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 2010 to FY 2011

Questions concerning this quality assurance project plan should be directed to:

Elizabeth Verdecchia
USIBWC Program Manager
4171 N. Mesa, C-100
El Paso, Texas 79902
(915) 832- 4701
emverdec@ibwc.gov

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Water Quality Planning Division

Laurie Curra 8/28/2009
Laurie Curra, Manager Date
Water Quality Monitoring & Assessment Section

Allison Woodall 8/28/09
Allison Woodall, Group Leader Date
Clean Rivers Program

Jennifer Delk 8/13/09
Jennifer Delk Date
Project QA Specialist, Clean Rivers Program

BAnsell 08/28/09
Bethany Ansell Date
Project Manager, Clean Rivers Program

Field Operations Support Division

Stephen Stubbs 8/31/09
Stephen Stubbs Date
TCEQ Quality Assurance Manager

Daniel R Burke 8/31/09
Daniel R. Burke Date
Lead CRP Quality Assurance Specialist
Quality Assurance Section

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

Elizabeth Verdecchia Date
USIBWC Project Manager

Leslie Grijalva Date
USIBWC Quality Assurance Officer

Kathryn Carberry Date
USIBWC Data Manager

A1 APPROVAL PAGE (Page 1 of 12)

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Water Quality Planning Division

Laurie Curra, Manager — Date
Water Quality Monitoring & Assessment Section

Allison Woodall, Group Leader — Date
Clean Rivers Program

Jennifer Delk — Date
Project QA Specialist, Clean Rivers Program

Bethany Ansell — Date
Project Manager, Clean Rivers Program

Field Operations Support Division

Stephen Stubbs — Date
TCEQ Quality Assurance Manager

Daniel R. Burke — Date
Lead CRP Quality Assurance Specialist
Quality Assurance Section

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

8/24/09
Elizabeth Verdecchia — Date
USIBWC Project Manager

8/24/09
Leslie Grijalva — Date
USIBWC Quality Assurance Officer

8/24/09
Kathryn Carberry — Date
USIBWC Data Manager

A1 APPROVAL PAGE (Page 2 of 12)

USIBWC CONTRACT LABORATORY

Environmental Testing and Consulting, Inc.

8/27/09

Andy Parrish Date
Supervisor, Project Management

8/27/09

Richard Medina Date
Quality Assurance Manager

A1 APPROVAL PAGE (page 3 of 12)

RIO GRANDE BASIN CRP PARTNERS

Brownsville Public Utilities Board

8/12/09	08/12/09
LeeRoy Atkinson Date	Juan Carrizales Date
Laboratory Manager	Quality Assurance Specialist

A1 APPROVAL PAGE (page 4 of 12)

RIO GRANDE BASIN CRP PARTNERS, cont.

City of Laredo Health Services

Rebecca Castro 8/10/09

Rebecca Castro — Date

Laboratory Manager

Rebecca Castro 8/10/09

QAO Vacant — Date

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RIO GRANDE BASIN CRP PARTNERS, cont.

Tom Vaughan 8/14/09

Dr. Tom Vaughan Date
Rio Grande International Study Center (RGISC)

A1 APPROVAL PAGE (page 6 of 12)

RIO GRANDE BASIN CRP PARTNERS, cont.

8-25-2009

Mr. Jeff Bennett Date
Big Bend National Park

A1 APPROVAL PAGE (page 7 of 12)

RIO GRANDE BASIN CRP PARTNERS, cont.

Mr. Riazul Mia Date
City of Laredo Environmental Services Department

A1 APPROVAL PAGE (page 8 of 12)

RIO GRANDE BASIN CRP PARTNERS, cont.

CHARLES B. KRUSE, IV, P.E.
Chief, Operations & Maintenance Division
US International Boundary and Water Commission, Field Offices

A1 APPROVAL PAGE (page 9 of 12)

RIO GRANDE BASIN CRP PARTNERS, cont.

Elizabeth Walsh 8/25/09

Dr. Elizabeth Walsh Date
University of Texas at El Paso

A1 APPROVAL PAGE (page 10 of 12)

RIO GRANDE BASIN CRP PARTNERS, cont.

[signature] 8-10-09

Dr. Vanessa Lougheed Date
University of Texas at El Paso

A1 APPROVAL PAGE (page 11 of 12)

RIO GRANDE BASIN CRP PARTNERS, cont.

8/13/09

Dr. Elizabeth Heise Date
University of Texas at Brownsville

A1 APPROVAL PAGE (page 12 of 12)

RIO GRANDE BASIN CRP PARTNERS, cont.

K Urbanczyk 8-18-09

Dr. Kevin Urbanczyk Date
Sul Ross University, Rio Grande Research Center

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. (See sample letter in Attachment 1 of this document.)

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**
GPS	**Global Positioning System**
LCS	**Laboratory Control Sample**
LCSD	**Laboratory Control Sample Duplicate**
LOD	**Limit of Detection**
LOQ	**Limit of Quantitation**
NELAC	**National Environmental Lab Accreditation Conference**
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**
RGBMP	**Rio Grande Basin Monitoring Program**
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**
TSWQS	**Texas Surface Water Quality Standards**
USIBWC	**International Boundary and Water Commission, U.S. Section**
VOA	**Volatile Organic Analytes**

A3 DISTRIBUTION LIST

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

Bethany Ansell, Project Manager
Clean Rivers Program
MC-234
(512) 239-1739

Daniel R. Burke
Lead CRP Quality Assurance Specialist
MC-176
(512) 239-0011

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

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

Elizabeth Verdecchia, Project Manager
(915) 832-4701

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

Kathryn Carberry, Data Manager
(915) 832-4107

USIBWC Field Offices: American Dam, Amistad Dam, Presidio, Falcon Dam, and Mercedes
Hydrotechs and Area Project Managers (see Section A4)

Environmental Testing and Consulting, Inc.
2790 Whitten Road
Memphis, TN 38133

Andy Parrish, Supervisor
(901) 213-2444

Richard Medina, Quality Assurance Manager
(901) 213-2400

Brownsville Public Utilities Board- Analytical Laboratory
425 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

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

Riazul Mia, Director
(956) 794-1650

Lucky Roncinske, Environmental Technician II
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

Big Bend National Park
Science & Resource Management
266 Tecolote Drive
Big Bend National Park, TX 79834

Jeff Bennett, Science and Resource Management
(432) 477-1141 or (432) 837-9964

University of Texas at Brownsville
Chemistry & Environmental Sciences Department
80 Fort Brown
Brownsville, TX 78520

Dr. Elizabeth Heise, Professor
(956) 882-6769

Rio Grande Research Center
Sul Ross State University
400 N. Harrison
Alpine, TX 79832

Dr. Kevin Urbanczyk, Professor
(432) 837-8259

Department of Biological Sciences
University of Texas at El Paso
500 W University Ave.
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 Group 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 program 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.

Bethany Ansell
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.

Maria Rafiuly
CRP Data Manager, Data Management and Analysis Group
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* (February 2009, 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. 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.

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.

USIBWC

Carlos Peña, Jr.
USIBWC Environmental Management Division Engineer

Responsible for oversight of the USIBWC CRP Project 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 Project Manager

Responsible for implementing and monitoring CRP requirements in contracts, QAPPs, and QAPP amendments and appendices. Coordinates basin planning activities and work of basin partners. Ensures monitoring systems audits are conducted to ensure QAPPs are followed by basin planning agency participants and that projects are producing data of known quality. Ensures that 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 is properly trained and that training records are maintained.

Kathryn Carberry
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 USIBWC internet sites.

ENVIRONMENTAL TESTING AND CONSULTING, INC. (ETC)

Andy Parrish
ETC Project Manager
Responsible for project coordination at ETC, 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 ETC 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 the ETC and USIBWC CRP Program Manager to resolve QA-related issues. Implements or ensures implementation of corrective actions needed to resolve nonconformance noted during assessments.

Richard Medina, Ph.D.
ETC Quality Assurance Officer
Responsible for the overall quality control and quality assurance of analyses performed by ETC. 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 Project Manager, QAO, and Data Manager for all of the below listed partners are the same as listed above for the USIBWC, unless otherwise noted.

Dr. Tom Vaughan
Rio Grande International Study Center (RGISC)
Responsible for water quality monitoring and data review in the Laredo area of the Rio Grande. Samples collected are submitted to Environmental Testing and Consulting, Inc. for analysis.

Mr. Jeff Bennett
Big Bend National Park
Responsible for water quality monitoring and data review in the Big Bend National Park area of the Rio Grande. Samples collected are submitted to Environmental Testing and Consulting, Inc. for analysis.

Mr. Riazul Mia
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 Environmental Testing and Consulting, Inc. for analysis.

Rebecca Castro
City of Laredo Laboratory
Responsible for water quality monitoring, analysis of bacteria data, and data review for samples collected in the Laredo area. Samples collected are analyzed by City of Laredo accredited laboratory.

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, Werner Graham – Amistad Dam, Silverio Garza – Falcon Dam, Rodolfo Montero – Mercedes, and Hector Hernandez – Presidio. Samples collected by the field offices are submitted to Environmental Testing and Consulting, Inc. 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 Environmental Testing and Consulting, Inc. 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 Environmental Testing and Consulting, Inc. 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 Environmental Testing and Consulting, Inc. for analysis.

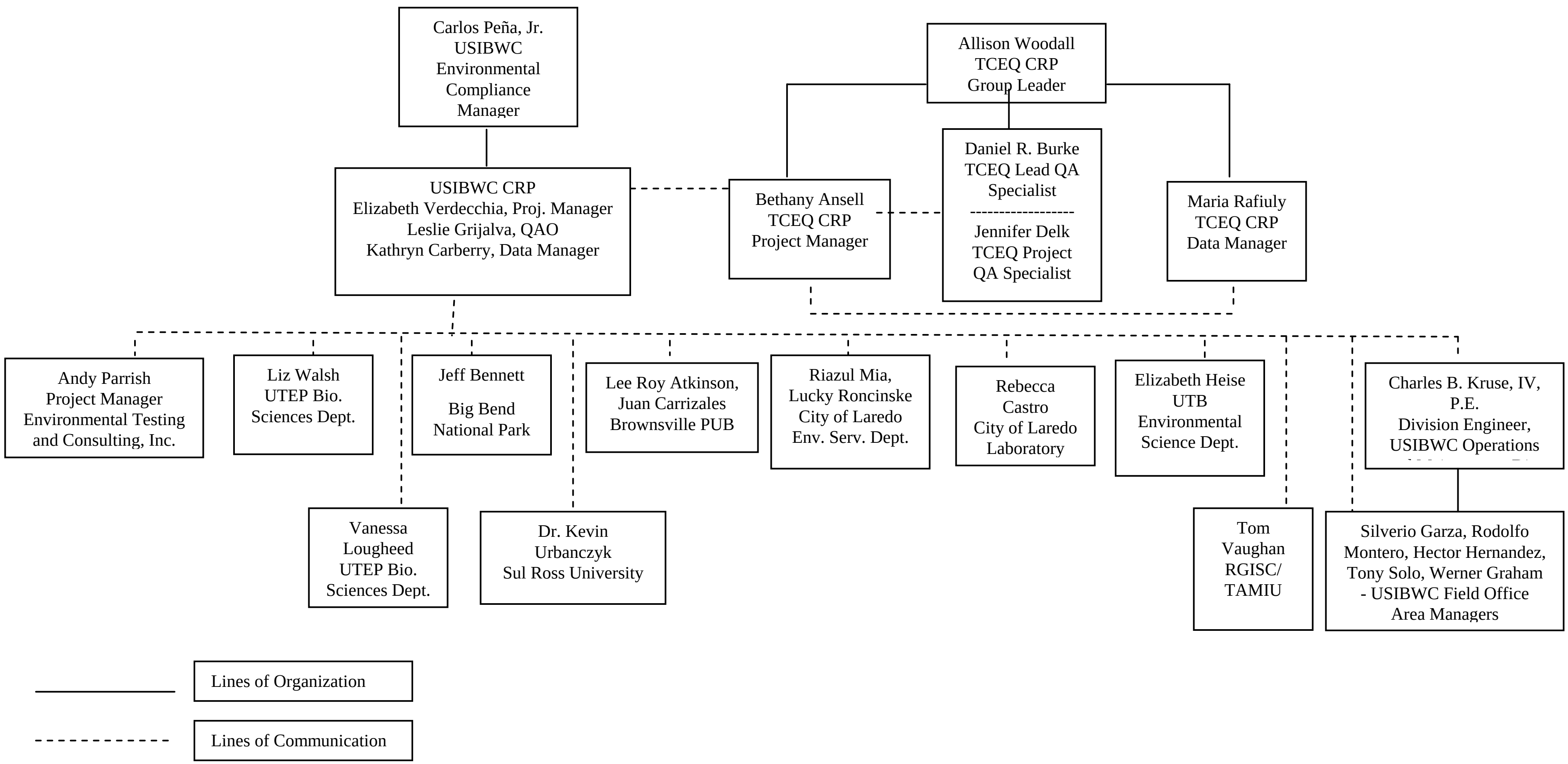
Lee Roy Atkinson, Laboratory Manager
Brownsville Public Utilities Board (PUB)
Responsible for water quality monitoring, analysis, and data review in the Brownsville area. Samples collected are analyzed by Brownsville PUB accredited laboratory as part of their regular permit monitoring.

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.

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 Environmental Testing and Consulting, Inc. for analysis.

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 *Quality Management Plan for the Clean Rivers Program* (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 and 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 2010 -2011.

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.

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 A1.1). 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 CRP 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)

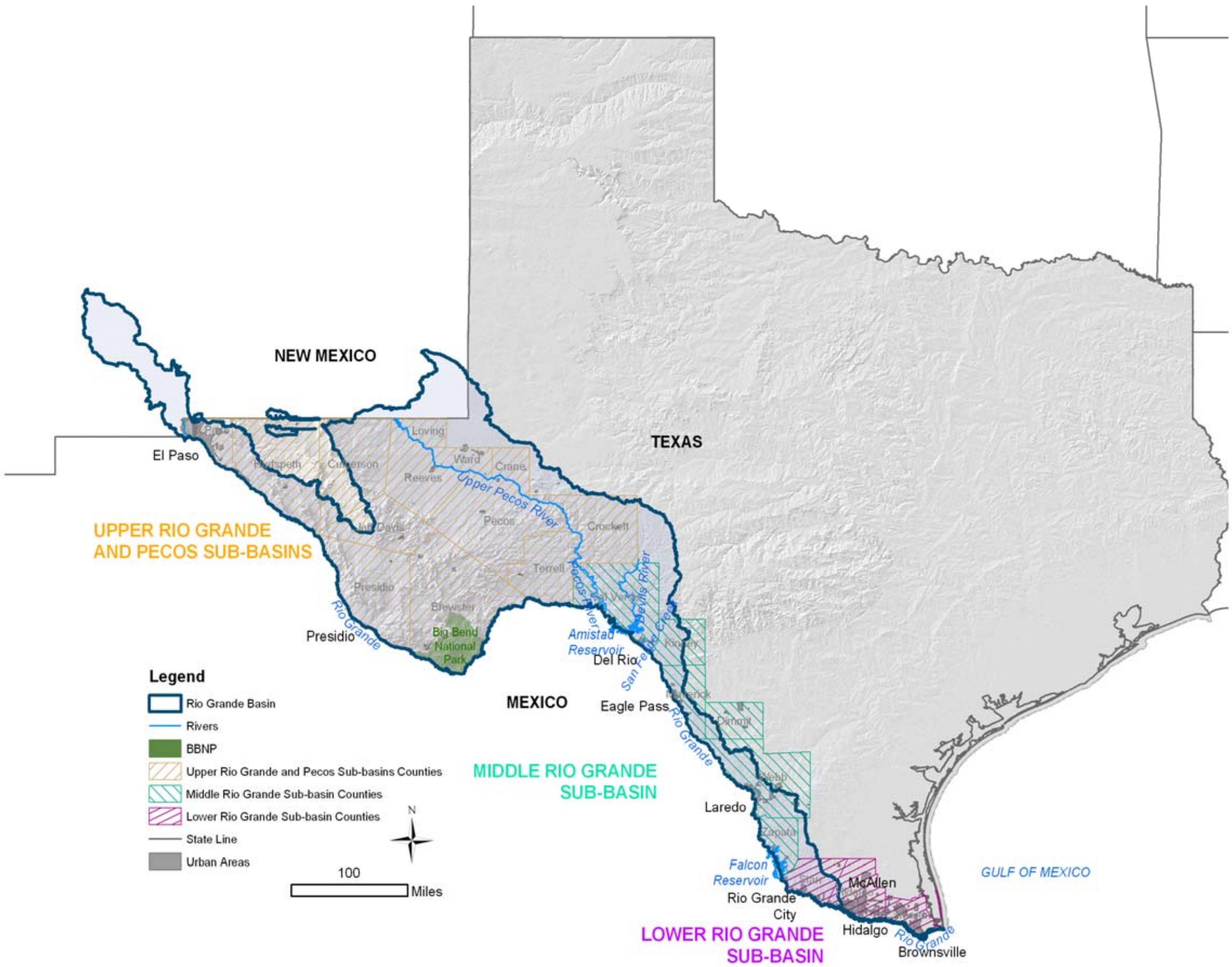


Table 1. A5.1 Designated Uses and Criteria for segments in the Rio Grande

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

A6 PROJECT/TASK DESCRIPTION

Basin-wide monitoring program contains sites collected by 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 FY2010-11, 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. A pilot study on dissolved metals will be conducted under a different QAPP at selected sites.

Under this QAPP, there are 46 monitoring sites collected by the USIBWC CRP and partners. TCEQ collected monitoring and monitoring sites are covered by a separate QAPP. See Appendix B for sampling design and monitoring pertaining to this QAPP.

See Appendix A for the project-related work plan tasks and schedule of deliverables for a description of work defined in 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 Project Manager to the CRP Project Manager electronically. Amendments are effective immediately upon approval by the USIBWC Project Manager, the USIBWC QAO, the Laboratory, the CRP Project Manager, the CRP Lead QA Specialist, and the CRP Project QA Specialist. They will be incorporated into the QAPP by way of attachment and distributed to personnel on the distribution list by the USIBWC Project Manager.

Special Project Appendices

Projects requiring QAPP appendices will be planned in consultation with the USIBWC 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 Project 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 needed for conducting water quality assessments in accordance with TCEQ's *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 Table A7.1 and in the text following.

Table 2 A7.1 Measurement Performance Specifications for Field and Laboratory Measurements for: U.S. International Boundary and Water Commission, Big Bend National Park, City of Laredo Environmental Engineering, Rio Grande International Study Center, Sul Ross, U.T. Brownsville, Sabal Palm Sanctuary, and U. T. El Paso (samples analyzed by Environmental Testing and Consulting, Inc.).

Field Parameters

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
pH	SU	water	EPA 150.1 & TCEQ-SWQM SOP, V1	00400	NA*	NA	NA	NA	NA	Field
DO	mg/L	water	EPA 360.1& TCEQ-SWQM SOP, V1	00300	NA*	NA	NA	NA	NA	Field
Specific conductance	µS/cm	water	EPA 120.1 & TCEQ-SWQM SOP, V1	00094	NA*	NA	NA	NA	NA	Field
Air temperature	centigrade	air	TCEQ-SWQM SOP, V1	00020	NA*	NA	NA	NA	NA	Field
Water temperature	centigrade	water	EPA 170.1 & TCEQ-SWQM SOP, V1	00010	NA*	NA	NA	NA	NA	Field
Secchi depth	meters	water	TCEQ-SWQM SOP, V1	00078	NA*	NA	NA	NA	NA	Field
Days since last significant rainfall	days	NA	TCEQ-SWQM SOP, V1	72053	NA*	NA	NA	NA	NA	Field
Flow	cfs	water	TCEQ-SWQM SOP, V1	00061	NA*	NA	NA	NA	NA	Field
Flow estimate	cfs	water	TCEQ-SWQM SOP, V1	74069	NA*	NA	NA	NA	NA	Field
Turbidity	NTU	water	SM 2130- B	82078	NA*	NA	NA	NA	NA	Field
Flow method	1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler	water	TCEQ-SWQM SOP, V1	89835	NA*	NA	NA	NA	NA	Field
Flow severity	1-no flow 2-low flow 3-normal flow 4-flood 5- high 6- dry	water	TCEQ-SWQM SOP, V1	01351	NA*	NA	NA	NA	NA	Field

Stream width	meters	water	TCEQ-SWQM SOP, V1	89861	NA*	NA	NA	NA	NA	Field
Water depth	meters	water	TCEQ-SWQM SOP, V1	82903	0.1	NA	NA	NA	NA	Field
Present Weather	1- clear 2 – partly cloudy 3 - cloudy 4 – rain 5 - other	NA	Field Observation	89966	NA*	NA	NA	NA	NA	Field
Wind intensity	1 - calm 2 - slight 3 - moderate 4 - strong	air	Field Observation	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	air	Field Observation	89010	NA*	NA	NA	NA	NA	Field

* AWRLs have not been developed for these parameters

Conventional Parameters

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
TDS, dried at 180º C	mg/L	water	EPA 160.1, SM2540C	70300	10	2	70-130	20	80-120	ETC
Chloride	mg/L	water	EPA 300.0	00940	5	2	70-130	20	80-120	ETC
TSS	mg/L	water	EPA 160.2, SM2540D	00530	4	2	70-130	20	80-120	ETC
VSS	mg/L	water	EPA 160.4	00535	4	2	70-130	20	80-120	ETC
Sulfate	mg/L	water	EPA 300.0	00945	5	1	70-130	20	80-120	ETC
TOC	mg/L	water	SM5310B, EPA 415.1	00680	2	1	70-130	20	80-120	ETC
Ammonia-N, total	mg/L	water	SM4500 NH3D, SM4500 NH3F, EPA 350.3	00610	0.1	0.1	70-130	20	80-120	ETC
T – Phosphorous-P	mg/L	water	SM 4500-P E	00665	0.06	0.05	70-130	20	80-120	ETC
Chlorophyll-a, spectrophotometric acid method	µg/L	water	SM 10200-H	32211	3	3	70-130	20	80-120	ETC
Pheophytin-a, spectrophotometric acid method	µg/L	water	EPA 446.0	32218	3	3	70-130	20	80-120	ETC
Fluoride	mg/L	water	EPA 300.0	00951	0.5	0.1	70-130	20	80-120	ETC
Bromide	mg/L	water	EPA 300.0	71870	0.5	0.5	70-130	20	80-120	ETC
BOD5 Day- 20ºC	mg/L	water	SM 5210 B	00310	2	2	70-130	20	80-120	ETC
T. Alkalinity as C_aCO_3	mg/L	water	SM 2320-B	00410	20	20	70-130	20	80-120	ETC
Nitrate+Nitrite-N	mg/L	water	EPA 300.0	00630	0.05	0.05	70-130	20	80-120	ETC
Calcium	mg/L	water	EPA 200.7	00916	0.5	0.1	70-130	20	80-120	ETC
Magnesium	mg/L	water	EPA 200.7	00927	0.5	0.1	70-130	20	80-120	ETC
Potassium	mg/L	water	EPA 200.7	00937	0.2	0.1	70-130	20	80-120	ETC
Sodium	mg/L	water	EPA 200.7	00929	NA	0.5	70-130	20	80-120	ETC
Hardness, Total as CaCO3	mg/L	water	SM2340B, EPA 130.2	00900	5	1	70-130	20	80-120	ETC
E. coli, Colilert, IDEXX Method	MPN/100 mL	water	SM 9223-B****	31699	1	1	NA	.5*****	NA	ETC
Holding time, E. coli IDEXX Colilert	hours	water	NA	31704	1	NA	NA	NA	NA	ETC

*	Reporting to be consistent with SWQM guidance and based on measurement capability.
****	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. Quality Control Guidelines. This criterion applies to bacteriological duplicates with concentrations >10 MPN/100mL or >10 organisms/100mL.
****	Based on a range statistic as described in Standard Methods, 20th Edition, Section 9020-B, "Quality Assurance/Quality Control - Intralaboratory Quality Control Guidelines. This criterion applies to bacteriological duplicates with concentrations >10 MPN/100mL or >10 organisms/100mL.

