RIO GRANDE BASIN MONITORING PROGRAM
QUALITY ASSURANCE PROJECT PLAN

INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES SECTION
4171 N. MESA, C-100
EL PASO, TEXAS 79902

CLEAN RIVERS PROGRAM
WATER QUALITY PLANNING DIVISION
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. BOX 13087, MC 234
AUSTIN, TEXAS 78711-3087

EFFECTIVE PERIOD: FY 2012 TO FY 2013

QUESTIONS CONCERNING THIS QAPP SHOULD BE DIRECTED TO:

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Water Quality Planning Division

Laurie Curra 8-12-11
Laurie Curra, Manager Date
Water Quality Monitoring & Assessment Section

Jennifer Delk 8/10/11
Alison Woodall, Work Leader Date
Clean Rivers Program

Jennifer Delk 8/10/11
Jennifer Delk Date
Project QA Specialist
Clean Rivers Program

Julie McEntire 8/10/11
Julie McEntire Date
Project Manager, Clean Rivers Program

8/10/11
Nancy Ragland, Team Leader Date
Data Management and Analysis

Field Operations Support Division

Sharon Coleman for Stephen Stubbs 08/15/11
Stephen Stubbs Date
TCEQ Quality Assurance Manager

Daniel R Burke 08/12/2011
Daniel R. Burke Date
Lead CRP Quality Assurance Specialist
Quality Assurance Section

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

8/9/11

Elizabeth Verdecchia Date
USIBWC Program Manager

8-9-11

Leslie Grijalva Date
USIBWC Quality Assurance Officer

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

8/12/11

Sheryl Franklin Date
USIBWC Operations and Maintenance Division Chief

Alamo Analytical Laboratories LTD.

7/28/11

Dr. Reddy Gosala Date
Alamo Analytical Laboratory Director

7/28/11

Vijaya Gosala Date
Alamo Analytical Quality Assurance Officer

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Brownsville Public Utilities Board Laboratory

Lee Roy Atkinson	7/22/2011 Date	Juan Carrizales	7/22/11 Date
Laboratory Manager		Quality Assurance Specialist	

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City of Laredo Health Department Laboratory

Rebecca Castro 8/5/11

Rebecca Castro Date

Technical Director/Quality Assurance Manager for the Environmental Division of the Laboratory

A1 APPROVAL PAGE 6 of 6

El Paso Water Utilities Public Services Board, International Water Quality Laboratory

Paul Rivas	Date	Richard Wilcox	Date
Laboratory Manager		Quality Assurance Chemist	

The USIBWC will secure written documentation from each sub-tier project participant (e.g., subcontractors, 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. The USIBWC will maintain this documentation as part of the project's quality assurance records, and will ensure the documentation is available for review.

A2 TABLE OF CONTENTS

Tables:

Figures:

LIST OF ACRONYMS

AWRL	Ambient Water Reporting Limit
BMP	Best Management Practices
CAP	Corrective Action Plan
COC	Chain of Custody
CRP	Clean Rivers Program
DOC	Demonstration of Capability
DMRG	Data Management Reference Guide
DM&A	Data Management and Analysis
DQO	Data Quality Objective
EPA	United States Environmental Protection Agency
FY	Fiscal Year
GIS	Geographical Information System
GPS	Global Positioning System
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LIMS	Laboratory Information Management System
LOD	Limit of Detection
LOQ	Limit of Quantitation
NELAP	National Environmental Lab Accreditation Program
QA	Quality Assurance
QM	Quality Manual
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QAS	Quality Assurance Specialist
QC	Quality Control
QMP	Quality Management Plan
RBP	Rapid Bioassessment Protocol
RWA	Receiving Water Assessment
SLOC	Station Location
SOP	Standard Operating Procedure
SWQM	Surface Water Quality Monitoring
SWQMIS	Surface Water Quality Monitoring Information System
TMDL	Total Maximum Daily Load
TCEQ	Texas Commission on Environmental Quality
TNI	The NELAC Institute
TSWQS	Texas Surface Water Quality Standards
VOA	Volatile Organic Analytes
USIBWC	International Boundary and Water Commission, U.S. Section

A3 DISTRIBUTION LIST

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Dr. Elizabeth Walsh, Professor
(915) 747-5421

Dr. Vanessa Lougheed, Professor
(915) 747-6887

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, 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 will ensure the documentation is available for review.

A4 PROJECT/TASK ORGANIZATION

Description of Responsibilities

TCEQ

Allison Woodall
CRP Work Leader
Responsible for TCEQ activities supporting the development and implementation of the Texas Clean Rivers Program. Responsible for verifying that the 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 QA guidance for the CRP. Reviews and approves all QA audits, corrective actions, reviews, reports, work plans, contracts, QAPPs, and TCEQ QMP. Enforces corrective action, as required, where QA protocols are not met. Ensures CRP personnel are fully trained.

Daniel R. Burke
CRP Lead Quality Assurance Specialist
Participates in the development, approval, implementation, and maintenance of written quality assurance 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.

Julie McEntire
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 quality assurance 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.

Nancy Ragland
Team Leader, Data Management and Analysis Team
Participates in the development, approval, implementation, and maintenance of written quality assurance standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Ensures DM&A staff perform data management related tasks, including coordination and tracking of CRP data sets from initial submittal through CRP Project Manager review and approval; ensuring that data is reported following instructions in the *Surface Water Quality Monitoring Data Management Reference Guide* (January 2010, or most current version); running automated data validation checks in SWQMIS and

coordinating data verification and error correction with CRP Project Managers; generating SWQMIS summary reports to assist CRP Project Managers' data review; identifying data anomalies and inconsistencies; providing training and guidance to CRP and Planning Agencies on technical data issues to ensure that data are submitted according to documented procedures; reviewing QAPPS for valid stream monitoring stations, validity of parameter codes, submitting entity code(s), collecting entity code(s), and monitoring type code(s); developing and maintaining data management-related standard operating procedures for CRP data management; and coordinating and processing data correction requests.

Peter Bohls
CRP Data Manager, Data Management and Analysis Team
Responsible for coordination and tracking of CRP data sets from initial submittal through CRP Project Manager review and approval. Ensures that data is reported following instructions in *the Surface Water Quality Monitoring Data Management Reference Guide* (January 2010, or most current version). Runs automated data validation checks in 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 standard operating procedures for CRP data management. Coordinates and processes data correction requests. Participates in the development, implementation, and maintenance of written quality assurance standards (e.g., Program Guidance, SOPs, QAPPs, QMP).

Jennifer Delk
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 quality assurance 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 CRP Program Manager and Clean Rivers Program at the USIBWC. Performs evaluations of USIBWC CRP personnel. Cost Center Manager for the USIBWC CRP budget.

Elizabeth Verdecchia
USIBWC 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 basin planning

agency participants and that projects are producing data of known quality. Manages subcontract work including laboratory services and ensures that subcontractors 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.

Leslie Grijalva
USIBWC Quality Assurance Officer
Responsible for coordinating the implementation of the QA program. Responsible for writing and maintaining the QAPP and monitoring its implementation. Responsible for maintaining records of QAPP distribution, including appendices and amendments. Responsible for maintaining written records of sub-tier commitment to requirements specified in this QAPP. Responsible for identifying, receiving, and maintaining project quality assurance records. Responsible for coordinating with the TCEQ QAS to resolve QA-related issues. Notifies the USIBWC 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 are properly trained and that training records are maintained.

Elizabeth Verdecchia and Leslie Grijalva
Acting USIBWC 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 basin planning agency internet sites.

Alamo Analytical Laboratories LTD.

Dr. Reddy Gosala
Alamo Analytical, Laboratory Director
Responsible for project coordination at Alamo 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 Alamo Analytical and may perform validation and verification of data before the report is sent to USIBWC. Notifies the USIBWC CRP Program Manager of particular circumstances which may adversely affect the quality of data. Responsible for coordinating with Alamo Analytical and USIBWC CRP Program Manager to resolve QA-related issues. Implements or ensures implementation of corrective actions needed to resolve nonconformance noted during assessments.

Vijaya Gosala
Alamo Analytical Quality Assurance Officer
Responsible for the overall quality control and quality assurance of analyses performed by Alamo 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 in the 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 of the below listed partners are the same as listed above for the USIBWC, unless otherwise noted.

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 project managers' direct activities on the local level as follows: Tony Solo – American Dam, Pablo Garza– Amistad Dam, Alberto Hinojosa – Falcon Dam, Rodolfo Montero – Mercedes, and Hector Hernandez – Presidio. Samples collected by the field offices are submitted to Alamo Analytical Laboratories LTD. for analysis.

Lee Roy Atkinson, Laboratory Manager
Brownsville Public Utilities Board (PUB)
Responsible for water quality monitoring, analysis, and data review in the Brownsville area. Samples collected are analyzed by Brownsville PUB accredited laboratory as part of their regular permit monitoring.

Juan Carrizales, Quality Assurance Specialist
Brownsville Public Utilities Board (PUB)
Responsible for the review of laboratory data and laboratory techniques performed at the Brownsville PUB.

Paul R. Rivas, Laboratory Services Manager
El Paso Water Utilities
Responsible for water quality laboratory analysis and data review in the El Paso area. Samples collected by USIBWC American Dam Field Office are analyzed by the El Paso Water Utilities laboratory, which is now an accredited laboratory. Responsible for sending data monthly to the USIBWC.

Richard Wilcox, Quality Assurance Chemist
El Paso Water Utilities
Responsible for the review of laboratory data and laboratory techniques performed at the El Paso Water Utilities.

Rebecca Castro
City of Laredo Health Department Laboratory
Responsible for analysis and review of bacteria data for samples collected in the Laredo area. Samples collected are analyzed by City of Laredo accredited 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.

and

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

Responsible for water quality monitoring and review of field data 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.

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

And

Lucky Roncinske
City of Laredo Environmental Services Department
Responsible for water quality monitoring and data review for samples collected on Manadas Creek in the Laredo area. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Dr. Tom Vaughan
Rio Grande International Study Center (RGISC) and TAMIU
Responsible for water quality monitoring and data review in the Laredo area of the Rio Grande. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Mr. Jimmy Paz
Sabal Palm Audubon Center and Sanctuary
Responsible for water quality monitoring and data review in the Brownsville area of the Rio Grande. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Mark Lockwood
Texas Parks and Wildlife Department, Natural Resources Program
Responsible for water quality monitoring and sample collection of stations in Big Bend Ranch State Park. Water samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

David Long and Nelson Rodriguez
Texas Parks and Wildlife Department, Barton Warnock Education Center
Responsible for water quality monitoring and sample collection of stations in Big Bend Ranch State Park. Water samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Mr. Jeff Bennett
Big Bend National Park
Responsible for water quality monitoring and data review in the Big Bend National Park and Rio Grande Wild and Scenic. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

And

Ms. Billie Brauch
Responsible for water quality monitoring and data review in the Big Bend National Park and Rio Grande Wild and Scenic. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Chris Hathcock
U.S. Fish and Wildlife Service
Responsible for water quality monitoring and data review of the Rio Grande in the Lower Rio Grande Basin. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Dr. Elizabeth Heise
University of Texas at Brownsville
Responsible for water quality monitoring and data review in the Brownsville area of the Rio Grande. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Dr. Kevin Urbanczyk
Sul Ross University
Responsible for water quality monitoring and data review of the Pecos River subbasin in the Alpine area. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Dr. Maria E. Alvarez, Professor of Biology, Biology District-Wide Coordinator, and MBRS-RISE and MSEIP Program Director
El Paso Community College
Responsible for water quality monitoring and sample collection of several stations in the El Paso area. Water samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Dr. Elizabeth Walsh
University of Texas at El Paso
Responsible for water quality monitoring and data review in the El Paso area of the Rio Grande. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Dr. Vanessa Lougheed
University of Texas at El Paso
Responsible for water quality monitoring and data review in the Forgotten Stretch of the Rio Grande. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Terms of Agreement

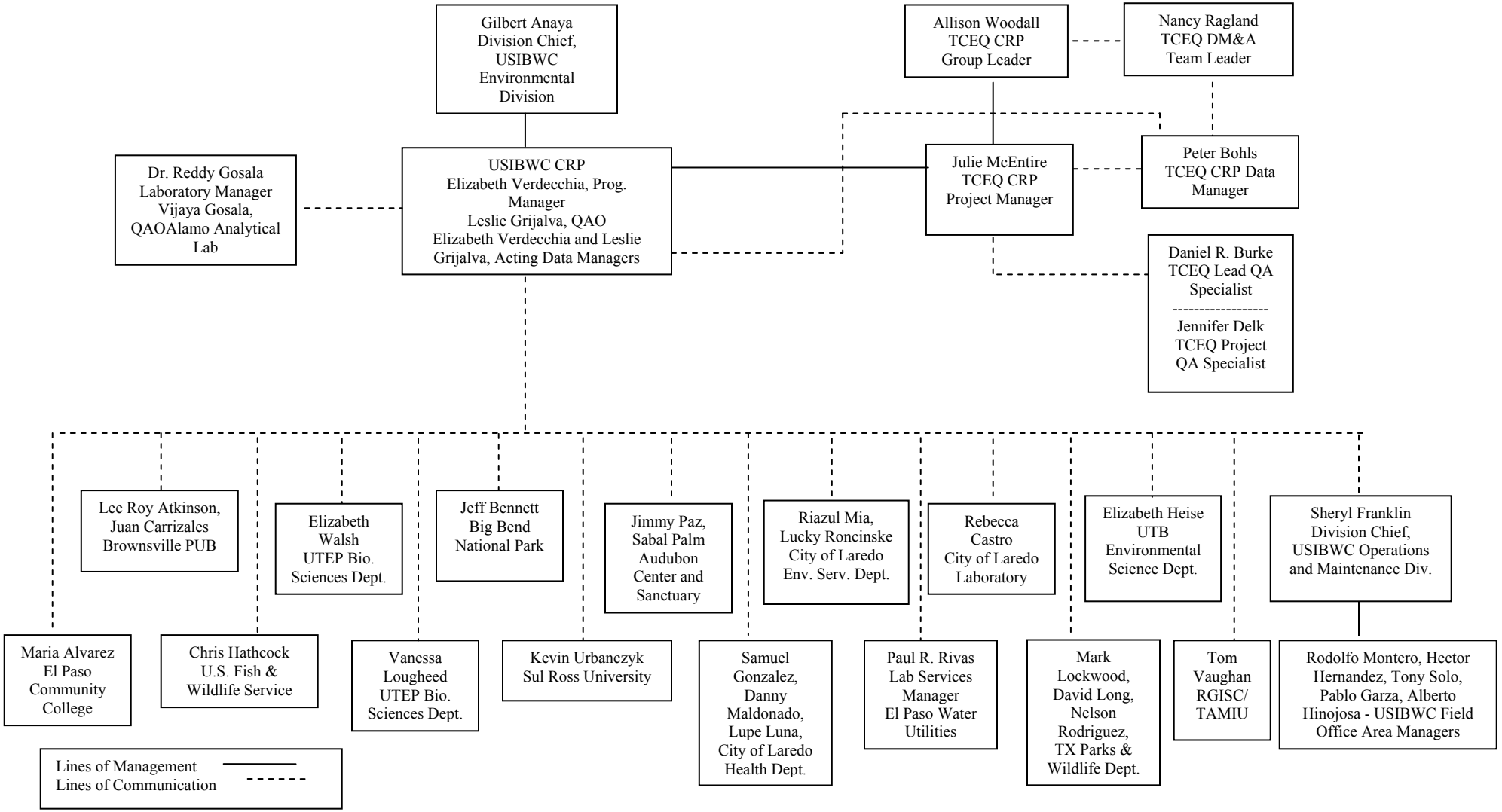
The USIBWC Clean Rivers Program Sampling Partners agree to the long- term collection of water quality samples and environmental data at designated monitoring stations on a prescribed schedule. The types of samples and data collected by each partner may vary in time, commitment, and geography. A Sampling 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, compensated for expenses associated with said volunteer 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. ORGANIZATION CHART - LINES OF COMMUNICATION



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 commission rules for surface water quality monitoring 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 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 (most recent version).

The purpose of this QAPP is to clearly delineate USIBWC 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 scientifically valid and legally defensible. 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 development, establishing water quality standards, making permit decisions and used by other programs deemed appropriate by the TCEQ. Project results will be used to support the achievement of Clean Rivers Program objectives as contained in the Clean Rivers Program Guidance and Reference Guide FY 2012 -2013.

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 Rivers); 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. Several additional segments define unclassified tributaries within each segment.

Figure 2 shows a map of the CRP portion of the Rio Grande Basin 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 8 west Texas counties and parts of the states of Chihuahua and Coahuila in the Republic of Mexico.

Texas Surface Water Quality Standards (TSWQS) identify and designate uses for six segments in the Upper Basin. The designated uses for each of these segments include Contact Recreation, High Aquatic Life, and Public Water Supply (Table 1 A5.1). However, the Rio Grande below International Dam (Segment 2308) is designated as Non-contact Recreation and Limited Aquatic Life.

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 TCEQ conducts its monitoring and assessment of the Pecos sub-basin from the Red Bluff Reservoir to the confluence with the Rio Grande. Segment 2312- Red Bluff Reservoir, is designated for contact recreation and high aquatic use. Segment 2311- Upper Pecos River and Segment 2310- Lower Pecos River are designated for contact recreation and high aquatic use with segment 2310 also being designated as a public water supply.

The Middle Rio Grande Basin includes the main stem of the Rio Grande from International Amistad Dam in Val Verde County to the confluence with the Arroyo Salado in the Mexican state of Tamaulipas (Segment 2304), International Falcon Dam (Segment 2303), and San Felipe Creek (Segment 2313). This portion of the basin includes parts of Val Verde, Edwards, Kinney, Maverick, Dimmit, Webb, Zapata, Jim Hogg, and Starr Counties in Texas and parts of the states of Coahuila, Nuevo Leon, and Tamaulipas in the Republic of Mexico. The designated uses for each of these segments are Contact Recreation, High Quality Aquatic Life, and Public Water Supply.

The study area in the Lower Rio Grande Basin includes the main stem of the Rio Grande from International Falcon Dam in Starr County to the Gulf of Mexico in Cameron County (Segments 2301 and 2302). This portion of the basin includes parts of Starr, Hidalgo, and Cameron Counties in Texas and parts of the state of Tamaulipas in the Republic of Mexico. Designated uses for segment 2302, Rio Grande below International Falcon Reservoir, include Contact Recreation, High Quality Aquatic Life, and Public Water Supply, while Segment 2301 is a tidal flat designated as Exceptional Aquatic Life and Contact Recreation.

Figure 2. A5.1 Map of Rio Grande Basin.

