	01093	205	2.5	60-140	30	60-140	DHL
ANTIMONY, BOTTOM DEPOSITS (MG/KG AS SB DRY WT)	mg/kg	sediment	EPA 6020 EPA 200.8	01098	12.5	1	60-140	30	60-140	DHL
ALUMINUM, BOTTOM DEPOSITS (MG/KG AS AL DRY WT)	mg/kg	sediment	EPA 6020 EPA 200.8	01108	NA	37.5	60-140	30	60-140	DHL
SELENIUM, BOTTOM DEPOSITS (MG/KG AS SE DRY WT)	mg/kg	sediment	EPA 6020 EPA 200.8	01148	NA	0.5	60-140	30	60-140	DHL
MERCURY,TOT. IN BOT. DEPOS. (MG/KG) AS HG DRY WG	mg/kg	sediment	EPA 7471 EPA 7470	71921	0.355	0.04	60-140	30	60-140	DHL
SEDIMENT PRTCL.SIZE CLASS >2.0MM GRAVEL %DRY WT*	% DRY WT	sediment	Gravel Retention #10 Sieve	80256	NA	NA	NA	% grave l- 20	NA	ANA LAB GCO LABS
SOLIDS IN SEDIMENT, PERCENT BY WEIGHT (DRY)	% BY WT	sediment	ASTM D2216	81373	NA	NA	NA	30	NA	DHL
PARTICLE SIZE, 0.05-0.002mm SILT, DRYWT,SEDIMENT*	%	sediment	ASTM D422	49906	NA	NA	NA	%silt - 20	NA	ANA LAB GCO LABS
SEDIMENT PRTL.SIZE CLASS.0039-.0625 SILT %DRY W*	% DRY WT	sediment	ASTM D422	82008	NA	NA	NA	%silt - 20	NA	ANA LAB GCO LABS
PARTICLE SIZE,CLAY0.002-0.0002mm DRYWT,SEDIMENT%*	%	sediment	ASTM D422	49900	NA	NA	NA	%clay - 20	NA	ANA LAB GCO LABS

Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
SEDIMENT PRCTL.SIZE CLASS <.0039 CLAY %DRY WT*	%	sediment	ASTM D422	82009	NA	NA	NA	%clay - 20	NA	ANA LAB GCO LABS
SEDIMENT PRCTL.SIZE CLASS,SAND .0625-2MM %DRYWT*	%	sediment	ASTM D422	89991	NA	NA	NA	%sand - 20	NA	ANA LAB GCO LABS
<p>USIBWC CRP partners that use this table include: City of Laredo Env. Services Dept.</p> <p>Particle size analysis is subcontracted by DHL Analytical to ANALAB/GCO Labs, whose adherence letter is on file</p> <p>*Sediment conventionals are not used for regulatory purposes but are extremely important in determining the availability of sediment toxics. Sediment grain size and TOC are recommended when analyzing metals and/or organics in sediment.</p> <p>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, 23rd Edition, 2017. 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).</p>										

TABLE A7.7 Measurement Performance Specifications for El Paso Water International Water Quality Laboratory										
Conventional Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of mean)	Bias %Rec. of LCS	Lab
BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C	mg/L	water	SM 5210B	00310	2	2	NA	NA	NA	IWQL
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610	0.1	0.5	70-130	20	80-120	IWQL
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	µg/L	water	SM 10200 H	32211	3	3	NA	20	80-120	IWQL
TURBIDITY, LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	SM 2130B	82079	0.5	0.1	90-110	10	90-110	IWQL
<p>The EPWU lab analyzes samples collected by the USIBWC American Dam field office.</p> <p>References:</p> <p>United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020</p> <p>American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)</p> <p>TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).</p> <p>TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416)</p>										

TABLE A7.10 Measurement Performance Specifications for City of Laredo Health Department Lab									
Bacteriological Parameters in Water									
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	Log Difference of Duplicates	Bias %Rec. of LCS	Lab
FECAL COLIFORM, MEMBR FILTER, MF AGAR (COLONIES/100ML)	#/100ML	water	SM 9222 D	31613	1	1	0.50*	NA	Laredo
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-B, IDEXX Colilert	31699	1	1	0.50*	NA	Laredo
<p>The City of Laredo Health Department Lab analyzes the bacteria samples collected by the City of Laredo Health Department.</p> <p>* 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.</p> <p>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, 21st Edition, 2005. (Note: The 21st edition may be cited if it becomes available.) TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 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)</p>									