References for Table A7.1:
TCEQ NELAP - Recognized Laboratory Fields of Accreditation for ETC. Certificate T104704180- 09A TX, Issue Date 4/29/2009.
United States Environmental Protection Agency (USEPA) "Methods for Chemical Analysis of Water and Wastes," Manual #EPA-600/4-79-020
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)

Dissolved Metals in Water

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Aluminum	µg/L	water	EPA 200.8	01106	200	100	70-130	20	80-120	ETC
Antimony	µg/L	water	EPA 200.8	01095	NA	1	70-130	20	80-120	ETC
Arsenic	µg/L	water	EPA 200.8	01000	5	2	70-130	20	80-120	ETC
Barium	µg/L	water	EPA 200.8	01005	1000	10	70-130	20	80-120	ETC
Beryllium	µg/L	water	EPA 200.8	01010	2	2	70-130	20	80-120	ETC
Boron	µg/L	water	EPA 200.7	01020	NA	10	70-130	20	80-120	ETC
Cadmium	µg/L	water	EPA 200.8	01025	0.3	0.3	70-130	20	80-120	ETC
Chromium	µg/L	water	EPA 200.8	01030	10	5	70-130	20	80-120	ETC
Copper	µg/L	water	EPA 200.8	01040	3	2	70-130	20	80-120	ETC
Iron	µg/L	water	EPA 200.8	01046	NA	100	70-130	20	80-120	ETC
Lead	µg/L	water	EPA 200.8	01049	1	1	70-130	20	80-120	ETC
Manganese	µg/L	water	EPA 200.8	01056	NA	10	70-130	20	80-120	ETC
Nickel	µg/L	water	EPA 200.8	01065	10	10	70-130	20	80-120	ETC
Selenium	µg/L	water	EPA 200.8	01145	NA	2	70-130	20	80-120	ETC
Silver	µg/L	water	EPA 200.8	01075	0.5	0.5	70-130	20	80-120	ETC
Thallium	µg/L	water	EPA 200.8	01057	1	1	70-130	20	80-120	ETC
Zinc	µg/L	water	EPA 200.8	01090	5	5	70-130	20	80-120	ETC

Total Metals in Water

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Iron	µg/L	water	EPA 200.8, EPA 200.7	01045	300	100	70-130	20	80-120	ETC
Manganese	µg/L	water	EPA 200.8, EPA 200.7	01055	50	10	70-130	20	80-120	ETC
Selenium	µg/L	water	EPA 200.8, EPA 200.7	01147	2	2	70-130	20	80-120	ETC

Total Metals in Sediment

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Aluminum	mg/kg	sediment	EPA 6020	01108	n/a*	20	60-140	20	60-140	ETC
Aluminum	mg/kg	sediment	EPA 6010	01108	n/a*	20	60-140	20	60-140	ETC
Antimony	mg/kg	sediment	EPA 6020	01098	12.5	12.5	60-140	20	60-140	ETC

Antimony	mg/kg	sediment	EPA 6010	01098	12.5	12.5	60-140	20	60-140	ETC
Arsenic	mg/kg	sediment	EPA 6020	01003	16.5	5	60-140	20	60-140	ETC
Arsenic	mg/kg	sediment	EPA 6010	01003	16.5	5	60-140	20	60-140	ETC
Barium	mg/kg	sediment	EPA 6020	01008	n/a*	5	60-140	20	60-140	ETC
Barium	mg/kg	sediment	EPA 6010	01008	n/a*	5	60-140	20	60-140	ETC
Cadmium	mg/kg	sediment	EPA 6020	01028	2.49	0.2	60-140	20	60-140	ETC
Cadmium	mg/kg	sediment	EPA 6010	01028	2.49	0.2	60-140	20	60-140	ETC
Chromium	mg/kg	sediment	EPA 6020	01029	55.5	5	60-140	20	60-140	ETC
Chromium	mg/kg	sediment	EPA 6010	01029	55.5	5	60-140	20	60-140	ETC
Copper	mg/kg	sediment	EPA 6020	01043	74.5	5	60-140	20	60-140	ETC
Copper	mg/kg	sediment	EPA 6010	01043	74.5	5	60-140	20	60-140	ETC
Lead	mg/kg	sediment	EPA 6020	01052	64	5	60-140	20	60-140	ETC
Lead	mg/kg	sediment	EPA 6010	01052	64	5	60-140	20	60-140	ETC
Mercury	Mg/kg	Sediment	EPA 7471	71921	0.355	0.02	70-130	30	60-140	ETC
Nickel	mg/kg	sediment	EPA 6020	01068	24.3	5	60-140	20	60-140	ETC
Nickel	mg/kg	sediment	EPA 6010	01068	24.3	5	60-140	20	60-140	ETC
Selenium	mg/kg	sediment	EPA 6020	01148	n/a*	1	60-140	20	60-140	ETC
Selenium	mg/kg	sediment	EPA 6010	01148	n/a*	1	60-140	20	60-140	ETC
Silver	mg/kg	sediment	EPA 6020	01078	1.1	0.5	60-140	20	60-140	ETC
Silver	mg/kg	sediment	EPA 6010	01078	1.1	0.5	60-140	20	60-140	ETC
Zinc	mg/kg	sediment	EPA 6020	01093	205	10	60-140	20	60-140	ETC
Zinc	mg/kg	sediment	EPA 6010	01093	205	10	60-140	20	60-140	ETC

* AWRLs have not been developed for these parameters.
All soil samples in this table are screened by SW846 6010B method for low-level metals, which are rerun under SW846 6020

Organics in Sediment

Parameter	UNITS	MATRIX	METHOD	PARAMATER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
DDT	µg/kg	sediment	EPA 8081	39373	23	2	60-140	20	60-140	ETC
DDD	µg/kg	sediment	EPA 8081	39363	15.65	2	60-140	20	60-140	ETC
DDE	µg/kg	sediment	EPA 8081	39368	3.91	2	60-140	20	60-140	ETC
Aldrin	µg/kg	sediment	EPA 8081	39333	40	2	60-140	20	60-140	ETC
Chlordane (Tech Mix and Metabs)	µg/kg	sediment	EPA 8081	39351	2.4	2	60-140	20	60-140	ETC
Endrin	µg/kg	sediment	EPA 8081	39393	103.5	2	60-140	20	60-140	ETC
Heptachlor	µg/kg	sediment	EPA 8081	39413	n/a	2	60-140	20	60-140	ETC
Methoxychlor	µg/kg	sediment	EPA 8081	39481	n/a	2	60-140	20	60-140	ETC
Mirex	µg/kg	sediment	EPA 8081	79800	650	2	60-140	20	60-140	ETC
Dieldrin	µg/kg	sediment	EPA 8081	39383	2.15	2	60-140	20	60-140	ETC
Hexachlorobenzene	µg/kg	sediment	EPA 8081	39701	120	2	60-140	20	60-140	ETC
Aroclor 1016	µg/kg	sediment	EPA 8082	39514	265	35	60-140	20	60-140	ETC
Aroclor 1248	µg/kg	sediment	EPA 8082	39503	750	35	60-140	20	60-140	ETC
Aroclor 1254	µg/kg	Sediment	EPA 8082	39507	170	35	60-140	20	60-140	ETC
Aroclor 1260	µg/kg	Sediment	EPA 8082	39511	120	35	60-140	20	60-140	ETC
Endosulfan I	µg/kg	sediment	EPA 8081	34364	n/a	1	60-140	20	60-140	ETC
Demeton	µg/kg	sediment	EPA 8270	82400	n/a	40	60-140	20	60-140	ETC
Guthion/ Azinphos-methyl	µg/kg	sediment	EPA 8270	39581	n/a	40	60-140	20	60-140	ETC
Malathion	µg/kg	sediment	EPA 8270	39531	n/a	40	60-140	20	60-140	ETC
Parathion Ethyl	µg/kg	sediment	EPA 8270	39541	n/a	40	60-140	20	60-140	ETC
2,4-D	µg/kg	sediment	EPA 8151	39731	n/a	40	60-140	20	60-140	ETC
2,4,5-T	µg/kg	sediment	EPA 8151	39741	n/a	9	60-140	20	60-140	ETC
Silvex	µg/kg	sediment	EPA 8151	39761	n/a	7	60-140	20	60-140	ETC
Fluorene	µg/kg	sediment	EPA 8270C	34384	268	66.7	60-140	20	60-140	ETC
Fluoranthene	µg/kg	sediment	EPA 8270C	34379	1115	66.7	60-140	20	60-140	ETC
Benzo(a)pyrene	µg/kg	sediment	EPA 8270C	34250	725	66.7	60-140	20	60-140	ETC
Napthalene	µg/kg	sediment	EPA 8270C	34445	280.5	66.7	60-140	20	60-140	ETC
Benzene	µg/kg	sediment	EPA 8260B	34237	22,505	1	60-140	20	60-140	ETC
Toluene	µg/kg	sediment	EPA 8260B	34483	2,830	5	60-140	20	60-140	ETC
Ethylbenzene	µg/kg	sediment	EPA 8260B	34374	1,965	1	60-140	20	60-140	ETC

References for Table A7.1:
TCEQ SOP, V1 - TCEQ SWQM Procedures, Volume 1: Physical & Chemical Monitoring Methods for Water, Sediment, & Tissue, 2008 (RG-415).
TCEQ, SWQM QAPP, January 2008, Revision 12.
United States International Boundary and Water Commission "Field Manual for Hydrologic Technicians," November 1998.
United States International Boundary and Water Commission "Collection and Field Analysis of Water Quality Sample," August 1997.
Title 40 of the Code of Federal Regulations, Parts 136 or 141.
United States Environmental Protection Agency (EPA) "Methods For Chemical Analysis of Water and Wastes", Manual #EPA-600/4-79-020.
United States Environmental Protection Agency (EPA) "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Manual #EPA-SW-846.
CRP AWRL List, http://www.tceq.state.tx.us/assets/public/compliance/monops/crp/QA/awrlmaster.pdf

Organics in Water

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Benzene in wtr sample GC-MS, Hexadecone Extr.	µg/L	water	EPA 624	34030	2.5	1	60-140	20	60-140	ETC
Toluene in wtr sample GC-MS, Hexadecone Extr.	µg/L	water	EPA 624	34010	N/A	5	60-140	20	60-140	ETC
Ethylbenzene	µg/L	water	EPA 624	34371	N/A	2	60-140	20	60-140	ETC
Fluorene	µg/L	water	EPA 625	34381	5.5	0.02	60-140	20	60-140	ETC
Fluoranthene	µg/L	water	EPA 625	34376	3	0.02	60-140	20	60-140	ETC
Acenaphthylene	µg/L	water	EPA 625	34200	5	0.02	60-140	20	60-140	ETC
Napthalene	µg/L	water	EPA 625	34696	250	0.02	60-140	20	60-140	ETC

Table 3 A7.2 Measurement Performance Specifications for Field and Laboratory Measurements for: Brownsville PUB

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Ammonia, N	mg/L	water	EPA 350.3	00610	0.1	0.1	70-130	20	80-120	BPUB
BOD	mg/L	water	SM 5210B	00310	2	2	70-130	20	80-120	BPUB
E. Coli, Colilert, IDEXX Method	MPN/100mL	water	SM9223B	31699	1	1	NA	0.5	NA	BPUB
TDS	mg/L	water	SM 2540C	70300	10	10	80-120	25	75-125	BPUB
TSS	mg/L	water	EPA 160.2	00530	4	2	70-130	20	80-120	BPUB
VSS	mg/L	water	EPA 160.4	00535	4	2	70-130	20	80-120	BPUB

References for Table A7.2:
Quality Control lab documents from Brownsville PUB (BPUB) and NELAP certification.
TCEQ, SWQM QAPP, January 2008, Revision 12.

Table 4 A7.3 Measurement Performance Specifications for Field and Laboratory Measurements for: City of Laredo Laboratory

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
E. Coli, Colilert, IDEXX Method	MPN/100mL	water	SM9223B	31699	1	1	NA	0.5	NA	Laredo
Specific Conductance	µS/cm	water	EPA 120.1 & TCEQ-SWQM	00094	NA*	NA	NA	NA	NA	Field

			SOP, V1							
Air temperature	centigrade	air	TCEQ-SWQM SOP, V1	00020	NA*	NA	NA	NA	NA	Field
Water temperature	centigrade	water	EPA 170.1 & TCEQ-SWQM SOP, V1	00010	NA*	NA	NA	NA	NA	Field
Days since last significant rainfall	days	NA	TCEQ-SWQM SOP, V1	72053	NA*	NA	NA	NA	NA	Field
Flow	cfs	water	TCEQ-SWQM SOP, V1	00061	NA*	NA	NA	NA	NA	Field
Flow method	1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler	water	TCEQ-SWQM SOP, V1	89835	NA*	NA	NA	NA	NA	Field
Flow severity	1-no flow 2-low flow 3-normal flow 4-flood 5- high 6- dry	water	TCEQ-SWQM SOP, V1	01351	NA*	NA	NA	NA	NA	Field
Present Weather	1- clear 2 – partly cloudy 3 - cloudy 4 – rain 5- other	NA	Field Observation	89966	NA*	NA	NA	NA	NA	Field
Wind intensity	1 - calm 2 - slight 3 - moderate 4 - strong	air	Field Observation	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	air	Field Observation	89010	NA*	NA	NA	NA	NA	Field

* AWRLs have not been developed for these parameters

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 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 standard 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, also called duplicates, 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. deioinized water, sand, commercially available tissue)or sample/duplicate pairs in the case of bacterial analysis. Precision results are compared against measurement performance specifications and used during evaluation of analytical performance. Program-defined measurement performance specifications for precision are defined in Table A7.1.

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 Standards prepared with verified and known amounts of all target analytes in the sample matrix (e.g. deioinized 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 Table A7.1.

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 includes 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

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 5.4.4 of the NELAC standards (concerning Review of Requests, Tenders and Contracts).

A9 DOCUMENTS AND RECORDS

The documents and records that describe, specify, report, or certify activities are listed.

Table 5. 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*
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*
Field equipment calibration/maintenance logs	USIBWC	7 yrs.	*Paper*
Field instrument printouts	USIBWC	7 yrs.	*Paper*
Field notebooks or data sheets	USIBWC	7 yrs.	*Paper*
Chain of custody records	USIBWC	7 yrs.	*Paper*

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 NELAC standards (Section 5.5.10) and include the information necessary for the interpretation and validation of data. The requirements for reporting data and the procedures are provided.

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.

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

Table 6. B2.1 Sample Storage, Preservation and Handling Requirements

Routine Conventionals-in-Water Samples (8 containers: 4 unpreserved, 1 preserved with HNO_3, 1 preserved with HCl, 1 preserved with H_2S0_4, 1 preserved with $Na_2S_2O_3$)				
Parameters	Containers	Sample Volume (ml)	Preservation	Maximum Holding Time
CONTAINER 1				
	2 HDPE bottles	1000	Cool to 4 C	
TSS (00530)/VSS (00535)		300	"	7 days
Chloride (Cl) (00940)		100	"	28 days
Sulfate (SO_4) (00945)		100	"	28 days
Fluoride (00951)		50	"	28 days
TDS (70300)		100	"	7 days
Bromide (71870)		50	"	28 days
Alkalinity (00410)		100	"	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 (00935)		50	"	6 months
Hardness (00900)		50	"	6 months
CONTAINER 3				
	HDPE	500	1-2 ml conc.H_2SO_4 to pH <2 and cool to 4 C	
Ammonia (NH_3) (00610)		150	"	28 days
Total Phosphorus (TPO_4) (00665)		150	"	28 days
Nitrate + Nitrite (00630)		150	"	28 days

$(NO_3 + NO_2)$				
CONTAINER 4 and 5				
Chlorophyll *a* (70953)	glass amber	1000	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 (32213)	glass amber	1000	dark and ice before filtration; dark and frozen after filtration	Filter within 48 hours Filters may be stored frozen up to 28 days
CONTAINER 6				
BOD (00310)	HDPE	1000	Cool to 4 C	2 days
CONTAINER 7				
Total Organic Carbon (TOC) (00680)	VOA glass vials (3)	40	0.5 ml conc. HCl to pH <2 and cool to 4 C	28 days
CONTAINER 8				
E. coli bacteria	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
DISSOLVED Metals, Total Hardness	HNO_3 cleaned plastic bottle	500	Filter at lab with 0.45 micron filter into ultra-pure HNO_3 pre-acidified container to pH<2	180 days
TOTAL	HNO_3 cleaned plastic bottle	500	Pre-acidified container with 5 ml ultra-pure HNO_3 to pH<2	28 days
Metals in Sediment				
Metals	glass jar with teflon lined lid	500 grams	Cool 4 C	180 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.

Sample Containers

Sample containers are purchased pre-cleaned for conventional parameters and are disposable. Containers used for bacteriological samples may have 1% sodium thiosulfate tablets added. Amber glass bottles are used routinely for chlorophyll and pheophytin 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. Certificates are maintained in a notebook by the USIBWC or by the laboratory supplying sample containers under the CRP. Environmental Testing and Consulting, Inc. 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 as presented in Appendix C. Flow worksheets, aquatic life use monitoring checklists, habitat assessment forms, field biological assessment forms, and records of bacteriological analyses 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)
9. E. coli and fecal coliform analyses indicated on the field sheet in Appendix C are only applicable for USIBWC field offices and sampling partners that are continuing bacterial analysis. This data is used for USIBWC purposes only, and is in addition to the bacteria analyzed by an accredited laboratory.

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:

1. Write legibly in indelible ink
2. Changes should be made by crossing out original entries with a single line, entering the changes, and initialing and dating the corrections.
3. 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 Project 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. Field splits/duplicates need a separate COC. USIBWC has different COC forms for organics in sediment samples. 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. Analyses required
7. Name of collector
8. Custody transfer signatures and dates and time of transfer

9. Bill of lading (*if applicable*)

Sample Labeling

Samples from the field are labeled with indelible marker or pen on labels provided by ETC and placed on the container. Label information includes:

1. Site identification
2. Date and time of collection
3. Preservative added, if applicable
4. Designation of "field-filtered" *(for metals)* as applicable

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, Big Bend National Park, and the University of Texas at El Paso samples will be collected and shipped to Environmental Testing and Consulting, Inc. 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 put 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 Project Manager. These include such items as delays in transfer, resulting in holding time violations; violations of sample preservation requirements; incomplete documentation, including signatures; possible tampering of samples; broken or spilled samples, etc. The USIBWC Project 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 Table A7.1 of Section A7. 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 will be in accordance with the most recently published edition of *Standard Methods for the Examination of Water and Wastewater*, the latest version of the *SWQM Procedures, Volume 1: Physical Methods for Water, Sediment, and Tissue*, 40 CFR 136, or other reliable procedures acceptable to the Executive Director.

Laboratories collecting data under this QAPP are compliant with the NELAC 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 USIBWC 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 Project Manager. The USIBWC Project Manager will include this information in the CAP and submit with the Progress Report which is sent to the TCEQ CRP Project Manager.

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

The TCEQ has determined that analyses associated with the qualifier codes "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). 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.

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

$$RPD = |(X_1 - X_2)/\{(X_1+X_2)/2\} * 100|$$

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 then 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 NELAC-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 on each day calibrations are performed. In addition, and LOQ check standard will be analyzed with each analytical batch. Calibrations including the standard at the LOQ 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 Table A7.1 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 Standard – An LOQ check standard 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 standard is spiked into the sample matrix at a level less than or near the LOQ for each analyte for each analytical batch of CRP samples run.

The LOQ check standard is carried through the complete preparation and analytical process. LOQ Check Standards are run at a rate of one per analytical batch.

The percent recovery of the LOQ check standard 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 standard:

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

Measurement performance specifications are used to determine the acceptability of LOQ Check Standard analyses as specified in Table A7.1.

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 mid point 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 Table A7.1.

Laboratory Duplicates – A laboratory duplicate is prepared by taking aliquots of a sample from the same container 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, precision is calculated by the relative percent difference (RPD) of LCS duplicate results as defined by 100 times the difference (range) of each duplicate set, divided by the average value (mean) of the set. For duplicate results, X_1 and X_2, the RPD is calculated from the following equation:

$$RPD = |(X_1 - X_2)/\{(X_1+X_2)/2\} * 100|$$

A bacteriological duplicate is considered to be a special type of laboratory duplicate and applies when bacteriological samples are run in the field as well as in the lab. Bacteriological duplicate analyses are performed on samples from the sample bottle on a 10% basis. Results of bacteriological duplicates are evaluated by calculating the logarithm of each result and determining the range of each pair.