(Detailed station location information can be found on the maps in Appendix B and at http://cms.lcra.org)

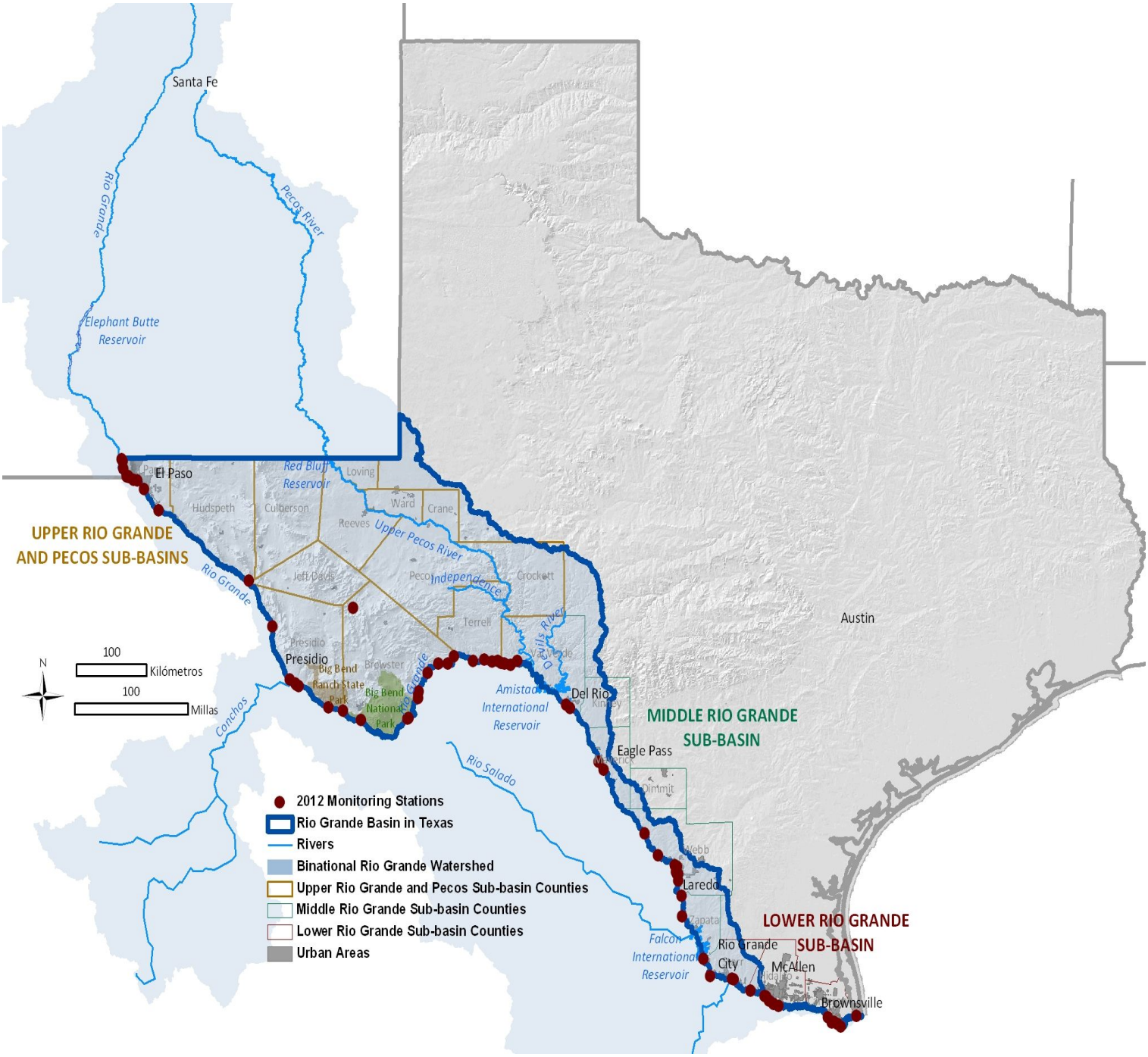


Table 1. A5.1 Designated Uses and Criteria for segments in the Rio Grande

RIO GRANDE BASIN		USES				CRITERIA						
Segment No.	SEGMENT NAME	Recreation	Aquatic Life	Domestic Water Supply	Other	Cl^{-1} (mg/L)	SO_4^{-2} (mg/L)	TDS (mg/L)	Dissolved Oxygen (mg/L)	pH Range (SU)	Indicator Bacteria[1] #/100ml	Temperature (°F)
2301	Rio Grande Tidal	PCR	E						5.0	6.5-9.0	35	95
2302	Rio Grande Below Falcon Reservoir	PCR	H	PS		270	350	880	5.0	6.5-9.0	126	90
2303	International Falcon Reservoir	PCR	H	PS		200	300	1,000	5.0	6.5-9.0	126	93
2304	Rio Grande Below Amistad Reservoir	PCR	H	PS		200	300	1,000	5.0	6.5-9.0	126	95
2305	International Amistad Reservoir	PCR	H	PS		150	270	800	5.0	6.5-9.0	126	88
2306	Rio Grande Above Amistad Reservoir	PCR	H	PS		300	570	1,550	5.0	6.5-9.0	126	93
2307	Rio Grande Below Riverside Diversion Dam	PCR	H	PS		300	550	1,500	5.0[2]	6.5-9.0	126	93
2308	Rio Grande Below International Dam	NCR	L			250	450	1,400	3.0	6.5-9.0	605	95
2309	Devils River [3]	PCR	E	PS		50	50	300	6.0	6.5-9.0	126	90
2310	Lower Pecos River	PCR	H	PS		1,700	1,000	4,000	5.0	6.5-9.0	126	92
2311	Upper Pecos River	PCR	H			7,000	3,500	15,000	5.0	6.5-9.0	33	92
2312	Red Bluff Reservoir	PCR	H			3,200	2,200	9,400	5.0	6.5-9.0	33	90
2313	San Felipe Creek [3]	PCR	H	PS		50	50	400	5.0	6.5-9.0	126	90
2314	Rio Grande Above International Dam	PCR	H	PS		340	600	1,800	5.0	6.5-9.0	126	92

1 The indicator bacteria for freshwater is *E. coli* and Enterococci for saltwater. The indicator bacteria and alternate indicator for Segments 2311 and 2312 are Enterococci and fecal coliform, respectively.

2 The dissolved oxygen criterion in the upper reach of Segment 2307 (Riverside Diversion Dam to the end of the rectified channel below Fort Quitman) is 3.0 mg/L when headwater flow over the Riverside Diversion Dam is less than 35 ft^3/s.

3 The critical low-flow for Segments 2309 and 2313 is calculated according to §307.8(a)(2)(A) of this title.

A6 PROJECT/TASK DESCRIPTION

Basin-wide monitoring program contains sites collected by USIBWC CRP staff, partners as listed in A4, and TCEQ field office staff throughout the basin. Monitoring sites are evaluated for location, frequency of collection, and parameters annually at coordinated monitoring meetings located at four locations in the basin. For FY2012-13, organics in sediment analyses have been dropped at most sites due to non- detects. Organics in sediment will only be analyzed at sites where organics have been detected in the previous two years. Metals and certain organics in water and sediment will still be collected at sites where they have historically shown levels of concern and where stakeholder interest requests continued collection

Under this QAPP, there are 68 monitoring sites collected by the USIBWC CRP and partners. TCEQ collected monitoring and monitoring sites are covered by a separate QAPP. (For a complete monitoring schedule of the Rio Grande Basin, see http://cms.lcra.org.) See Appendix B for sampling design and monitoring pertaining to this QAPP.

See Appendix B for the project-related work plan tasks and schedule of deliverables for a description of work defined in this QAPP. Attach work plan tasks pertaining to 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 Program Manager to the CRP Project Manager electronically. Amendments are effective immediately upon approval by the USIBWC Program Manager, the USIBWC QAO, the CRP Project Manager, the CRP Lead QA Specialist, the CRP Project QA Specialist, and additional parties affected by the amendment. Amendments are not retroactive. They will be incorporated into the QAPP by way of attachment and distributed to personnel on the distribution list by the USIBWC Program Manager or QAO.

Special Project Appendices

Projects requiring QAPP appendices will be planned in consultation with the USIBWC Program Manager 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 Program Manager, the USIBWC QAO, the Laboratory, the CRP Project Manager, the CRP Project QA Specialist, the CRP Lead QA Specialist and other TCEQ personnel as appropriate. Copies of approved QAPPs appendices will be distributed by the USIBWC to project participants before data collection activities commence.

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 *TCEQs Guidance for Assessing Texas Surface and Finished Drinking Water Quality Data*. These water quality data, and data collected by other organizations (e.g., USGS, TCEQ, etc.), will be subsequently reconciled for use and assessed by the TCEQ.

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

The measurement performance specifications to support the project purpose for a minimum data set are specified in Appendix A Table A7.1 and in the text following.

Ambient Water Reporting Limits (AWRLs)

The AWRL establishes the reporting specification at or below which data for a parameter must be reported to be compared with freshwater screening criteria. The AWRLs specified in Appendix A Table A7.1 are the program-defined reporting specifications for each analyte and yield data acceptable for the TCEQ's water quality assessment. A full listing of AWRLs can be found at http://www.tceq.state.tx.us/compliance/monitoring/crp/qa/index.html.

The **limit of quantitation (LOQ)** is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The following requirements must be met in order to report results to the CRP:

The laboratory's LOQ for each analyte must be at or below the AWRL as a matter of routine practice

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.

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 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.

Field splits are used to assess the variability of sample handling, preservation, and storage, as well as the analytical process, and are prepared by splitting samples in the field. Control limits for field splits are defined in Section B5.

Laboratory precision is assessed by comparing replicate analyses of laboratory control samples in the sample matrix (e.g. deionized water, sand, commercially available tissue) or sample/duplicate pairs in the case of bacterial analysis. Precision results are compared against measurement performance specifications and used during evaluation of analytical performance. Program-defined measurement performance specifications for precision are defined in Appendix A.

Bias

Bias is a statistical measurement of correctness and includes multiple components of systematic error. A measurement is considered unbiased when the value reported does not differ from the true value. Bias is determined through the analysis of laboratory control samples 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, the sampling of all pertinent media according to TCEQ SOPs, and use of only approved analytical methods will assure that the measurement data represents the conditions at the site. Routine data collected under the Clean Rivers Program for water quality assessment are considered to be spatially and temporally representative of routine 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 total representation of the water body will be tempered by the potential funding for complete representativeness.

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 and as described in this QAPP and in TCEQ SOPs. 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 Section B10.

Completeness

The completeness of the data is basically a relationship of how much of the data is 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

New field personnel receive training in proper sampling and field analysis. Before actual sampling or field analysis occurs, they will demonstrate to the QA Officer (or designee) their ability to properly calibrate field equipment and perform field sampling and analysis procedures. Field personnel training is documented and retained in the personnel file and will be available during a monitoring systems audit.

The requirements for Global Positioning System (GPS) certification are located in Section B10, Data Management.

Contractors and subcontractors must ensure that laboratories analyzing samples under this QAPP meet the requirements contained in section TNI Volume 1 Module 2, Section 4.5.5 (concerning Review of Requests, Tenders and Contracts).

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 3 A9.1 Project Documents and Records

Document/Record	Location	Retention (yrs)	Format
QAPPs, amendments and appendices	USIBWC	7 yrs.	*Paper, electronic*
Field SOPs	USIBWC	7 yrs.	*Paper, electronic*
Laboratory Quality Manuals	USIBWC/ Laboratories	7 yrs.	*Paper*
Laboratory SOPs	USIBWC/ Laboratories	7 yrs.	*Paper*
QAPP distribution documentation	USIBWC	7 yrs.	*Paper, electronic*
Field staff training records	USIBWC	7 yrs.	*Paper, electronic*
Field equipment calibration/maintenance logs	USIBWC	7 yrs.	*Paper*
Field instrument printouts (manuals, instructions, general information)	USIBWC	7 yrs.	*Paper*

Field notebooks or data sheets	USIBWC	7 yrs.	*Paper, electronic*
Chain of custody records	USIBWC	7 yrs.	*Paper, electronic*
Laboratory calibration records	Laboratories	7 yrs.	*Paper*
Laboratory instrument printouts	Laboratories	7 yrs.	*Paper*
Laboratory data reports/results	USIBWC/ Laboratories	7 yrs.	*Paper, electronic*
Laboratory equipment maintenance logs	Laboratories	7 yrs.	*Paper*
Corrective Action Documentation	USIBWC/ Laboratories	7 yrs.	*Paper, electronic*

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 Volume 1, Module 2, Section 5.10 and include the information necessary for the interpretation and validation of data. The laboratory supervisor 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 requirements for reporting data and the procedures are provided. The NELAC 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 the very 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
Date Analyzed
Holding time for SM9223-B
LOQ and LOD (formerly referred to as the reporting limit and the method detection limit, respectively), and qualification of results outside the working range (if applicable)
Certification of NELAP compliance
Lab Method
Prep Date/Time

Electronic Data

Data will be submitted electronically to the TCEQ in the Event/Result file format described in the most current version of *the Surface Water Quality Monitoring Data Management Reference Guide* (http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wdma/dmrg_index.html). A

completed Data Review Checklist and Data Summary (see Appendix E) will be submitted with each data submittal. Data from CRP partners will be sent in paper format and kept on file at the USIBWC office.

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 according to procedures documented in the *TCEQ Surface Water Quality Monitoring Procedures Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2008.(RG-415)* and *Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data (RG-416).* Additional aspects outlined in Section B below reflect specific requirements for sampling under the Clean Rivers Program and/or provide additional clarification. In addition, USIBWC CRP partners using a YSI 556 for field parameter collection should follow *USIBWC Clean Rivers Program Standard Operating Procedure: Calibration, Maintenance, and Troubleshooting of the YSI 556,* dated April 2011 or later.

Sample volume, container types, minimum sample volume, preservation requirements, and holding time requirements.

Table 4 B2.1 Sample Storage, Preservation and Handling Requirements, Alamo Analytical

Routine Conventionals-in-Water Samples (5 containers: 2 unpreserved, 1 preserved with HNO_3, 1 preserved with H_2S0_4, 1 preserved with $Na_2S_2O_3$)				
Parameters	Containers	Sample Volume (ml)	Preservation	Maximum Holding Time
CONTAINER 1				
	HDPE	500	Cool to 4 C	
TSS (00530)		200	"	7 days
Chloride (Cl) (00940)		50	"	28 days
Sulfate (SO_4) (00945)		50	"	28 days
Fluoride (00951)		50	"	28 days
TDS (70300)		50	"	7 days
Bromide (71870)		50	"	28 days
Alkalinity (00410)		50	"	14 days
CONTAINER 2				
	HDPE	500	1-2 ml conc.HNO_3 to pH <2 and cool to 4 C	
Calcium (00916)		50	"	6 months
Magnesium (00927)		50	"	6 months
Sodium (00929)		50	"	6 months
Potassium (00937)		50	"	6 months
Hardness (00900)		50	"	6 months
CONTAINER 3				

	HDPE	250	1-2 ml conc.H_2SO_4 to pH <2 and cool to 4 C	
Ammonia (NH_3) (00610)		50	"	28 days
TKN (00625)		50	"	28 days
Total Phosphorus (TPO_4) (00665)		50	"	28 days
Nitrate + Nitrite (00630) ($NO_3 + NO_2$)		50	"	28 days
CONTAINER 4				
Chlorophyll *a* (32211)	glass amber	500	dark and ice before filtration; dark and frozen after filtration	Filter within 48 hours. Filters may be stored frozen up to 28 days
Pheophytin-a (32218)	glass amber	500	dark and ice before filtration; dark and frozen after filtration	Filter within 48 hours Filters may be stored frozen up to 28 days
CONTAINER 5				
E. coli bacteria (31699)	Sterilized plastic container	100	Cool to 4 C Sodium thiosulfate	6-8 hours *extended 48 hours
Metals -In-Water				
Parameters	Containers	Sample Volume (ml)	Preservation	Maximum Holding Time
TOTAL	HNO_3 cleaned plastic bottle	500	Pre-acidified container with 5 ml ultra-pure HNO_3 to pH<2	180 days
Total Mercury	HNO3- cleaned glass or Teflon bottle	250	Preserved by lab	28 days
Metals in Sediment				
Metals	glass jar with teflon lined lid	500 grams	Cool 4 C	180 days
Total Mercury	1 pint glass jar with Teflon- lined lid	500 grams	Dark and cool to 4 C	28 days
Organics in Water				
BTE	3- 40 ml VOA	120	Pre-acidified with 0.5 ml HCl	14 days
Pesticides	glass jar with teflon lined lid	1000	Cool 4 C	7 days
SVOC's	glass jar with teflon lined lid	1000	Cool 4 C	7 days
Organics in Sediment				
Pesticides	glass jar with teflon lined lid	500 grams	Cool 4 C	14 days
SVOC's	glass jar with teflon lined lid	500 grams	Cool 4 C	14 days

** E.coli samples analyzed by SM 9223-B 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 48 hours.

Table 5 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)				
Parameters	Containers	Sample Volume (ml)	Preservation	Maximum Holding Time
CONTAINER 1				
E. coli, Colilert, IDEXX Method (31699)	Polystyrene	120	Cool to 4 C Sodium Thiosulfate	6-8 hrs
CONTAINER 2				
Fecal Coliform (31616)	Polystyrene	120	Cool to 4 C Sodium Thiosulfate	6-8 hrs

Table 6 B2.3 Sample Storage, Preservation and Handling Requirements, EPWU International Water Quality Laboratory

Routine Conventionals-in-Water Samples				
Parameters	Containers	Sample Volume (ml)	Preservation	Maximum Holding Time
CONTAINER 1				
Turbidity (82079)	HDPE	100	Cool to 4 C	48 hours
CONTAINER 2				
BOD (00310)	HDPE	1000	Cool to 4 C	2 days
CONTAINER 3				
E. coli bacteria (31699)	Sterilized plastic container	2X250	Cool to 4 C Sodium thiosulfate	6-8 hours
Chlorophyll-a	HDPE (Brown)	1000	Dark and ice before filtration; dark and frozen after filtration	Filter within 48 hours. Filters may be stored frozen up to 30 Days

Table 7 B2.4 Sample Storage, Preservation and Handling Requirements, Brownsville PUB

Routine Conventionals-in-Water Samples				
Parameters	Containers	Sample Volume (ml)	Preservation	Maximum Holding Time
CONTAINER 1				
TSS (00530)/ VSS (00535)	HDPE	2000	Cool to 4 C	48 hours
TDS (70300)	HDPE	250	Cool to 4 C	48 hours
CONTAINER 2				
Ammonia (NH_3) (00610)	HDPE	500	1-2 ml conc.H_2SO_4 to pH <2 and cool to 4 C	28 days
CONTAINER 3				
BOD (00310)	HDPE	2000	Cool to 4 C	2 days
CONTAINER 4				
E. coli bacteria (31699)	Sterilized plastic container	120	Cool to 4 C Sodium thiosulfate	6-8 hours
CONTAINER 5				
Enterococcus (31701)	Sterilized plastic container	120	Cool to 4 C Sodium thiosulfate	6-8 hours

Sample Containers

Sample containers (sometimes cubitainers) are purchased pre-cleaned for conventional parameters and are disposable. Sample containers used for bacteriological samples may have 1% sodium thiosulfate tablets added. Amber glass bottles are used routinely for chlorophyll samples. The sample containers for metals are new, certified glass or plastic bottles, or glass or plastic bottles cleaned and documented according to EPA method 1669. Sample containers for organics are purchased pre-cleaned and certified. The analyzing laboratory adds the appropriate preservative to the proper sample containers and provides them to the partners. Certificates are maintained in a notebook by the USIBWC or by the laboratory supplying sample containers under the CRP. Alamo Analytical, LTD., the City of Laredo Health Department Lab, EPWU, BPUB, and the USIBWC supply sample containers for its CRP partners in the Rio Grande Basin.

Processes to Prevent Contamination

Procedures outlined in the *TCEQ Surface Water Quality Monitoring Procedures* outline the necessary steps to prevent contamination of samples. These include: direct collection into sample containers, when possible; clean sampling techniques for metals; and certified containers for organics. 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 (or actual name of the documents used to record field data) as presented in Appendix C. Flow worksheets, aquatic life use monitoring checklists, habitat assessment forms, field biological assessment forms, and records of bacteriological analyses (if applicable) are part of the field data record. The following will be recorded for all visits:

1. Station ID
2. Sampling Date
3. Location
4. Sampling depth
5. Sampling time
6. Sample collector's name/signature
7. Values for all field parameters
8. Detailed observational data, including:
   water appearance
   weather
   biological activity
   unusual odors
   pertinent observations related to water quality or stream uses (e.g., exceptionally poor water quality conditions/standards not met; stream uses such as swimming, boating, fishing, irrigation pumps, etc.)
   watershed or instream activities (events impacting water quality, e.g., bridge construction, livestock watering upstream, etc.)

   specific sample information (number of sediments grabs, type/number of fish in a tissue sample, etc.)
   missing parameters (i.e., when a scheduled parameter or group of parameters is not collected)

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
Changes should be made by crossing out original entries with a single line, entering the changes, 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 and appropriate sampling procedures may invalidate resulting data and may require corrective action. Corrective action may include for samples to be discarded and re-collected. It is the responsibility of the USIBWC Program Manager, in consultation with the USIBWC 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 corrective action plan (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 D). The following list of items matches the COC form in Appendix D.

1. Date and time of collection
2. Site identification
3. Sample matrix
4. Number of containers
5. Preservative used
6. Was the sample filtered
7. Analyses required
8. Name of collector

9. Custody transfer signatures and dates and time of transfer
10. Bill of lading (if applicable)

Sample Labeling

Samples from the field are labeled on the container (or on a label; please specify) with an indelible marker. Label information includes:

1. Site identification
2. Date and time of collection
3. Preservative added, if applicable
4. Indication of field-filtration (for metals) as applicable
5. Sample type (i.e., analysis(es)) to be performed

Sample Handling

Handling procedures for water, sediment and biological samples are discussed in detail in the TCEQ *Surface Water Quality Monitoring Procedures Manual Volume I* (2008 or subsequent edition*) and Volume II (2007 or subsequent edition).* 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, whether intentional or accidental, after the sample is placed in a container. USIBWC, Rio Grande International Study Center, University of Texas at Brownsville, Sabal Palm Sanctuary, Sul Ross State University, Big Bend National Park, City of Laredo Environmental, El Paso Community College, Texas Parks and Wildlife Department, U.S. Fish & Wildlife Service, and the University of Texas at El Paso samples will be collected and shipped to Alamo Analytical, LTD. Please refer to the Chain of Custody section below for more details.

Field Data Reporting Forms (See Appendix C) will be required for reporting field data. The first form, "Field Data Reporting Form", will be used when collecting grab samples. This form will include DO, temperature, pH, Specific conductance, Secchi disk, flow, flow severity, flow measurement method, stream width, stream depth, and days since significant precipitation (and turbidity for RGISC). A second form, "Field Data Reporting Form for 24 hr D.O. and Sediment Samples", will be used for composite sampling of sediment samples. If a routine water chemistry sample is collected, the COC Form(s) are submitted to the laboratory with the sample(s).

Chain of Custody forms are submitted with all water and/or sediment chemistry samples. If both water and sediment sampled 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 typically 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 chain-of-custody procedures as described in this QAPP are immediately reported to the USIBWC Program 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 Program Manager in consultation with the USIBWC 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. Corrective Action Plans will be prepared by the USIBWC 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 the Clean Rivers Program is derived from the TSWQS (' '307.1 - 307.10) in that data generally are generated for comparison to those standards and/or criteria. The Standards state that "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 commission, and in accordance with chapter 25 of this title."

Laboratories collecting data under this QAPP are compliant with the TNI Standards. Copies of laboratory QMs and SOPs are 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 Alamo Analytical Laboratory Supervisor, who will make the

determination and notify the USIBWC QAO or the USIBWC Program Manager. 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 Program Manager. The USIBWC Program Manager or QAO 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 the qualifier codes (e.g."holding time exceedance", "sample received unpreserved", "estimated value", etc...) 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.