TABLE A7.12 Measurement Performance Specifications for BPUB										
Conventional Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Verification Sample %Rec (Method)	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C	mg/L	water	SM 5210B	00310	2	1	70-130	30	80-120	BPUB
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	EPA 160.2, SM 2540D	00530	5	2	70-130	5	80-120	BPUB
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.3, SM 4500 NH3 D	00610	0.1	0.1	70-130	20	80-120	BPUB
RESIDUE, TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540C	70300	10	2	70-130	5	90-110	BPUB
TURBIDITY, LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	EPA 180.1	82079	0.5	0.03	NA	5	± 5	BPUB
<p>The BPUB analyzes their own data. The BPUB does not collect field parameters.</p> <p>References:</p> <p>Quality Control Lab documents from Brownsville PUB and NELAP certification.</p> <p>United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020</p> <p>American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)</p> <p>TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).</p> <p>TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416)</p>										

TASK 3: WATER QUALITY MONITORING

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

- planning and coordinating Basin-wide monitoring;
- routine, regularly-scheduled monitoring to collect long-term information and support statewide assessment of water quality; and
- systematic, regularly-scheduled short-term monitoring to screen water bodies for issues.

Task Description: The Performing Party's water quality monitoring area encompasses the Rio Grande basin in Texas, including the Pecos River watershed. For planning purposes, the basin has been divided into 4 sub-basins as follows: the Upper Rio Grande Sub-Basin from El Paso to Amistad Dam; the Pecos River Sub-Basin from Red Bluff Reservoir to the confluence with the Rio Grande; the Middle Rio Grande Sub-Basin extending from below Amistad Dam downstream to Falcon Dam; and the Lower Rio Grande Sub-Basin from below Falcon Dam to the Gulf of Mexico.

The Performing Party will complete the following subtasks:

Monitoring Description — In FY 2020, the Performing Party, the Performing Party's field offices, and participating partner agencies will collect water quality data at a minimum of 52 stations throughout the basin. Minimum monitoring frequencies and parameter groups and frequencies planned for FY 2020 include:

- 52 stations monitored quarterly for field, conventionals, bacteria and flow (when possible);
- One station sampled for metals in sediment;
- One station monitored for metals in water; and
- Ten stations monitored monthly for field and bacteria only.

For FY 2021, the Performing Party will monitor at level of effort similar to FY 2020.

The actual number of sites, location, frequency and parameters collected for each fiscal year will be based on priorities identified at the Basin Advisory Committee (BAC) Meetings and coordinated monitoring meetings and included in Appendix B of the QAPP.

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

Coordinated Monitoring Meeting — The Performing Party will hold an annual coordinated monitoring meeting as described in the FY 2020-2021 CRP Guidance. Qualified monitoring organizations will be invited to attend the working meeting in which monitoring needs and purposes will be discussed segment by segment and station by station. Information provided by participants and stakeholders will be used to select stations and parameters that will enhance overall water quality monitoring coverage, eliminate duplication of effort, and address basin priorities. A summary of the changes to the monitoring schedule will be provided to the participants within two weeks of the meeting. Changes to the monitoring schedule will be entered into the statewide CMS (<http://cms.lcra.org>) and communicated to meeting attendees. Changes to monitoring schedules that occur during the year will be entered into the CMS and communicated to meeting attendees.

QPRs — Each QPR will include all types of monitoring and indicate the number of sampling events and the types of monitoring conducted in the quarter.

Deliverables and Dues Dates:

September 1, 2019 through August 31, 2020

A. Conduct water quality monitoring, summarize activities, and submit with QPRs — December 15, 2019; March 15 and June 15, 2020

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- B. Coordinated monitoring meeting — between March 15 and April 30, 2020
- C. Coordinated monitoring meeting summary of changes — within 2 weeks of the meeting
- D. Email notification that CMS updates are complete — May 31, 2020

September 1, 2020 through August 31, 2021

- A. Conduct water quality monitoring, summarize activities, and submit with QPRs — September 15 and December 15, 2020; March 15 and June 15 and August 31, 2021
- B. Coordinated monitoring meeting — between March 15 and April 30, 2021
- C. Coordinated monitoring meeting summary of changes — within 2 weeks of the meeting
- D. Email notification that CMS updates are complete — May 31, 2021

Appendix B Sampling Process Design and Monitoring Schedule (plan)

Sample Design Rationale FY 2021

The sample design is based on the legislative intent of CRP. Under the legislation, the Basin Planning Agencies have been tasked with providing data to characterize water quality conditions in support of the Texas Water Quality Integrated Report, and to identify significant long-term water quality trends. Based on Steering Committee input, achievable water quality objectives and priorities and the identification of water quality issues are used to develop work plans which are in accord with available resources. As part of the Steering Committee process, the USIBWC CRP coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed.