Measurement performance specifications are used to determine the acceptability of duplicate analyses as specified in Table A7.1. The specifications for bacteriological duplicates in Table A7.1 apply to samples with concentrations > 10 org./100mL.

Laboratory equipment blank - Laboratory equipment blanks are provided by the laboratory, and collection materials for metals sampling equipment are new and sterile. 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 are used, for example, to determine the effect of the matrix on a method's recovery efficiency.

Percent recovery of the known concentration of added analyte is used to assess accuracy of the analytical process. The spiking occurs prior to sample preparation and analysis. Spiked samples are routinely prepared and analyzed at a rate of 10% of samples processed, or one per preparation batch whichever is greater. The information from these controls is sample/matrix specific and is not used to determine the validity of the entire batch. To the extent possible, matrix spikes prepared and analyzed over the course of the project should be performed on samples from different sites. The MS is spiked at a level less than or equal to the midpoint of the calibration or analysis range for each analyte. Percent recovery (%R) is defined as 100 times the observed concentration, minus the sample concentration, divided by the true concentration of the spike.

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 laboratory shall document the calculation for %R. The percent recovery of the matrix spike is calculated using the following equation in which %R is percent recovery, SSR is the observed spiked sample concentration, SR is the sample result, and SA is the reference concentration of the spike added:

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

Measurement performance specifications for matrix spikes are not specified in this document.

The results are compared to the acceptance criteria as published in the mandated test method. Where there are no established criteria, the laboratory shall determine the internal criteria and document the method used to establish the limits. For matrix spike results outside established criteria, corrective action shall be documented or the data reported with appropriate data qualifying codes.

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 then 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 Project 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 Project 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 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 Laboratory QAO. The Laboratory QAO will discuss with the USIBWC Project Manager. If applicable, the USIBWC Project Manager will include this information in the CAP and submit with the Progress Report which is sent to the TCEQ CRP Project Manager.

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

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 after 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 7. 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 consumable, in order to satisfy the technical and quality objectives of this project, are documented in the individual laboratories' QMS.

B9 NON-DIRECT MEASUREMENTS

This QAPP does not include the use of routine data obtained from non-direct measurement sources. 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. 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. 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 SWQM data collected by USIBWC, as well as other agencies and partners participating under this QAPP. 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, 2009 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 8 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

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, TCEQ established AWRL's, 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, 2009 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 9. B10.2 Personal Computer and Software Configuration.

Configuration	Current		Anticipated	
Type	Hardware/Software	Date	Hardware/Software	Date
PC Workstation Hardware	Gateway 2000 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; 40GB Hard Drive; 1.44 MB Disk; 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 6.5 Groupwise; MS Office 2003 Premium	Current	Software upgrades	As needed
Type	Hardware/Software	Date	Hardware/Software	Date
Portable PC Hardware	Portable PC: 14.1" XGA Active Matrix color Display Intel Pentium II processor 333MHz w/ 256K Full Speed L2 Cache; 64MB SDRAM; 256-Bit Accelerator w/ 2.5MB Video Memory; 16-Bit Software Wavetable audio; 6.4GB Ultra ATA hard drive; 1.44MB 3.5" Disk Drive; 20X CD-Rom; 56K Data/Fax Modem; 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
Portable PC Software	Corel Office Professional 10 Suite ArcView GIS 3.2a MS Office 2003 Premium	Current	Software upgrades	As needed
Data Backup System	Each workstation contains a 16x rewritable drive.	Current		

Table 10. B10.3 GIS Workstation Hardware and Software Configuration

Configuration	Current		Anticipated	
Type	Hardware/Software	Date	Hardware/Software	Date
Intel PC Workstation Hardware	PC Workstation configured as follows: Intel Pentium IV 2.4GHz w/512k Cache; 1GB PC800 SDRAM; 24" LCD color monitor; 128MB NVIDIA GeForce 4ti Graphics Card; 80GB hard drive; 3.5" 1.44MB disk drive; 16X rewritabe CD-ROM; DVD-ROM drive; 104+ keyboard; 3COM PCI 10/100 Twisted pair Ethernet w/WOL; MS Intellimouse; Hewlett Packard DesignJet 1050C Printer	Current	Hardware upgrades	As needed
PC Workstation Software	ArcEditor 9.3, Mapviewer 5, MS Activesync 3.6, ESRI ArcPad, Spatial Analyst, 3D Analyst, GPS Analyst, Geostatistical Analyst and Streetmaps, MS Office 2000 Premium Trimble Pathfinder Office Software v.3 Adobe Creative Suite 2	Current	Software upgrades	As needed
Trimble GeoXH	Intel StrongARM processor with 1 GB	Current	Software upgrades	As

	memory; Windows CE 3.1; Terrasync; and Esri ArcPad			needed

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.

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 11. 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	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 USIBWC Project 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).

Corrective Action

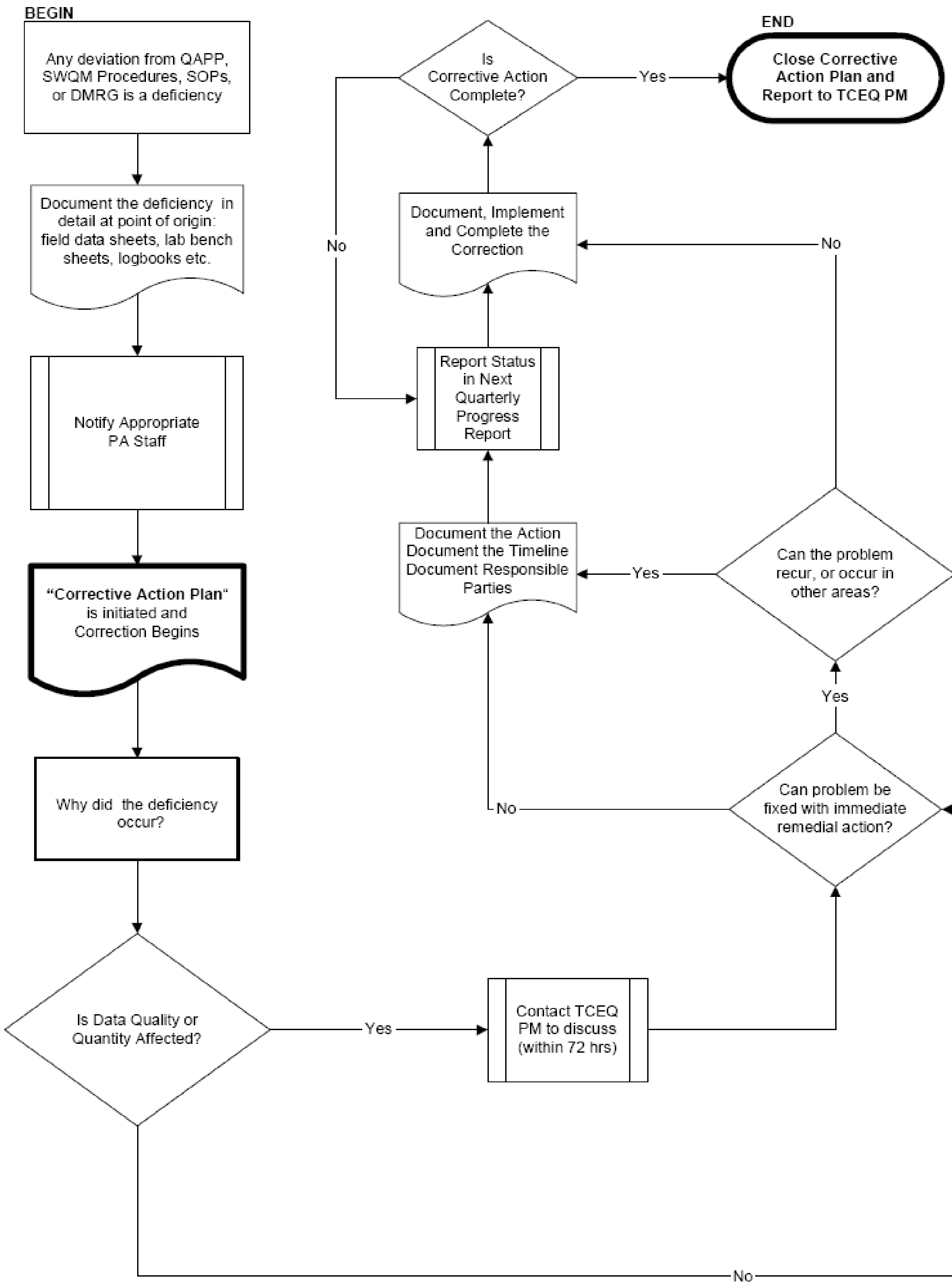
Corrective Action Plans (CAPs) Corrective Action Plans should:

- 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

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 Project Manager is responsible for implementing and tracking corrective actions. Records of audit findings and corrective actions are maintained by both the CRP and the USIBWC Project 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 CRP 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 Project Coordinator. 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.
- Environmental Testing and Consulting, Inc. 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 12. 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 Project Manager	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 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 is listed in the first two columns of Table D2.1, respectively. Potential errors are identified by examination of documentation and by both manual and 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.

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 Project Manager validates that the data meet the data quality objectives of the project and are suitable for reporting to TCEQ.

If any requirements or specifications of the CRP are not met, based on any part of the data review, the responsible party should document the nonconforming activities and submit the information to the USIBWC Data Manager with the data. This information is communicated to the TCEQ by the USIBWC in the Data Summary (See Appendix E).

Table 13. D2.1: Data Review Tasks ***(please insert the name/position of the person responsible for each task in the table)***

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 Inventory and 303(d) List* in accordance with TCEQ's *Guidance for Assessing Texas Surface and Finished Drinking Water Quality Data*, and for TMDL development, stream standards modifications, 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:
Task 3 Workplan

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
- special study, intensive monitoring targeted to:
  - identify sources and causes
  - assess priority water quality issues
  - obtain background water quality information
  - provide information for setting site-specific permit effluent limits
  - evaluate & develop statewide, regional, and site-specific water quality standards

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

Monitoring Description

The USIBWC and partner agencies collect water quality data at 46 stations throughout the basin. Under a separate QAPP, an additional 44 stations are monitored by the TCEQ under the Surface Water Quality Monitoring Program (SWQM) in the Rio Grande. In addition, 5 of those 44 stations will be piloted in the Upper Rio Grande for total and dissolved metals, also under the SWQM QAPP.

The sampling frequency for the parameter groups that will be collected under the USIBWC QAPP include:

- 41 stations monthly for field, flow, conventional, and bacteria;
- 9 of the stations will also be collected for organics in sediment;
- 1 of the stations will also be collected for metals in water; and
- 7 stations monthly for bacteria only;

All monitoring procedures and methods 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. Qualified monitoring organizations will be invited to attend the working meetings 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.

Biological Data Reporting
Biological/habitat data reported to the TCEQ under an approved QAPP, will be submitted in a pdf document using Biological Data Reporting Packet outlined in Exhibit 3D in the CRP Guidance.

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).

Currently, USIBWC is working with TCEQ and Texas AgriLife Extension to track sources of high salinity and salt loading in the Pecos River. TCEQ will collect an additional year of data, and a report of this project should be completed by the end of this biennium.

A special study under the USIBWC QAPP is the Brownsville bacteria source-tracking special study that aims to gain a better understanding of the bacteria contamination in a 20-mile stretch of Segment 2302. The data will be collected in FY 10 and a report will be prepared in FY 11.

Task 3
Deliverables
& Dues Dates: September 1, 2009 through August 31, 2010

A. Conduct water quality monitoring, summarize activities, and submit with Progress Report - December 30, 2009; March 30 and June 30, 2010
B. Coordinated Monitoring Meeting - between March 15 and April 30, 2010
C Coordinated Monitoring Meeting Summary of Changes - May 15, 2010
D. Email notification that Coordinated Monitoring Schedule updates are complete - May 31, 2010
E. Biological Data Report - TBD
F Special Study - Status Reports - December 30, 2009; March 30 and June 30, 2010
G. Special Study - Draft Report - TBD
H. Special Study - Final Report - TBD
I. Special Study - post Final Report to web -TBD

September 1, 2010 through August 31, 2011

A. Conduct water quality monitoring, summarize activities, and submit with Progress Report - September 30 and December 30, 2010; March 30 and June 30 and August 30, 2011

B. Coordinated Monitoring Meeting - between March 15 and April 30, 2011
C Coordinated Monitoring Meeting Summary of Changes - May 15, 2011

D. Email notification that Coordinated Monitoring Schedule updates are complete - May 31, 2011
E. Biological Data Report - coordinate due date(s) with TCEQ Project Manager
F. Special Study - Status Reports - September 30 and December 30, 2010; March 30 and June 30, 2011
G. Special Study - Draft Report - TBD
H. Special Study - Final Report - coordinate TBD
I. Special Study - post Final Report to web - TBD

USIBWC Clean Rivers Program

FY 2010/2011 QAPP - Appendix B Monitoring Schedule for FY 2010

Appendix B   Sampling Process Design and Monitoring Schedule (plan)

Sample Design Rationale FY 2010

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 305(b) assessment, and to identify significant long-term water quality trends. Based on Steering Committee input, achievable water quality objectives and priorities and the identification of water quality issues are used to develop work plans which are in accord with available resources. As part of the Steering Committee process, the USIBWC coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed. Input from CRP partners and evaluation of previous assessments has led to increased monitoring activities and monitoring stations in areas that need additional coverage to determine sources of concerns and potential future concerns in the basin.

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 2010 are presented on the following page.

Monitoring Sites for FY 2010

The sample design for surface water quality monitoring for basin 23, fiscal year 2010 is shown below.

The following is a list of headings used to describe and identify each column heading and its contents.

1. SEG - This column is used to identify the river segment in which a station is located.

The segments are described as follows:

Segments in the Rio Grande Basin		
Lower Rio Grande Basin		
Segment	Name	Description
2301	Rio Grande Tidal	From the confluence with the Gulf of Mexico in Cameron County to a point 6.7 mi (10.8 km) downstream of the International Bridge in Cameron County
2302	Rio Grande below Falcon Reservoir	From a point 6.7 mi (10.8 km) downstream of the International Bridge in Cameron County to Falcon Dam in Starr County
Middle Rio Grande Basin		
Segment	Name	Description
2303	International Falcon Reservoir	From Falcon Dam in Starr County to the confluence of the Arroyo Salado (Mexico) in Zapata County, up to the normal pool elevation of 301.1 feet (impounds Rio Grande)
2304	Rio Grande below Amistad Reservoir	From the confluence or the Arroyo Salado (Mexico) in Zapata County to Amistad Dam in Val Verde County
2313	Tributary - San Felipe Creek	From the confluence with the Rio Grande in Val Verde County to a point 4.0 km (2.5 mi) upstream of US 90 in Val Verde County
Upper Rio Grande Basin		
Segment	Name	Description
2305	International Amistad Reservoir	From Amistad Dam in Val Verde County to a point 1.8 km (1.1 mi) downstream of the confluence of Ramsey Canyon on the Rio Grande Arm in Val Verde County and to a point 0.7 km (0.4 mi) downstream of the confluence of Painted Canyon on the Pecos River Arm in Val Verde County and to a point 0.6 km (0.4 mi) downstream of the confluence of Little Satan Creek on the Devil's River Arm in Val Verde County, up to the normal pool elevation of 1117 feet (impounds Rio Grande)
2306	Rio Grande above Amistad Reservoir	From a point 1.8 km downstream of the confluence of Ramsey Canyon in Val Verde County to the confluence of the Rio Conches (Mexico) in Presidio County
2307	Rio Grande below Riverside Diversion Dam	From the confluence of the Rio Conches (Mexico) in Presidio county to Riverside Diversion Dam in El Paso County

2308	Rio Grande below International Dam	From the Riverside Diversion Dam in El Paso County to International Dam in El Paso County
2309	Tributary - Devils River	From a point 0.6 km (0.4 mi) downstream of the confluence of Little Satan Creek in Val Verde County to the confluence of Dry Devils River in Sutton County
2314	Rio Grande above International Dam	From International Dam in El Paso County to the New Mexico State line in El Paso County
Pecos River Sub-basin		
2310	Tributary - Lower Pecos River	From a point 0.7 km (0.4 miles) downstream of the confluence of Painted Canyon in Val Verde County to a point immediately upstream of the confluence of Independence Creek in Crockett/Terrell County
2311	Tributary - Upper Pecos River	From a point immediately upstream of the confluence of Independence Creek in Crockett/Terrell County to Red Bluff Dam in Loving/Reeves County
2312	Tributary - Red Bluff Reservoir	From Red Bluff Dam in Loving/Reeves County to the New Mexico state line in Loving/Reeves County, up to the normal pool elevation of 2842 feet (impounds Pecos River)

* This table includes segments for the entire Rio Grande Basin. Segments that are listed in the above table and are not in the CMS listed in this QAPP are sampled by TCEQ field offices, and not by USIBWC CRP.

2. REGION - This column is used to identify the TCEQ regional office in which the stations are located, and the TCEQ regional office conducting the water quality monitoring.

The TCEQ regional offices are identified as follows:

Region #	Location	Address
Region 6	El Paso	401 East Franklin Ave., Ste 560 El Paso, TX 79901-1206 (915) 534-4949
Region 7	Midland	3300 North A St., Bldg 4, Ste. 107 Midland, TX 79705-5404 (915) 570-1359
Region 13	San Antonio	14250 Judson Rd. San Antonio, TX 78233-4329 210-490-3096
Region 15	Harlingen	1804 West Jefferson Ave. Harlingen, TX 78550-5247 (956) 425-6010
Region 16	Laredo	707 E. Calton, Suite, 304 Laredo, TX 78043 (956) 791-6611

3. LAT - The GPS confirmed latitude of the sampling location.
4. LONG - The GPS confirmed longitude of the sampling location.

5. STATION DESCRIPTION - This column is used to describe the monitoring station locations.

6. STAT ID - The station ID is a unique TCEQ assigned number used to numerically identify the particular monitoring station.

7. START DATE/END DATE - These columns are used to identify the beginning and ending dates for which the designated sampling will take place.

8. Submitting Entity Code/Collecting Entity Code - This column is used to identify the source codes, which represent the entities responsible for the sampling. The submitting entity code identifies the entity responsible for the sampling, and the collecting entity code identifies the entity actually conducting the sampling at each station.

The following table contains a description of each abbreviation:

Submitting Entity Code	**Entity**
IB	U.S. International Boundary and Water Commission
Collecting Entity Code	Entity
BB	Big Bend National Park
IB	U.S. International Boundary and Water Commission
LA	City of Laredo, Health Department Laboratory
LE	City of Laredo, Environmental Engineering Division
RN	Rio Grande International Study Center
SL	Sul Ross University
UB	University of Texas at Brownsville, Environmental Sciences Department
UE	University of Texas at El Paso, Biological Services Department
BO	Brownsville Public Utilities Board

9. MONITOR TYPE - The program code describes the type of water quality monitoring that will be conducted at a particular station.

The following table describes the program type for the Rio Grande:

Program Code	**Description**
RT	Routine Water Sampling/Baseline (Long-term monitoring)

10. METALS WATER - The number of metals in water samples to be collected for determining compliance with water quality standards to protect aquatic life scheduled within the given sampling period. Parameters to be analyzed are listed on the chain of custody.

11. ORG WATER - The number of organics in water samples to be collected within the given sampling period. Parameters to be analyzed are listed on the chain of custody.

12. METALS SED - The number of metals in sediment samples to be collected within the given sampling period. Parameters to be analyzed are listed on the chain of custody

13. ORG SED - The number of organics in sediment samples to be collected within the given sampling period. Parameters to be analyzed are listed on the chain of custody

14. CONV - The number of conventional chemical water samples to be collected within the given sampling period. Conventional parameters to be analyzed are listed on the chain of custody. Conventional parameters may vary among CRP Cooperators due to minor differences in monitoring program objectives.

15. TOX WAT - The number of ambient toxicity in water samples to be collected within the given sampling period.

16. TOX SED - The number of ambient toxicity in sediment samples to be collected within the given sampling period.

17. FLOW - The number of instantaneous flow measurements to be taken within the given sampling period.

18. FIELD - The number of field measurements scheduled within the given sampling period. Minimum parameters to be collected are: Temperature (00010); PH (00400); Dissolved oxygen (00300); Specific conductance (00094); Secchi disc transparency (00078); Days since last precipitation event (72053); Flow severity (01351); Instantaneous flow (00061); Flow method (89835); Weather (89966); Wind intensity (89965); and Wind direction (89010). Field parameters may vary due to differences in monitoring program objectives among CRP Cooperators.