B5 QUALITY CONTROL

Sampling Quality Control Requirements and Acceptability Criteria

The minimum Field QC Requirements are outlined in the *TCEQ Surface Water Quality Monitoring 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 the contamination from field sources such as airborne materials, containers, and preservatives. Field blanks are performed on 10% of samples taken. If less than 10 samples are collected in a month, one field blank is submitted per month.

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.

Field equipment blank - Field equipment blanks are required for metals-in-water samples when collected using sampling equipment. Field equipment blank is a sample of analyte-free media which has been used to rinse common sampling equipment to check the effectiveness of decontamination procedures. It is collected in the same type of container as the environmental sample, preserved in the same manner and analyzed for the same parameter. A set of field equipment blanks is submitted with every tenth sample. If less than 10 samples are collected in a month, submit one set of blanks per month.

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

Field Split - A field split, also called a duplicate, is a single sample subdivided by field staff immediately following collection and submitted to the laboratory as two separately identified samples

according to procedures specified in the SWQM Procedures. Split samples are preserved, handled, shipped, and analyzed identically and are used to assess variability in all of these processes. Field splits apply to conventional samples only and are collected on a 10% basis or one per batch, whichever is greater. To the extent possible, field splits prepared and analyzed over the course of the project should be performed on samples from different sites.

The precision of field split results is calculated by relative percent difference (RPD) using the following equation:

$$RPD = |(X1 - X2)/\{(X1+X2)/2\} * 100|$$

A 30% RPD criteria will be used to screen field split results as a possible indicator of excessive variability in the sample handling and analytical system. If it is determined that elevated quantities of analyte (i.e., > 5 times the LOQ) were measured and analytical variability can be eliminated as a factor, than variability in field split results will primarily be used as a trigger for discussion with field staff to ensure samples are being handled in the field correctly. Some individual sample results may be invalidated based on the examination of all extenuating information. The information derived from field splits is generally considered to be event specific and would not normally be used to determine the validity of an entire batch; however, some batches of samples may be invalidated depending on the situation. Professional judgment during data validation will be relied upon to interpret the results and take appropriate action. The qualification (i.e., invalidation) of data will be documented on the Data Summary. Deficiencies will be addressed as specified in this section under Quality Control or Acceptability Requirements Deficiencies and Corrective Actions.

Trip blank - Trip blanks are required for volatile organic analyses (VOA) only. VOA trip blanks are samples prepared in the laboratory with laboratory pure water and preserved as required. A trip blank is submitted with each ice chest of VOA samples submitted to the laboratory. They are transported to the sampling site, handled like an environmental sample, and returned to the laboratory for analysis. Trip blanks are not opened in the field. Their purpose is to check contamination of the sample through leaching of the septum. The analysis of trip blank should yield values less than the LOQ. When target analyte concentrations are very high, blank values should be less than 5% of the lowest value of the batch, or corrective action will be implemented.

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, are run (e.g., sample duplicates, surrogates, internal standards, continuing calibration samples, interference check samples, positive control, negative control, and media blank) as specified in the methods. 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.

Limit of Quantitation (LOQ) – The laboratory will analyze a calibration standard (if applicable) at the LOQ published in Appendix A, Table A7, 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, Table A7 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 Table A7 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 near the LOQ published in Appendix A, Table A7, 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 samples run on batches with calibration curves that do not include the LOQ published in Appendix A, Table A7, 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. LOQ Check Samples are run 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, SR is the sample result, and SA is the reference concentration for the check sample:

$$\%R = SR/SA * 100$$

Measurement performance specifications are used to determine the acceptability of LOQ Check Sample analyses as specified in Appendix A Table A7.

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 multipeak responses.

The LCS is carried through the complete preparation and analytical process. LCSs are run 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; SR is the measured result; and SA is the true result:

$$\%R = SR/SA * 100$$

Measurement performance specifications are used to determine the acceptability of LCS analyses as specified in Appendix A Table A7.

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 control sample duplicate (LCSD) is prepared in the laboratory by splitting aliquots of an LCS. Both samples are carried through the entire preparation and analytical process. LCSDs are used to assess precision and are performed at a rate of one per preparation batch.

For most parameters except bacteria, precision is calculated by the relative percent difference (RPD) between duplicate LCS 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, X1 and X2, the RPD is calculated from the following equation:

$$RPD = |(X1 - X2)/\{(X1+X2)/2\} * 100|$$

For bacteriological parameters, precision is evaluated using the results from laboratory duplicates. A bacteriological duplicate is considered to be a special type of laboratory duplicate and applies when bacteriological samples are run in the lab. Bacteriological duplicate analyses are performed on samples from the sample bottle on a 10% basis (or once per sampling run, whichever is more

frequent). These duplicates will be collected in sufficient volume (200 mL or more) for analysis of the sample and its laboratory duplicate from the same container.

The base-10 logarithms of the result from the original sample and the result from its duplicate will be calculated. The absolute value of the difference between the two logarithms will be calculated, and that difference will be compared to the precision criterion in Appendix A Table A7.

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

The precision criterion in Appendix A Table A7 for bacteriological duplicates applies only to samples with concentrations >10 MPN/100 mL. Field splits will not be collected for bacteriological analyses.

Laboratory equipment blank - Laboratory equipment blanks are prepared at the laboratory where collection materials for metals sampling equipment are cleaned between uses. These blanks document that the materials provided by the laboratory are free of contamination. The QC check is performed before the metals sampling equipment is sent to the field. The analysis of laboratory equipment blanks should yield values less than the LOQ. Otherwise, the equipment should not be used.

Matrix spike (MS) – Matrix spikes are prepared by adding a known mass 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. 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, SSR is the concentration measured in the matrix spike, SR is the concentration in the unspiked sample, and SA is the concentration of analyte that was added:

$$\%R = (SSR - SR)/SA * 100$$

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 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 blanks are performed at a rate of once per preparation batch. 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 or 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 (example: volatiles in water) 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 Program Manager, in consultation with the USIBWC 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 Program Manager and QAO will be relied upon in evaluating results. Rejecting sample results based on wide variability is a possibility. Field blanks for trace elements and trace organics are scrutinized very closely. Field blank values exceeding the acceptability criteria may automatically invalidate the sample, especially in cases where high blank values may be indicative of contamination which may be causal in putting a value above the standard. Notations of field split excursions and blank contamination are noted in the quarterly report and the final QC Report. 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 problem is reported to the USIBWC Program Manager and QAO by the Alamo Analytical laboratory manager. The USIBWC QAO will discuss with the USIBWC Program Manager. If applicable, the USIBWC Program 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.

B6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION AND MAINTENANCE

All sampling equipment testing and maintenance requirements are detailed in the *TCEQ Surface Water Quality Monitoring 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 *TCEQ Surface Water Quality Monitoring Procedures*. Post-calibration error limits and the disposition resulting from error are adhered to. Post- calibration should be done within 24 hours of the initial calibration. Data not meeting post-error limit requirements invalidate associated data collected subsequent to the pre-calibration and are not submitted to the TCEQ.

Table 8 B7.1 Post- Calibration Check Error Limits

Parameter	Value
Dissolved oxygen	± 0.5 mg/L, ± 6 % saturation
pH	± 0.5 standard units
Specific conductance	± 5 %
Temperature	± 0.2 º C
Depth	± 0.2 at 1 m

- Values above apply when using the YSI probe.

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

B8 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

All laboratory- related items will be inspected and accepted for use in this project by the laboratories. Acceptance criteria for such supplies and consumables, in order to satisfy the technical and quality objectives of this project, are documented in the individual laboratories' QMS.

B9 NON-DIRECT MEASUREMENTS

The following non- direct measurement source(s) will also be used for this project: USIBWC gage station data will be used throughout the project to aid in determining gage height and flow. Rigorous QA checks are completed on gage data by the USIBWC and the data is approved by the USIBWC and permanently stored at the USIBWC. 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 USIBWC gage station.

Only data collected directly under this QAPP is submitted to the SWQMIS database.

B10 DATA MANAGEMENT

Data Management Process

Data will be managed in accordance with the *TCEQ Surface Water Quality Monitoring Data Management Reference Guide* and applicable USIBWC information resource management policies.

Quantitative measurements are taken in the field by personnel using multiparameter instruments. Qualitative measurements, which include observational data (i.e. weather conditions), are also taken in the field. Samples for laboratory analysis may also be collected. The field investigator has prime

responsibility to assure that all pertinent information is recorded, is recorded correctly, and is recorded in the proper units. RGBMP 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 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 in Section B3. Field data and laboratory results will be reported on the required data forms and submitted to the USIBWC by the RGBMP Partners. The data from the forms will be reviewed and checked for outliers. The data will then be entered into the database by the USIBWC Data Manager using Access software. The Access software is then used to query the data for outliers and incorrect data format. The database will contain only data in Table A7 collected by USIBWC and partners participating under this QAPP. Data are verified using the TCEQ SWQMIS data loader. Water quality monitoring data files will then be submitted to the TCEQ CRP Project Manager. The TCEQ CRP Project Manager then transfers the data to the TCEQ CRP Data Manager, who then loads the data into the SWQMIS database.

RGBMP water quality monitoring data that have been added to the USIBWC CRP database undergo the following quality control checks:

1. Each set of data forms received by USIBWC will be reviewed for the following:
    a. valid and complete station number, date, and time;
    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 insure 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, a potential for loss of data quality arises in the manipulation and reporting of the data. All procedures that may lower the chance for number handling errors will be followed. Data exchange and management among USIBWC and RGBMP partners follow the lines of communication established in the organizational chart in Figure 1.

Data Dictionary - Terminology and field descriptions are included in the *SWQM Data Management Reference Guide*, January 2010 or most recent version. For the purposes of verifying which entity codes are included in this QAPP, a table outlining the entities that will be used when submitting data under this QAPP is included below.

Table 9: 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
Univ. of TX at Brownsville	B	IB	UB
Rio Grande International Study Center	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
Sul Ross University	B	IB	SL
Univ. of TX at El Paso	B	IB	UE
Brownsville PUB	B	IB	BO
US Fish & Wildlife Service	B	IB	UF
El Paso Community College	B	IB	EP
TX Parks and Wildlife Dept.	B	IB	PW
Sabal Palm Audubon Center and Sanctuary	B	IB	SP
El Paso Water Utilities	BD	IB	IB

Data Errors and Loss

Upon receipt of field and laboratory data, the USIBWC QAO insures that no outliers or errors in the data are present. If any are observed, the QAO either corrects the error if possible or verifies the error with the source. The data is then given to the USIBWC Data Manager who also checks the data for any errors. If any errors are present, the Data Manager corrects the error if possible or alerts the QAO so that they can verify the error with the source. The data is then entered into an 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 errors discovered by the database are corrected and the data is exported from Access into ASCII pipe delimited file formats as described in the Surface Water Quality Monitoring Data Management Reference Guide, 2010 or most recent version.

Record Keeping and Data Storage

All field data sheets and laboratory data received by the USIBWC are entered into a logbook. Complete data sets are assigned a tag ID and logged into a spreadsheet. Complete original data sets are archived in hard copy form and retained on-site by USIBWC for a minimum of seven years. USIBWC CRP staff back up all electronic logs and datasets on external hard drives. Additionally, IT personnel backup all network drives weekly at a separate location from the CRP. Data is submitted on a more frequent basis than required by the CRP guidance and all data is 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 Clean Rivers Program computer system is attached to a Novell Netware 6.5 Local Area Network (LAN) consisting of multiple servers and backup servers on a 10-BaseT backbone. The Netware 6.5 LAN is comprised of workstation nodes plus networked and individual printers. All components communicate with each other through switches (10/100) 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 10: 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 2 Quad CPU Q9550 2.83 GHz; 3.25 GB RAM; 18" LCD Color Monitor 64MB 4x AGP Graphics Accelerator; 150GB Hard Drive; CD-RW drives; DVD-ROM drive; 3COM PCI 10/100 Twisted Pair Ethernet w/WOL Network Card; 104+ Keyboard; and MS IntelliMouse; Printer.	Three systems currently installed.	System upgrades	As Needed
PC Software	MS Windows XP 2002 Professional; Novell Netware 8 Groupwise; MS Office 2007	Current	Software upgrades	As needed
Portable PC Hardware	Portable PC: Dell Precision M2400; Intel Core 2Duo CPU P8600 2.4 GHz, 3.48 GB RAM; 300 GB Hard Drive, CD and DVD-RW drive; Lithium Ion battery with battery gauge and AC pack; Full size 88 key keyboard; and EZ Pad Plus Pointing device	Current	Hardware upgrades	As needed
llPortable PC Software	Adobe Creative Suite 4 Master MS Office 2007	Current	Software upgrades	As needed
Data Backup System	Each workstation contains a 16x rewritable drive.	Current		

Table 11. 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 Core 2 Quad CPU Q9550 2.83 GHz; 3.25 GB RAM; 18" LCD Color Monitor 64MB 4x AGP Graphics Accelerator; 150GB Hard Drive; CD-RW drives; DVD-ROM drive; 3COM PCI 10/100 Twisted Pair Ethernet w/WOL Network Card; 104+ Keyboard; and MS IntelliMouse; Printer.	Three systems currently installed.	System upgrades	As Needed

PC Software	MS Windows XP 2002 Professional; Novell Netware 8 Groupwise; MS Office 2007	Current	Software upgrades	As needed
Portable PC Hardware	Portable PC: Dell Precision M2400; Intel Core 2Duo CPU P8600 2.4 GHz, 3.48 GB RAM; 300 GB Hard Drive, CD and DVD-RW drive; Lithium Ion battery with battery gauge and AC pack; Full size 88 key keyboard; and EZ Pad Plus Pointing device	Current	Hardware upgrades	As needed
llPortable PC Software	Adobe Creative Suite 4 Master MS Office 2007	Current	Software upgrades	As needed
Data Backup System	Each workstation contains a 16x rewritable drive.	Current		

Information Resource Management Requirements

Data will be managed in accordance with the *TCEQ Surface Water Quality Monitoring Data Management Reference Guide* and applicable USIBWC information resource management policies. The USIBWC maintains a Data Manager's Reference Guide, which includes a Standard Operating Procedure for Data Management, the SWQM test environment instructions, web updating instructions and other miscellaneous information for data managers.

Global Positioning System (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 the TCEQ's SWQMIS database. Positional data obtained by the Clean Rivers Program grantees using a Global Positioning System will follow the TCEQ's OPP 8.11 and 8.12 policy regarding the collection and management of positional data. All positional data entered into SWQMIS will be collected by a GPS certified individual with an agency approved GPS device to ensure that the agency receives reliable and accurate positional data. Certification can be obtained in any of three ways: completing a TCEQ training class, completing a suitable training class offered by an outside vendor, or by providing documentation of sufficient GPS expertise and experience. Contractors must agree to adhere to relevant TCEQ policies when entering GPS-collected data.

In lieu of entering certified GPS coordinates, 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 station location.

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 12: C1.1 Assessments and Response Requirements

Assessment Activity	Approximate Schedule	Responsible Party	Scope	Response Requirements
Status Monitoring Oversight, etc.	Continuous	USIBWC	Monitoring of the project status and records to ensure requirements are being fulfilled	Report to TCEQ in Quarterly Report
Monitoring Systems Audit of USIBWC	Dates to be determined by TCEQ CRP	TCEQ	Field sampling, handling and measurement; facility review; and data management as they relate to CRP	30 days to respond in writing to the TCEQ to address corrective actions
Monitoring Systems Audit of Program Subparticipants	Dates to be determined by the USIBWC (at least once per contract period)	USIBWC	Field sampling, handling and measurement; facility review; and data management as they relate to CRP	30 days to respond in writing to the USIBWC. PM will report problems to TCEQ in Progress Report.
Laboratory Inspection	Dates to be determined by TCEQ	TCEQ Laboratory Inspector	Analytical and quality control procedures employed at the laboratory and the contract laboratory	30 days to respond in writing to the TCEQ to address corrective actions

Corrective Action Process for Deficiencies

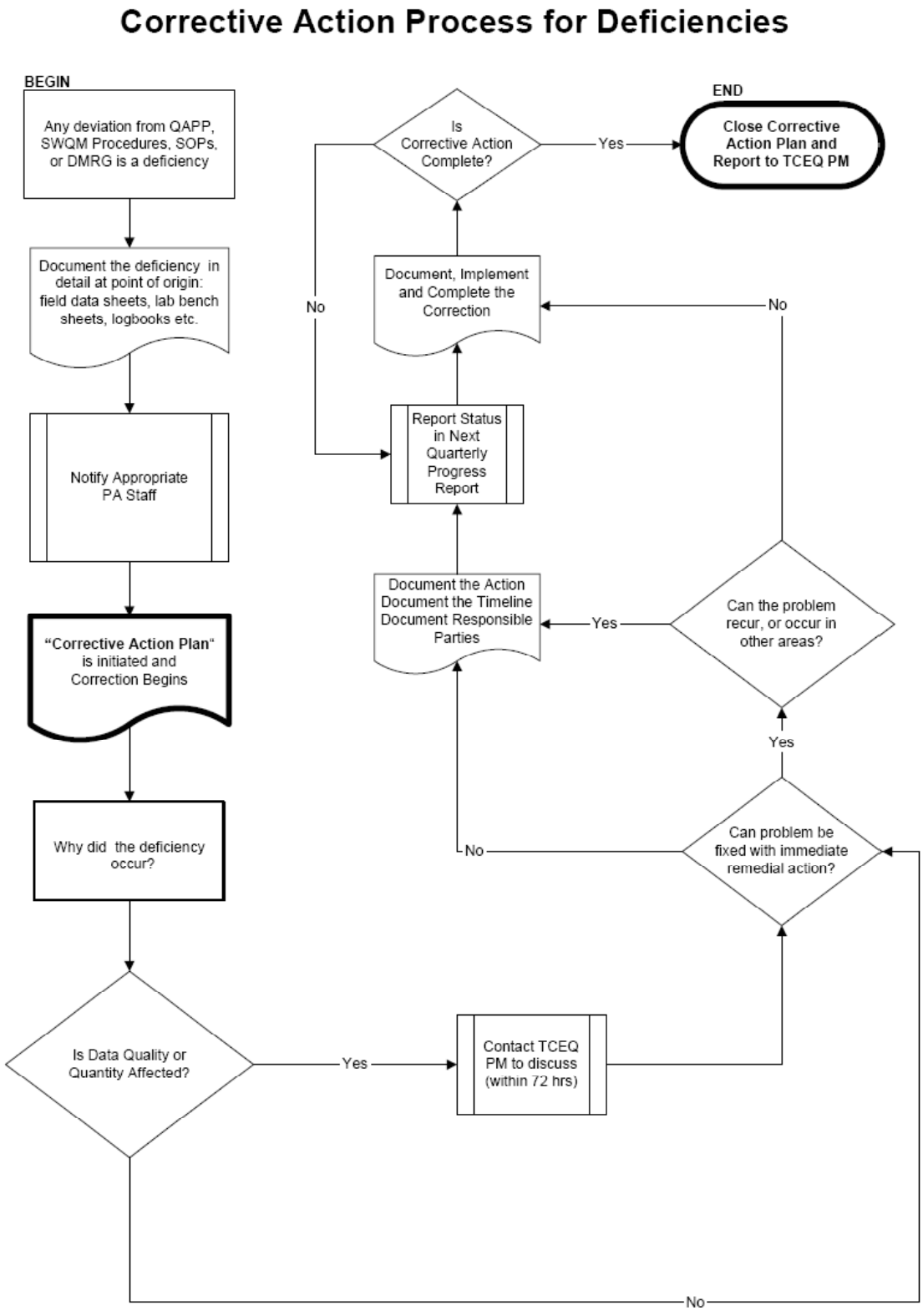
Deficiencies are any deviation from the QAPP, SWQM Procedures Manual, SOPs, or Data Management Reference Guide. Deficiencies may invalidate resulting data and may require corrective action. Corrective action may include for samples to be discarded and re-collected. Deficiencies are documented in logbooks, field data sheets, etc. by field or laboratory staff. It is the responsibility of the Lead Organization Project Manager, in consultation with the Lead Organization 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 corrective action plan (CAP).

Corrective Action

Corrective Action Plans (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
Evaluate the need for Corrective Action
Use 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

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

Figure 3: C1.1 Corrective Action Process for Deficiencies



Status of Corrective Action Plans will be included with quarterly progress reports. In addition, significant conditions (i.e., situations 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 Program Manager is responsible for implementing and tracking corrective actions. Records of audit findings and corrective actions are maintained by the USIBWC Program Manager. Audit reports and corrective action documentation will be submitted to the TCEQ with the Progress Report.

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

C2 REPORTS TO MANAGEMENT

Reports to USIBWC Project Management

The USIBWC QAO reports the status of implementation of the procedures discussed in the QAPP to the USIBWC Program Manager. The USIBWC QAO must be informed of any quality assurance problems encountered and solutions adopted (corrective action reports as filed).