Changes applicable to the FY21 Coordinated Monitoring Schedule

Upper 1:
No Changes

Upper 2:
No Changes

Pecos:
No Changes

Middle:

- Station 13103 being removed from UTRGV's schedule. Will be picked up by USIBWC Falcon Dam Field Office, sampled quarterly for field, conventionals and bacteria.
- Stations 13104, 21591, and 21749 will be picked up by the USIBWC Falcon Dam Field Office. These stations will be sampled quarterly for field, conventionals and bacteria.

Lower:

- UTRGV dropping Station 16288 due to access and safety issues.

Monitoring Sites for FY 2021

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

Table B1.1 Sample Design and Schedule, FY 2021

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
Segment 2301 Rio Grande Tidal Map																						
<u>RIO GRANDE RIVER TIDAL AT THE END OF QUICKSILVER AVE 375 METERS SOUTH FROM THE INTERSECTION OF BOCA CHICA BLVD AND QUICKSILVER AVE Map</u>	13176	2301	15	IB	PT	RT									4			4			4	Entero analyzed by BPUB. Conventional analyzed by DHL.
Segment 2302 Rio Grande Below Falcon Reservoir Map																						
<u>RIO GRANDE RIVER AT RIVER BEND GOLF COURSE BOAT RAMP WEST OF BROWNSVILLE Map</u>	13179	2302	15	IB	PT	RT									4			4			4	
<u>RIO GRANDE AT EL JARDIN PUMP STATION LOCATED 350 METERS WEST OF INTERSECTION OF MONSEES ROAD AND CALLE MILPA VERDE Map</u>	13177	2302	15	IB	IB	RT									8			8	8		8	

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE RIVER AT HWY 281/INTERNATIONAL BLVD IN HIDALGO</u> Map	13181	2302	15	IB	IB	RT									8			8	8		8	
<u>RIO GRANDE AT FM 886 NEAR LOS EBANOS</u> Map	13184	2302	15	IB	IB	RT									8			8	8		8	
<u>RIO GRANDE AT FORT RINGGOLD 1 MI DOWNSTREAM OF RIO GRANDE CITY</u> Map	13185	2302	15	IB	IB	RT									12			12	12		12	
<u>RIO GRANDE 0.5 MI DOWNSTREAM ANZALDUAS DAM 12.2 MI FROM HIDALGO</u> Map	13664	2302	15	IB	IB	RT									8			8	8		8	
<u>RIO GRANDE 300M UPSTREAM OF PHARR INTERNATIONAL BRIDGE/US 281</u> Map	15808	2302	15	IB	IB	RT									8			8	8		8	
<u>RIO GRANDE RIVER AT BROWNSVILLE PUB WATER TREATMENT PLANT NUMBER 1 INTAKE BETWEEN WTP RESERVOIR AND RIO GRANDE LEVEE 910 METERS WEST AND 335 METERS SOUTH TO THE INTERSECTION OF WEST ELIZABETH STREET AND SOUTH MILITARY ROAD</u> Map	20449	2302	15	IB	BO	RT									12			12				E. coli and limited conventionals

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE APPROX 380 METERS DOWNSTREAM OF CONFLUENCE WITH LOS OLMOS CREEK</u> Map	21749	2302	15	IB	IB	RT									4			4	4		4	New site, added FY16
<u>LOS OLMOS CREEK AT US 83/EAST 2ND STREET SOUTH OF RIO GRANDE CITY</u> Map	13103	2302A	15	IB	IB	RT									4			4	4		4	
<u>ARROYO LOS OLMOS AT SH 755 NW OF RIO GRANDE CITY</u> Map	13104	2302A	15	IB	IB	RT									4			4	4		4	Added FY16.
ARROYO LOS OLMOS 400M UPSTREAM OF CONFLUENCE WITH RIO GRANDE NEAR RIO GRANDE CITY Map	21591	2302A	15	IB	IB	RT									4			4	4		4	Added FY16.