19. BACT – The number of bacteriological samples (e. coli) to be collected within the given sampling period.

Table 14. Appendix B.1 Sample Design and Schedule, FY 2010

CRP SCHEDULE HOME River Basin: 23 FY: 2010

Desc	Stat	Reg	Submit Entity	Collect Entity	Mon Type	DO	AqHab	Benth	Nekt	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tis	Fld	Comments
Segment 2301 Rio Grande Tidal																					
RIO GRANDE TIDAL AT SH 4 NEAR BOCA CHICA	13176	15	IB	UB	RT									4						4	
RIO GRANDE AT SABAL PALM SANCTUARY AT NORTHEAST BOUNDARY OFF PARK ROAD APPROX. 1MI SOUTH OF FM1419 NEAR PALM GROVE	16288	15	IB	UB	RT									4			4			4	
Segment 2302 Rio Grande Below Falcon Reservoir																					
RIO GRANDE EL JARDIN PUMP STATION, AT LOW WATER DAM 300 FT. BELOW INTAKE	13177	15	IB	IB	RT								1	8			8	8		8	
RIO GRANDE INTERNATIONAL BRIDGE ON US 77 AT BROWNSVILLE	13178	15	IB	UB	RT									4			4			4	
RIO GRANDE NEAR RIVER BEND BOAT RAMP APPROXIMATELY 5 MI. WEST OF BROWNSVILLE ON US 281	13179	15	IB	UB	RT									4			4			4	
RIO GRANDE INTERNATIONAL BRIDGE AT US 281 AT HIDALGO	13181	15	IB	IB	RT								1	8			8	8		8	
RIO GRANDE AT SH 886 NEAR LOS EBANOS	13184	15	IB	IB	RT									7			7	7		7	
RIO GRANDE AT FORT RINGGOLD 1 MI. DOWNSTREAM FROM RIO GRANDE CITY	13185	15	IB	IB	RT								1	12			12	12		12	
RIO GRANDE BELOW RIO ALAMO NEAR FRONTON	13186	15	IB	IB	RT									8			8	8		8	
RIO GRANDE 0.5 MI. BELOW ANZALDUAS DAM, 12.2 MI. FROM HIDALGO	13664	15	IB	IB	RT									8			8	8		8	
RIO GRANDE 200M UPSTREAM OF PHARR INTERNATIONAL BRIDGE (US281)	15808	15	IB	IB	RT									8			8	8		8	
RIO GRANDE RIVER AT BROWNSVILLE PUB WATER TREATMENT PLANT NUMBER 1 INTAKE BETWEEN WTP RESERVOIR AND RIO GRANDE LEVEE	20449	15	IB	BO	RT									12			12				

Desc	Stat	Reg	Submit Entity	Collect Entity	Mon Type	DO	AqHab	Benth	Nekt	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tis	Fld	Comments
Segment 2303 International Falcon Reservoir																					
FALCON LAKE AT INTERNATIONAL BOUNDARY MONUMENT I	13189	16	IB	IB	RT									4			4			4	
FALCON RESERVOIR AT SAN YGNACIO WTP INTAKE, 350M DWNSTR FROM US B83 BRIDGE	15818	16	IB	RN	RT									2			2			2	
Segment 2304 Rio Grande Below Amistad Reservoir																					
MANADAS CREEK AT FM 1472 NORTH OF LAREDO	13116	16	IB	LE	RT					4		4	1	4			4	4		4	
RIO GRANDE AT PIPELINE CROSSING 8.7 MI. BELOW LAREDO	13196	16	IB	LA	RT												12			12	
RIO GRANDE 30 METERS UPSTREAM OF US 81 BRIDGE (CONVENT AVENUE) IN LAREDO	13201	16	IB	LA	RT												12			12	
RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE	13202	16	IB	LA	RT												12			12	
RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE	13202	16	IB	RN	RT									4			4	4		4	
RIO GRANDE 12.8 MI. BELOW AMISTAD DAM, NEAR GAGE, 340 M UPSTREAM OF US 277 BRIDGE IN DEL RIO	13208	16	IB	IB	RT									2			2	2		2	
RIO GRANDE, 4.5 MI. DOWNSTREAM OF DEL RIO AT MOODY RANCH	13560	16	IB	IB	RT								1	8			8	8		8	
RIO GRANDE AT INTERNATIONAL BRIDGE #2 (EAST BRIDGE) IN LAREDO	15814	16	IB	LA	RT												12	12		12	
RIO GRANDE AT INTERNATIONAL BRIDGE #2 (EAST BRIDGE) IN LAREDO	15814	16	IB	RN	RT									4			4	4		4	
RIO GRANDE AT MASTERSON RD IN LAREDO, 9.9KM DWNSTR INTL BRIDGE #1 (WEST BRIDGE), DWNSTR SOUTHSIDE WWTP AND UPSTR NUEVO LAREDO WWTP	15815	16	IB	LA	RT												12			12	
RIO GRANDE AT RIO BRAVO, 0.5KM DWNSTR OF THE COMMUNITY OF EL CENIZO	15816	16	IB	LA	RT												12			12	

Desc	Stat	Reg	Submit Entity	Collect Entity	Mon Type	DO	AqHab	Benth	Nekt	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tis	Fld	Comments
RIO GRANDE AT WEBB/ZAPATA COUNTY LINE	15817	16	IB	RN	RT								1	12			12	12		12	
RIO GRANDE AT THE COLOMBIA BRIDGE, 2.7KM UPSTREAM OF THE DOLORES PUMP STATION, 45.1KM UPSTREAM OF THE LAREDO WTP INTAKE	15839	16	IB	LA	RT												12	12		12	
RIO GRANDE AT WORLD TRADE BRIDGE ON FM 3484	17410	16	IB	RN	RT									4			4	4		4	
RIO GRANDE AT APACHE RANCH WEST OF INTERSECTION OF PRIVATE ROAD AND EASTERN AIRSTRIP NO BETWEEN LARADO AND EAGLE PASS	17596	16	IB	IB	RT								1	4			4	4		4	
RIO GRANDE AT KICKAPOO RESERVATION 1.92 KM SOUTH AND 2.02 KM WEST OF RR 1021 AT MAVERICK COUNTY HWY 523 SOUTH OF EAGLE PASS	18795	16	IB	IB	RT									8			8	8		8	
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	16	IB	LA	RT												12			12	
Segment 2306 Rio Grande Above Amistad Reservoir																					
RIO GRANDE AT THE MOUTH OF SANTA ELENA CANYON	13228	6	IB	BB	RT									8			8	8		8	
RIO GRANDE BELOW RIO CONCHOS CONFLUENCE NEAR PRESIDIO	13229	6	IB	IB	RT								1	8			8	8		8	
RIO GRANDE AT BOAT RAMP AT RIO GRANDE VILLAGE IN BIG BEND NATIONAL PARK	16730	6	IB	BB	RT									8			8	8		8	
RIO GRANDE AT PRESIDIO RAILROAD BRIDGE, 3.25KM DOWNSTREAM OF US67, SOUTH OF PRESIDIO	17000	6	IB	IB	RT												8	8		8	
RIO GRANDE AT PRESIDIO/OJINAGA TOLL BRIDGE (INTERNATIONAL), 0.75KM DOWNSTREAM OF US67 IN PRESIDIO	17001	6	IB	IB	RT												8	8		8	

Desc	Stat	Reg	Submit Entity	Collect Entity	Mon Type	DO	AqHab	Benth	Nekt	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tis	Fld	Comments
Segment 2307 Rio Grande Below Riverside Diversion Dam																					
RIO GRANDE 2.4 MI. UPSTREAM FROM RIO CONCHOS CONFLUENCE	13230	6	IB	IB	RT									8			8	8		8	
RIO GRANDE AT GUADALUPE POINT OF ENTRY BRIDGE AT FM 1109 WEST OF TORNILLO	15704	6	IB	UE	RT									4			4	4		4	
RIO GRANDE AT ALAMO CONTROL STRUCTURE, 9.7KM UPSTREAM OF FT. HANCOCK PORT OF ENTRY	15795	6	IB	IB	RT					2			1	4			4	4		4	
RIO GRANDE AT SAN ELIZARIO, 500M UPSTREAM OF CAPOMO ROAD END OF PAVEMENT AND 10.2KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE	16272	6	IB	UE	RT					4				4			4	4		4	
RIO GRANDE 1.47 KILOMETERS UPSTREAM OF THE CONFLUENCE WITH GREEN RIVER AT INDIO MOUNTAINS RESEARCH STATION	20648	6	IB	UE	RT									4			4			4	
Segment 2308 Rio Grande Below International Dam																					
RIO GRANDE AT RIVERSIDE CANAL 1.8 KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE	14465	6	IB	IB	RT															12	
RIO GRANDE 1.3 KM DOWNSTREAM FROM HASKELL ST. WWTP OUTFALL	15528	6	IB	IB	RT															12	
RIO GRANDE 2.4 KM UPSTREAM FROM HASKELL ST. WWTP OUTFALL, SOUTH OF BOWIE HIGH SCHOOL FOOTBALL STADIUM IN EL PASO	15529	6	IB	IB	RT															12	
Segment 2311 Upper Pecos River																					
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	6	IB	SL	RT						2		2	6						6	

Desc	Stat	Reg	Submit Entity	Collect Entity	Mon Type	DO	AqHab	Benth	Nekt	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tis	Fld	Comments
Segment 2314 Rio Grande Above International Dam																					
RIO GRANDE AT COURCHESNE BRIDGE, 1.7 MI UPSTREAM FROM AMERICAN DAM	13272	6	IB	IB	RT					4								12		12	
RIO GRANDE IMMED. UPSTREAM OF THE CONFL. WITH ANTHONY DRAIN EAST OF LA TUNA PRISON NEAR THE STATE LINE	13276	6	IB	UE	RT					4				4				4		4	
RIO GRANDE AT ANAPRA BRIDGE ON SUNLAND PARK DRIVE, 4.2KM UPSTREAM FROM AMERICAN DAM (IN NEW MEXICO)	17040	6	IB	IB	RT					4				4			4			4	

Critical vs. non-critical measurements

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

Changes to FY10 CMS for Basin 23:

- Removed organics in sediment from the following stations: 13179, 13184, 13186, 13664, 15808, 13176, 16288, 13202, 15814, 17410, 18795, 13228, 16730, 13230, 15704, 16272.
- Changed organics in sediment from 2 to 1 times/year for stations: 15795, 13229, 13116, 13560, 15817, 17596, 13185, 13181, 13177.
- Added quarterly metals to stations 16272, 13276, 17040, 13272. Added semi-annual metals to station 15795.
- Added stations 13276, 13178 (quarterly). Changed analysis for 17040 to quarterly. Added station 20449 (monthly conventionals and bacteria). Added station 20558 (conventionals and field 6x/year; organics in water, organics in sediment, semi-annual)
- Removed all but field at 14465, 15528, 15529, and 13272 (lab not accredited).
- Removed bacteria from 13176 (tidal, needs different bacteria).
- Deleted station 15813 (station moved, needs new SLOC).
- Added monthly field and bacteria to the following stations: 13196, 13201, 13202, 15814, 15839, 15815, 15816.
- Added flow to stations 15814 and 15839 (LA).
- Added bacteria to all stations with IB submitting code. (These were never removed from FY09 so no change made, but we will submit bacteria in FY10)
- Added 2 new stations: in Forgotten Stretch (20648) and in Laredo (20650).

Figure 4. Appendix B, Map of Upper Rio Grande Basin and Pecos sub- basin, including FY2010 monitoring station locations.
(Detailed station location information can be found at http://cms.lcra.org)

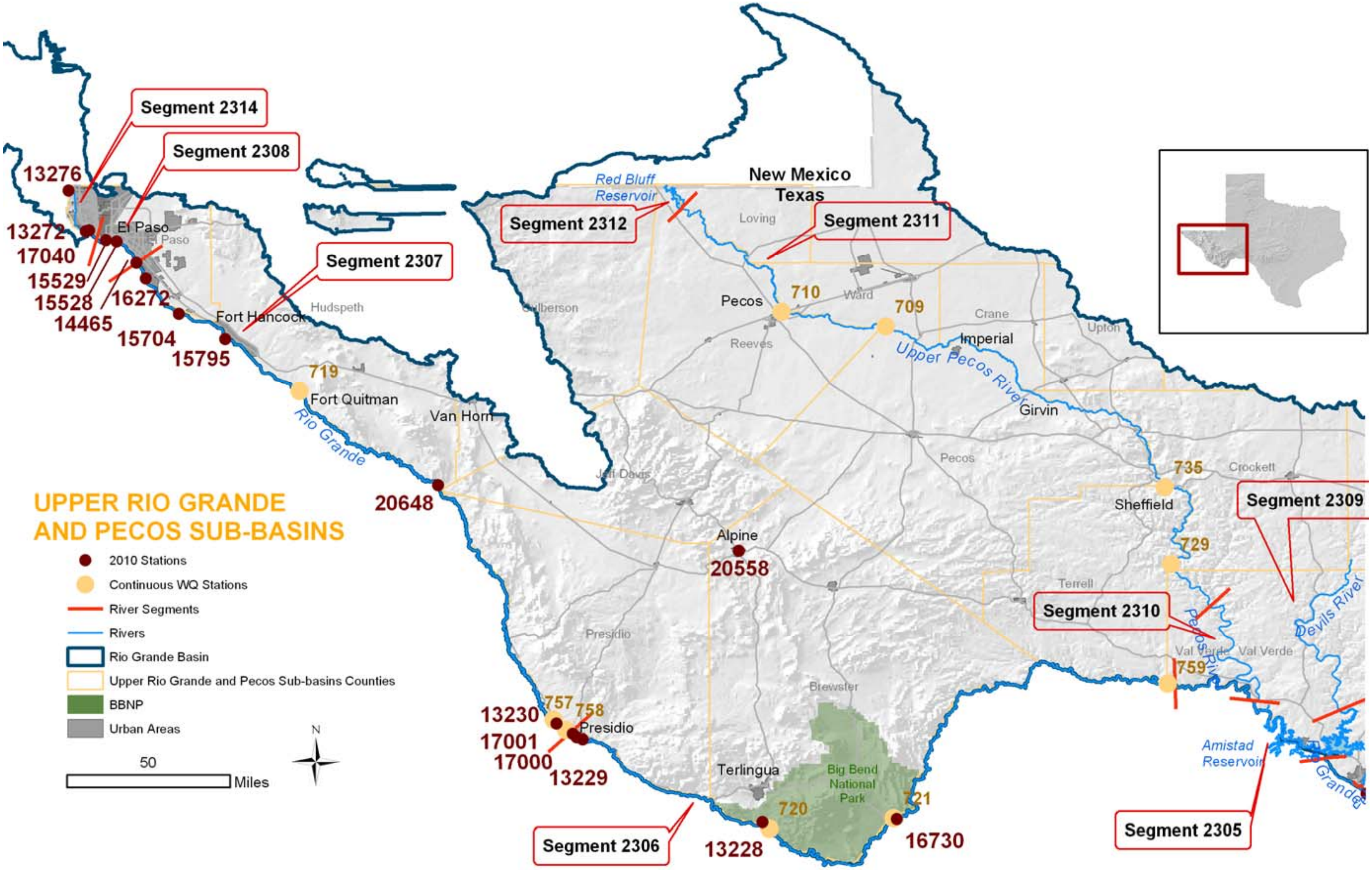


Figure 5. Appendix B, Map of Middle Rio Grande Basin, including FY2010 monitoring station locations.
(Detailed station location information can be found at http://cms.lcra.org)

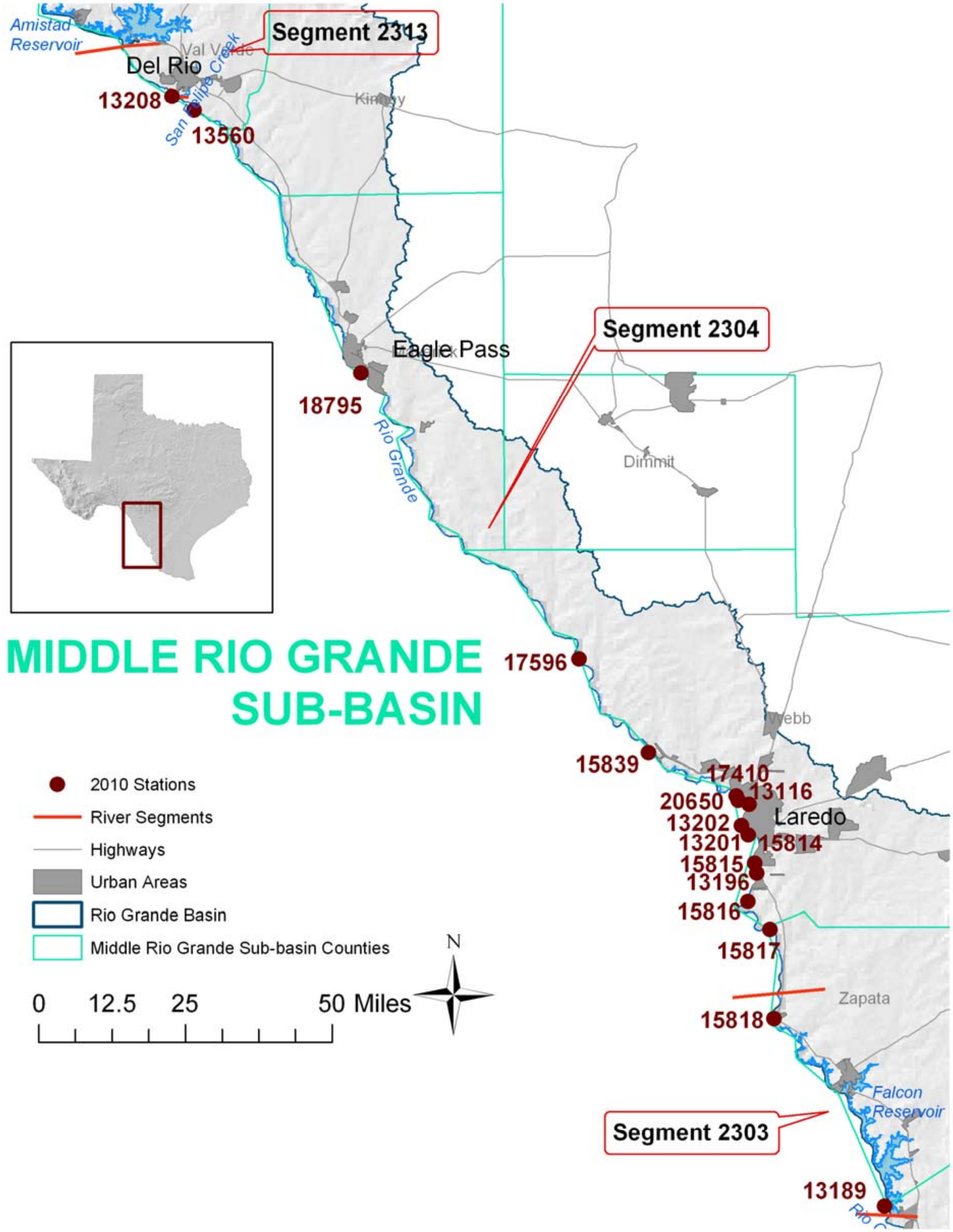
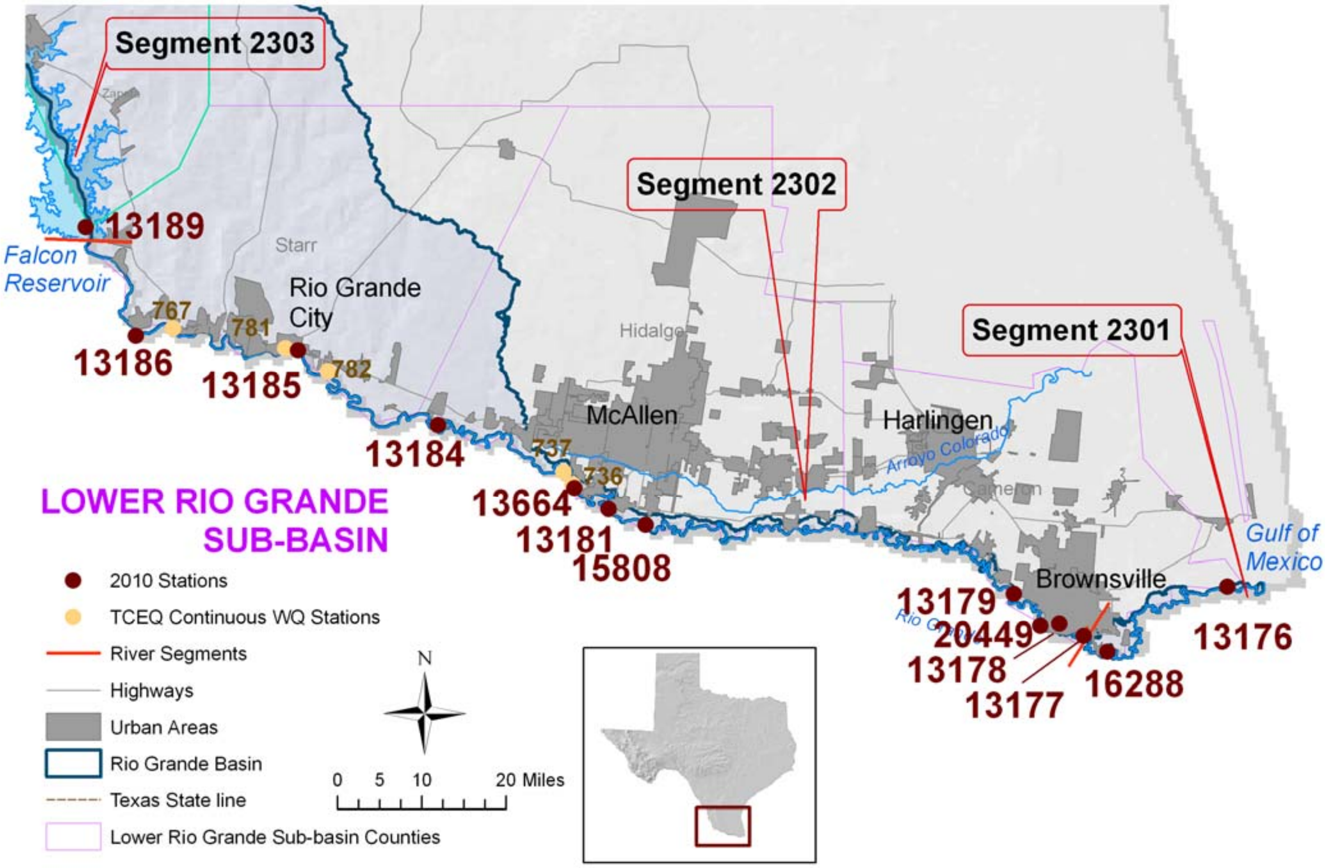


Figure 6. Appendix B, Map of Lower Rio Grande Basin, including FY2010 monitoring station locations.
(Detailed station location information can be found at http://cms.lcra.org)



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 ______ SC1 I B ______ SC2 ______ PC ______

Station Description____

GRAB SAMPLE

M	M	D	D	Y	Y	Y	Y	H	H	M	M		M = meters

DATE TIME DEPTH

00010		WATER TEMP (deg C only)
00020		AIR TEMP (deg C only)
00400		pH (SU)
00300		D.O. (mg/L)
00094		SPECIFIC CONDUCTANCE (uS/cm)
00078		SECCHI DISK (meters)
72053		DAYS SINCE LAST SIGNIFICANT PRECIPITATION
01351		FLOW SEVERITY 1-no flow 2-low 3-normal 4-flood 5-high 6-dry
00061		INSTANTANEOUS FLOW (cfs)

89835		FLOW MEASUREMENT METHOD 1-Gage 2-Electric 3-Mechanical 4-Weir/flume 5-Doppler
74069		ESTIMATED FLOW (cfs)
89861		STREAM WIDTH (meters)
82903		WATER DEPTH (meters)
31616		FECAL COLIFORM (CFU/100 ml)
31699		E. coli (MPN/100 ml)
89966		WEATHER 1-clear 2- partly cloudy 3-cloudy 4-rain 5- other
89965		WIND INTENSITY 1-calm 2-slight 3-moderate 4-strong
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. 06/30/06

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

TAG#	LABORATORY	COC/LAB #
	ETC	

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.: __________________

Sample Location Description: _______________

____

Collected by: ____________________________

Signature: _______________________________

Segment/Sequence: _______________________

Collection Date: __________________________

Collection Time: __________________________

Invoice Information: _______________________

Conventionals			
Storet Code	Analyze if checked	Contract line no.	Parameter
70300	√		TDS, dried at 180 deg C (mg/L)
00940	√		Chloride (mg/L)
00530	√		TSS (mg/L)
00535	√		VSS (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)

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)
31699	√		E. coli bacteria
			*All sample containers are provided
			with appropriate preservative.