- Laboratory data reports - Reports contain QC information so that this information can be reviewed by the USIBWC QAO. The USIBWC QAO maintains a log of lab results, field data reports, and QA/QC results submitted to the USIBWC. QA/QC issues are documented in the log and recorded on the laboratory report.
- CRP partners submit Field data reporting forms to the USIBWC after all data has been collected.
- Alamo Analytical Laboratories, LTD. submits laboratory results (as described in Section A9 under "laboratory reports") on a monthly basis to the USIBWC CRP as specified in the laboratory services contract.
- Events/Results files and Data Review Checklist - The USIBWC Data Manager transfers results from lab reports and field data sheets that have been reviewed and approved by USIBWC QAO into the CRP database. The data is reviewed utilizing the CRP data review checklist.

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's activities for each task; reports monitoring status, problems, delays, and corrective actions; and outlines the status of each task's deliverables.
- Monitoring Systems Audit Report and Response - Following any audit performed by the USIBWC, a report of findings, recommendations and response is sent to the TCEQ in the quarterly progress report.

- Data Review Checklist and 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 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.

Table 13: 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
Monitoring Report	Quarterly	March 30, June 30, September 30, December 30	USIBWC Program Manager or QAO	TCEQ Program Manager
Corrective Action Plan	Quarterly until completed	30 days from the day USIBWC became aware of the deviation	QAO	USIBWC Project Manager
Non-compliance Reports	As needed	With lab results to document lab issues or late cooler arrivals	Lab QAO	USIBWC Project Manager
Data Review Checklist	As needed	With Data Submittals	USIBWC Data Manager	TCEQ Program Manager

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. 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 and meet the conditions of end use as described in Section A7 of this document.

Data review, verification, and validation will be performed using self-assessments and 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 (or computer-assisted) examination of corollary or unreasonable data. 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. All checklists, reports, phone conversations, and written and email correspondence are documented, filed, and kept in the USIBWC CRP files.

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 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 E) 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 Program 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 Data Manager with the data. This information is communicated to the TCEQ by the USIBWC in the Data Summary (See Appendix E).

Table 14: D2.1 Data Review Tasks

Data to be Verified	Field Task	Laboratory Task	Lead Organization Data Manager Task
Field Data Review			
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	
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		USIBWC QAO
Instrument calibration data complete	Field Personnel		USIBWC QAO
Bacteriological records complete	Field Personnel		USIBWC QAO
Laboratory Data Review			
NELAC Accreditation is current		Lab QAO	USIBWC QAO
Sample preservation and handling acceptable	Field Personnel	Lab QAO	USIBWC QAO
Holding times not exceeded		Lab QAO	USIBWC QAO
QC samples analyzed at required frequency	Field Personnel	Lab PM	USIBWC PM
QC results meet performance and program specifications		Lab QAO	USIBWC QAO
Analytical sensitivity (Minimum Analytical Levels/Ambient Water Reporting Limits) 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 parameters		Lab QAO	USIBWC QAO
Corollary data agree	Field Personnel		USIBWC QAO
Nonconforming activities documented	Field Personnel	Lab QAO	USIBWC QAO
Date Set Review			
Outliers confirmed and documented; reasonableness check performed			USIBWC QAO
Dates formatted correctly			USIBWC Data Manager
Depth reported correctly			USIBWC Data Manager
TAG IDs correct			USIBWC Data Manager
TCEQ ID number assigned			USIBWC Data Manager
Valid parameter codes			USIBWC Data Manager
Codes for submitting entity(ies), collecting entity(ies), and monitoring type(s) used correctly			USIBWC Data Manager
Time based on 24-hour clock			USIBWC Data Manager
Absence of transcription error confirmed	Field Personnel	Lab QAO	USIBWC QAO

Absence of electronic errors confirmed		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 QC results attached to data review checklist			USIBWC QAO
Verified data log submitted			USIBWC QAO
10% of data manually reviewed			USIBWC QAO

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 meeting project requirements will be used by the TCEQ for the *Texas Water Quality Integrated Report* in accordance *with TCEQ's Guidance for Assessing Texas Surface and Finished Drinking Water Quality Data*, and for TMDL development, water quality standards development, and permit decisions as appropriate. Data which do not meet requirements will not be submitted to SWQMIS nor will be considered appropriate for any of the uses noted above.

APPENDIX A:
MEASUREMENT PERFORMANCE SPECIFICATIONS (TABLE A7.1)

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 laboratory control samples
precision limits for laboratory control sample duplicates
completeness goals
qualitative statements regarding representativeness and comparability

The items identified above need to be considered for each type of monitoring activity. The CRP emphasizes that data should be collected to address multiple objectives, if possible, thereby maximizing the expenditure of resources. 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 should be given to the main use of the project data and the data quality needed to support that use, then secondary goals should be considered.

Table A7 should be modified to reflect actual parameters, methods, etc. employed by the USIBWC and its participants. Alternative methods than those listed in the following table may be used. 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 Table A7 are stored in SWQMIS. Any parameters listed in Table A7 that do not have a valid TCEQ parameter code assigned will not be stored in SWQMIS.

Based on a general review of available information regarding achievable recoveries of additional parameters, use the following bias limits (percent recovery of the LCS and LOQ Check Sample) in Table A7.1: metals-in solid samples (i.e., sediment and tissue) 60-140%; organics-in-water samples 65-135%; organics-in-solid samples (i.e., sediment and tissue) 40-160%. There may be poor performing analytes within these groups that do not perform well with specific methods and usually recover poorly. Before these compounds are included in the list of analytes to be submitted to the TCEQ, the USIBWC should discuss the situation with the TCEQ who will discuss if they are project specific analytes of concern, if low recoveries are acceptable or alternative methods should be run.

Table 2: A7.1 - Measurement Performance Specifications

Please see the attached Excel file.

TABLE A7.1 Measurement Performance Specifications											
Field Parameters											
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD of LCS/LCSD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE,FIELD (uS/CM @ 25C)	us/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G and TCEQ SOP, V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)	s.u	water	EPA 150.1 and TCEQ SOP, V1	00400	NA*	NA	NA	NA	NA	Field
TURBIDITY, FIELD	NTU	water	SM 2130-B	82078	NA*	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)	cfs	water	TCEQ SOP, V1	74069	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE MET	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPL	NU	other	TCEQ SOP V1	89835	NA*	NA	NA	NA	NA	Field
STREAM WIDTH (M)	meters	water	TCEQ SOP V1	89861	NA*	NA	NA	NA	NA	Field
WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD.,4=STRONG)	NU	other	NA	89965	NA*	NA	NA	NA	NA	Field
WIND DIRECTION (1=North, 2=South, 3=East, 4=West, 5=NE, 6=SE, 7=NW, 8=SW)	NU	other	NA	89010	NA*	NA	NA	NA	NA	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER)	NU	other	NA	89966	NA	NA	NA	NA	NA	Field

* Reporting to be consistent with SWQM guidance and based on measurement capability.
References:U.S. Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), StandardMethods for the Examination of Water and Wastewater, 20th Edition, 1998. (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 for Water, Sediment, and Tissue, 2008 (RG-415).TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

TABLE A7.2 Measurement Performance Specifications for Alamo Analytical Laboratories, LTD.										
Conventional and Bacteriological Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	EPA 160.2	00530	4	4	NA	NA	NA	Alamo
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.2	00610	0.1	0.1	70-130	20	80-120	Alamo
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.3	00625	0.2	0.2	70-130	20	80-120	Alamo
NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	mg/L	water	EPA 300.0	00630	0.05	0.05	70-130	20	80-120	Alamo
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.2	00665	0.06	0.06	70-130	20	80-120	Alamo
HARDNESS, TOTAL (MG/L AS CACO3)*	mg/L	water	EPA 130.2	00900	5	5	NA	20	80-120	Alamo
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0	00940	5	2	70-130	20	80-120	Alamo
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0	00945	5	5	70-130	20	80-120	Alamo
CALCIUM, TOTAL (MG/L AS CA)	mg/L	water	EPA 200.7, 6010	00916	0.5	0.5	70-130	20	80-120	Alamo
MAGNESIUM, TOTAL (MG/L AS MG)	mg/L	water	EPA 200.7	00927	0.5	0.25	70-130	20	80-120	Alamo
SODIUM, TOTAL (MG/L AS NA)	mg/L	water	EPA 200.7, 6010	00929	NA	0.5	70-130	20	80-120	Alamo
POTASSIUM, TOTAL (MG/L AS K)	mg/L	water	EPA 200.7, 6010	00937	NA	0.5	70-130	20	80-120	Alamo
FLUORIDE, TOTAL (MG/L AS F)	mg/L	water	EPA 300.0	00951	0.5	0.5	70-130	20	80-120	Alamo
BROMIDE, TOTAL	mg/L	water	EPA 300.0	71870	NA	5	70-130	20	80-120	Alamo
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML****	MPN/100 mL	water	SM 9223-B***	31699	1	1	NA	0.50**	NA	Alamo
E.COLI, COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	Alamo
ALKALINITY, TOTAL (MG/L AS CACO3)	mg/L	water	EPA 310.1	00410	20	10	NA	20	NA	Alamo
PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH.	µg/L	water	SM 10200 H	32218	3	3	NA	NA	NA	Alamo
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	ug/L	water	SM 10200 H	32211	3	3	NA	20	80-120	Alamo
RESIDUE,TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	EPA 160.1	70300	10	10	NA	20	80-120	Alamo

*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).
** 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 SM 9223-B 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 48 hours.
****NELAC accreditation for Drinking Water. The NELAC definition for drinking water is "*Drinking water: any aqueous sample that has been designated as a potable or potential potable water source."* The entire Rio Grande, with the excpetion of segments 2301, 2308, 2011, and 2312 is designated as a potable water source. Data from the aforementioned segments will not be reported to the TCEQ.
References:U.S. Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020American 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.)TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2008 (RG-415).TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

TABLE A7.3 Measurement Performance Specifications for Alamo Analytical Laboratories, LTD.

Metals in Water

Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
IRON, TOTAL (UG/L AS FE)	µg/L	water	EPA 200.7, 6010	01045	300	100	70-130	20	80-120	Alamo
MANGANESE, TOTAL (UG/L AS MN)	µg/L	water	EPA 200.7, 6010	01055	50	50	70-130	20	80-120	Alamo
SELENIUM, TOTAL (UG/L AS SE)	ug/L	water	EPA 200.7, 6010	01147	2	2	70-130	20	80-120	Alamo
MERCURY, TOTAL, WATER, METHOD 1631 ug/L	ug/L	water	EPA 245.1	71960	0.006	0.006	70-130	20	80-120	Alamo

References:
U.S. 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, 20th Edition, 1998. (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 for Water, Sediment, and Tissue, 2008 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

TABLE A7.4 Measurement Performance Specifications for Alamo Analytical Laboratories, LTD.

Organics in Water

Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias % Rec. of LCS	Lab
1,4-DICHLOROBENZENE, TOTW (UG/L)	µg/L	water	EPA 624, 625, 8270	34571	38	5	65-135	30	65-135	Alamo
ACENAPHTHYLENE, TOTW (UG/L)	µg/L	water	EPA 625, 8270	34200	5	5	65-135	30	65-135	Alamo
BENZENE IN WTR SMPLE GC-MS, HEXADECONE EXTR.UG/L	µg/L	water	EPA 624, 8021, 8260	34030	2.5	2.5	65-135	30	65-135	Alamo
ETHYLBENZENE TOTWUG/L	µg/L	water	EPA 624, 8021, 8260	34371	NA	5	65-135	30	65-135	Alamo
FLUORANTHENE TOTWUG/L	µg/L	water	EPA 625, 8270	34376	3	3	65-135	30	65-135	Alamo
FLUORENE TOTWUG/L	µg/L	water	EPA 625, 8270	34381	5.5	5	65-135	30	65-135	Alamo
HEXACHLOROBUTADIENE TOTWUG/L	µg/L	water	EPA 8260, 8270	34391	1.5	1.5	65-135	30	65-135	Alamo
HEXACHLOROETHANE TOTWUG/L	µg/L	water	EPA 8260	34396	42	42	65-135	30	65-135	Alamo
NAPHTHALENE TOTWUG/L	µg/L	water	EPA 624, 625, 8260, 8270	34696	250	250	65-135	30	65-135	Alamo
TOLUENE IN WTR SMPLE GC-MS, HEXADECONE EXTR.UG/L	µg/L	water	EPA 624, 8021, 8260	34010	NA	5	65-135	30	65-135	Alamo
XYLENE WHL WATER SMPL (UG/L)	µg/L	water	EPA 624, 8021, 8260	81551	NA	15	65-135	30	65-135	Alamo

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, 20th Edition, 1998. (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 for Water, Sediment, and Tissue, 2008 (RG-415).
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TABLE A7.5 Measurement Performance Specifications for Alamo Analytical Laboratories, LTD. Organics in Sediment										
Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
2,4,5-T, BOTTOM DEPOSITS (UG/KG DRY SOLIDS)	µg/kg	sediment	EPA 8151	39741	NA	5	40-160	30	40-160	Alamo
2,4-D, BOTTOM DEPOSITS (UG/KG DRY SOLIDS)	µg/kg	sediment	EPA 8151	39731	NA	5	40-160	30	40-160	Alamo
ALDRIN, BOTTOM DEPOS. (UG/KG DRY SOLIDS)	µg/kg	sediment	EPA 8081	39333	40	40	40-160	30	40-160	Alamo
BENZENE DRY WTBOTUG/KG	µg/kg	sediment	EPA 8260	34237	22505	10	40-160	30	40-160	Alamo
BENZO-A-PYRENE DRY WTBOTUG/KG	µg/kg	sediment	EPA 8270	34250	725	200	40-160	30	40-160	Alamo
CHLORDANE(TECH MIX&METABS) SED,DRY WT,UG/KG	µg/kg	sediment	EPA 8081	39351	2.4	2	40-160	30	40-160	Alamo
DDD IN BOTTOM DEPOS. (UG/KGDRY SOLIDS)	µg/kg	sediment	EPA 8081	39363	3.91	3.5	40-160	30	40-160	Alamo
DDE IN BOTTOM DEPOS. (UG/KG DRY SOLIDS)	µg/kg	sediment	EPA 8081	39368	15.65	7	40-160	30	40-160	Alamo
DDT IN BOTTOM DEPOS. (UG/KG DRY SOLIDS)	µg/kg	sediment	EPA 8081	39373	23	3.5	40-160	30	40-160	Alamo
DIELDRIN IN BOTTOM DEPOS. (UG/KG DRY SOLIDS)	µg/kg	sediment	EPA 8081	39383	2.15	2	40-160	30	40-160	Alamo
ENDOSULFAN, ALPHA DRY WTBOTUG/KG	µg/kg	sediment	EPA 8081	34364	NA	5	40-160	30	40-160	Alamo
ENDRIN IN BOTTOM DEPOS. (UG/KG DRY SOLIDS)	µg/kg	sediment	EPA 8081	39393	103.5	50	40-160	30	40-160	Alamo
ETHYLBENZENE DRY WTBOTUG/KG	µg/kg	sediment	EPA 8260	34374	1965	10	40-160	30	40-160	Alamo
FLUORANTHENE DRY WTBOTUG/KG	µg/kg	sediment	EPA 8270	34379	1115	200	40-160	30	40-160	Alamo
FLUORENE DRY WTBOTUG/KG	µg/kg	sediment	EPA 8270	34384	268	200	40-160	30	40-160	Alamo
HEPTACHLOR IN BOT. DEP. (UG/KG DRY SOLIDS)	µg/kg	sediment	EPA 8081	39413	NA	3.5	40-160	30	40-160	Alamo
HEXACHLOROBENZENE IN BOT DEPOS (UG/KG DRY SOLIDS	µg/kg	sediment	EPA 8270	39701	120	50	40-160	30	40-160	Alamo
METHOXYCHLOR, BOTTOM DEPOSITS (UG/KG DRY SOL.)	µg/kg	sediment	EPA 8081	39481	NA	3.5	40-160	30	40-160	Alamo
NAPHTHALENE DRY WTBOTUG/KG	µg/kg	sediment	EPA 8270	34445	280.5	200	40-160	30	40-160	Alamo
PCBS, BOTTOM DEPOSITS (UG/KG DRY SOLIDS)	µg/kg	sediment	EPA 8082	39519	90	50	40-160	30	40-160	Alamo
SILVEX, BOTTOM DEPOSITS (UG/KG DRY SOLIDS)	µg/kg	sediment	EPA 8151	39761	NA	5	40-160	30	40-160	Alamo

TOLUENE DRY WTBOTUG/KG	µg/kg	sediment	EPA 8260	34483	2830	10	40-160	30	40-160	Alamo
XYLENE SEDIMENT, DRY WT (UG/KG)	µg/kg	sediment	EPA 8021, 8260	45510	NA	10	40-160	30	40-160	Alamo

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, 20th Edition, 1998. (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 for Water, Sediment, and Tissue, 2008 (RG-415).TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

TABLE A7.6 Measurement Performance Specifications for Alamo Analytical Laboratories, LTD.

Metals in Sediment

Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
ARSENIC, BOTTOM DEPOSITS (MG/KG AS AS DRY WT)	mg/kg	sediment	EPA 6010	01003	16.5	5	60-140	30	60-140	Alamo
BARIUM, BOTTOM DEPOSITS (MG/KG AS BA DRY WT)	mg/kg	sediment	EPA 6010	01008	NA	2	60-140	30	60-140	Alamo
CADMIUM,TOTAL, BOTTOM DEPOSITS (MG/KG,DRY WT)	mg/kg	sediment	EPA 6010	01028	2.49	1	60-140	30	60-140	Alamo
CHROMIUM,TOTAL, BOTTOM DEPOSITS (MG/KG,DRY WT	mg/kg	sediment	EPA 6010	01029	55.5	2	60-140	30	60-140	Alamo
COPPER, BOTTOM DEPOSITS (MG/KG AS CU DRY WT)	mg/kg	sediment	EPA 6010	01043	74.5	5	60-140	30	60-140	Alamo
LEAD, BOTTOM DEPOSITS (MG/KG AS PB DRY WT)	mg/kg	sediment	EPA 6010	01052	64	5	60-140	30	60-140	Alamo
NICKEL, TOTAL, BOTTOM DEPOSITS (MG/KG,DRY WT)	mg/kg	sediment	EPA 6010	01068	24.3	5	60-140	30	60-140	Alamo
ZINC, BOTTOM DEPOSITS (MG/KG AS ZN DRY WT)	mg/kg	sediment	EPA 6010	01093	205	5	60-140	30	60-140	Alamo
ALUMINUM, BOTTOM DEPOSITS (MG/KG AS AL DRY WT	mg/kg	sediment	EPA 6010	01108	NA	10	60-140	30	60-140	Alamo
MERCURY,TOT. IN BOT. DEPOS. (MG/KG) AS HG DRY WG	mg/kg	sediment	EPA 7470, 7471	71921	0.355	0.355	60-140	30	60-140	Alamo

*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, 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.), TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2008 (RG-415).TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

TABLE A7.7 Measurement Performance Specifications for BPUB										
Conventional and Bacteriological Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	EPA 160.2	00530	4	2	NA	NA	NA	BPUB
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.3	00610	0.1	0.1	70-130	20	80-120	BPUB
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-B***	31699	1	1	NA	0.50**	NA	BPUB
BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C	mg/L	water	SM 5210B	00310	2	2	NA	NA	NA	BPUB
RESIDUE, VOLATILE NONFILTRABLE (MG/L)	mg/L	water	EPA 160.4	00535	4	2	NA	NA	NA	BPUB
ENTEROCOCCI, ENTEROLERT, IDEXX, (MPN/100 ML)	MPN/100 mL	water	Enterolert	31701	1	1	NA	0.50**	NA	BPUB
RESIDUE,TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540C	70300	10	10	NA	20	80-120	BPUB

** 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 SM 9223-B 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 48 hours.

References:
Quality Control Lab documents from Brownsville PUB and NELAP certification.
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, 20th Edition, 1998. (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 for Water, Sediment, and Tissue, 2008 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

TABLE A7.8 Measurement Performance Specifications for City of Laredo Health Department Lab										
Field and Lab Parameters										
Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B, TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE,FIELD (uS/CM @ 25C)	us/cm	water	EPA 120.1, TCEQ SOP, V1	00094	NA*	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPL	NU	other	TCEQ SOP V1	89835	NA*	NA	NA	NA	NA	Field
STREAM WIDTH (M)	meters	water	TCEQ SOP V1	89861	NA*	NA	NA	NA	NA	Field
WIND INTENSITY 1=CALM,2=SLIGHT,3=MOD.,4=STRONG	NU	other	NA	89965	NA*	NA	NA	NA	NA	Field
WIND DIRECTION (1=North, 2=South, 3=East, 4=West, 5=NE, 6=SE, 7=NW, 8=SW)	NU	other	NA	89010	NA*	NA	NA	NA	NA	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN, 5=OTHER)	NU	other	NA	89966	NA	NA	NA	NA	NA	Field
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-B***	31699	1	1	NA	0.50**	NA	Laredo
FECAL COLIFORM,MEMBR FILTER,M-FC BROTH, #/100ML	#/100ML	water	SM 9222-D	31616	1	1	NA	0.50**	NA	Laredo

*Reporting to be consistent with SWQM guidance and based on measurement capability.
** 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 SM 9223-B 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 48 hours.
References: Quality Control lab documents from City of Laredo Health Department Laboratory and NELAP certification.
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, 20th Edition, 1998. (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 for Water, Sediment, and Tissue, 2008 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

TABLE A7.9 Measurement Performance Specifications for El Paso Water Utilities Laboratory Conventional and Bacteriological Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
TURBIDITY,LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	SM 2130B	82079	0.5	0.1	NA	NA	NA	EPWU
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-B***	31699	1	1	NA	0.50**	NA	EPWU
BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C	mg/L	water	SM 5210B	00310	2	2	NA	NA	NA	EPWU
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	ug/L	water	EPA 446.0	32211	3	3	NA	20	80-120	EPWU

** 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 SM 9223-B 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 48 hours.