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
Segment 2303 International Falcon Reservoir Map																						
<u>FALCON LAKE AT INTERNATIONAL BOUNDARY MONUMENT I</u> Map	13189	2303	16	IB	IB	RT									4			4			4	
Segment 2304 Rio Grande Below Amistad Reservoir Map																						

<u>RIO GRANDE AT PIPELINE CROSSING 8.7 MI DOWNSTREAM LAREDO</u> Map	13196	2304	16	IB	RN	RT									4			4	4		4	Site added to capture effluent from NLIWWTP
<u>RIO GRANDE 50 YD UPSTREAM OF CONFLUENCE OF ZACATA CREEK AND RIO GRANDE</u> Map	13200	2304	16	IB	LA	RT												12			12	
<u>RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE</u> Map	13202	2304	16	IB	LA	RT												12			12	E. coli and FC, and field
<u>RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE</u> Map	13202	2304	16	IB	RN	RT									4			4	4		4	

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE 4.5 MI DOWNSTREAM OF DEL RIO AT MOODY RANCH</u> Map	13560	2304	16	IB	IB	RT									4			4	4		4	Frequency reduced FY12 to add another station in Eagle Pass (20997)
<u>RIO GRANDE AT JUAREZ-LINCOLN BRIDGE / BRIDGE #2 IN LAREDO</u> Map	15814	2304	16	IB	LA	RT												12	12		12	E. coli and FC; flow from IBWC gage; field data

<u>RIO GRANDE AT JUAREZ-LINCOLN INTERNATIONAL BRIDGE / BRIDGE #2 IN LAREDO</u> Map	15814	2304	16	IB	RN	RT									4			4	4		4	
<u>RIO GRANDE AT MASTERSON RD IN LAREDO 9.9KM DWNSTR INTL BRIDGE #1/WEST BRIDGE DWNSTR SOUTHSIDE WWTP AND UPSTREAM NUEVO LAREDO WWTP</u> Map	15815	2304	16	IB	LA	RT												12			12	E. coli and fecal coliform, and field data
<u>RIO GRANDE AT RIO BRAVO 0.5KM DWNSTR OF THE COMMUNITY OF EL CENIZO</u> Map	15816	2304	16	IB	RN	RT									4			4			4	Reactivated for FY 2015.

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE AT THE COLOMBIA BRIDGE 2.7KM UPSTREAM OF THE DOLORES PUMP STATION 45.1KM UPSTREAM OF THE LAREDO WTP INTAKE</u> Map	15839	2304	16	IB	LA	RT												12	12		12	E. coli and FC; flow from IBWC gage; field data

<u>RIO GRANDE AT THE COLOMBIA BRIDGE</u> <u>2.7KM UPSTREAM OF THE DOLORES PUMP STATION 45.1KM UPSTREAM OF THE LAREDO WTP INTAKE</u> Map	15839	2304	16	IB	RN	RT									4			4	4		4	Flow from IBWC gage.
<u>RIO GRANDE AT WORLD TRADE BRIDGE ON FM 3484</u> Map	17410	2304	16	IB	RN	RT									4			4	4		4	

<u>RIO GRANDE 115 METERS SOUTH AND 304 METERS WEST FROM THE INTERSECTION OF RANCHO VIEJO DRIVE/ZEBU COURT AND RIENDA DRIVE IN FATHER MCNABOE CITY PARK IN LAREDO</u> Map	20650	2304	16	IB	LA	RT												12			12	E. coli and fecal
<u>RIO GRANDE AT MAIN STREET BOAT RAMP APPROX 400 METERS UPSTREAM OF US 57/INTERNATIONAL BRIDGE IN EAGLE PASS</u> Map	20997	2304	16	IB	IB	RT					4			4				4	4		4	New station FY12 to fill data gap in AU 2304_08; quarterly sampling of metals in sediment added FY17.
<u>RIO GRANDE AT EL CENIZO PARK 220 METERS WEST OF INTERSECTION OF CADENA AND JIMENEZ</u> Map	21542	2304	16	IB	RN	RT								4				4			4	

<u>RIO GRANDE AT KICKAPOO CASINO BOAT RAMP SOUTH OF EAGLE PASS</u> Map	20999	2304	16	IB	IB	RT									8			8	8		8	Replaces 18795 and 18792; removal of metals in sediment FY17.
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Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>MANADAS CREEK AT FM 1472 NORTH OF LAREDO</u> Map	13116	2304B	16	IB	LE	RT					4		4		4			4			4	Total Metals in Water and Dissolved Metals in Water are both being analyzed. The Total Metals are submitted to TCEQ and the Dissolved Metals are not, due to when the sample is filtered. Dissolved Metals in water data can be