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

Rev. 01/05/09

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

								ETC								

TAG# LABORATORY COC/LAB #

CHAIN OF COUSTODY

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.: ____________________

Sample Location Description: ____________________

____

Collected by: ____________________

Signature: ____________________

Segment/Sequence: ____________________

Collection Date: ____________________

Collection Time: ____________________

Invoice Information: ____________________

Analysis Requested

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)
00665	√		Total Phosphorus (mg/L as P)
00610	√		Ammonia (mg/L as N)
00956	√		Silica (mg/l)
00310	√		BOD (mg/L)
32218	√		Phaeophytin (ug/L)
32211	√		Chlorophyll-A (ug/L)
00410	√		Total Alkalinity (mg/l)
00929	√		Sodium (mg/L)
00916	√		Calcium (mg/L)
00927	√		Magnesium (mg/L)
00937	√		Potassium (mg/L)
00951	√		Fluoride (mg/L)
71870	√		Bromide
31699	√		Bacteria (ecoli)

Analysis Requested

Storet Code	Analyze if checked	Contract line no.	Parameter
			Dissolved Metals (lab filtered, preserved)
01106	√		Aluminum
01095	√		Antimony
01000	√		Arsenic
01005	√		Barium
01010	√		Beryllium
01020	√		Boron
01025	√		Cadmium
01030	√		Chromium
01040	√		Copper
01046	√		Iron
01049	√		Lead
01056	√		Manganese
01065	√		Nickel
01145	√		Selenium
01075	√		Silver
01057	√		Thallium
01090	√		Zinc
			Total Metals (preserved)
01147			Selenium
01045			Iron
01055			Manganese
00900			Hardness
*All sample containers are provided with appropriate preservative.			

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

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

								ETC							

TAG# LABORATORY COC/LAB #

CHAIN OF COUSTODY

Released by (printed):____________________

Signature: ____________________

Date/Time: ____________________

Received by (printed): ____________________

Signature: ____________________

Date/Time: ____________________

No. Of Containers: ____________________

Type of containers: ____________________

Preservative used: ____________________

Matrix Type: _________Sediment____________

CLIENT INFORMATION

Requested by: ____________________

Sample TCEQ Station No.: ____________________

Sample Location Description: ____________________

____

Collected by: ____________________

Signature: ____________________

Segment/Sequence: ____________________

Collection Date: ____________________

Collection Time: ____________________

Invoice Information: ____________________

Analysis Requested			
Storet Code	Analyze if checked	Contract line no.	Parameter
Organics			
	√		DDT (ug/L)
	√		Pesticide 8081A (ug/L)
	√		PCBs (ug/L) (8082)
	√		Endosulfan (ug/L)
	√		Pesticide 8141A (ug/L)
	√		Chlorinated herbicides (ug/L)

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

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

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):

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	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.

Data Format and Structure	**Y, N, 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 the sampling *Times* based on the 24 hour clock (e.g. 13:04) with leading zeros?	
G. Is the *Comment* field filled in where appropriate (e.g. unusual occurrence, sampling problems, unrepresentative of ambient water quality)?	
H. *Submitting Entity, Collecting Entity, and Monitoring Type* codes used correctly?	
I. Are the sampling dates in the *Results* file the same as the one 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	**Y, N, or N/A**
A. Are all the "less-than" values reported at the LOQ? **If no, explain in the 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 that site?	
D. Have at least 10% of the data in the data set been reviewed against the field and lab 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	**Y, N, or N/A**
A. Are blank results acceptable as specified in the QAPP?	
B. Were control charts used to determine the acceptability of field duplicates?	
C. Was documentation of any unusual occurrences that may affect water quality included in the *Event* table'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 NELAC Accreditation current for analysis conducted?	

Y = Yes **N = No** **N/A** = Not applicable

DATA SUMMARY

Data Information

Data Source: ____

Date Submitted: ____

Tag_id Range: ____

Date Range: ____

Comments

Please explain in the space below any data discrepancies including:

I. Inconsistencies with AWRL specifications or LOQs;

II. 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

III. Include completed Corrective Action Plans with the applicable Progress Report.

Quality Control Narrative from USIBWC-CRP

____

____

____

____

____

□ 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 Data Review Checklist.

Planning Agency Data Manager: ____.

Date: ____.

Appendix F to the United States Section, International Boundary and Water Commission (USIBWC) Clean Rivers Program FY 2010/2011 QAPP

Bacteria Source Tracking in Segment 2302_07: Phase I

Prepared by the USIBWC

In Cooperation with the Texas Commission on Environmental Quality (TCEQ)

Effective October 23, 2009

Questions concerning this QAPP should be directed to:

Elizabeth Verdecchia
USIBWC - CRP
4171 N. Mesa C-100, El Paso TX 79902
915-832-4701
915-832-4166
elizabethverdecchia@ibwc.gov

S-A1a APPROVAL PAGE (page 1 of 3)

The following signatures are required for the special study:

Elizabeth Verdecchia, USIBWC Project Manager — 10/14/09 — Date

Leslie Grijalva, USIBWC Quality Assurance Officer — 10-14-09 — Date

Bethany Ansell, TCEQ CRP Project Manager — 10-19-09 — Date

Jennifer Delk, CRP Project QAS — 10/20/09 — Date

Allison Woodall, CRP Manager — 10/20/09 — Date

Daniel R. Burke, CRP Lead QAS — 10/23/09 — Date

S-A1a APPROVAL PAGE (page 2 of 3)

University of Texas at Brownsville

Dr. Elizabeth Heise, Professor UTB — Date: 10/13/09

S-A1a APPROVAL PAGE (page 3 of 3)

Environmental Testing and Consulting, Inc.

Andy Parrish, Supervisor, Project Management — 10/7/09 Date

Richard Medina, PhD, ETC Quality Assurance Officer — 10/7/09 Date

A2 TABLE OF CONTENTS

Figures:

Tables:

LIST OF ACRONYMS

As described in Section A2 of the basin-wide QAPP

SS-A3 DISTRIBUTION LIST

As described in Section A3 of the basin-wide QAPP, and

Dr. Elizabeth Heise
University of Texas at Brownsville
Chemistry & Environmental Sciences Department
80 Fort Brown
Brownsville, TX 78520

Andy Parrish
Environmental Testing and Consulting, Inc
2790 Whitten Road
Memphis, TN 38133

SS-A4 PROJECT/TASK ORGANIZATION

TCEQ

Bethany Ansell
CRP Project Manager
As described in the basin-wide QAPP, FY 2010, Section A4.

Other TCEQ staff as described in the basin-wide QAPP, FY 2010, Section A4.

USIBWC

Elizabeth Verdecchia
USIBWC Program Manager
As described in the basin-wide QAPP, FY 2010, Section A4, and will also coordinate this special study. Will also assist UTB to prepare a written report based on the findings of this study.

Leslie Grijalva
USIBWC QA Officer
As described in the basin-wide QAPP, FY 2010, Section A4, and will also review data to insure it meets the requirements of this QAPP.

Kathryn Carberry
USIBWC Data Manager
As described in the basin-wide QAPP, FY 2010, Section A4, and will manage data resulting from the study.

RIO GRANDE BASIN CRP PARTNERS

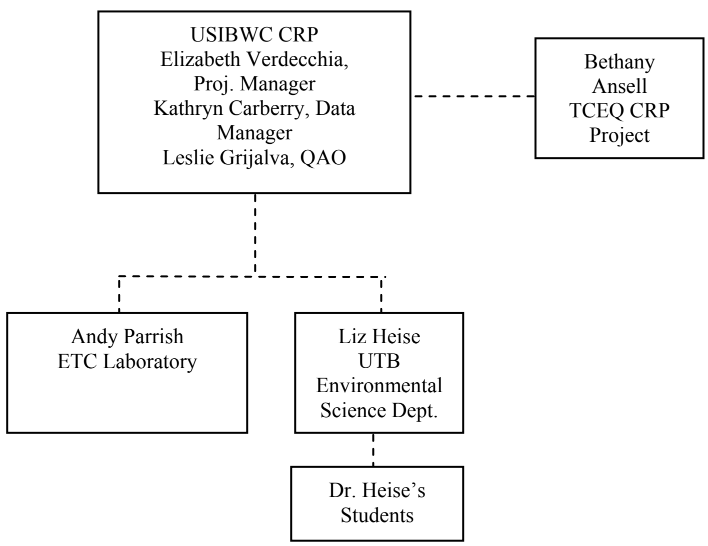
Dr. Elizabeth Heise
University of Texas at Brownsville (UTB)
As described in the basin-wide QAPP, FY 2010, Section A4, and will also coordinate students to collect samples and ensure the students follow TCEQ sampling procedures. Will also coordinate logistics of sampling, including boat launch and boat safety.

Dr. Heise's Students at UTB
Responsible for collecting samples and shipping to ETC laboratory for analysis.

Andy Parrish
Environmental Testing and Consulting, Inc.
Responsible for analysis of samples and reporting of data to USIBWC-CRP.

Richard Medina
Environmental Testing and Consulting, Inc.
Responsible for quality assurance of laboratory analysis and data submittals to USIBWC.

PROJECT ORGANIZATION CHART



SS-A5 PROBLEM DEFINITION

Introduction

Rio Grande Segment 2302_01 has been listed on the Clean Water Act Section 303(d) Impairment List by TCEQ since 1996. TCEQ attempted to initiate a TMDL process within two years of an impairment being listed; however, due to the binational nature of the Rio Grande, implementing TMDLs has not been possible. In addition, bacteria data are sporadic, incomplete and limited in the ability to identify the origin of bacterial contamination.

The USIBWC-CRP and the Earth and Environmental Science Department at the University of Texas at Brownsville (UTB) propose conducting a multi-phase special study to address the bacteria impairment in Segment 2302_07. This special study will accomplish two goals: a) evaluate and identify possible sources of bacteria contamination, and b) characterize the bacteria contamination. The information and data collected from the special study will provide the information necessary to begin steps to reduce pollutant loads and ultimately delist the impairment.

Study Area

According to the 2008 *Texas Water Quality Inventory Water Bodies Evaluated*, Rio Grande Segment 2302_07 uses stations 13177 and 13179. Therefore, sampling will focus on this reach of the Rio Grande, extending approximately 20 miles from TCEQ Station 13177 to 13179 in Segment 2302_07. The attached map shows the stations and the extent of the proposed study area.
Sources and nature of the bacteria contamination are currently unknown. There is limited correlation with flow and precipitation, as seen in graphs of loadings and plotting bacteria versus rainfall. The limited and sporadic data make it difficult to say whether the contamination is point source, nonpoint source, or steady-state. Since graphs show some bacteria spikes correlate with rain and others do not coincide, the more probable explanation for the bacteria contamination is a combination of runoff and point or nonpoint source pollution.

Figure 1. A5.1 Site Map of Study Area for this Project

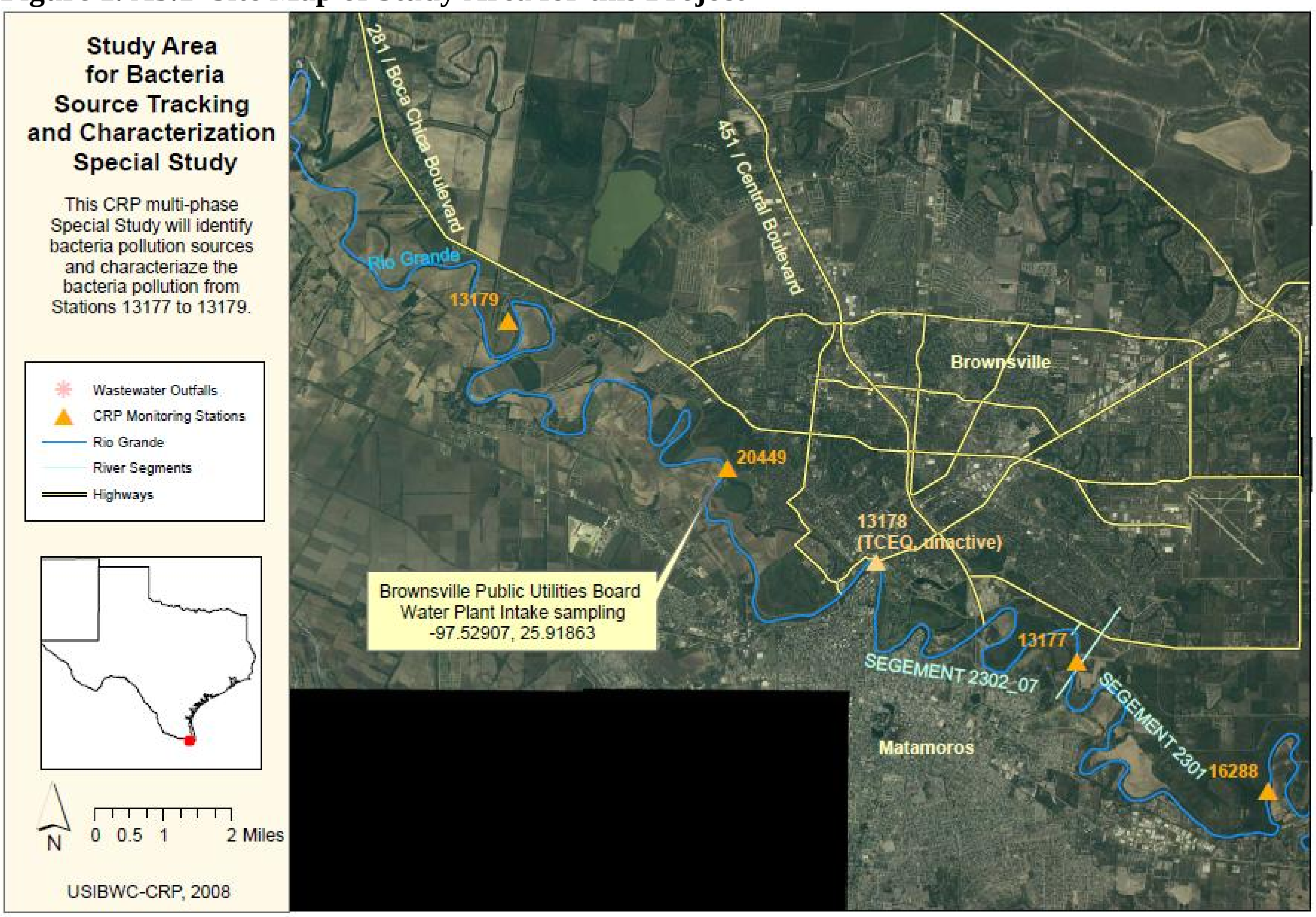
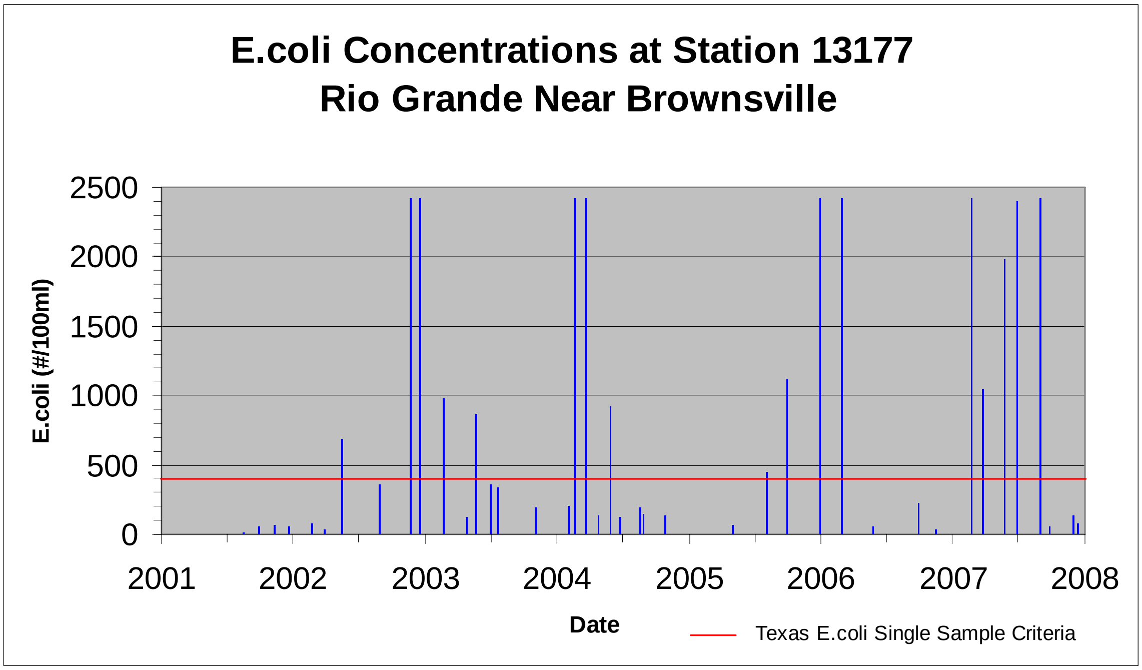
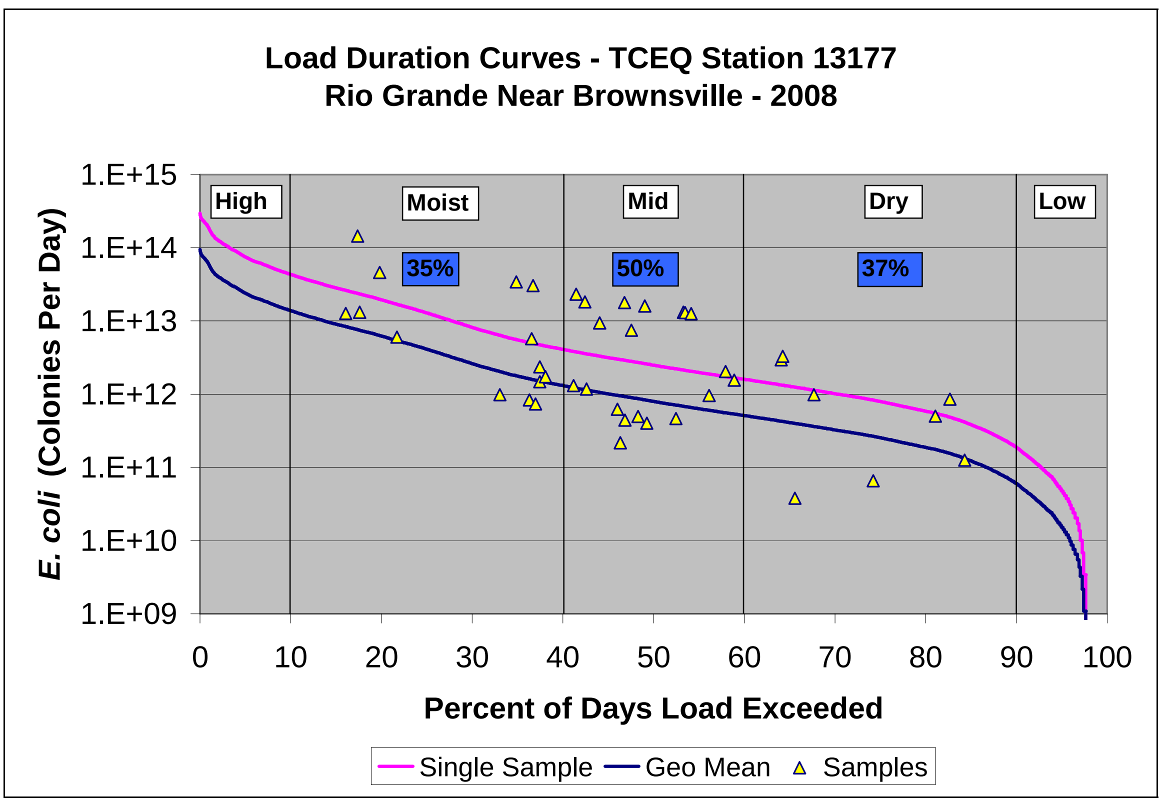
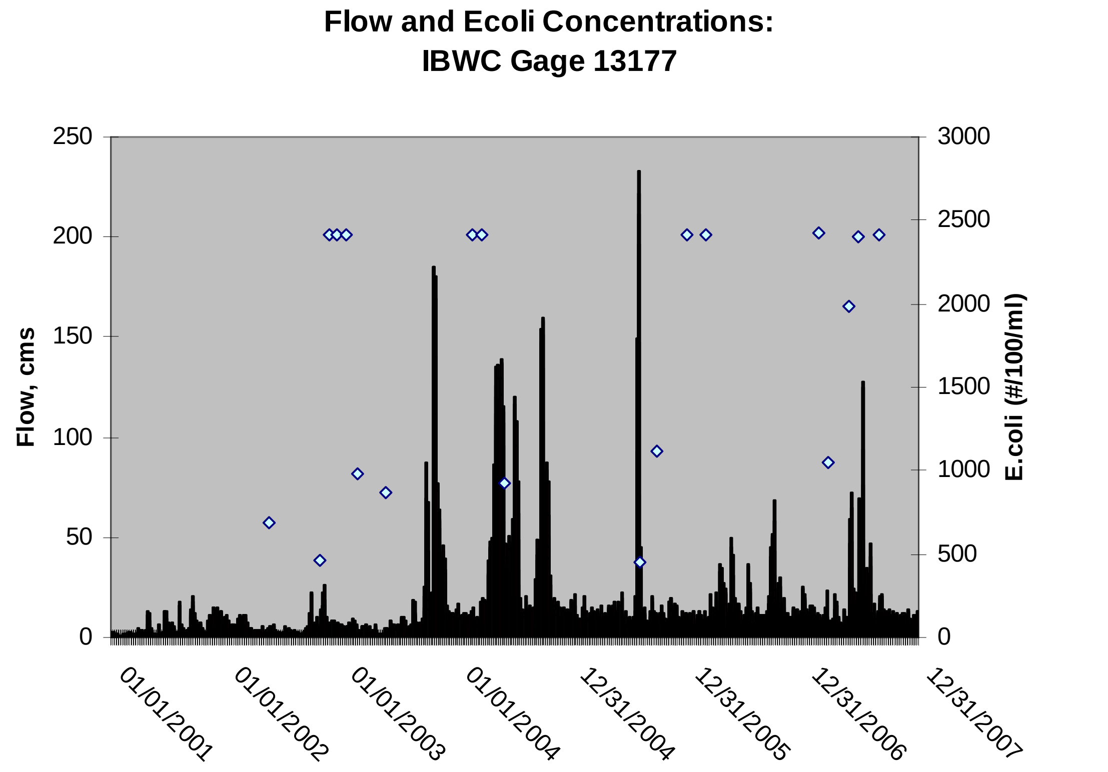
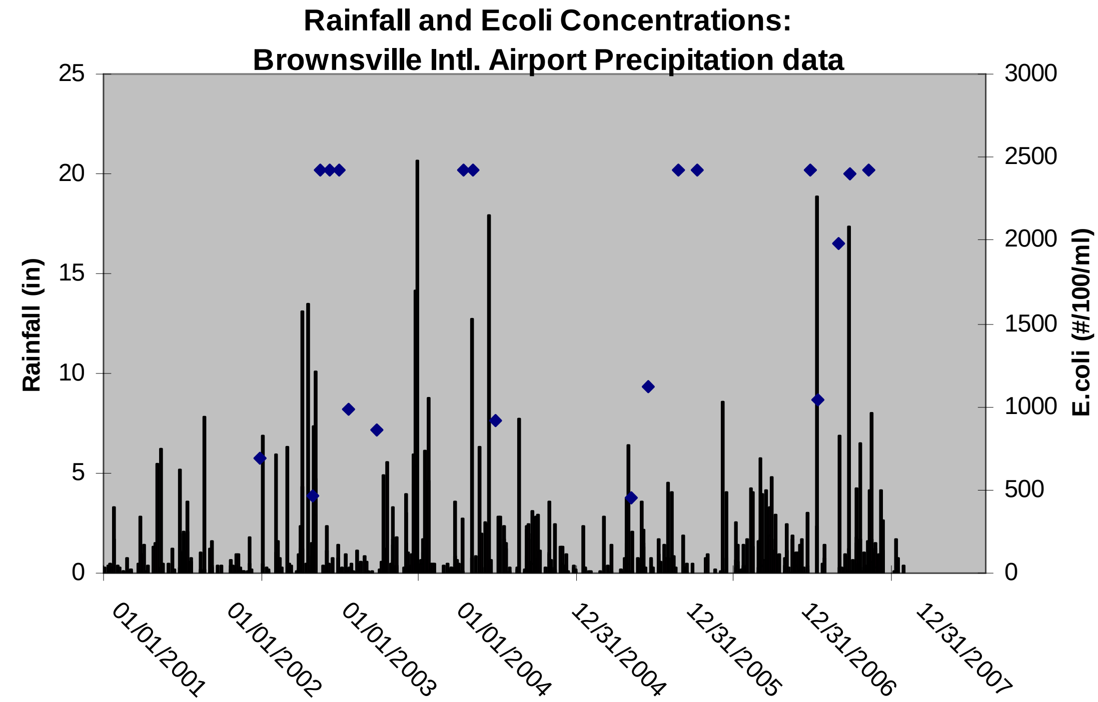