References:
Quality Control lab documents from El Paso Water Utilities International Water Quality Laboratory and NELAP certification.
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, 20th Edition, 1998. (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 for Water, Sediment, and Tissue, 2008 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

USIBWC CLEAN RIVERS PROGRAM

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,
- systematic, regularly-scheduled short-term monitoring to screen water bodies for issues,
- permit support monitoring to provide information for setting permit effluent limits, and
- special study, intensive monitoring targeted to:
- identify sources and causes of pollution,
- assess priority water quality issues,
- obtain background water quality information,
- provide information for setting site-specific permit effluent limits, and
- evaluate statewide, regional, and site-specific water quality standards.

Task Description: The study area encompasses the Rio Grande 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.

Monitoring Description - The USIBWC and 20 partner agencies collect water quality data at 53 stations throughout the basin.

The lab analysis for the parameter groups that will be collected include:

- 43 stations monthly for field, conventionals, bacteria, and flow (when possible);
- 17 of the stations will also be collected once for organics in sediment;
- 7 of the stations will also be collected for metals in water; and
- 10 stations monthly for field and bacteria only.

NOTE: Certain lab analysis for 32 of the stations listed above will be paid for outside of this contract, either through funds from IBWC or in-kind services provided by partnering laboratories. Data from all 53 stations are included in the USIBWC QAPP.

In FY 2013 USIBWC will monitor at a similar level of effort as in FY 2012. The actual number of sites, location, frequency, and parameters collected for FY 2013 will be based on priorities identified at the Basin Advisory Committee Meetings and Coordinated Monitoring Meetings and included in the amended Appendix B schedule of the QAPP.

Additional details concerning the monitoring activities conducted by USIBWC are outlined in the USIBWC QAPP. In general USIBWC and USIBWC partners all will follow the guidelines prescribed in the USIBWC QAPP, the TCEQ *Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue (RG-415)* and the TCEQ *Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data (RG-416).*

Coordinated Monitoring Meeting - The USIBWC will hold annual coordinated monitoring meetings. USIBWC has traditionally held CMMs for the Upper, Middle and Lower Rio Grande Sub-Basins and a fourth for the Pecos River Sub-Basin. 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. 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 that occur during the course of the year will be entered into the statewide database on the Internet and communicated to meeting attendees.

Progress Report - Each Progress Report will indicate the number of sampling events and the types of monitoring conducted in the quarter, to include all types of monitoring.

Special Studies - Status reports of each special study will describe activities during the quarter. The status reports will be submitted along with the Progress Report. To help keep the public and basin stakeholders informed, the Web site will be updated in a timely manner to include key elements of Special Studies' Reports or Summaries (e.g., status reports, executive summary, maps, data analysis). USIBWC is working with various entities in Laredo to address bacteria in the Laredo area of Segment 2304. The planning as well as much of the field work took place in FY11. The completion of the Laredo Bacteria Special Study and its final report will be completed in this biennium.

Deliverables & Dues Dates:

September 1, 2011 through August 31, 2012

A. Conduct water quality monitoring, summarize activities, and submit with Progress Report - December 30, 2011; March 30 and June 30, 2012
B. Coordinated Monitoring Meeting - between March 15 and April 30, 2012
C. Coordinated Monitoring Meeting Summary of Changes - May 15, 2012
D. Email notification that Coordinated Monitoring Schedule updates are complete - May 31, 2012
E. Special Study - Status Reports - December 30, 2011; March 30 and June 30, 2012
F. Special Study - Draft Report – July 15, 2012
G. Special Study - Final Report – August 31, 2012
H. Special Study - post Final Report to Web – August 31, 2012

September 1, 2012 through August 31, 2013

A. Conduct water quality monitoring, summarize activities, and submit with Progress Report - September 30 and December 30, 2012; March 30 and June 30 and August 31, 2013
B. Coordinated Monitoring Meeting - between March 15 and April 30, 2013
C. Coordinated Monitoring Meeting Summary of Changes – May 15, 2013
D. Email notification that Coordinated Monitoring Schedule updates are complete - May 31, 2013
E. Special Study - Status Reports - September 30 and December 30, 2012; March 30 and June 30, 2013

Appendix B Sampling Process Design and Monitoring Schedule (plan)

Sample Design Rationale FY 2012

The sample design is based on the legislative intent of the Clean Rivers Program. 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 advisory 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 advisory committee process, the USIBWC 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 are changes made from FY 2011 monitoring:

Lower:

- Deleted Station 20696. Added Station 21012 (at CAMS 792) with a frequency of 4.
- Changed 20698 frequency from 3 to 4.
- 16288 is now being monitoring by SP instead of UB
- Entero analysis added to Stations 16288 and 13176.

Middle:

- Reduced the frequency of Station 13560 for Collecting Entity IB to 4 and added new station at Eagle Pass 20997 with frequency 4.
- Added metals in sediment to new Eagle Pass Station 20997.
- Deleted Station 18792 with CE of IB and added Station 20999 (new station upstream of Kickapoo Casino at the BP boat ramp), frequency 8.
- Removed Stations 15816 and 13196 completely for security reasons.
- Removed Station 13717.

Upper:

- Removed Station 15795 (IB and FO) and 13232 (FO) due to security. 16272 has been removed for IB but remains for FO.
- Added Station 15089, sampling frequency 2, UE.
- Added Station 13274 with quarterly field plus bacteria.
- Reduced PW frequency at Stations 18441 and 16862 to 4 instead of 6.
- Added Stations 20625, 20626, 20632, 20623, 13224, 13225, 13226, 20619, 20629, 20631, 20628, 13722, 13223, in Segment 2306 and Stations 20627, 20630, and 20624 in Segment 2305, sampling entity BB, frequency 1, field data only.
- Added Total Mercury to 18841, 13228, 13229, 13230, 16730, 16862, 17407, 15704, 20648, frequency 2.
- Removed metals from SWQM QAPP at 15704, 17040, and 13272.

Site Selection Criteria

This data collection effort involves monitoring routine water quality, using procedures that are consistent with the TCEQ SWQM program, for the purpose of data entry into the SWQMIS database maintained by the TCEQ. To this end, some general guidelines are followed when selecting sampling sites, as basically outlined below, and discussed thoroughly in the TCEQ Surface Water Quality Monitoring Procedures, Volume 1 (RG-415). 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.

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 few sites are available for a stream segment, choose one that would best represent the water body, and not an unusual condition or contaminant source. 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. Routine 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 routine monitoring site that adequately characterizes the water body, and should be coordinated with the TCEQ or other qualified monitoring entities reporting routine data to TCEQ.

6. Routine 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

Monitoring Tables for fiscal year 2012 are presented on the following page.

Monitoring Sites for FY 2012

The sample design for surface water quality monitoring is shown in Table B1.1 below. Terminology and field descriptions are included in the *SWQM Data Management Reference Guide*, January 2010 or most recent version. **Schedule downloaded at http://cms.lcra.org.**

Table 15: B1.1 Sample Design and Schedule, FY 2012

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
RIO GRANDE AT SABAL PALM SANCTUARY AT NORTHEAST BOUNDARY OFF PARK ROAD APPROX 1MI SOUTH OF FM1419 NEAR PALM GROVE	16288	2301	23	15	IB	SP	RT	4	4	4													entero bacteria analyzed by BPUB. Conventionals by IBWC lab.
RIO GRANDE TIDAL AT SH 4 NEAR BOCA CHICA	13176	2301	23	15	IB	UB	RT	4	4	4													
OLD RIO GRANDE MEANDER LA PARIDO BANCO NUMBER 144 BOAT RAMP IN BENTSEN RIO GRANDE STATE PARK 787 METERS WEST AND 780 METERS SOUTH FROM THE INTERSECTION OF MILITARY ROAD AND FM 2062/SOUTH BENTSEN PALM DRIVE/BENTSEN STATE PARK ROAD 43/ BENTSEN PALM DRIVE /B	20698	2302	23	15	IB	UF	RT	4	4	4													

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
RIO GRANDE 0.5 MI DOWNSTREAM ANZALDUAS DAM 12.2 MI FROM HIDALGO	13664	2302	23	15	IB	IB	RT	8	8	8	8												
RIO GRANDE 200M UPSTREAM OF PHARR INTERNATIONAL BRIDGE/US281	15808	2302	23	15	IB	IB	RT	8	8	8	8												
RIO GRANDE AT FM 886 NEAR LOS EBANOS	13184	2302	23	15	IB	IB	RT	7	7	7	7												
RIO GRANDE AT FORT RINGGOLD 1 MI DOWNSTREAM OF RIO GRANDE CITY	13185	2302	23	15	IB	IB	RT	12	12	12	12								1				
RIO GRANDE DOWNSTREAM RIO ALAMO NEAR FRONTON	13186	2302	23	15	IB	IB	RT	8	8	8	8												
RIO GRANDE EL JARDIN PUMP STATION AT LOW WATER DAM 140 M DOWNSTREAM INTAKE	13177	2302	23	15	IB	IB	RT	8	8	8	8								1				
RIO GRANDE INTERNATIONAL BRIDGE AT US 281 AT HIDALGO	13181	2302	23	15	IB	IB	RT	8	8	8	8								1				
RIO GRANDE INTERNATIONAL BRIDGE ON US 77 AT BROWNSVILLE	13178	2302	23	15	IB	UB	RT	4	4	4									1				

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
RIO GRANDE NEAR RIVER BEND BOAT RAMP APPROXIMATELY 5 MI WEST OF BROWNSVILLE ON US 281	13179	2302	23	15	IB	UB	RT	4	4	4									1				
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	20449	2302	23	15	IB	BO	RT		12	12													E. coli and limited conventionals
RIO GRANDE RIVER OFF SHUERBACH ROAD / AIRFIELD ROAD 1.2 KILOMETERS SOUTH AND 70 METERS EAST FROM THE INTERSECTION OF SHUERBACH ROAD AND MILITARY ROAD SOUTH OF MISSION CAMS 792	21012	2302	23	15	IB	FW	RT	4	4	4													replaces 20696
ARROYO LOS OLMOS BRIDGE ON US 83 SOUTH OF RIO GRANDE CITY	13103	2302A	23	15	IB	IB	BF	3	3	3													Bacteria nitrates and field collected when flowing

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
FALCON LAKE AT INTERNATIONAL BOUNDARY MONUMENT I	13189	2303	23	16	IB	IB	RT	4	4	4													
FALCON RESERVOIR AT SAN YGNACIO WTP INTAKE WEST OF US 83 INTERSECTION WITH FM 3169	15818	2303	23	16	IB	RN	RT	2	2	2													
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	20650	2304	23	16	IB	LA	RT	12		12													ecoli and fecal
RIO GRANDE 12.8 MI DOWNSTREAM AMISTAD DAM NEAR GAGE 340 M UPSTREAM OF US 277 BRIDGE IN DEL RIO	13208	2304	23	16	IB	IB	RT	2	2	2	2												
RIO GRANDE 4.5 MI DOWNSTREAM OF DEL RIO AT MOODY RANCH	13560	2304	23	16	IB	IB	RT	4	4	4	4								1				frequency reduced FY12 to add another station in Eagle Pass (20997)

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
RIO GRANDE 50 YD UPSTREAM OF CONFLUENCE OF ZACATA CREEK AND RIO GRANDE	13200	2304	23	16	IB	LA	RT	12		12													site used to be reported as 13201 but site is still same - Azteca park
RIO GRANDE AT APACHE RANCH WEST OF INTERSECTION OF PRIVATE ROAD AND EASTERN AIRSTRIP NO BETWEEN LARADO AND EAGLE PASS	17596	2304	23	16	IB	IB	RT	4	4	4	4												
RIO GRANDE AT INTERNATIONAL BRIDGE #2/EAST BRIDGE IN LAREDO	15814	2304	23	16	IB	LA	RT	12		12	12												E. coli and FC; flow from IBWC gage; field data
RIO GRANDE AT INTERNATIONAL BRIDGE #2/EAST BRIDGE IN LAREDO	15814	2304	23	16	IB	RN	RT	4	4	4	4								1				
RIO GRANDE AT KICKAPOO CASINO BOAT RAMP SOUTH OF EAGLE PASS	20999	2304	23	16	IB	IB	RT	8	8	8	8								1				replaces 18795 and 18792
RIO GRANDE AT MAIN STREET BOAT RAMP APPROX 400 METERS UPSTREAM OF US 57/INTERNATIONAL BRIDGE IN EAGLE PASS	20997	2304	23	16	IB	IB	RT	4	4	4	4							2					new station FY12 to fill data gap in AU 2304_08

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
RIO GRANDE AT MASTERSON RD IN LAREDO 9.9KM DWNSTR INTL BRIDGE #1/WEST BRIDGE DWNSTR SOUTHSIDE WWTP AND UPSTREAM NUEVO LAREDO WWTP	15815	2304	23	16	IB	LA	RT	12		12													ecoli and fecal coliform, and field data
RIO GRANDE AT THE COLOMBIA BRIDGE 2.7KM UPSTREAM OF THE DOLORES PUMP STATION 45.1KM UPSTREAM OF THE LAREDO WTP INTAKE	15839	2304	23	16	IB	LA	RT	12		12	12												E. coli and FC; flow from IBWC gage; field data
RIO GRANDE AT WEBB/ZAPATA COUNTY LINE	15817	2304	23	16	IB	RN	RT	12	12	12	12								1				
RIO GRANDE AT WORLD TRADE BRIDGE ON FM 3484	17410	2304	23	16	IB	RN	RT	4	4	4	4								1				
RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE	13202	2304	23	16	IB	LA	RT	12		12													E. coli and FC, and field
RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE	13202	2304	23	16	IB	RN	RT	4	4	4	4												

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
MANADAS CREEK AT FM 1472 NORTH OF LAREDO	13116	2304B	23	16	IB	LE	RT	4	4	4								4	1				Also collecting metals in water, lab-filtered not field filtered. therefore not submitted to SWQMIS but available on IBWC website.
RIO GRANDE 1.04 KILOMETERS EAST AND 367 METERS SOUTH FROM THE SOUTH END OF FOSTERS RANCH ROAD IN VAL VERDE COUNTY	20627	2305	23	16	IB	BB	RT	1															field data collected at least once a year by canoe
RIO GRANDE 1.35 KILOMETERS DOWNSTREAM FROM LANGTRY CREEK AND PUMP CANYON AND 870 METERS EAST AND 350 METERS SOUTH FROM THE INTERSECTION OF STATE PARK ROAD 25 AND TORRES AVENUE IN VAL VERDE COUNTY	20630	2305	23	16	IB	BB	RT	1															field data collected at least once a year by canoe
RIO GRANDE 3.03 KILOMETERS UPSTREAM OF RATTLESNAKE CANYON SOUTHWEST OF LANGTRY	20624	2305	23	16	IB	BB	RT	1															field data collected at least once a year by canoe

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
RIO GRANDE 1.3 KILOMETERS DOWNSTREAM OF BEAR CANYON AND APPROXIMATELY 9.3 KILOMETERS DOWNSTREAM OF COOK CREEK IN TERRELL COUNTY	20628	2306	23	7	IB	BB	RT	1															field data collected at least once a year by canoe
RIO GRANDE 1.895 KILOMETERS SOUTH AND 552 METERS WEST FROM THE INTERSECTION OF UNNAMED STREET AND FOSTER RANCH ROAD AND 10.1021 KILOMETERS SOUTH AND 4.37 KILOMETERS WEST FROM THE INTERSECTION OF US HIGHWAY 90 AND FOSTERS RANCH ROAD IN VAL VERDE COUNTY CAM	13223	2306	23	16	IB	BB	RT	1															field data will be reported at least once in the year.
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	13229	2306	23	6	IB	IB	RT	8	8	8	8					2			1				Metals - Total Mercury sampled FY12

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
RIO GRANDE 50 METERS UPSTREAM OF SILBER CANYON SOUTH OF SANDERSON IN BREWSTER COUNTY	20625	2306	23	6	IB	BB	RT	1															field data collected at least once a year by canoe
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	20629	2306	23	7	IB	BB	RT	1															field data collected at least once a year by canoe
RIO GRANDE 7.5 KILOMETERS UPSTREAM FROM THE CONFLUENCE WITH SAN FRANCISCO CREEK IN BREWSTER COUNTY	20632	2306	23	6	IB	BB	RT	1															field data collected at least once a year by canoe
RIO GRANDE AT BOAT RAMP AT RIO GRANDE VILLAGE IN BIG BEND NATIONAL PARK	16730	2306	23	6	IB	BB	RT	8	8	8	8					2							Metals - Total Mercury sampled FY12
RIO GRANDE AT BOQUILLAS CROSSING IN BIG BEND NATIONAL PARK	20619	2306	23	6	IB	BB	RT	1															field data collected at least once a year by canoe
RIO GRANDE AT FM 2627/GERSTACKER BRIDGE DOWNSTREAM BIG BEND	13225	2306	23	6	IB	BB	RT	1															field data will be reported at least once in the year

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
RIO GRANDE AT HORSE CANYON 2.4 MI DOWNSTREAM OF GERSTACKER BRIDGE	13224	2306	23	6	IB	BB	RT	1															field data will be reported at least once in the year
RIO GRANDE AT LAJITAS RESORT/FM 170 BOAT RAMP 240 M UPSTREAM OF BLACK HILLS CREEK CONFLUENCE NEAR LAJITAS	18441	2306	23	6	IB	PW	RT	4	4	4						2							Metals - Total Mercury sampled FY12
RIO GRANDE AT PRESIDIO RAILROAD BRIDGE 3.25KM DOWNSTREAM OF US67 SOUTH OF PRESIDIO	17000	2306	23	6	IB	IB	RT	8		8	8												
RIO GRANDE AT PRESIDIO/OJINAGA TOLL BRIDGE/INTERNATIONAL 0.75KM DOWNSTREAM OF US67 IN PRESIDIO	17001	2306	23	6	IB	IB	RT	8		8	8												
RIO GRANDE AT STILLWELL CROSSING	13226	2306	23	6	IB	BB	RT	1															field data collected by canoe at least once a year.
RIO GRANDE AT TAYLORS FARM SOUTHWEST OF SANDERSON	20623	2306	23	6	IB	BB	RT	1															field data collected at least once a year by canoe

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
RIO GRANDE AT THE CONFLUENCE WITH INDIAN CREEK IN TERRELL COUNTY	20631	2306	23	7	IB	BB	RT	1															field data collected at least once a year by canoe
RIO GRANDE AT THE MOUTH OF SANTA ELENA CANYON	13228	2306	23	6	IB	BB	RT	8	8	8	8					2							Metals - Total Mercury sampled FY12
RIO GRANDE DOWNSTREAM OF RODEO RAPIDS SOUTH OF SANDERSON IN BREWSTER COUNTY	20626	2306	23	6	IB	BB	RT	1															field data collected at least once a year by canoe
RIO GRANDE IMMEDIATELY DOWNSTREAM FROM MOUTH OF LOZIER CANYON 44 KM SE OF DRYDEN	13722	2306	23	7	IB	BB	RT	1															field data collected at least once a year by canoe
RIO GRANDE RIVER AT COLORADO CANYON APPROX 30KM SE OF REDFORD ON RR170 IN PRESIDIO COUNTY	16862	2306	23	6	IB	PW	RT	4	4	4						2							Metals - Total Mercury sampled FY12; sampling frequency reduced to quarterly

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
RIO GRANDE 1.47 KILOMETERS UPSTREAM OF THE CONFLUENCE WITH GREEN RIVER AT INDIO MOUNTAINS RESEARCH STATION	20648	2307	23	6	IB	UE	RT	4	4	4						2							extremely remote site 48hr HT parameters bacteria BOD chloropheo will not be reported. Metals - Total Mercury added FY12
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	13230	2307	23	6	IB	IB	RT	8	8	8	8					2							Metals - Total Mercury sampled FY12
RIO GRANDE AT GUADALUPE POINT OF ENTRY BRIDGE AT FM 1109 WEST OF TORNILLO	15704	2307	23	6	IB	UE	RT	4	4	4	4					2			1				Metals - Total Mercury collected FY12

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
RIO GRANDE UPSTREAM OF CANDELARIA 0.5 KM UPSTREAM OF CAPOTE CREEK CONFLUENCE	17407	2307	23	6	IB	SL	RT	4	4							2							no 48 hour parameters (BOD, chloro/pheo, or bacteria) due to remoteness of site. Metals - Total Mercury sampled FY12
RIO GRANDE 1.3 KM DOWNSTREAM FROM HASKELL ST WWTP OUTFALL	15528	2308	23	6	IB	IB	RT	12	12	12	12												partial conventional analysis
RIO GRANDE 2.4 KM UPSTREAM FROM HASKELL ST WWTP OUTFALL SOUTH OF BOWIE HIGH SCHOOL FOOTBALL STADIUM IN EL PASO	15529	2308	23	6	IB	IB	RT	12	12	12	12												partial conventional analysis
RIO GRANDE AT RIVERSIDE CANAL 1.8 KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE	14465	2308	23	16	IB	IB	RT	12	12	12	12												partial conventional analysis

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
KOKERNOT SPRINGS 105 METERS SOUTH 20 METERS EAST FROM THE INTERSECTION OF ALPINE CREEK AND HENDRYX DRIVE/HARRISON STREET/SH 223 AND 40 METERS EAST OF THE KOKERNOT LODGE ON SUL ROSS UNIVERSITY CAMPUS IN ALPINE	20558	2311	23	6	IB	SL	RT	4	4	4							2		2				
RIO GRANDE 40M SOUTH OF VINTON BRIDGE APPROXIMATELY 4 KM S OF ANTHONY	13275	2314	23	6	IB	IB	RT	4	4	4									1				in support of Paso del Norte Watershed Councils 319h grant
RIO GRANDE AT ANAPRA BRIDGE ON SUNLAND PARK DRIVE 4.2 KM UPSTREAM OF AMERICAN DAM IN NEW MEXICO	17040	2314	23	6	IB	EP	RT	4	4	4													
RIO GRANDE AT COURCHESNE BRIDGE 1.7 MI UPSTREAM FROM AMERICAN DAM CAMS 718	13272	2314	23	6	IB	IB	RT	12	12	12	12												partial conventional analysis. Additional non-accredited data available with IBWC for metals, organics, and other conventionals.