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
Segment 2306 Rio Grande Above Amistad Reservoir Map																						

<u>RIO GRANDE AT THE MOUTH OF SANTA ELENA CANYON</u> Map	13228	2306	6	IB	BB	RT									8			8	8		8	Metals - Total Mercury sampled FY12
<u>RIO GRANDE 449 METERS WEST AND 121 METERS SOUTH FROM THE INTERSECTION OF RANCH ROAD 170 AND RANCH ROAD 169 IN PRESIDIO COUNTY CAMS 758</u> Map	13229	2306	6	IB	IB	RT									8			8	8		8	Metals - Total Mercury sampled FY12

Site Description	Station ID	Water body ID	Region	IB	BB	RT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE AT BOAT RAMP AT RIO GRANDE VILLAGE IN BIG BEND NATIONAL PARK</u> Map	16730	2306	6	IB	BB	RT									8			8	8		8	Metals - Total Mercury sampled FY12
<u>RIO GRANDE RIVER AT COLORADO CANYON APPROX 30KM SE OF REDFORD ON RR170 IN PRESIDIO COUNTY</u> Map	16862	2306	6	IB	PW	RT									4			4			4	Metals - Total Mercury sampled FY12; sampling frequency reduced to quarterly
<u>RIO GRANDE AT PRESIDIO RAILROAD BRIDGE 3.25KM DOWNSTREAM OF US67 SOUTH OF PRESIDIO</u> Map	17000	2306	6	IB	IB	RT												8	8		8	

<u>RIO GRANDE AT PRESIDIO/OJINAGA TOLL BRIDGE/INTERNATIONAL 0.75KM DOW NSTREAM OF US67 IN PRESIDIO Map</u>	17001	2306	6	IB	IB	RT											8	8		8	
<u>RIO GRANDE AT LAJITAS RESORT/FM 170 BOAT RAMP 240 M UPSTREAM OF BLACK HILLS CREEK CONFLUENCE NEAR LAJITAS Map</u>	18441	2306	6	IB	PW	RT								4			4			4	Metals - Total Mercury sampled FY12

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
Segment 2307 Rio Grande Below Riverside Diversion Dam Map																						
<u>RIO GRANDE 3.38 KILOMETERS UPSTREAM FROM THE CONFLUENCE WITH THE RIO CONCHOS 6.72 KILOMETERS WEST AND 2.445 KILOMETERS NORTH FROM THE INTERSECTION OF RANCH ROAD 170 AND RODRIQUEZ ROAD IN PRESIDIO COUNTY CAMS 757 Map</u>	13230	2307	6	IB	IB	RT									8			8	8		8	Metals - Total Mercury sampled FY12

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE AT RIVERSIDE CANAL 1.8 KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE</u> Map	14465	2307	6	IB	IB	RT									12			12	12		12	Monitored by IBWC American Dam FO. Partial conventional analysis due to lab accreditation. Additional non-accredited data for metals, organics and other
<u>RIO GRANDE UPSTREAM OF CANDELARIA 0.5 KM UPSTREAM OF CAPOTE CREEK CONFLUENCE</u> Map	17407	2307	6	IB	IB	RT									4			4	4		4	Added FY17. Due to shipping issues and remoteness, will test to see if 30 hr HT can be met.
<u>RIO GRANDE 632 METERS UPSTREAM OF IBWC GAUGE 08-3705.00 RIO GRANDE AT FORT QUITMAN</u>	22193	2307	6	IB	IB	RT									4			4	4		4	New station added FY20. Added to fill a data gap between Fort Hancock and Candelaria.
<u>RIO GRANDE AT GUADALUPE POINT OF ENTRY BRIDGE AT FM 1109 WEST OF TORNILLO</u> Map	15704	2307	6	IB	IB	RT									4			4	4		4	Metals in water removed FY16. USIBWC Hdqtrs with UTEP, CE may be UE

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE AT ALAMO CONTROL STRUCTURE 9.7KM UPSTREAM OF FT HANCOCK PORT OF ENTRY</u> Map	15795	2307	6	IB	IB	RT									4			4			4	
Segment 2308 Rio Grande Below International Dam Map																						
<u>RIO GRANDE 1.3 KM DOWNSTREAM FROM HASKELL ST WWTP OUTFALL</u> Map	15528	2308	6	IB	IB	RT									12			12	12		12	Monitored by IBWC American Dam FO. Partial conventional analysis due to lab accreditation. Additional non-accredited data for metals, organics and other conventionals available thru IBWC.
<u>RIO GRANDE 2.4 KM UPSTREAM FROM HASKELL ST WWTP OUTFALL SOUTH OF BOWIE HIGH SCHOOL FOOTBALL STADIUM IN EL PASO</u> Map	15529	2308	6	IB	IB	RT									12			12	12		12	Monitored by IBWC American Dam FO. Partial conventional analysis due to limited lab accreditation. Additional non-accredited data for metals, organics and other conventionals available thru IBWC.