Figure 2. A5.2 Graphs of Background data









19 exceedances since 2001

11 exceedances occurred during dry periods (58%)

8 exceedances occurred after anticendent rainfall of at least 1mm within 3 preceeding days (42%)

SS-A6 PROJECT/TASK DESCRIPTION

Phase I Sampling

UTB will conduct intensive sampling to pinpoint sources of bacteria. Based on the attached data for Stations 13179, 20449 (Brownsville Public Utility Board), and 13177, the source is more than likely downstream of the PUB water intake and upstream of 13177. UTB students will collect samples as part of a volunteer research project led by Dr. Elizabeth Heise. Students will use a UTB motorboat to collect samples during two periods of intensive sampling in the study area. Each sample period will result in 34 water samples:

- From Station13177 to 13178, 14 samples will be collected at approximately half-mile intervals, including at starting Station 13177;
- From 13178 to 20449, ten samples will be collected at approximately half-mile intervals including at Stations 13178 and 20449;
- From 20449 to 13179, ten samples will be collected at approximately one-mile intervals, including at ending Station 13179.

This sampling routine will be repeated on a different day, for a **total of 68 samples**. Each period of sampling will take one day, for a total of two field days. Each sampling location will have a GPS reading, conventional field parameters including DO, pH, specific conductance, and temperature, and a water sample for bacteria analysis.

In addition to water samples, the boat trip will include flow measurements. Since flow data is available at the downstream station, 13177, the crew will take estimated flow measurements at three upstream flow locations: at 13179 (most upstream station), at the Brownsville PUB intake (20449), and at Station 13178 at the international bridge.

Third, Phase I will also include a survey of discharges to the river. The crew will photograph and GPS any discharges they see while traveling upstream. These points will be compared with known discharges on both sides of the river to verify if the crew found any new point sources. Although the flow data at Station 13177 shows a high variability of high and low flows and the months in which they occur, generally the months with higher flow are summer and early fall, and lower river stages occur during early spring. Phase I samples will be collected in the Fall of 2009.

Phase I samples will be analyzed by ETC laboratory.

Phase I will attempt to confirm the source, identify discharges emptying into the river, and create a baseline for evaluating the contamination. The study will result in improved understanding of where the contamination may be coming from.

Phase II Sampling

Phase II of the special study will depend on the results of Phase I. Phase II will be a yearlong characterization of the bacteria contamination to answer additional questions about the contamination. In Spring of 2010, the planning team (USIBWC-CRP, UTB, and TCEQ) will analyze data from Phase I and assess any trends in the data. Ideally, the data will show within a narrow spatial range of one to two miles from where the bacteria contamination is coming. The planning team will decide the sampling routine for Phase II based on the data of Phase I. A revision to this appendix will reflect the new sampling routine.

For example, if the Phase I data show a short spatial range where contamination source is likely, Phase II will involve intensive monitoring of that particular spatial range to further narrow the location of the probably source. If, on the other hand, Phase I data do not show a spatial range where contamination starts, then point source is not probable cause and additional sampling of the kind performed in Phase I is required to gain an understanding of source and variation of contamination with seasons, flow, and rainfall. The planning team will determine frequency and location of sampling. In addition, a revised budget will be submitted upon planning the new sampling routine.

Sampling for Phase II will be conducted in 2010 in the spring and summer of the academic year by UTB students under the direction of Dr. Heise. Sampling will continue through FY2010 through volunteer research students, and possibly a paid summer internship.

Phase II will also consist of a spatial analysis of the region. GPS locations collected of drains, outfalls, and sampling locations in Phase I will be input into a GIS for analysis with meteorological data, land cover, elevation and other available data. Data currently available include USGS Border Environmental Health Initiative Data and Border Water Quality Data Warehouse, UT Austin Rio Grande ArcHydro model, and other border data for both sides of the basin. The intern will conduct spatial analysis with the assistance of UTB professors and staff from USIBWC.

Once the sampling and spatial analyses of Phase II are completed, the final data analysis will be documented in a report for stakeholders, TCEQ, and USIBWC.

Revisions to the Special Study Appendix

A Revision to this Special Study Appendix will be necessary to incorporate Phase II sampling and schedule. Other revisions may be necessary to address incorrectly documented information or to reflect changes in project organization, tasks, schedules, objectives, and methods. Requests for revisions will be directed from the USIWBC Project Manager to the CRP Project Manager electronically. Revisions are effective immediately upon approval by the USIBWC Project Manager, the USIWBC QAO, the CRP Project Manager, the CRP Lead QA Specialist, the CRP Project QA Specialist, and all participating partners. They will be incorporated into the QAPP by way of attachment and distributed to personnel on the distribution list by the Planning Agency Project Manager.

SS-A7 QUALITY OBJECTIVES AND CRITERIA

The objective of this project is to characterize bacteria contamination in Segment 2302_07. Data that will be collected includes field parameters and *E. coli* bacteria through an intensive monitoring that will identify the source of bacteria contamination and help to better understand the nature of the bacteria spikes that have historically been recorded in this segment.

The measurement performance specifications to support the project objectives are specified in Table SS-A7.1.

Table SS-A7.1 - Measurement Performance Specifications

Parameter	Units	Matrix	Method	PARAMETER CODE	AWRL	Limit of Quantitation (LOQ	PRECISION (RPD of LCS/LCSD)	BIAS (%Rec. of LCS)	LOQ CHECK STANDARD %Rec	Lab
Field Parameters (Water Column)										
pH	pH units	water	EPA 150.1and TCEQ SOP	00400	1.0	NA	NA	NA	NA	Field
DO	mg/L	water	SM 4500-O G and TCEQ SOP, V1	00300	1.0	NA	NA	NA	NA	Field
Conductivity	µS/cm	water	EPA 120.1and	00094	1	NA	NA	NA	NA	Field

			TCEQ SOP							
Water temperature	degrees centigrade	water	EPA 170.1 & TCEQ-SWQM SOP, V1	00010	NA*	NA	NA	NA	NA	Field
Flow estimate	cfs	water	TCEQ SOP	74069	NA	NA	NA	NA	NA	Field
Flow	cfs	Water	TCEQ-SWQM SOP, V1	00061	NA*	NA	NA	NA	NA	Field/Gage
Days since last significant rainfall	days	NA	TCEQ-SWQM SOP, V1	72053	NA*	NA	NA	NA	NA	Field
Flow method	1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler	water	TCEQ-SWQM SOP, V1	89835	NA*	NA	NA	NA	NA	Field
Indicator Bacteria (Water)										
E. coli, IDEXX Colilert	MPN/100 mL	water	SM 9223-B**	31699	1	1	0.5***	NA	NA	ETC
holding time, *E. coli* IDEXX Colilert **	hours	water	NA	31704	NA	NA	NA	NA	NA	ETC

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** Note for SM9223-B: *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.
***Based on a range statistic as described in Standard Methods, 20th Edition, Section 9020-B, A Quality Assurance/Quality Control - Intralaboratory Quality Control Guidelines. This criterion applies to bacteriological duplicates with concentrations >10 MPN/100mL or >10 organisms/100mL.

References:

United States Environmental Protection Agency (USEPA) "Methods for Chemical Analysis of Water and Wastes," Manual #EPA-600/4-79-020
TCEQ SOP - Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2003.

Ambient Water Reporting Limits (AWRLs)

As described in Section A7 of the basin-wide QAPP.

Precision

As described in Section A7 of the basin-wide QAPP.

Bias

As described in Section A7 of the basin-wide QAPP.

Representativeness

Samples will be collected at half-mile intervals between the station that has not been picking up high *E. coli* bacteria counts, the Brownsville PUB Water Intake (20449), and the station that has been getting consistently high bacteria counts, Station 13177. Because the objective is to find the source, samples taken at half-mile intervals will narrow the spatial distance of a possible point source to within one mile. The findings in Phase I will allow Phase II sampling to be representative of the contamination.

Comparability

As described in Section A7 of the basin-wide QAPP.

Completeness

As described in Section A7 of the basin-wide QAPP.

SS-A8 SPECIAL TRAINING/CERTIFICATION

As described in Section A8 of the basin-wide QAPP. Also, Phase I sampling will be conducted by students who are already trained and conduct the routine sampling at stations in the area.

SS-A9 DOCUMENTS AND RECORDS

As described in Section A9 of the basin-wide QAPP.

SS-B1 SAMPLING PROCESS DESIGN

The data collection design is summarized in Table SS-B1 (Sampling Sites and Monitoring Frequencies) and Figure SS-B1 (Sample Site Map)

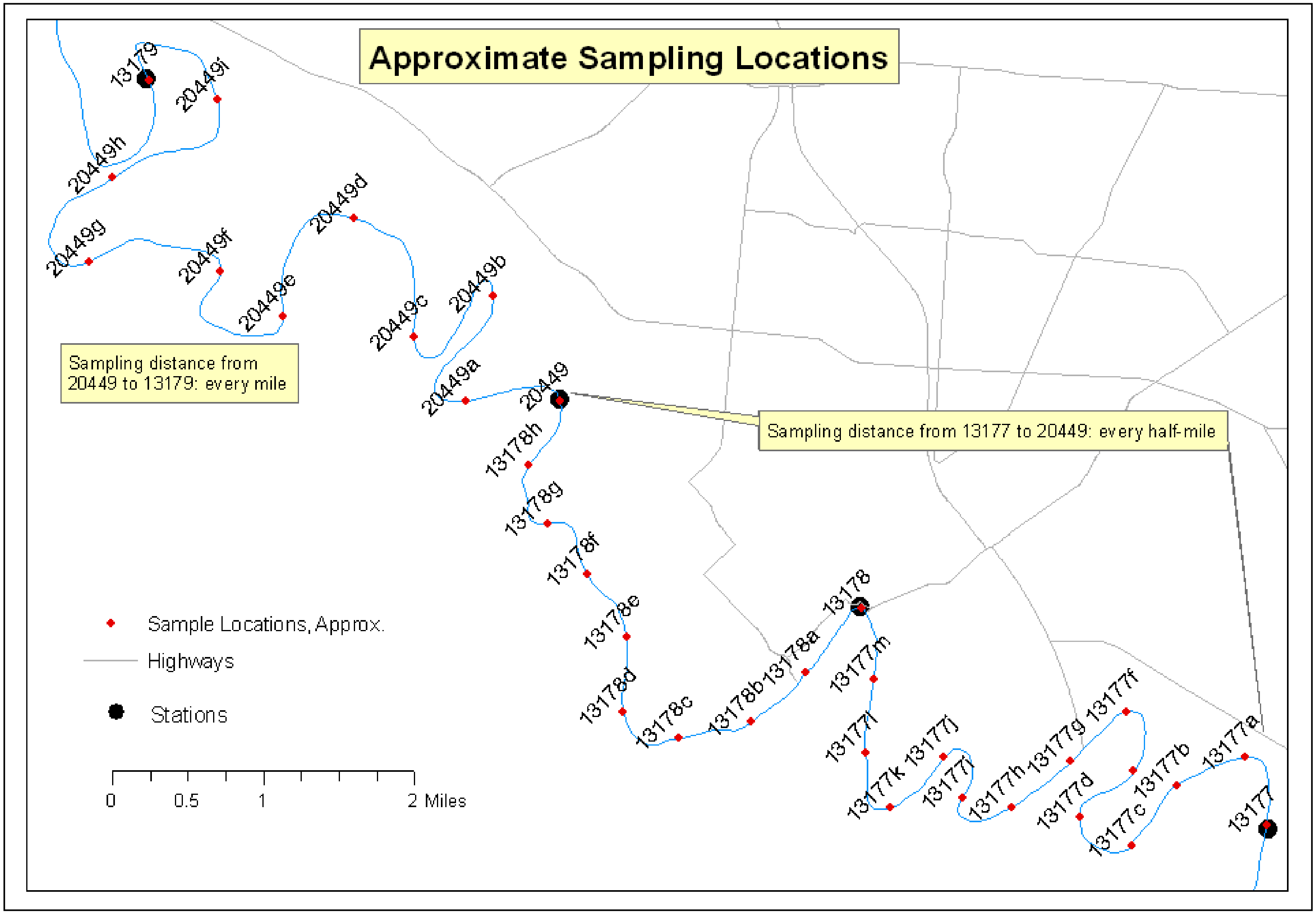
Table SS-B1. Sampling Sites and Monitoring Frequencies

Segment	Region	Site Description	Station ID	Monitoring Resp	Monitoring Type	Inst. Flow	Est. Flow	Indicator Bacteria	Field
2302	15	Rio Grande at El Jardin Pump Station	13177	UB	BS	2		2	2
2302	15	0.5 mile upstream of 13177	13177a	UB	BS			2	2
2302	15	1 mile upstream of 13177	13177b	UB	BS			2	2
2302	15	1.5 miles upstream of 13177	13177c	UB	BS			2	2
2302	15	2 miles upstream of 13177	13177d	UB	BS			2	2
2302	15	2.5 miles upstream of 13177	13177e	UB	BS			2	2
2302	15	3 miles upstream of 13177	13177f	UB	BS			2	2
2302	15	3.5 miles upstream of 13177	13177g	UB	BS			2	2
2302	15	4 miles upstream of 13177	13177h	UB	BS			2	2
2302	15	4.5 miles upstream of 13177	13177i	UB	BS			2	2
2302	15	5 miles upstream of 13177	13177j	UB	BS			2	2
2302	15	5.5 miles upstream of 13177	13177k	UB	BS			2	2
2302	15	6 miles upstream of 13177	13177l	UB	BS			2	2
2302	15	6.5 miles upstream of 13177	13177m	UB	BS			2	2
2302	15	Rio Grande at US 77, Brownsville	13178	UB	BS		2	2	2
2302	15	0.5 mile upstream of 13178	13178a	UB	BS			2	2
2302	15	1 mile upstream of 13178	13178b	UB	BS			2	2
2302	15	1.5 miles upstream of 13178	13178c	UB	BS			2	2
2302	15	2 miles upstream of 13178	13178d	UB	BS			2	2
2302	15	2.5 miles upstream of 13178	13178e	UB	BS			2	2
2302	15	3 miles upstream of 13178	13178f	UB	BS			2	2
2302	15	3.5 miles upstream of 13178	13178g	UB	BS			2	2
2302	15	4 miles upstream of 13178	13178h	UB	BS			2	2
2302	15	Brownsville PUB Water Plant Intake	20449	UB	BS		2	2	2
2302	15	0.5 mile upstream of 20449	20449a	UB	BS			2	2
2302	15	1 mile upstream of 20449	20449b	UB	BS			2	2
2302	15	2 miles upstream of 20449	20449c	UB	BS			2	2
2302	15	3 miles upstream of 20449	20449d	UB	BS			2	2
2302	15	4 miles upstream of 20449	20449e	UB	BS			2	2

2302	15	5 miles upstream of 20449	20449f	UB	BS			2	2
2302	15	6 miles upstream of 20449	20449g	UB	BS			2	2
2302	15	7 miles upstream of 20449	20449h	UB	BS			2	2
2302	15	8 miles upstream of 20449	20449i	UB	BS			2	2
2302	15	Rio Grande near River Bend boat ramp	13179	UB	BS		2	2	2

Data for the four stations already in SWQMIS will be reported to TCEQ for data upload and assessment. These stations are 13177, 13178, 13179, and 20449. All other points are temporary stations being sampled only for informational purposes for this study.

Figure 3. SS-B1. Sampling Site Map



Sample Design Rationale and Site Selection Criteria

The sample design rationale is based on the intent of the study to characterize the spatial distribution of the bacteria impairment in Segment 2302_07 by sampling at half-mile intervals between stations that have historically picked up high bacterial counts. To this end, 34 sites have been selected based on distance from beginning station 13177, the intent to assess the progressive impairment along the water body, and the intent to assess the impact of anthropogenic sources (i.e., wastewater and agricultural discharges). In addition, the Phase I will include a survey of all discharges and this survey will assist in planning Phase II sampling.

SS-B2 SAMPLING METHODS

Field Sampling Procedures.

As described in Section B2 of the basin-wide QAPP.

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

As described below in Table SS-B2.

Table SS-B2. Sample Storage, Preservation, and Handling Requirements

Parameter	Matrix	Container	Preservation	Sample Volume	Holding Time
E. coli bacteria	Water	Sterilized plastic container	Cool to 4 C Sodium thiosulfate	500 mL	****6-8 hours**

** *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.

Sample Containers

Sample containers are shipped in coolers to UTB by the USIBWC-CRP contract laboratory. Sterilized 500 mL plastic containers preserved with sodium thiosulfate.

Processes to Prevent Contamination

As described in Section B2 of the basin-wide QAPP.

Documentation of Field Sampling Activities

Field sampling activities are documented on the field data reporting forms shown on the next page. The following data will be recorded at each of the 34 stations:

1. Station ID and station description
2. GPS coordinates of special study station
3. Sampling Date and time
4. Sampling depth
5. Sample collector's name/signature
6. Values for field parameters shown in Table SS-A7.1

7. Detailed observational data such as water appearance, unusual odors, and more, as listed in the *TCEQ Surface Water Quality Monitoring Procedures Vol.1*

Recording Data

As described in Section B2 of the basin-wide QAPP.

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

As described in Section B2 of the basin- wide QAPP.

UNITED STATES INTERNATIONAL BOUNDARY AND WATER COMMISSION
TEXAS CLEAN RIVERS PROGRAM
RIO GRANDE BASIN
Special Study: Bacteria Source Tracking in Segment 2302_07: Phase I

FIELD DATA REPORTING FORM

[ ][ ][ ][ ][ ][ ][ ]	[ ][ ][ ]	I B	U B	B S
TAG#	SET #	SC1/SE	SC2/CE	MT

[ ][ ][ ][ ][ ][ ]	[ ]	[ ]	[ ]
TCEQ STATION ID OR Special Study STATION ID	Latitude	Longitude	COLLECTOR (printed)
	Special Study Station GPS Coordinates		

Station Description____

GRAB SAMPLE

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

00010		WATER TEMP (deg C only)
00400		pH (SU)
00300		D.O. (mg/L)
00094		SPECIFIC CONDUCTANCE (uS/cm)
72053		DAYS SINCE LAST SIGNIFICANT PRECIPITATION
00061		INSTANTANEOUS FLOW (cfs)
89835		FLOW MEASUREMENT METHOD 1-Gage 2-Electric 3-Mechanical 4-Weir/flume 5-Doppler
74069		ESTIMATED FLOW (cfs)
89966		PRESENT WEATHER 1-clear 2- partly cloudy 3-cloudy 4-rain 5- other

Measurement Comments and Field Observations:

____

____

____

____

Signature of Collector: ___________________________________

Rev. 02/27/09

SS-B3 SAMPLING HANDLING AND CUSTODY

Sample Tracking

The Chain of Custody (COC) sheet for this study is shown on the following page. COC form will include date and time of collection, site identification, sample matrix, number of containers, preservative used, analyses required, name of collector, custody transfer signatures, and the shipping bill information. Additional information is provided in Section B3 of the basin-wide QAPP.