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bact	Flow	24hr DO	AqHab	Ben	Nek	Met Wat	Org. Wat	Met Sed	Org Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed	Comments
RIO GRANDE IMMED. UPSTREAM OF THE CONFL. WITH ANTHONY DRAIN EAST OF LA TUNA PRISON NEAR THE STATE LINE	13276	2314	23	6	IB	IB	RT	4	4	4													In support of Paso del Norte Watershed Councils 319h grant
RIO GRANDE RIVER AT AMERICAN EAGLE BRICK FACTORY BRIDGE ABANDONED RR 0.1 MI DOWNSTREAM FROM SOUTHERN PACIFIC RR AT SMELTERTOWN	15089	2314	23	6	IB	UE	RT	2		2													
RIO GRANDE AT BORDERLAND BRIDGE	13274	2314	23	6	IB	IB	RT	4		4													To address contact recreation public concerns

Critical vs. non-critical measurements

All data taken for CRP and entered into SWQMIS are considered critical.

Figure 4. Map of Upper Rio Grande Basin, Northern Half

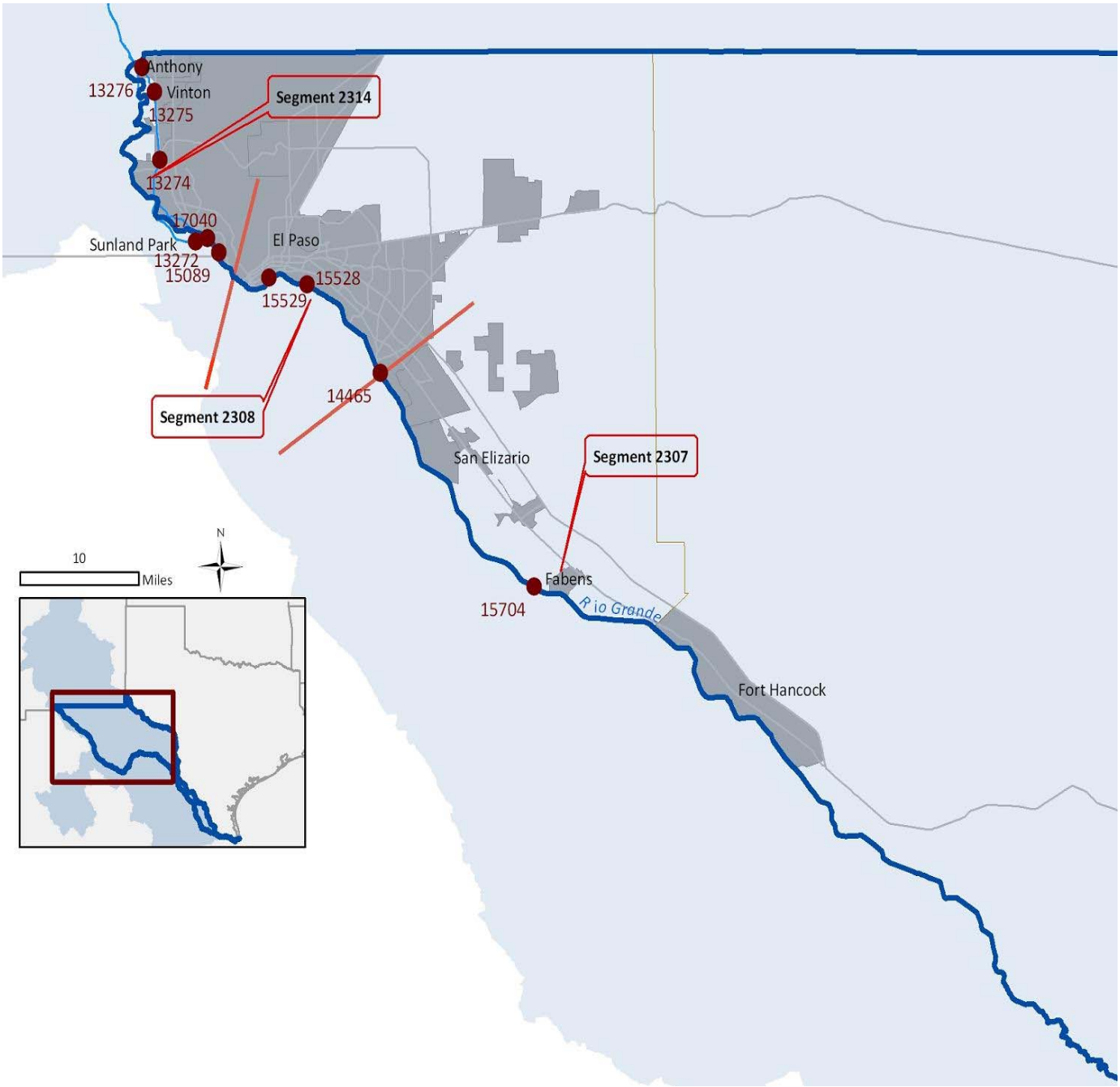


Figure 5. Map of Upper Rio Grande Basin, Southern Half

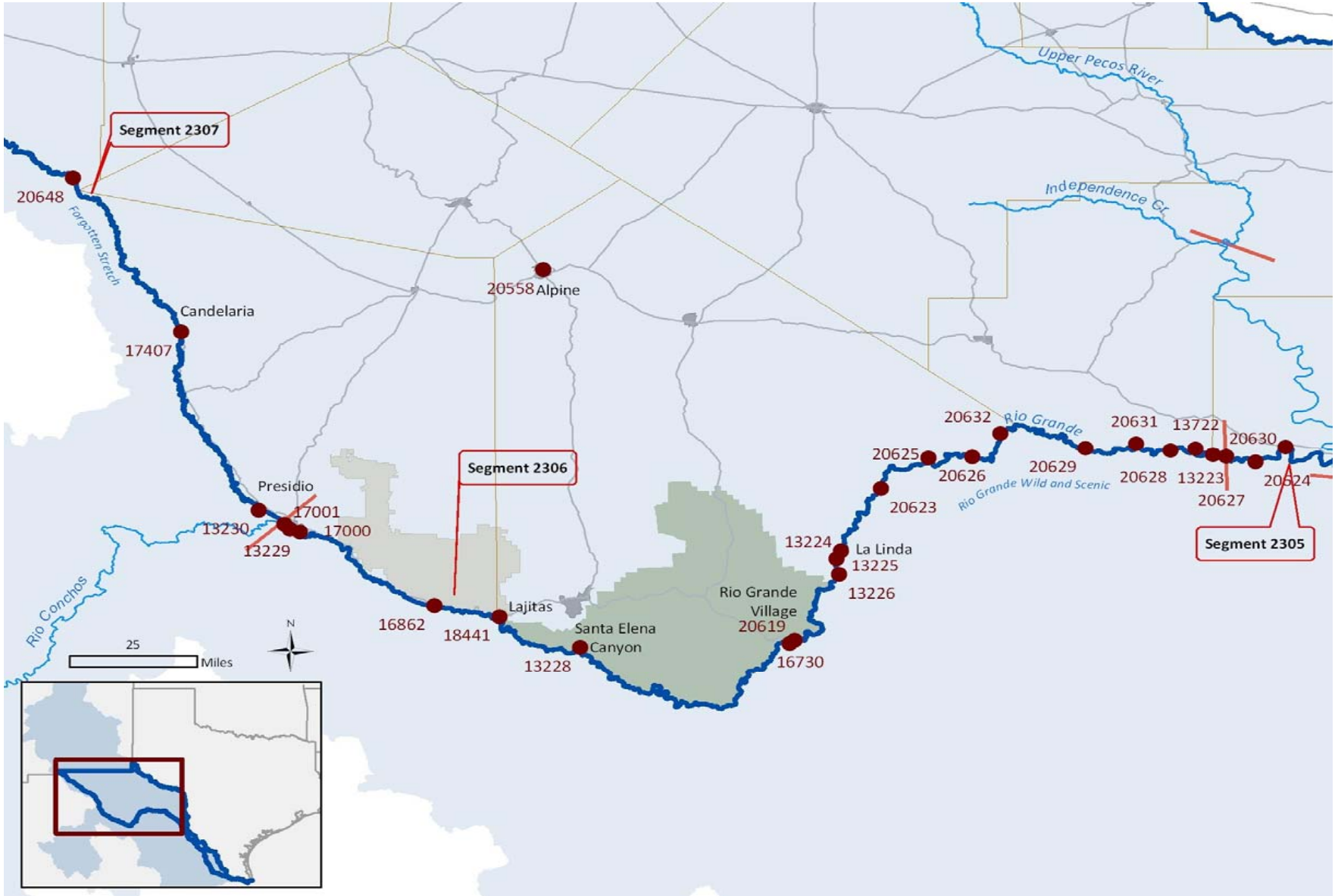


Figure 6. Map of Middle Rio Grande Basin

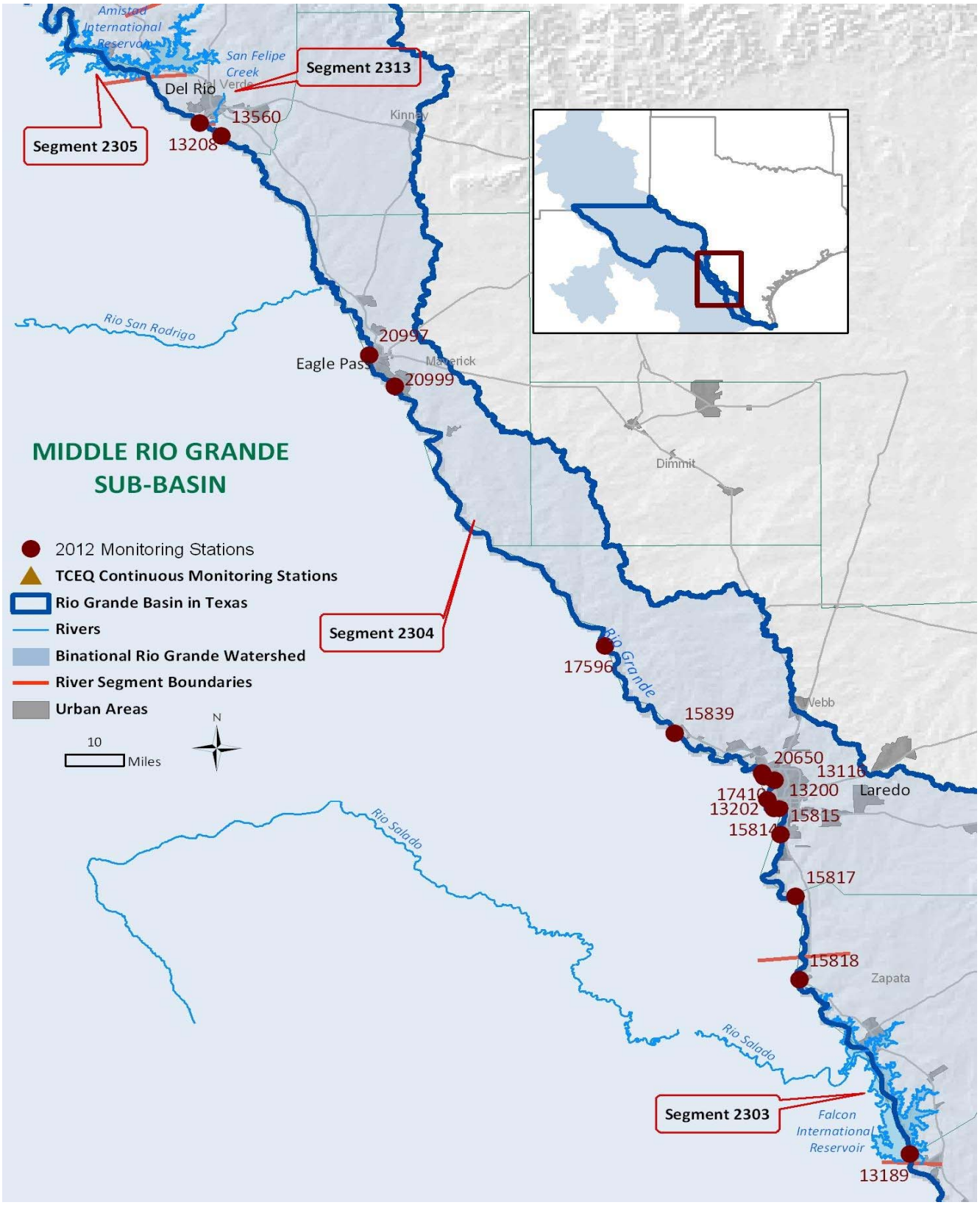
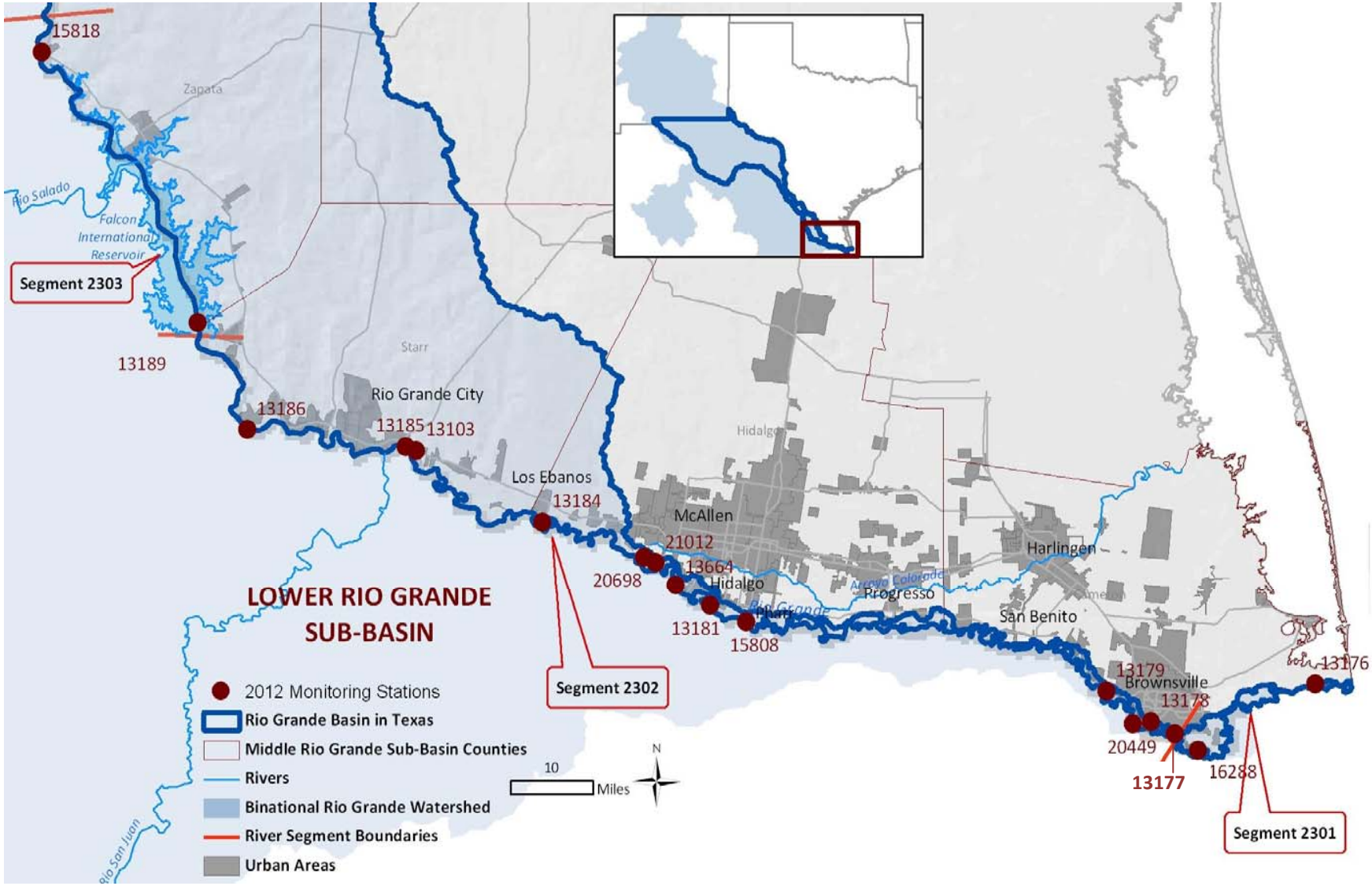


Figure 7. Map of Lower Rio Grande Basin



APPENDIX C:
FIELD DATA SHEETS

UNITED STATES INTERNATIONAL BOUNDARY AND WATER COMMISSION
TEXAS CLEAN RIVERS PROGRAM
RIO GRANDE BASIN
FIELD DATA REPORTING FORM

TAG#	SET #	COLLECTOR(printed)

TCEQ STATION ID	SEGMENT	SEQUENCE	SE	CE	MT
			I B		

Station Description_____

GRAB SAMPLE

DATE (M M D D Y Y Y Y)	TIME (H H M M)	DEPTH	M = meters

00010		WATER TEMP (deg C only)	89835		FLOW MEASUREMENT METHOD 1-Gage 2-Electric 3-Mechanical 4-Weir/flume 5-Doppler
00020		AIR TEMP (deg C only)	74069		ESTIMATED FLOW (cfs)
00400		pH (SU)	89861		STREAM WIDTH (meters)
00300		D.O. (mg/L)	82903		WATER DEPTH (meters)
00094		SPECIFIC CONDUCTANCE (uS/cm)	31616		FECAL COLIFORM (CFU/100 ml)
00078		SECCHI DISK (meters)	31699		E. coli (MPN/100 ml)
72053		DAYS SINCE LAST SIGNIFICANT PRECIPITATION	31704		E. Coli Holding Time (Hours)
01351		FLOW SEVERITY 1-no flow 2-low 3-normal 4-flood 5-high 6-dry	89966		WEATHER 1-clear 2-cloudy 3-overcast 4-rain
			89965		WIND INTENSITY 1-calm 2-slight 3-moderate 4-strong
00061		INSTANTANEOUS FLOW (cfs)	89010		WIND DIRECTION 1-north 2-south 3-east 4-west 5-NE 6-SE 7-NW 8-SW

Measurement Comments and Field Observations:

_____

_____

_____

_____

Signature of Collector: _____

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

FIELD DATA REPORTING FORM FOR SEDIMENT SAMPLES

TAG# (FOR CRP)

SET # (FOR CRP)

COLLECTOR(printed)

																I	B					R	T

TCEQ STATION ID | SEGMENT | SEQUENCE optional | SE | CE | MT

Station Description _____

COMPOSITE SAMPLE

B	COMPOSITE CATEGORY:	T = Time	S = Space (ie Depth)	B = Both	F = Flow Wight

															.			M	

M M D D Y Y Y Y — H H M M — . — M = meters

START DATE — START TIME — START DEPTH (SURFACE)

															.			M	

M M D D Y Y Y Y — H H M M — END DEPTH (DEPPEST) — M = meters

END DATE — END TIME

	Number of Grabs	#	#	COMPOSITE TYPE:	## = Number of Grabs in Composite — CN = Continuous

Measurement Comments and Field Observations:

_____

_____

_____

_____

Signature of Collector:_____

Rev. 03/15/10

Note: This form should be completed in addition to the water parameters field sheet when both water and sediment samples are collected.