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
Segment 2310 Lower Pecos River Map																						
PECOS RIVER APPROX 355 METERS DOWNSTREAM FROM THE CONFLUENCE WITH INDEPENDENCE CREEK Map	14163	2310	7	IB	MC	RT									3			3	6		6	Collecting conv, bacteria, flow, field 3x/yr; field and flow only 3 additional
Segment 2311 Upper Pecos River																						
PECOS RIVER APPROXIMATELY 2.98 KM UPSTREAM OF THE CONFLUENCE WITH INDEPENDENCE CREEK Map	14164	2311	7	IB	MC	RT									3				6		6	Collecting conv, field, flow 3x/yr; field and flow only 3 additional
Segment 2314 Rio Grande Above International Dam Map																						
RIO GRANDE AT COURCHESNE BRIDGE 1.7 MI UPSTREAM FROM AMERICAN DAM CAMS 718 Map	13272	2314	6	IB	IB	RT									12			12	12		12	Monitored by IBWC American Dam FO. Partial conventional analysis due to lab accreditation. Additional non-accredited data for metals, organics and other

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE AT BORDERLAND RD NW OF EL PASO</u> Map	13274	2314	6	IB	IB	RT									4			4	4		4	In support of Paso del Norte Watershed Councils 319h grant and for stakeholder concerns for bacteria. Total Mercury removed FY16. USIBWC Hdqtrs with EPCC, CE may be EP.
<u>RIO GRANDE 40M SOUTH OF VINTON BRIDGE APPROXIMATELY 4 KM S OF ANTHONY</u> Map	13275	2314	6	IB	IB	RT									4			4	4		4	In support of Paso del Norte Watershed Councils 319h grant and for stakeholder concerns for bacteria. Total Mercury removed FY16. USIBWC Hdqtrs with EPCC, CE may be EP.
<u>RIO GRANDE IMMEDIATELY UPSTREAM OF THE CONFL WITH ANTHONY DRAIN WEST OF LA TUNA PRISON NEAR THE STATE LINE</u> Map	13276	2314	6	IB	IB	RT									4			4	8		8	In support of Paso del Norte Watershed Councils 319h grant and for stakeholder recreation concerns. Total Mercury removed FY16. 4x/yr field data only. USIBWC Hdqtrs with EPCC, CE may be EP.

Site Description	Station ID	Water body ID	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bacteria	Flow	Fish Tissue	Field	Comments
<u>RIO GRANDE AT BORDERLAND RD NW OF EL PASO</u> Map	13274	2314	6	IB	IB	RT									4			4	4		4	In support of Paso del Norte Watershed Councils 319h grant and for stakeholder concerns for bacteria. Total Mercury removed FY16. USIBWC Hdqtrs with EPCC, CE may be EP.
<u>RIO GRANDE RIVER AT AMERICAN EAGLE BRICK FACTORY BRIDGE ABANDONED RR 0.1 MI DOWNSTREAM FROM SOUTHERN PACIFIC RR AT SMELTERTOWN</u> Map	15089	2314	6	IB	IB	RT									3			5			5	Metals in water removed FY16. 2x/yr bacteria and field data only. USIBWC Hdqtrs with UTEP, CE may be UE
<u>RIO GRANDE AT ANAPRA BRIDGE ON SUNLAND PARK DRIVE 4.2 KM UPSTREAM OF AMERICAN DAM IN NEW MEXICO</u> Map	17040	2314	6	IB	IB	RT									4			4			4	Total metals in water removed FY16. 2x/yr field only. USIBWC Hdqtrs with EPCC, CE may be EP.

Appendix C: Station Location Maps

Station Location Maps

Maps of stations monitored by the USIBWC CRP are provided below. The maps were generated by the USIBWC CRP. 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 Leslie Grijalva at 915-832-4770.