Sample Labeling

Samples from the field are labeled on the container or container label with a permanent marker. Label information includes: site identification and the date and time of sampling.

Sample Handling

As described in Section B3 of the basin-wide QAPP.

Sample Tracking Procedure Deficiencies and Corrective Action

As described in Section B3 of the basin-wide QAPP.

UNITED STATES INTERNATIONAL BOUNDARY AND WATER COMMISSION - TEXAS CLEAN RIVERS PROGRAM
RIO GRANDE BASIN PARTNER
WATER QUALITY CHAIN OF CUSTODY/REQUEST FOR ANALYSIS FORM
Special Study: Bacteria Source Tracking in Segment 2302_07: Phase I

TAG#	LABORATORY	COC/LAB #
	ETC	

CHAIN OF CUSTODY

Released by (printed): ______________________

Signature: ______________________

Date/Time: ______________________

Received by (printed): ______________________

Signature: ______________________

Date/Time: ______________________

No. Of Containers: ______________________

Invoice Information: ______________________

CLIENT INFORMATION

Requested by: ______________________

Collected by: ______________________

Signature: ______________________

Segment/Sequence: ____2302__________________

Matrix Type: ___water______________________

Preservative used: __sodium thiosulfate________

Analysis Requested:

Conventionals			
Storet Code	Analyze if checked	Contract line no.	Parameter
31699	√		E. Coli bacteria

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

Rev. 2/27/09

Special Study: Bacteria Source Tracking in Segment 2302_07: Phase I COC page 1 of 2

USIWBC - CRP CHAIN OF CUSTODY

Station ID	Site Description	Sample Collection Date	Sample Collection Time
13177	Rio Grande at El Jardin Pump Station		
13177a	0.5 mile upstream of 13177		
13177b	1 mile upstream of 13177		
13177c	1.5 miles upstream of 13177		
13177d	2 miles upstream of 13177		
13177e	2.5 miles upstream of 13177		
13177f	3 miles upstream of 13177		
13177g	3.5 miles upstream of 13177		
13177h	4 miles upstream of 13177		
13177i	4.5 miles upstream of 13177		
13177j	5 miles upstream of 13177		
13177k	5.5 miles upstream of 13177		
13177l	6 miles upstream of 13177		
13177m	6.5 miles upstream of 13177		
13178	Rio Grande at US 77, Brownsville		
13178a	0.5 mile upstream of 13178		
13178b	1 mile upstream of 13178		
13178c	1.5 miles upstream of 13178		
13178d	2 miles upstream of 13178		
13178e	2.5 miles upstream of 13178		
13178f	3 miles upstream of 13178		
13178g	3.5 miles upstream of 13178		
13178h	4 miles upstream of 13178		
20449	Brownsville PUB Water Plant Intake		
20449a	0.5 mile upstream of 20449		
20449b	1 mile upstream of 20449		
20449c	2 miles upstream of 20449		
20449d	3 miles upstream of 20449		
20449e	4 miles upstream of 20449		
20449f	5 miles upstream of 20449		
20449g	6 miles upstream of 20449		
20449h	7 miles upstream of 20449		
20449i	8 miles upstream of 20449		
13179	Rio Grande near River Bend boat ramp		

Special Study: Bacteria Source Tracking in Segment 2302_07: Phase I COC page 2 of 2

SS-B4 ANALYTICAL METHODS

The analytical methods, associated matrices, and performing laboratories are listed in Table SS-A7.1 of Section SS-A7. 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. Laboratories collecting data under this QAPP are compliant with the NELAC standards. Copies of laboratory QMs and SOPs are available for review by the TCEQ.

Standards Traceability

As described in Section B4 of the basin-wide QAPP.

Analytical Method Deficiencies and Corrective Actions

As described in Section B4 of the basin-wide QAPP.

SS-B5 QUALITY CONTROL

Sampling Quality Control Requirements and Acceptability Criteria

As described in Section B5 of the basin-wide QAPP.

Laboratory Measurement Quality Control Requirements and Acceptability

As described in Section B5 of the basin-wide QAPP.

Quality Control or Acceptability Requirements Deficiencies and Corrective Actions

As described in Section B5 of the basin-wide QAPP.

SS-B6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION AND MAINTENANCE

As described in Section B6 of the basin-wide QAPP.

SS-B7 INSTRUMENT CALIBRATION AND FREQUENCY

As described in Section B7 of the basin-wide QAPP.

SS-B8 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

As described in Section B8 of the basin-wide QAPP.

SS-B9 NON-DIRECT MEASUREMENTS

This QAPP does not include the use of data obtained from non-direct measurement sources.

SS-B10 DATA MANAGEMENT

As described in Section B10 of the basin-wide QAPP.

SS-C1 ASSESSMENTS AND RESPONSE ACTIONS

As described in Section C1 of the basin-wide QAPP.

Corrective Action

As described in Section C1 of the basin-wide QAPP.

SS-C2 REPORTS TO MANAGEMENT

Reports to USIBWC Project Management

As described in Section C2 of the basin-wide QAPP.

Reports to TCEQ Project Management

As described in Section C2 of the basin-wide QAPP. A Report of this special study will be finalized after Phase II.

Reports by TCEQ Project Management

As described in Section C2 of the basin-wide QAPP.

SS-D1 DATA REVIEW, VERIFICATION, AND VALIDATION

As described in Section D1 of the basin-wide QAPP.

SS-D2 VERIFICATION AND VALIDATION

As described in Section D2 of the basin-wide QAPP.

SS-D3 RECONCILIATION WITH USER REQUIREMENTS

Data produced by Phase I of this special study will be analyzed and reviewed by USIBWC and TCEQ, with the intent on finding a spatial trend of higher bacteria counts which will lead to a better grasp on the source of the bacteria contamination. USIBWC-CRP will review the data to ensure they meet the data quality objectives from SS A7. If data do not meet DQOs and/or is determined unusable, data will be discarded and new data must be collected. Data will be used to plan for the second phase of the special study, a more intensive monitoring to characterize the nature of the source that we hope to find in Phase I.

Amendment # 1
to the International Boundary and Water Commission, United States Section (USIBWC)
Clean Rivers Program FY 2010/2011 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, Texas 78711-3087

Effective Period: FY 2010 to FY 2011

Questions concerning this QAPP should be directed to:

Elizabeth Verdecchia
USIBWC
4171 N. Mesa, C-100
915-832-4701
Fax 915-832-4166
elizabethverdecchia@ibwc.gov

Effective: March 12, 2010

Justification:
This document details the changes made to the basin-wide Quality Assurance Project Plan (QAPP) for FY10-11, including the addition or deletion of contacts, addition of partners, addition of parameters, an updated Table A7.1, additional stations, the addition of text, and an updated station map.

Summary of Changes:
This amendment includes the following changes:

- Adds four new subpartners: El Paso Community College (EPCC), Texas Parks and Wildlife Department (TPWD), El Paso Water Utilities (EPWU), and U.S. Fish & Wildlife Service (USFWS).
- Updates contacts in Sections A3 and A4 and the organizational chart.
- Table A7.1, Organics in Water, removes "…in wtr sample GC-MS, Hexadecane Extr" from Benzene and Toluene.
- Table A7.1, Organics in Water, changes LOQ for samples analyzed by EPA method 625 to 2 µg/L.
- Adds fecal coliform analysis to Laredo lab in Table A7.3.
- Adds a previously inactive station at Arroyo Los Olmos, Station ID 13103 with sampling 3 times a year with biased flow. Parameters at this station will be nitrates, dissolved oxygen, specific conductance, and bacteria.
- Adds two new stations (20696 and 20698) for new sampling partner, U.S. Fish & Wildlife Service (USFWS).
- Adds two previously inactive stations (18441 and 16862) for new sampling partner, Texas Parks & Wildlife Department (TPWD).
- Adds El Paso Water Utilities (EPWU) as a partner and adds a new table, Table A7.4, for El Paso Water Utilities parameters analyzed (ammonia, turbidity, BOD, *E. coli*).
- Adds parameters analyzed by the EPWU at Stations 13272, 14465, 15528, and 15529.
- Changes the volume needed for *E. coli* analysis in Table B.2.1 to 500 mLs.
- Adds text to Section A4.
- Removes dissolved metals from section A7.1, Table B2.1, and Table 14 Appendix B.1. Dissolved metals will be collected under a different QAPP. Dissolved metals at station 13116 removed because field-filtering is not possible and will also be collected under a different QAPP.
- Changes maximum holding time for total metals in water to 180 days in Table B2.1.
- Adds Table B2.2 for Laredo containers, Table B2.3 for EPWU containers, and Table B2.4 for Brownsville PUB containers.
- Adds new collecting entity codes to Table B10.1.
- Includes a revised station map showing the new stations.
-Includes an updated coordinated monitoring schedule (CMS) that includes all new stations and monitoring information (Table 14. Appendix B.1 Sample Design and Schedule, FY 2010).

Details of Changes:
This amendment includes the following specific changes:

Section A3
-Adds USIBWC Field offices and new partners to distribution list

Section A4
-Adds subpartners EPCC, TPWD, USFWS, and EPWU to Rio Grande Basin CRP Partners.
-Updates USIBWC Field Office personnel.

-Updates organizational chart.
-Adds text at the end of the description of responsibilities.
-Adds Table A7.4 for EPWU parameters.

Table A7.1
- Removes dissolved metals
- Deletes duplicate references in the footnotes.
- Organics in Water, changes LOQ for samples analyzed by EPA method 625 to 2 μg/L.
- Organics in Water, removes "…in wtr sample GC-MS, Hexadecane Extr" from Benzene and Toluene.

Table A7.3
-Adds fecal coliform.

Table B2.1
- Removes row describing dissolved metals in water.
- Changes maximum holding time for total metals in water to 180 days.
- Changes volume of E.coli bottle to 500ml.

Tables B2.2, B2.3 and B2.4
-New tables

Table B10.1
- Adds EPCC, TPWD, USFWS, and EPWU codes.

Figures 4 and 6
-Adds previously inactive station 13103 (to be monitored by USIBWC FO).
-Adds previously inactive stations 18441 and 16862 (to be monitored by TPWD).
-Adds new stations 20696 and 20698 (to be monitored by USFWS).

Appendix B
- Updates Appendix B.1 with new stations (13103, 18441, 16862, 20696, and 20698).
- Deletes metals in water analysis from station 15795, collecting entity EP.
- Deletes metals in water analysis from station 16272, collecting entity UE.
- Deletes metals in water analysis from station 13272, collecting entity IB.
- Deletes metals in water analysis from station 13276, collecting entity UE.
- Deletes metals in water analysis from station 17040, collecting entity EP.
- Deletes metals in water analysis and flow from station 13116, collecting entity LE.
- Deletes flow from station 13276, collecting entity UE.
- Deletes organics in water analysis from station 15795, collecting entity EP.
- Adds organics in sediment analysis once a year to station 15795, collecting entity EP.
- Adds organics in sediment biannually to station 16730, collecting entity BB.
- Adds quarterly bacteria analysis for stations 13276, collecting entity UE.
- Adds bacteria analysis 6 times a year for station 20558, collecting entity SL.
- Adds partial conventional analysis to stations 13272, 14465, 15528, and 15529, collecting entity IB.

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

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

APPROVAL PAGE 1 of 9

USIBWC CRP

2/4/10

Elizabeth Verdecchia, USIBWC Project Manager Date

2-4-2010

Leslie Grijalva, USIBWC QAO Date

APPROVAL PAGE 2 of 9

ENVIRONMENTAL TESTING AND CONSULTING, INC (ETC)

March 1, 2010

Andy Parrish, Laboratory Manager — Date

3-1-2010

Richard Medina, Laboratory Quality Assurance Officer — Date

APPROVAL PAGE 3 of 9

U.S. FISH & WILDLIFE

3/3/10

Chris Hathcock Date
Assistant Manager, Lower Rio Grande Valley NWR

APPROVAL PAGE 4 of 9

TEXAS PARKS AND WILDLIFE DEPARTMENT

2/12/2010

David Long
Barton Warnock Education Center

Date

12-Feb 2010

Mark Lockwood
Natural Resources Program, Texas Parks and Wildlife Dept.

Date

APPROVAL PAGE 5 of 9

EL PASO WATER UTILITIES

2·16·10

Paul R. Rivas, Laboratory Services Manager — Date

2-16-10

Richard Wilcox, Quality Assurance Chemist — Date

EL PASO COMMUNITY COLLEGE

Maria Alz 2/19/2010

Dr. Maria Alvarez Date
Professor of Biology, Biology District-Wide Coordinator, and
MBRS-RISE and MSEIP Program Director

APPROVAL PAGE 7 of 9

BROWNSVILLE PUB

LeeRoy Atkinson 2/09/2010 Date Laboratory Manager	Juan Carrizales 02/09/10 Date Quality Assurance Specialist

APPROVAL PAGE 8 of 9

CITY OF LAREDO HEALTH SERVICES

Rebecca A. Castro 02-05-2010 Rebecca A. Castro - 02-05-2010

Rebecca Castro Date QAO Vacant Date
Laboratory Manager

APPROVAL PAGE 9 of 9

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

B Ansell 03/10/10

Bethany Ansell, CRP Project Manager Date

Allison Woodall for JD 3/10/10

Jennifer Delk, CRP Project QAS Date

Allison Woodall 3/10/10

Allison Woodall, CRP Group Leader Date

Daniel R Burke 3/12/2010

Daniel R. Burke, CRP Lead QAS Date

Note: Additional signatures may be required.

A3 DISTRIBUTION LIST

Add the following to the complete list in the FY10-11 RGBMP QAPP:

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

U.S. Fish & Wildlife Service
Rt. 2, Box 202A
Alamo, TX 78516

Chris Hathcock, Assistant Manager, Lower Rio Grande Valley NWR
(956) 784-7593

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
(432) 424-3327

El Paso Water Utilities
PO Box 511 - 79961
4100-L Delta Drive
El Paso, TX 79905

Paul R. Rivas, Laboratory Services Manager
(915) 594-5722

El Paso Community College
P.O. Box 20500
El Paso, TX 79998

Dr. Maria E. Alvarez, Professor of Biology, Biology District-Wide Coordinator,
and MBRS-RISE and MSEIP Program Director
(915) 831-5074

Section A4 PROJECT/TASK ORGANIZATION

Add the following to the complete list in the FY10-11 RGBMP QAPP:

Description of Responsibilities

RIO GRANDE BASIN CRP PARTNERS

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 Environmental Testing and Consulting, Inc. 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 Environmental Testing and Consulting, Inc. for analysis.

David Long
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 Environmental Testing and Consulting, Inc. for analysis.

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.

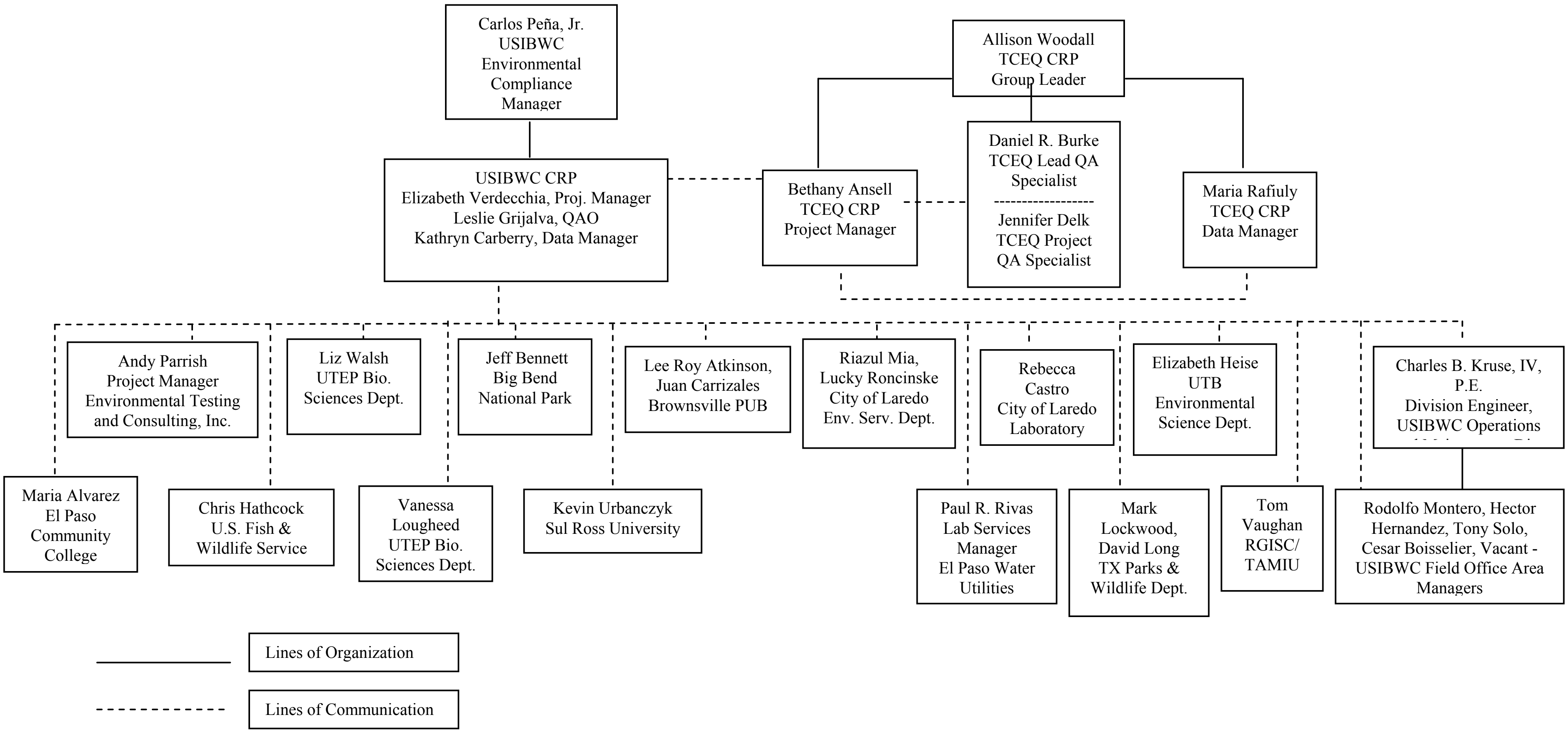
Dr. Maria E. Alvarez, Professor of Biology, Biology District-Wide Coordinator, and MBRS-RISE and MSEIP Program Director
El Paso Community College
Responsible for water quality monitoring and sample collection of several stations in the El Paso area. Water samples collected are submitted to Environmental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

US International Boundary and Water Commission, Field Offices
Manages data collection activities and generates the work orders for water quality monitoring at six field offices along the Texas portion of the Rio Grande. The project managers' direct activities on the local level as follows: Cesar Boisselier – American Dam, Tony Solo– Amistad Dam, Vacant – Falcon Dam, Rodolfo Montero – Mercedes, and Hector Hernandez – Presidio. The field office managers report to the Division Engineer of the IBWC Operations and Maintenance Division, Charles B. Kruse. Samples collected by the field offices are submitted to Environmental Testing and Consulting, Inc. for analysis.

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 type 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.

PROJECT ORGANIZATION CHART

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



Section A7

Table A7.1 Measurement Performance Specifications for Field and Laboratory Measurements for:

U.S. International Boundary and Water Commission, Big Bend National Park, City of Laredo Environmental Engineering, Rio Grande International Study Center, U.T. Brownsville, Sul Ross, U.S. Fish & Wildlife, TX Parks & Wildlife, El Paso Community College, and U. T. El Paso (samples analyzed by Environmental Testing and Consulting, Inc.).

Field Parameters

Parameter	UNITS	MATRIX	METHOD	STORET Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
pH	SU	water	EPA 150.1 & TCEQ-SWQM SOP, V1	00400	NA*	NA	NA	NA	NA	Field
DO	mg/L	water	EPA 360.1& TCEQ-SWQM SOP, V1	00300	NA*	NA	NA	NA	NA	Field
Conductivity	µS/cm	water	EPA 120.1 & TCEQ-SWQM SOP, V1	00094	NA*	NA	NA	NA	NA	Field
Air temperature	centigrade	air	TCEQ-SWQM SOP, V1	00020	NA*	NA	NA	NA	NA	Field
Water temperature	centigrade	water	EPA 170.1 & TCEQ-SWQM SOP, V1	00010	NA*	NA	NA	NA	NA	Field
Secchi depth	meters	water	TCEQ-SWQM SOP, V1	00078	NA*	NA	NA	NA	NA	Field
Days since last significant rainfall	days	NA	TCEQ-SWQM SOP, V1	72053	NA*	NA	NA	NA	NA	Field
Flow	cfs	water	TCEQ-SWQM SOP, V1	00061	NA*	NA	NA	NA	NA	Field
Flow estimate	cfs	water	TCEQ-SWQM SOP, V1	74069	NA*	NA	NA	NA	NA	Field
Flow method	1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler	water	TCEQ-SWQM SOP, V1	89835	NA*	NA	NA	NA	NA	Field
Flow severity	1-no flow 2-low flow 3-normal flow 4-flood 5- high 6- dry	water	TCEQ-SWQM SOP, V1	01351	NA*	NA	NA	NA	NA	Field
Stream width	meters	water	TCEQ-SWQM SOP, V1	89861	NA*	NA	NA	NA	NA	Field
Water depth	meters	water	TCEQ-SWQM SOP, V1	82903	0.1	NA	NA	NA	NA	Field
Weather	1- clear 2 - cloudy 3 - overcast 4 - rain	NA	Field Observation	89966	NA*	NA	NA	NA	NA	Field
Wind intensity	1 - calm 2 - slight 3 - moderate 4 - strong	air	Field Observation	89965	NA*	NA	NA	NA	NA	Field
Wind direction	1 - North 2 - South 3 - East 4 - West	air	Field Observation	89010	NA*	NA	NA	NA	NA	Field

Conventional Parameters

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
TDS, dried at 180º C	mg/L	water	EPA 160.1, SM2540C	70300	10	2	70-130	20	80-120	ETC
Chloride	mg/L	water	EPA 300.0	00940	5	2	70-130	20	80-120	ETC
TSS	mg/L	water	EPA 160.2, SM2540D	00530	4	2	70-130	20	80-120	ETC
VSS	mg/L	water	EPA 160.4	00535	4	2	70-130	20	80-120	ETC
Sulfate	mg/L	water	EPA 300.0	00945	5	1	70-130	20	80-120	ETC
TOC	mg/L	water	SM5310B, EPA 415.1	00680	2	1	70-130	20	80-120	ETC
Ammonia-N, total	mg/L	water	SM4500 NH3D, SM4500 NH3F, EPA 350.3	00610	0.1	0.1	70-130	20	80-120	ETC
T – Phosphorous-P	mg/L	water	SM 4500-P E	00665	0.06	0.05	70-130	20	80-120	ETC
Chlorophyll-a, spectrophotometric acid method	µg/L	water	SM 10200-H	32211	3	3	70-130	20	80-120	ETC
Pheophytin-a, spectrophotometric acid method	µg/L	water	EPA 446.0	32218	3	3	70-130	20	80-120	ETC
Fluoride	mg/L	water	EPA 300.0	00951	0.5	0.1	70-130	20	80-120	ETC
Bromide	mg/L	water	EPA 300.0	71870	0.5	0.5	70-130	20	80-120	ETC
BOD5 Day- 20ºC	mg/L	water	SM 5210 B	00310	2	2	70-130	20	80-120	ETC
T. Alkalinity as C_aCO_3	mg/L	water	SM 2320-B	00410	20	20	70-130	20	80-120	ETC
Nitrate+Nitrite-N	mg/L	water	EPA 300.0	00630	0.05	0.05	70-130	20	80-120	ETC
Calcium	mg/L	water	EPA 200.7	00916	0.5	0.1	70-130	20	80-120	ETC
Magnesium	mg/L	water	EPA 200.7	00927	0.5	0.1	70-130	20	80-120	ETC
Potassium	mg/L	water	EPA 200.7	00937	0.2	0.1	70-130	20	80-120	ETC
Sodium	mg/L	water	EPA 200.7	00929	NA	0.5	70-130	20	80-120	ETC
Hardness, Total as CaCO3	mg/L	water	SM2340B, EPA 130.2	00900	5	1	70-130	20	80-120	ETC
E. coli, Colilert, IDEXX Method	MPN/100 mL	water	SM 9223-B****	31699	1	1	NA	.5*****	NA	ETC
Holding time, E. coli IDEXX Colilert	hours	water	NA	31704	1	NA	NA	NA	NA	ETC

* Reporting to be consistent with SWQM guidance and based on measurement capability.