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

FIELD DATA REPORTING FORM

B										
TAG#							SET #		COLLECTOR(printed)	

1	5	8	1	7	2	3	0	4						I	B	R	N	R	T
TCEQ STATION ID					SEGMENT				SEQUENCE					SE		CE		MT	

Station Description_____

GRAB SAMPLE

M	M	D	D	Y	Y	Y	Y	H	H	M	M		0	.	3	M			
DATE								TIME				DEPTH				M = meters			

00010		WATER TEMP (deg C only)	89835		FLOW MEASUREMENT METHOD 1-Gage 2-Electric 3-Mechanical 4-Weir/flume 5-Doppler
00020		AIR TEMP (deg C only)	74069		ESTIMATED FLOW (cfs)
00400		pH (SU)	89861		STREAM WIDTH (meters)
00300		D.O. (mg/L)	82903		WATER DEPTH (meters)
00094		SPECIFIC CONDUCTANCE (uS/cm)	31616		FECAL COLIFORM (CFU/100 ml)
00078		SECCHI DISK (meters)	31699		E. coli (MPN/100 ml)
72053		DAYS SINCE LAST SIGNIFICANT PRECIPITATION	89966		WEATHER 1-clear 2-cloudy 3-overcast 4-rain
01351		FLOW SEVERITY 1-no flow 2-low 3-normal 4-flood 5-high 6-dry	82078		Turbidity (NTU)
			89965		WIND INTENSITY 1-calm 2-slight 3-moderate 4-strong
00061		INSTANTANEOUS FLOW (cfs)	89010		WIND DIRECTION 1-north 2-south 3-east 4-west 5-NE 6-SE 7-NW 8-SW

Measurement Comments and Field Observations:

_____

_____

_____

_____

Signature of Collector: _____

Rev. 08/18/10

APPENDIX D:
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

							Alamo 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: _____H2O_____

CLIENT INFORMATION

(To be filled out by CRP partner)

Requested by: _USIBWC Clean Rivers Program_____

Sample TCEQ Station No.: _____

Sample Location Description:_____

_____

_____

Collected by: _____

Signature: _____

Segment/Sequence: _____

Collection Date: _____

Collection Time: _____

Conventionals			
Storet Code	Analyze if checked	Contract line no.	Parameter
70300	√		TDS, dried at 180 deg C (mg/L)
00530	√		TSS (mg/L)
00535	√		VSS (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) **
32218	√		Phaeophytin (ug/L)
32211	√		Chlorophyll-a (ug/L)
31699	√		Ecoli (MPN/100ml)
00625	√		TKN (mg/L)

Conventionals			
Storet Code	Analyze if checked	Contract line no.	Parameter
00929	√		Sodium (mg/L)
00916	√		Calcium (mg/L)
00927	√		Magnesium (mg/L)
00935	√		Potassium
00951	√		Fluoride (mg/L)
00630	√		Nitrate+Nitrite
00900	√		Total Hardness
00310	√		BOD (mg/L) **
00410	√		Total Alkalinity (mg/l)
			*All sample containers are provided
			with appropriate preservative.
			**Analyzed but not reported to TCEQ

Send samples to:	**Submit report to:**
Alamo Analytical Laboratories, LTD 10526 Gulfdale San Antonio, Texas 78216-3601 Ph. (210) 340-8121, Fax. (210) 340-8123	Texas Clean Rivers Program USIBWC 4171 N. Mesa, Suite C-100 El Paso, TX 79902

Non-compliance items should be addressed on an attached NCR by the lab. Rev. 09/10/10

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

							Alamo 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: _____

Organics in sediment			
Storet Code	Analyze if checked	Contract line no.	Parameter
39373	√		DDT (ug/kg)
39368	√		DDE (ug/kg)
39363	√		DDD (ug/kg)
39333	√		Aldrin (ug/kg)
39351	√		Chlordane (ug/kg)
39393	√		Endrin (ug/kg)
39413	√		Heptachlor (ug/kg)
39481	√		Methoxychlor (ug/kg)
39383	√		Dieldrin (ug/kg)
39701	√		Hexachlorobenzene (ug/kg)
39519	√		Total PCBs (ug/kg)
34364	√		Endosulfan I (ug/kg)
39731	√		2,4- D (ug/kg)

Storet Code	Analyze if checked	Contract line no.	Parameter
39741	√		2,4,5- T (ug/kg)
39761	√		Silvex (ug/kg)
34384	√		Fluorene (ug/kg)
34379	√		Fluoranthene (ug/kg)
34250	√		Benzo(a)pyrene (ug/kg)
34445	√		Napthalene (ug/kg)
34237	√		Benzene (ug/kg)
34483	√		Toluene (ug/kg)
34374	√		Ethylbenzene (ug/kg)
			*All sample containers are provided
			with appropriate preservative.

Send samples to:	**Submit report to:**
Alamo Analytical Laboratories, LTD 10526 Gulfdale San Antonio, Texas 78216-3601 Ph. (210) 340-8121, Fax. (210) 340-8123	Texas Clean Rivers Program USIBWC 4171 N. Mesa, Suite C-100 El Paso, TX 79902

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

Rev. 10/01/10

UNITED STATES INTERNATIONAL BOUNDARY AND WATER COMMISSION - TEXAS CLEAN RIVERS PROGRAM

RIO GRANDE BASIN PARTNER

WATER QUALITY CHAIN OF CUSTODY/REQUEST FOR ANALYSIS FORM

								Alamo 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: _____

Analysis Requested			
Storet Code	Analyze if checked	Contract line no.	Parameter
			Metals in sediment (EPA 6010)
01108	√		Aluminum
01098	√		Antimony
01003	√		Arsenic
01008	√		Barium
01028	√		Cadmium
01029	√		Chromium
01043	√		Copper
01052	√		Lead
01068	√		Nickel
01148	√		Selenium
01078	√		Silver
01093	√		Zinc
71921	√		Mercury (EPA 7471)

Send samples to:	**Submit report to:**
Alamo Analytical Laboratories, LTD 10526 Gulfdale San Antonio, Texas 78216-3601 Ph. (210) 340-8121, Fax. (210) 340-8123	Texas Clean Rivers Program USIBWC 4171 N. Mesa, Suite C-100 El Paso, TX 79902

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

Rev. 01/05/10

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

								Alamo 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: _____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: _____

Analysis Requested			
Storet Code	Analyze if checked	Contract line no.	Parameter
Organics **in water**			
34030	√		Benzene – EPA 624
34010	√		Toluene – EPA 624
34371	√		Ethylbenzene – EPA 624
34381	√		Fluorene – EPA 625
34376	√		Fluoranthene – EPA 625
34200	√		Acenaphthylene – EPA 625
34696	√		Napthalene – EPA 625
81551	√		Xylene- EPA 624
34571	√		1,4- Dichlorobenzene- EPA 625
34396	√		Hexachloroethane- EPA 8260
31391	√		Hexaclrorobutadiene- EPA 8260

Analysis Requested			
Storet Code	Analyze if checked	Contract line no.	Parameter
			*All sample containers are provided with appropriate preservative.

Send samples to:	**Submit report to:**
Alamo Analytical Laboratories, LTD 10526 Gulfdale San Antonio, Texas 78216-3601 Ph. (210) 340-8121, Fax. (210) 340-8123	Texas Clean Rivers Program USIBWC 4171 N. Mesa, Suite C-100 El Paso, TX 79902

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

Rev. 10/18/10

UNITED STATES INTERNATIONAL BOUNDARY AND WATER COMMISSION - TEXAS CLEAN RIVERS PROGRAM

RIO GRANDE BASIN PARTNER

WATER QUALITY CHAIN OF CUSTODY/REQUEST FOR ANALYSIS FORM

								Alamo 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: _____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: _____

Analysis Requested			
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)
00535	√		VSS (mg/L) **
00665	√		Total Phosphorus (mg/L as P)
00610	√		Ammonia (mg/L as N)
00956	√		Silica (mg/l) **
32218	√		Phaeophytin (ug/L)
32211	√		Chlorophyll-A (ug/L)
00410	√		Total Alkalinity (mg/l)
00929	√		Sodium (mg/L)
00916	√		Calcium (mg/L)
00625	√		TKN (mg/L)

Analysis Requested			
Storet Code	Analyze if checked	Contract line no.	Parameter
00927	√		Magnesium (mg/L)
00937	√		Potassium (mg/L)
00951	√		Fluoride (mg/L)
71870	√		Bromide
00680	√		TOC (mg/L as C) **
31699	√		Bacteria (ecoli)
00310	√		BOD (mg/L) **
			Total Metals (preserved)
01147			Selenium (ug/L)
01045			Iron (ug/L)
01055			Manganese (ug/L)
00900			Hardness (mg/L)

*All sample containers are provided with appropriate preservative.
** Parameters analyzed but not reported to TCEQ.

Send samples to:	**Submit report to:**
Alamo Analytical Laboratories, LTD 10526 Gulfdale San Antonio, Texas 78216-3601 Ph. (210) 340-8121, Fax. (210) 340-8123	Texas Clean Rivers Program USIBWC 4171 N. Mesa, Suite C-100 El Paso, TX 79902

Non-compliance items should be addressed on an attached NCR by the lab. Rev. 10/18/10

CITY OF LAREDO HEALTH DEPARTMENT
2600 CEDAR
LAREDO TEXAS 78044

Water Bacteriology
Custody Form

1. Name of person releasing the sample(s) under custody:

_____ _____
Signature Print Name

2. Date and time sample(s) under custody is released:

AM
PM

_____ _____
Date Time

3. Date sample(s) was/ were collected: _____

4. Name of person receiving the sample(s) under custody:

_____ _____
Signature Print Name

5. Condition of the sample(s) under custody:

_____

6. Name of person testing sample(s) under custody:

_____ _____
Signature Print Name

7. Date and Time sample(s) was/were tested: _____ _____
Date Time

8. Sample(s) Collection Sites:

Sites	Collected (Circle One)	Tested For:	
		Fecal Coliform/	E. Coli
1. Columbia	Yes/No	Yes/No	Yes/No
2. Father McNaboe	Yes/No	Yes/No	Yes/No
3. Jefferson Intake	Yes/No	Yes/No	Yes/No
4. Bridge II	Yes/No	Yes/No	Yes/No
5. La Azteca	Yes/No	Yes/No	Yes/No
6. Rio Bravo	Yes/No	Yes/No	Yes/No
7. Masterson Road	Yes/No	Yes/No	Yes/No
8. Quintero Property	Yes/No	Yes/No	Yes/No

Other Site (s):

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

								El Paso Water Utilities							
TAG#								LABORATORY							COC/LAB #

CHAIN OF CUSTODY

Released by (printed): _____

Signature: _____

Date/Time: _____

Received by (printed):_____

Signature:_____

Date/Time:_____

No. Of Containers:_____

Type of containers:_____

Preservative used:_____

Matrix Type:_____

CLIENT INFORMATION

Requested by:_____

Sample TCEQ Station No._____13272_____

Sample Location Description:___Rio Grande_____

_____at Courchesne Bridge_____

Collected by: _____

Signature:_____

Segment/Sequence:_____

Collection Date:_____

Collection Time: _____

Chemistry Conventionals		
00610	√	Ammonia-Nitrogen (mg/L)
00310	√	BOD (mg/L)
00900	√	Total Hardness (mg/L)
70300	√	TDS (mg/L)
82079	√	Turbidity (NTU)
00665	√	Total Phosphorus as P (mg/l)
32211	√	Chloropyll-a (ug/l)
32218	√	Pheophytin (ug/l)
00956	√	Silica (mg/l)
71870	√	Bromide (mg/l)
00940	√	Chloride
00671	√	Ortho-phosphate as P (mg/l)
00625	√	TKN (mg/L)
00620	√	Nitrate-Nitrogen (mg/l)
00615	√	Nitrite-Nitrogen (mg/l)
00951	√	Fluoride (mg/l)
00916	√	Calcium (mg/l)
00927	√	Magnesium (mg/l)
00935	√	Potassium (mg/l)
00929	√	Sodium (mg/l)
00945	√	Sulfate (mg/l)
00410	√	Total Alkalinity (mg/L)

Microbiology		
31616	√	Fecal Coliform, Membrane Filter, (CFU/100)
31699	√	E. Coli, IDEXX, (MPN/100)
Metals		
	√	Dissolved Metals (lab filtered, preserved) -Al, Ag, As, B, Ba, Be, Cd, Cr, Cu, Fe, Li, Mn, Ni, Pb, Se, Tl, Zn
Organics		
46491	√	MTBE
	√	SVOCs (MDNR Pesticides)
		*All sample containers are provided
		with appropriate preservative.

Please return to: Texas Clean Rivers Program
USIBWC
4171 N. Mesa, Suite C-100
El Paso, TX 79902

Rev. 12/08/08

BROWNSVILLE
PUBLIC UTILITIES BOARD

Analysis Request and Chain of Custody Record

Name: Brownsville Public Utilities Board
Address: 1385 PUB Dr. or P.O. Box 3270
City/St: Brownsville, Texas 78521
Contact: Lee Roy Atkinson

Project #: # 20449 | **Client/Project** | **Texas Clean Rivers Program**

Field ID	Field Identification	Date	Time	Grab	Composite	Sample Container And Volume	Sample Matrix	Preservative	Immediate Analysis	Analysis Requested: Ammonia, N	BOD	TDS	TSS / VSS	E. COLI				Laboratory Remarks
	Station # 20449			☒	☐	1/500ml	Water	H_2SO_4		X								
	Station # 20449			☒	☐	1/2000ml	Water	4° C			X							
	Station # 20449			☒	☐	1/250ml	Water	4° C				X						
	Station # 20449			☒	☐	1/2000ml	Water	4° C					X					
	Station # 20449			☒	☐	1/100ml	Water	$Na_2S_2O_3$						X				
				☐	☐													
				☐	☐													
				☐	☐													
				☐	☐													

Sampler Name and Signature:	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:
	Relinquished by: (Signature)	Date: Time:	Received by: Signature)	Date: Time:
	Relinquished by: (Signature)	Date: Time:	Received by: Signature)	Date: Time:
	Technician Comments:			

Remarks: **Submit report to**: Texas Clean Rivers Program
USIBWC
4171 N. Mesa, Suite C-100
El Paso, TX 79902

Lab Location: Analytical Laboratory
1385 PUB Dr.
P.O. Box 3270
Brownsville, Texas 78521

Laboratory No.
EPA -TX01425

TCEQ No.
T104704357-09-TX

Page: 1 of 1

APPENDIX E:
DATA REVIEW CHECKLIST AND SUMMARY

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	**✓, ✗, or N/A**
A. Are there any duplicate Tag Id numbers in the Events file?	
B. Do the Tag prefixes correctly represent the entity providing the data?	
C. Have any Tag Id numbers been used in previous data submissions?	
D. Are TCEQ station location (SLOC) numbers assigned?	
E. Are sampling Dates in the correct format, MM/DD/YYYY with leading zeros?	
F. Are sampling Times based on the 24 hr clock (e.g. 09:04) with leading zeros?	
G. Is the Comments field filled in where appropriate (e.g. unusual occurrence, sampling problems, unrepresentative of ambient water quality)?	
H. Are submitting Entity, Collecting Entity, and Monitoring Type codes used correctly?	
I. Do sampling dates in the Results file match those in the Events file for each Tag Id?	
J. Are values represented by a valid parameter code with the correct units?	
K. Are there any duplicate parameter codes for the same Tag Id?	
L. Are there any invalid symbols in the Greater Than/Less Than (GT/LT) field?	
M. Are there any Tag Ids in the Results file that are not in the Events file or vice versa?	
Data Quality Review	**✓, ✗, or N/A**
A. Are "less-than" values reported at the LOQ? If no, explain in Data Summary.	
B. Have the outliers been verified and a "1" placed in the Verify_flg field?	
C. 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?	
D. Have at least 10% of the data in the data set been reviewed against the field and laboratory data sheets?	
E. Are all parameter codes in the data set listed in the QAPP?	
F. Are all stations in the data set listed in the QAPP?	
Documentation Review	**✓, ✗, or N/A**
A. Are blank results acceptable as specified in the QAPP?	
B. Were control charts used to determine the acceptability of duplicates?	
C. Was documentation of any unusual occurrences that may affect water quality included in the Event files 's Comments field?	
D. 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.	
E. 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.	
F. Was the laboratory's NELAP Accreditation current for analysis conducted?	

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:_____

Comments
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).

Parameter	Tag Ids Affected	Type of Problem	Reason for Problem	Percent Loss*	Corrective Action (Y/N/SOP)
pH	XL12345	Post calibration	Equipment failure	4%	SOP
pH	XL12346	Post calibration	Forgot to write in log	4%	N
TKN	XL12351-XL12353	Laboratory analysis	LOQ Check Sample failed	10%	Y
TOC	XL12345-XL12350	Exceeded hold time	Sample received late in day and not set up next day.	10%	Y
Zinc	XL12365	Field equipment blank	Possible contamination	4%	N

* Percent Loss = # Data Points Lost / # Data Points Expected for that parameter in the data set.

ATTACHMENT 1: Adherence Letter

TO: (name)
(organization)

RE: FY2012-13 USIBWC CRP QAPP

This letter will summarize the understanding between the United States Section, International Boundary and Water Commission (USIBWC) Texas Clean Rivers Program (CRP) and the Partner on the surface water quality-monitoring program for the Rio Grande. Enclosed is a copy of the FY 2012 Rio Grande Basin Monitoring Program (RGBMP) Quality Assurance Project Plan (QAPP), which outlines the procedures and quality assurance requirements of the RGBMP. ***Please indicate your acceptance and adherence to the RGBMP QAPP by signing and returning the terms of agreement/endorsement (Attachment 1) at the bottom of this letter to the USIBWC.***

The following lists the responsibilities of Partner and USIBWC to fulfill this understanding:

Partner

1. Partner will collect water quality samples during the period of September 1, 2011 through August 31, 2012, as listed in the attached Monitoring Schedule. **(Attachment 2)**

2. Partner will perform the field data collection to include instantaneous flow and submit the results to the USIBWC CRP.

3. For each water sample designated for conventional analysis, including duplicates, Partner will complete and attach to each shipment a Chain of Custody Form and submit to the USIBWC contract laboratory for analysis. Partner will submit the Field Data Reporting Forms to the USIBWC.

4. Partner will follow the procedures for sampling as described in the Surface Water Quality Procedures Manual, TCEQ, October 2008 or subsequent editions, the RGBMP QAPP and the USIBWC CRP SOP for YSI 556 Calibration and Maintenance.

5. Partner will notify the USIBWC CRP staff of any problems with the monitoring effort and will work with staff to resolve problems as they occur.

6. If possible, Partner should participate in the annual coordinated monitoring meeting to be scheduled between March 15 and April 30, 2012 in order to provide input on the monitoring schedule and local water quality issues.

7. Partner will participate in a monitoring systems audit every two years to ensure proper monitoring procedures.

US International Boundary and Water Commission

1. Staff from the USIBWC CRP will meet as needed with Partner to assess the effectiveness of this monitoring effort and will work with Partner to resolve problems as they occur. USIBWC CRP will perform a monitoring systems audit of Partner once every two years.

2. The USIBWC will incur laboratory costs for the samples and field splits collected by Partner.

3. The USIBWC will also incur the shipping costs for the samples being sent to the contract laboratory. Please contact the CRP staff to obtain shipping account information.

4. On an as-needed basis, staff from the USIBWC CRP will provide any training and supplies necessary to accomplish the objectives of the CRP monitoring program.

The USIBWC appreciates the willingness of Partner to participate in this cooperative effort to collect water quality information in the Rio Grande Basin. If you have any questions please contact meat the 915-832-4701.

Sincerely,

Elizabeth Verdecchia
Program Manager
USIBWC Clean Rivers Program

Enclosure(s): As Stated
bcc: CRP files

Terms of Agreement

The USIBWC Clean Rivers Program Sampling Partners agree to the long- term collection or analysis 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, compensated for expenses associated with said volunteer 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.

ENDORSEMENT

I acknowledge receipt of the "RIO GRANDE BASIN MONITORING PROGRAM QUALITY ASSURANCE PROJECT PLAN, FY2012-2013". I understand the document(s) describe quality assurance, quality control, data management and reporting, and other technical activities that must be implemented to ensure the results of work performed will satisfy stated performance criteria. My signature on this document signifies that I have read and approved the document contents pertaining to my program. Furthermore, I will ensure that all staff members participating in Clean Rivers Program activities will be required to familiarize themselves with the document contents and adhere to them as well.

_____

Signature Date

_____

Sampling Partner

Adherence letters may vary as needed to address specific partners. Copies of the signed forms should be sent by the USIBWC to the TCEQ CRP Project Manager within 60 days of TCEQ approval of the QAPP.

AMENDMENT # 1 TO THE RIO GRANDE BASIN MONITORING PROGRAM CLEAN RIVERS PROGRAM FY 2012/2013 QAPP

PREPARED BY THE USIBWC
IN COOPERATION WITH THE
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ)

CLEAN RIVERS PROGRAM
WATER QUALITY PLANNING DIVISION
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. BOX 13087, MC 234
AUSTIN, TX 78711-3087

EFFECTIVE PERIOD: FY 2012 TO FY 2013

QUESTIONS CONCERNING THIS QAPP SHOULD BE DIRECTED TO:

ELIZABETH VERDECCHIA
USIBWC PROGRAM MANAGER
4171 N. MESA ST., C-100
EL PASO, TX 79902
(915) 832-4701
(915) 832-4166
ELIZABETH.VERDECHIA@IBWC.GOV

EFFECTIVE: IMMEDIATELY UPON APPROVAL BY ALL PARTIES

Justification: This document details the changes made to the basin-wide Quality Assurance Project Plan (QAPP) for FY12-13, including the addition or deletion of contacts, addition of USIBWC CRP staff, an updated organizational chart, and an updated Table A7.

Summary of Changes:
This amendment includes the following changes:

-Updates contacts in Sections A3 and A4 and the organizational chart.
-Table A7.1, adds drought parameters from the TCEQ Drought Guidance in the section under Field Parameters.
-Table A7.1, adds a footnote addressing the drought guidance in the section under Field Parameters.
-Section B9 has been updated to include information on acquired reservoir data.

Detail of Changes:

Section/Figure/Table	Page in Original QAPP Document to be changed	Change	Justification
A3	11	Adding personnel under the USIBWC CRP.	Adding USIBWC's new data manager, Ms. Vanessa Dueñas.
A3	13	Adding personnel under the City of Laredo Environmental Services Dept.	Adding the two additional staff members who sample in the field, Mr. Gerardo Flores and Mr. Francisco Rosales.
A3	13	Adding personnel under the Sabal Palm Audubon Sanctuary.	Adding the two additional staff members who sample in the field, Mr. Guillermo Aguilar and Mr. Pablo Quintanilla.
A3	14	Removing personnel under Big Bend National Park.	Removing Ms. Billie Brauch, who is no longer in that position.
A4	18	Changing EV and LG to the current data manager VD under the description of responsibilities for the USIBWC CRP.	Adding the USIBWC CRP's new data manager.
A4	20	Adding the additional two personnel under the City of Laredo Environmental Services Dept.	Adding the two additional staff members who sample in the field, Mr. Gerardo Flores and Mr. Francisco Rosales.
A4	20	Adding the additional two personnel under Sabal Palm Audubon Sanctuary.	Adding the two additional staff members who sample in the field, Mr. Guillermo Aguilar and Mr. Pablo Quintanilla.
A4	20	Removing personnel under Big Bend National Park.	Removing Ms. Billie Brauch from the section.
Figure 1, A4.1, Organizational Chart	23	Adding and deleting contacts and personnel.	Contacts and staff must be kept current.
Table A7.1	61	Adding new parameters under the "Field Parameters" section of the table.	TCEQ issued a new guidance to address sampling in the present drought situation.
Table A7.1	61	Adding a footnote under the "Field Parameters" section of the table.	Footnote added under TCEQ Drought Guidance.
B9	46	Added text that addresses acquired reservoir data.	TCEQ requested that the language be added to this section.

Distribution: QAPP Amendments/Revisions to Appendices will be distributed to all personnel on the distribution list maintained by the USIBWC.

USIBWC

11-1-11

Elizabeth Verdecchia, USIBWC Program Manager Date

11-1-2011

Leslie Grijalva, USIBWC QAO Date

11/1/2011

Vanessa Dueñas, USIBWC Data Manager Date

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Julie McEntire, CRP Project Manager — Date 11/29/11

Jennifer Delk, CRP Project QAS — Date 11/29/11

Allison Woodall, CRP Work Leader — Date 11/29/11

Daniel R. Burke, CRP Lead QAS — Date 11/29/2011

A3 DISTRIBUTION LIST

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Austin, Texas 78711-3087

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Clean Rivers Program
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Daniel R. Burke
Lead CRP Quality Assurance Specialist
MC-165
(512) 239-0011

Nancy Ragland
Team Leader, Data Management and Analysis
MC-234
(512) 239-6546

United States Section, International Boundary and Water Commission (USIBWC)
4171 N. Mesa, C-100
El Paso, Texas 79902

Elizabeth Verdecchia, Program Manager
(915) 832-4701

Leslie Grijalva, Quality Assurance Officer
(915) 832-4770

Vanessa Dueñas, Data Manager
(915) 832-4729

USIBWC Field Office- American Dam/Carlos Marin Field Office
2616 W. Paisano Drive
El Paso, TX 79922-1629

Attention: Area Project Manager
(915) 351-1030

USIBWC Field Office- Amistad Dam Field Office
670 Texas Spur 349
Del Rio, TX 78840-0425

Attention: Area Project Manager
(830) 775-2437

USIBWC Field Office- Falcon Dam Field Office
PO Box 1
FM 2098, Reservoir Road
Falcon Heights, TX 78545-0001

Attention: Area Project Manager
(956) 848-5211

USIBWC Field Office- Mercedes Field Office
325 Golf Course Road
Mercedes, TX 78570-9677

Attention: Area Project Manager
(956) 565-3150

USIBWC Field Office- Presidio Field Office
PO Box 848
110 South Dod Avenue
Presidio, TX 79485-0848

Attention: Area Project Manager
(432) 229-3751

Alamo Analytical Laboratories LTD.
10526 Gulfdale
San Antonio, Texas 78216- 3601

Dr. Reddy Gosala, Laboratory Director
(210) 340-8121

Vijaya Gosala, Quality Assurance Officer
(210) 340-8121

Brownsville Public Utilities Board- Analytical Laboratory
1425 Robinhood Drive, P.O. Box 3270
Brownsville, TX 78523-3270

LeeRoy Atkinson, Laboratory Manager
(956) 983-6357

Juan Carrizales, Quality Assurance Specialist
(956) 983-6253

El Paso Water Utilities Public Service Board
4100 Delta Drive, P.O. Box 511
El Paso, TX 79961

Paul Rivas, Laboratory Manager
(915) 594- 5722

Richard Wilcox, Quality Assurance Chemist
(915) 594- 5444

City of Laredo Health Department Laboratory
2600 Cedar- P.O. Box 2337
Laredo, TX 78044-2337

Rebecca Castro, Laboratory Manager and Acting Quality Assurance Officer
(956) 795- 4908 ext. 4693

City of Laredo Health Department
2600 Cedar, P.O. Box 2337
Laredo, TX 78044-2337

Samuel Gonzalez
(956) 740-3964

Daniel Maldonado, Sanitation Inspector
(956) 795- 4904 ext. 4626

Lupe Luna, Sanitation Inspector
(956) 795- 4904 ext. 4624

City of Laredo Environmental Services Department
619 Reynolds St.
Laredo, TX 78040

Riazul Mia, Director
(956) 794-1650

Lucky Roncinske, Environmental Technician II
(956) 794-1650

Gerardo Flores, Environmental Technician I
(956) 794-1650

Francisco Rosales, Environmental Technician I
(956) 794-1650

Rio Grande International Study Center (RGISC)
c/o TX A&M University
5201 University Blvd.
Laredo, TX 78041

Dr. Tom Vaughan, Professor
(956) 326-2592

Sabal Palm Audubon Center and Sanctuary
c/o Gorgas Science Foundation
P.O. Box 5688
Brownsville, TX 78523

Jimmy Paz
(956) 541- 8034

Guillermo Aguilar
(956) 541-8034

Pablo Quintanilla
(956) 541-8034

Texas Parks and Wildlife Department

Natural Resources Program
State Parks Region 1
P.O. Box 1807
Fort Davis, Texas 79734

Mark Lockwood
(432) 426-3897

Barton Warnock Education Center
HC 70 Box 375
Terlingua, Texas 79852

David Long
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El Paso, Texas 79968-0519

Dr. Elizabeth Walsh, Professor
(915) 747-5421

Dr. Vanessa Lougheed, Professor
(915) 747-6887

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, 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 will ensure the documentation is available for review.

A4 PROJECT/TASK ORGANIZATION

Description of Responsibilities

TCEQ

Allison Woodall
CRP Work Leader
Responsible for TCEQ activities supporting the development and implementation of the Texas Clean Rivers Program. Responsible for verifying that the 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 QA guidance for the CRP. Reviews and approves all QA audits, corrective actions, reviews, reports, work plans, contracts, QAPPs, and TCEQ QMP. Enforces corrective action, as required, where QA protocols are not met. Ensures CRP personnel are fully trained.

Daniel R. Burke
CRP Lead Quality Assurance Specialist
Participates in the development, approval, implementation, and maintenance of written quality assurance 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.

Julie McEntire
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 quality assurance 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.

Nancy Ragland
Team Leader, Data Management and Analysis Team
Participates in the development, approval, implementation, and maintenance of written quality assurance standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Ensures DM&A staff perform data management related tasks, including coordination and tracking of CRP data sets from initial submittal through CRP Project Manager review and approval; ensuring that data is reported following instructions in the *Surface Water Quality Monitoring Data Management Reference Guide* (January 2010, or most current version); running automated data validation checks in SWQMIS and coordinating data verification and error correction with CRP Project Managers; generating SWQMIS summary reports to assist CRP Project Managers' data review; identifying data anomalies and inconsistencies; providing training and guidance to CRP and Planning Agencies on technical data issues to ensure that data are submitted

according to documented procedures; reviewing QAPPS for valid stream monitoring stations, validity of parameter codes, submitting entity code(s), collecting entity code(s), and monitoring type code(s); developing and maintaining data management-related standard operating procedures for CRP data management; and coordinating and processing data correction requests.

Peter Bohls
CRP Data Manager, Data Management and Analysis Team
Responsible for coordination and tracking of CRP data sets from initial submittal through CRP Project Manager review and approval. Ensures that data is reported following instructions in *the Surface Water Quality Monitoring Data Management Reference Guide* (January 2010, or most current version). Runs automated data validation checks in 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 standard operating procedures for CRP data management. Coordinates and processes data correction requests. Participates in the development, implementation, and maintenance of written quality assurance standards (e.g., Program Guidance, SOPs, QAPPs, QMP).

Jennifer Delk
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 quality assurance 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 CRP Program Manager and Clean Rivers Program at the USIBWC. Performs evaluations of USIBWC CRP personnel. Cost Center Manager for the USIBWC CRP budget.

Elizabeth Verdecchia
USIBWC 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 basin planning agency participants and that projects are producing data of known quality. Manages subcontract work including laboratory services and ensures that subcontractors 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.

Leslie Grijalva
USIBWC Quality Assurance Officer
Responsible for coordinating the implementation of the QA program. Responsible for writing and maintaining the QAPP and monitoring its implementation. Responsible for maintaining records of QAPP distribution, including appendices and amendments. Responsible for maintaining written records of sub-tier commitment to requirements specified in this QAPP. Responsible for identifying, receiving, and maintaining project quality assurance records. Responsible for coordinating with the TCEQ QAS to resolve QA-related issues. Notifies the USIBWC 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 are properly trained and that training records are maintained.

Vanessa Dueñas
USIBWC 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 basin planning agency internet sites.

Alamo Analytical Laboratories LTD.

Dr. Reddy Gosala
Alamo Analytical, Laboratory Director
Responsible for project coordination at Alamo 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 Alamo Analytical and may perform validation and verification of data before the report is sent to USIBWC. Notifies the USIBWC CRP Program Manager of particular circumstances which may adversely affect the quality of data. Responsible for coordinating with Alamo Analytical and USIBWC CRP Program Manager to resolve QA-related issues. Implements or ensures implementation of corrective actions needed to resolve nonconformance noted during assessments.

Vijaya Gosala
Alamo Analytical Quality Assurance Officer
Responsible for the overall quality control and quality assurance of analyses performed by Alamo 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 in the 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 of the below listed partners are the same as listed above for the USIBWC, unless otherwise noted.

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 project managers' direct activities on the local level as follows: Tony Solo – American Dam, Pablo Garza– Amistad Dam, Alberto Hinojosa – Falcon Dam, Rodolfo Montero – Mercedes, and Hector Hernandez – Presidio. Samples collected by the field offices are submitted to Alamo Analytical Laboratories LTD. for analysis.

Lee Roy Atkinson, Laboratory Manager
Brownsville Public Utilities Board (PUB)
Responsible for water quality monitoring, analysis, and data review in the Brownsville area. Samples collected are analyzed by Brownsville PUB accredited laboratory as part of their regular permit monitoring.

Juan Carrizales, Quality Assurance Specialist
Brownsville Public Utilities Board (PUB)
Responsible for the review of laboratory data and laboratory techniques performed at the Brownsville PUB.

Paul R. Rivas, Laboratory Services Manager
El Paso Water Utilities
Responsible for water quality laboratory analysis and data review in the El Paso area. Samples collected by USIBWC American Dam Field Office are analyzed by the El Paso Water Utilities laboratory, which is now an accredited laboratory. Responsible for sending data monthly to the USIBWC.

Richard Wilcox, Quality Assurance Chemist
El Paso Water Utilities
Responsible for the review of laboratory data and laboratory techniques performed at the El Paso Water Utilities.

Rebecca Castro
City of Laredo Health Department Laboratory
Responsible for analysis and review of bacteria data for samples collected in the Laredo area. Samples collected are analyzed by City of Laredo accredited 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.

and

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

Responsible for water quality monitoring and review of field data 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.

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

And

Lucky Roncinske, Gerardo Flores, and Francisco Rosales, Environmental Technicians
City of Laredo Environmental Services Department
Responsible for water quality monitoring and data review for samples collected on Manadas Creek in the Laredo area. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Dr. Tom Vaughan
Rio Grande International Study Center (RGISC) and TAMIU
Responsible for water quality monitoring and data review in the Laredo area of the Rio Grande. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Jimmy Paz, Guillermo Aguilar, and Pablo Quintanilla
Sabal Palm Audubon Center and Sanctuary
Responsible for water quality monitoring and data review in the Brownsville area of the Rio Grande. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Mark Lockwood
Texas Parks and Wildlife Department, Natural Resources Program
Responsible for water quality monitoring and sample collection of stations in Big Bend Ranch State Park. Water samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

David Long and Nelson Rodriguez
Texas Parks and Wildlife Department, Barton Warnock Education Center
Responsible for water quality monitoring and sample collection of stations in Big Bend Ranch State Park. Water samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Mr. Jeff Bennett
Big Bend National Park
Responsible for water quality monitoring and data review in the Big Bend National Park and Rio Grande Wild and Scenic. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Chris Hathcock
U.S. Fish and Wildlife Service
Responsible for water quality monitoring and data review of the Rio Grande in the Lower Rio Grande Basin. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Dr. Elizabeth Heise
University of Texas at Brownsville
Responsible for water quality monitoring and data review in the Brownsville area of the Rio Grande. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Dr. Kevin Urbanczyk
Sul Ross University
Responsible for water quality monitoring and data review of the Pecos River subbasin in the Alpine area. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Dr. Maria E. Alvarez, Professor of Biology, Biology District-Wide Coordinator, and MBRS-RISE and MSEIP Program Director
El Paso Community College
Responsible for water quality monitoring and sample collection of several stations in the El Paso area. Water samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Dr. Elizabeth Walsh
University of Texas at El Paso
Responsible for water quality monitoring and data review in the El Paso area of the Rio Grande. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

Dr. Vanessa Lougheed
University of Texas at El Paso
Responsible for water quality monitoring and data review in the Forgotten Stretch of the Rio Grande. Samples collected are submitted to Alamo Analytical Laboratories LTD. for analysis.

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, compensated for expenses associated with said volunteer 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. ORGANIZATION CHART - LINES OF COMMUNICATION

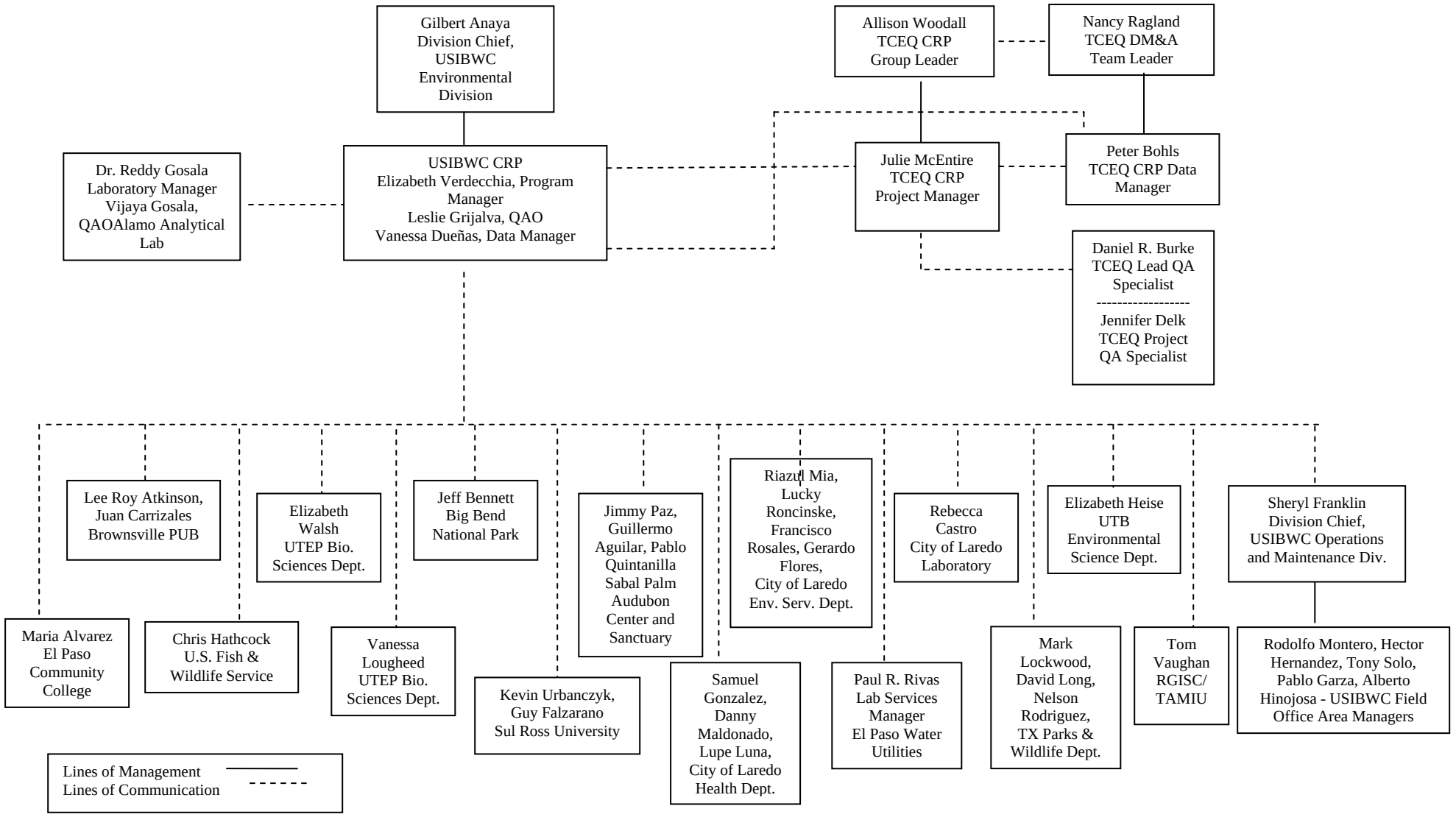

TABLE A7.1 Measurement Performance Specifications										
Field Parameters										
Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING	NS	other	TCEQ Drought Guidance	00051	NA*	NA	NA	NA	NA	Field
RESERVOIR STAGE (FT ABOVE MEAN SEA LEVEL) **	FT ABOVE MSL	water	TWDB	00052	NA*	NA	NA	NA	NA	Field
RESERVOIR % FULL**	% RESERVOIR CAPACITY	water	TWDB	00053	NA*	NA	NA	NA	NA	Field
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE,FIELD (uS/CM @ 25C)	us/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G and TCEQ SOP, V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)	s.u	water	EPA 150.1 and TCEQ SOP, V1	00400	NA*	NA	NA	NA	NA	Field
TURBIDITY, FIELD	NTU	water	SM 2130-B	82078	NA*	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)	cfs	water	TCEQ SOP, V1	74069	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE MET	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPL	NU	other	TCEQ SOP V1	89835	NA*	NA	NA	NA	NA	Field
STREAM WIDTH (M)	meters	water	TCEQ SOP V1	89861	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY (METERS)	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS***	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field

% POOL COVERAGE IN 500 METER REACH***	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD.,4=STRONG)	NU	other	NA	89965	NA*	NA	NA	NA	NA	Field
WIND DIRECTION (1=North, 2=South, 3=East, 4=West, 5=NE, 6=SE, 7=NW, 8=SW)	NU	other	NA	89010	NA*	NA	NA	NA	NA	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER)	NU	other	NA	89966	NA	NA	NA	NA	NA	Field

* Reporting to be consistent with SWQM guidance and based on measurement capability.
**As published by the TX Water Development Board on their website
http://wiid.twdb.state.tx.us/ims/resinfo/BushButton/lakeStatus.asp?selcat=3&slbasin=2
***To be routinely reported when collecting data from perennial pools.

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
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.)
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2008 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

B9 NON-DIRECT MEASUREMENTS

The following non- direct measurement source(s) will also be used for this project: USIBWC gage station data will be used throughout the project to aid in determining gage height and flow. Rigorous QA checks are completed on gage data by the USIBWC and the data is approved by the USIBWC and permanently stored at the USIBWC. 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 USIBWC gage station.

Reservoir stage data are collected every day from the United States Geological Survey (USGS), International Boundary and Water Commission (IBWC), and the Unites 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://wiid.twdb.state.tx.us/ims/resinfo/BushButton/lakeStatus.asp?selcat=3&slbasin=2. The web application uses real time gaged observations 7 AM reading each day (or closest reading available) from 119 major reservoirs to approximate daily storage for each reservoir, as well as daily total storage for water planning regions, river basins and the state of Texas. These instantaneous data are updated to mean daily data for all previous days. These data will be submitted to the TCEQ under parameter code 00052 Reservoir Stage and parameter code 00053 Reservoir Percent Full.

Only data collected directly under this QAPP is submitted to the SWQMIS database.