******** 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. Quality Control Guidelines. This criterion applies to bacteriological duplicates with concentrations >10 MPN/100mL or >10 organisms/100mL.

**** Based on a range statistic as described in Standard Methods, 20th Edition, Section 9020-B, AQuality Assurance/Quality Control - Intralaboratory Quality Control Guidelines. This criterion applies to bacteriological duplicates with concentrations >10 MPN/100mL or >10 organisms/100mL.

Total Metals in Water

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Iron	µg/L	water	EPA 200.8, EPA 200.7	01045	300	100	70-130	20	80-120	ETC
Manganese	µg/L	water	EPA 200.8, EPA 200.7	01055	50	10	70-130	20	80-120	ETC
Selenium	µg/L	water	EPA 200.8, EPA 200.7	01147	2	2	70-130	20	80-120	ETC

Total Metals in Sediment

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Aluminum	mg/kg	sediment	EPA 6020	01108	n/a*	20	60-140	20	60-140	ETC
Aluminum	mg/kg	sediment	EPA 6010	01108	n/a*	20	60-140	20	60-140	ETC
Antimony	mg/kg	sediment	EPA 6020	01098	12.5	12.5	60-140	20	60-140	ETC
Antimony	mg/kg	sediment	EPA 6010	01098	12.5	12.5	60-140	20	60-140	ETC
Arsenic	mg/kg	sediment	EPA 6020	01003	16.5	5	60-140	20	60-140	ETC
Arsenic	mg/kg	sediment	EPA 6010	01003	16.5	5	60-140	20	60-140	ETC
Barium	mg/kg	sediment	EPA 6020	01008	n/a*	5	60-140	20	60-140	ETC
Barium	mg/kg	sediment	EPA 6010	01008	n/a*	5	60-140	20	60-140	ETC
Cadmium	mg/kg	sediment	EPA 6020	01028	2.49	0.2	60-140	20	60-140	ETC
Cadmium	mg/kg	sediment	EPA 6010	01028	2.49	0.2	60-140	20	60-140	ETC
Chromium	mg/kg	sediment	EPA 6020	01029	55.5	5	60-140	20	60-140	ETC
Chromium	mg/kg	sediment	EPA 6010	01029	55.5	5	60-140	20	60-140	ETC
Copper	mg/kg	sediment	EPA 6020	01043	74.5	5	60-140	20	60-140	ETC
Copper	mg/kg	sediment	EPA 6010	01043	74.5	5	60-140	20	60-140	ETC
Lead	mg/kg	sediment	EPA 6020	01052	64	5	60-140	20	60-140	ETC
Lead	mg/kg	sediment	EPA 6010	01052	64	5	60-140	20	60-140	ETC
Mercury	Mg/kg	Sediment	EPA 7471	71921	0.355	0.02	70-130	30	60-140	ETC
Nickel	mg/kg	sediment	EPA 6020	01068	24.3	5	60-140	20	60-140	ETC
Nickel	mg/kg	sediment	EPA 6010	01068	24.3	5	60-140	20	60-140	ETC
Selenium	mg/kg	sediment	EPA 6020	01148	n/a*	1	60-140	20	60-140	ETC
Selenium	mg/kg	sediment	EPA 6010	01148	n/a*	1	60-140	20	60-140	ETC
Silver	mg/kg	sediment	EPA 6020	01078	1.1	0.5	60-140	20	60-140	ETC
Silver	mg/kg	sediment	EPA 6010	01078	1.1	0.5	60-140	20	60-140	ETC
Zinc	mg/kg	sediment	EPA 6020	01093	205	10	60-140	20	60-140	ETC
Zinc	mg/kg	sediment	EPA 6010	01093	205	10	60-140	20	60-140	ETC

* AWRLs have not been developed for these parameters.
All soil samples in this table are screened by SW846 6010B method for low-level metals, which are rerun under SW846 6020

Organics in Sediment

Parameter	UNITS	MATRIX	METHOD	PARAMATER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISIO N (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laborator y
DDT	µg/kg	sediment	EPA 8081	39373	23	2	60-140	20	60-140	ETC
DDD	µg/kg	sediment	EPA 8081	39363	15.65	2	60-140	20	60-140	ETC
DDE	µg/kg	sediment	EPA 8081	39368	3.91	2	60-140	20	60-140	ETC
Aldrin	µg/kg	sediment	EPA 8081	39333	40	2	60-140	20	60-140	ETC
Chlordane (Tech Mix and Metabs)	µg/kg	sediment	EPA 8081	39351	2.4	2	60-140	20	60-140	ETC
Endrin	µg/kg	sediment	EPA 8081	39393	103.5	2	60-140	20	60-140	ETC
Heptachlor	µg/kg	sediment	EPA 8081	39413	n/a	2	60-140	20	60-140	ETC

Methoxychlor	µg/kg	sediment	EPA 8081	39481	n/a	2	60-140	20	60-140	ETC
Mirex	µg/kg	sediment	EPA 8081	79800	650	2	60-140	20	60-140	ETC
Dieldrin	µg/kg	sediment	EPA 8081	39383	2.15	2	60-140	20	60-140	ETC
Hexachlorobenzene	µg/kg	sediment	EPA 8081	39701	120	2	60-140	20	60-140	ETC
Aroclor 1016	µg/kg	sediment	EPA 8082	39514	265	35	60-140	20	60-140	ETC
Aroclor 1248	µg/kg	sediment	EPA 8082	39503	750	35	60-140	20	60-140	ETC
Aroclor 1254	µg/kg	Sediment	EPA 8082	39507	170	35	60-140	20	60-140	ETC
Aroclor 1260	µg/kg	Sediment	EPA 8082	39511	120	35	60-140	20	60-140	ETC
Endosulfan I	µg/kg	sediment	EPA 8081	34364	n/a	1	60-140	20	60-140	ETC
Demeton	µg/kg	sediment	EPA 8270	82400	n/a	40	60-140	20	60-140	ETC
Guthion/ Azinphos-methyl	µg/kg	sediment	EPA 8270	39581	n/a	40	60-140	20	60-140	ETC
Malathion	µg/kg	sediment	EPA 8270	39531	n/a	40	60-140	20	60-140	ETC
Parathion Ethyl	µg/kg	sediment	EPA 8270	39541	n/a	40	60-140	20	60-140	ETC
2,4-D	µg/kg	sediment	EPA 8151	39731	n/a	40	60-140	20	60-140	ETC
2,4,5-T	µg/kg	sediment	EPA 8151	39741	n/a	9	60-140	20	60-140	ETC
Silvex	µg/kg	sediment	EPA 8151	39761	n/a	7	60-140	20	60-140	ETC
Fluorene	µg/kg	sediment	EPA 8270C	34384	268	66.7	60-140	20	60-140	ETC
Fluoranthene	µg/kg	sediment	EPA 8270C	34379	1115	66.7	60-140	20	60-140	ETC
Benzo(a)pyrene	µg/kg	sediment	EPA 8270C	34250	725	66.7	60-140	20	60-140	ETC
Napthalene	µg/kg	sediment	EPA 8270C	34445	280.5	66.7	60-140	20	60-140	ETC
Benzene	µg/kg	sediment	EPA 8260B	34237	22,505	1	60-140	20	60-140	ETC
Toluene	µg/kg	sediment	EPA 8260B	34483	2,830	5	60-140	20	60-140	ETC
Ethylbenzene	µg/kg	sediment	EPA 8260B	34374	1,965	1	60-140	20	60-140	ETC

References for Table A7.1:

TCEQ SOP, V1 - TCEQ SWQM Procedures, Volume 1: Physical & Chemical Monitoring Methods for Water, Sediment, & Tissue, 2008 (RG-415).
TCEQ, SWQM QAPP, January 2008, Revision 12.
United States International Boundary and Water Commission "Field Manual for Hydrologic Technicians," November 1998.
United States International Boundary and Water Commission "Collection and Field Analysis of Water Quality Sample," August 1997.
Title 40 of the Code of Federal Regulations, Parts 136 or 141.
United States Environmental Protection Agency (EPA) "Methods For Chemical Analysis of Water and Wastes", Manual #EPA-600/4-79-020.
United States Environmental Protection Agency (EPA) "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Manual #EPA-SW-846.
CRP AWRL List, http://www.tceq.state.tx.us/assets/public/compliance/monops/crp/QA/awrlmaster.pdf
TCEQ NELAP - Recognized Laboratory Fields of Accreditation for ETC. Certificate T104704180- 09A TX, Issue Date 4/29/2009.

Organics in Water

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Benzene	µg/L	water	EPA 624	34030	2.5	1	60-140	20	60-140	ETC
Toluene	µg/L	water	EPA 624	34010	N/A	5	60-140	20	60-140	ETC
Ethylbenzene	µg/L	water	EPA 624	34371	N/A	2	60-140	20	60-140	ETC
Fluorene	µg/L	water	EPA 625	34381	5.5	2	60-140	20	60-140	ETC
Fluoranthene	µg/L	water	EPA 625	34376	3	2	60-140	20	60-140	ETC
Acenaphthylene	µg/L	water	EPA 625	34200	5	2	60-140	20	60-140	ETC
Napthalene	µg/L	water	EPA 625	34696	250	2	60-140	20	60-140	ETC

Table A7.3 Measurement Performance Specifications for Field and Laboratory Measurements for: City of Laredo Laboratory

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
E. Coli, Colilert, IDEXX Method	MPN/100mL	water	SM9223B	31699	1	1	NA	0.5	NA	Laredo
Fecal Coliform	CFU/100 mL	water	SM9222D	31616	1	1	NA	NA	NA	Laredo
Specific Conductance	µS/cm	water	EPA 120.1 & TCEQ-SWQM SOP, V1	00094	NA*	NA	NA	NA	NA	Field
Air temperature	centigrade	air	TCEQ-SWQM SOP, V1	00020	NA*	NA	NA	NA	NA	Field
Water temperature	centigrade	water	EPA 170.1 & TCEQ-SWQM SOP, V1	00010	NA*	NA	NA	NA	NA	Field
Days since last significant rainfall	days	NA	TCEQ-SWQM SOP, V1	72053	NA*	NA	NA	NA	NA	Field
Flow	cfs	water	TCEQ-SWQM SOP, V1	00061	NA*	NA	NA	NA	NA	Field
Flow method	1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler	water	TCEQ-SWQM SOP, V1	89835	NA*	NA	NA	NA	NA	Field
Flow severity	1-no flow 2-low flow 3-normal flow 4-flood 5- high 6- dry	water	TCEQ-SWQM SOP, V1	01351	NA*	NA	NA	NA	NA	Field
Present Weather	1- clear 2 – partly cloudy 3 - cloudy 4 – rain 5- other	NA	Field Observation	89966	NA*	NA	NA	NA	NA	Field
Wind intensity	1 - calm 2 - slight 3 - moderate 4 - strong	air	Field Observation	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	air	Field Observation	89010	NA*	NA	NA	NA	NA	Field

* AWRLs have not been developed for these parameters

Table A7.4 Measurement Performance Specifications for Field and Laboratory Measurements for: El Paso Water Utilities

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
BOD	mg/L	water	SM 5210B	00310	2	2	58-115	30	58-115	EPWU
E. Coli, Colilert, IDEXX Method	MPN/100mL	water	SM9223B	31699	1	1	NA	0.5	NA	EPWU
Turbidity	NTU	water	SM2130B	82079	0.5	0.1	70-130	20	80-120	EPWU

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

Routine Conventionals-in-Water Samples (9 containers: 4 unpreserved, 1 preserved with HNO_3, 2 preserved with HCl, 1 preserved with H_2SO_4, 1 preserved with $Na_2S_2O_3$)				
Parameters	Containers	Sample Volume (ml)	Preservation	Maximum Holding Time
CONTAINER 1				
	HDPE	1000	Cool to 4 C	
TSS (00530)/VSS (00535)		300	"	7 days
Chloride (Cl) (00940)		100	"	28 days
Sulfate (SO_4) (00945)		100	"	28 days
Fluoride (00951)		50	"	28 days
TDS (70300)		100	"	7 days
Bromide (71870)		50	"	28 days
Alkalinity (00410)		100	"	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 (00935)		50	"	6 months
Hardness (00900)		50	"	6 months
CONTAINER 3				
	HDPE	500	1-2 ml conc.H_2SO_4 to pH <2 and cool to 4 C	
Ammonia (NH_3) (00610)		150	"	28 days
Total Phosphorus (TPO_4) (00665)		150	"	28 days
Nitrate + Nitrite (00630) (NO_3 + NO_2)		150	"	28 days
CONTAINER 4 and 5				
Chlorophyll *a* (70953)	glass amber	1000	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 (32213)	glass amber	1000	dark and ice before filtration; dark and frozen after filtration	Filter within 48 hours Filters may be stored frozen up to 28 days
CONTAINER 6				
BOD (00310)	HDPE	1000	Cool to 4 C	2 days
CONTAINER 7 and 8				
Total Organic Carbon (TOC) (00680)	VOA glass vials (2)	40	0.5 ml conc. HCl to pH <2 and cool to 4 C	28 days
CONTAINER 9				
E. coli bacteria	Sterilized plastic container	500	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
Metals in Sediment				
Metals	glass jar with teflon lined lid	500 grams	Cool 4 C	180 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 B2.2 Sample Storage, Preservation and Handling Requirements, City of Laredo Laboratory

E.Coli and Fecal Coliform Analysis- City of Laredo 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 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				
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	1000	Cool to 4 C	2 days
CONTAINER 4				
E. coli bacteria (31699)	Sterilized plastic container	2X250	Cool to 4 C Sodium thiosulfate	6-8 hours

Table 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

Data Dictionary - Terminology and field descriptions are included in the SWQM Data Management Reference Guide, 2009 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 8 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
El Paso Water Utilities	BD	IB	IB

Table 14. Appendix B.1 Sample Design and Schedule, FY 2010

Site Description	Station	Region	SE	CE	MT	24hr DO	AqHab	Benth	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tiss	Field	Comments
Segment 2301 Rio Grande Tidal | Map | Hide / Show Header Bar																					
RIO GRANDE TIDAL AT SH 4 NEAR BOCA CHICA | Map	**13176**	15	IB	UB	RT								1	4			4			4	
RIO GRANDE AT SABAL PALM SANCTUARY AT NORTHEAST BOUNDARY OFF PARK ROAD APPROX. 1MI SOUTH OF FM1419 NEAR PALM GROVE | Map	**16288**	15	IB	UB	RT									4			4			4	
Segment 2302 Rio Grande Below Falcon Reservoir | Map | Hide / Show Header Bar																					
ARROYO LOS OLMOS BRIDGE ON US 83 SOUTH OF RIO GRANDE CITY | Map	**13103**	15	IB	IB	BF									3			3			3	Bacteria, nitrates, and field collected when flowing
RIO GRANDE EL JARDIN PUMP STATION, AT LOW WATER DAM 300 FT. BELOW INTAKE | Map	**13177**	15	IB	IB	RT								1	8			8	8		8	
RIO GRANDE INTERNATIONAL BRIDGE ON US 77 AT BROWNSVILLE | Map	**13178**	15	IB	UB	RT								1	4			4			4	
RIO GRANDE NEAR RIVER BEND BOAT RAMP APPROXIMATELY 5 MI. WEST OF BROWNSVILLE ON US 281 | Map	**13179**	15	IB	UB	RT								1	4			4			4	
RIO GRANDE INTERNATIONAL BRIDGE AT US 281 AT HIDALGO | Map	**13181**	15	IB	IB	RT								1	8			8	8		8	
RIO GRANDE AT SH 886 NEAR LOS EBANOS | Map	**13184**	15	IB	IB	RT									7			7	7		7	
RIO GRANDE AT FORT RINGGOLD 1 MI. DOWNSTREAM FROM RIO GRANDE CITY | Map	**13185**	15	IB	IB	RT								1	12			12	12		12	
RIO GRANDE BELOW RIO ALAMO NEAR FRONTON | Map	**13186**	15	IB	IB	RT									8			8	8		8	
RIO GRANDE 0.5 MI. BELOW ANZALDUAS DAM, 12.2 MI. FROM HIDALGO | Map	**13664**	15	IB	IB	RT									8			8	8		8	
RIO GRANDE 200M UPSTREAM OF PHARR INTERNATIONAL BRIDGE (US281) | Map	**15808**	15	IB	IB	RT									8			8	8		8	
RIO GRANDE RIVER AT BROWNSVILLE PUB WATER TREATMENT PLANT NUMBER 1 INTAKE BETWEEN WTP RESERVOIR AND RIO GRANDE LEVEE | Map	**20449**	15	IB	BO	RT									12			12				
RIO GRANDE AT THE EL MORILLO TRACT OF THE LOWER RIO GRANDE VALLEY NATIONAL WILDLIFE REFUGE | Map	**20696**	15	IB	UF	RT									3			3			3	

Site Description	Station	Region	SE	CE	MT	24hr DO	AqHab	Benth	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tiss	Field	Comments
OLD RIO GRANDE MEANDER LA PARIDO BANCO NUMBER 144 BOAT RAMP | Map	**20698**	15	IB	UF	RT									3			3			3	
Segment 2303 International Falcon Reservoir | Map | Hide/Show Header Bar																					
FALCON LAKE AT INTERNATIONAL BOUNDARY MONUMENT I | Map	13189	16	IB	IB	RT									4			4			4	
FALCON RESERVOIR AT SAN YGNACIO WTP INTAKE, 350M DWNSTR FROM US B83 BRIDGE | Map	15818	16	IB	RN	RT									2			2			2	
Segment 2304 Rio Grande Below Amistad Reservoir | Map | Hide/Show Header Bar																					
MANADAS CREEK AT FM 1472 NORTH OF LAREDO | Map	**13116**	16	IB	LE	RT							4	1	4			4			4	
RIO GRANDE AT PIPELINE CROSSING 8.7 MI. BELOW LAREDO | Map	**13196**	16	IB	LA	RT												12			12	
RIO GRANDE 30 METERS UPSTREAM OF US 81 BRIDGE (CONVENT AVENUE) IN LAREDO | Map	**13201**	16	IB	LA	RT												12			12	
RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE | Map	**13202**	16	IB	LA	RT												12			12	
RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE | Map	**13202**	16	IB	RN	RT									4			4	4		4	
RIO GRANDE 12.8 MI. BELOW AMISTAD DAM, NEAR GAGE, 340 M UPSTREAM OF US 277 BRIDGE IN DEL RIO | Map	13208	16	IB	IB	RT									2			2	2		2	
RIO GRANDE, 4.5 MI. DOWNSTREAM OF DEL RIO AT MOODY RANCH | Map	**13560**	16	IB	IB	RT								1	8			8	8		8	
RIO GRANDE AT INTERNATIONAL BRIDGE #2 (EAST BRIDGE) IN LAREDO | Map	**15814**	16	IB	LA	RT												12	12		12	
RIO GRANDE AT INTERNATIONAL BRIDGE #2 (EAST BRIDGE) IN LAREDO | Map	**15814**	16	IB	RN	RT								1	4			4	4		4	
RIO GRANDE AT MASTERSON RD IN LAREDO, 9.9KM DWNSTR INTL BRIDGE #1 (WEST BRIDGE), DWNSTR SOUTHSIDE WWTP AND UPSTR NUEVO LAREDO WWTP | Map	**15815**	16	IB	LA	RT												12			12	
RIO GRANDE AT RIO BRAVO, 0.5KM DWNSTR OF THE COMMUNITY OF EL CENIZO | Map	**15816**	16	IB	LA	RT												12			12	
RIO GRANDE AT WEBB/ZAPATA COUNTY LINE | Map	**15817**	16	IB	RN	RT								1	12			12	12		12	

Site Description	Station	Region	SE	CE	MT	24hr DO	AqHab	Benth	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tiss	Field	Comments
RIO GRANDE AT THE COLOMBIA BRIDGE, 2.7KM UPSTREAM OF THE DOLORES PUMP STATION, 45.1KM UPSTREAM OF THE LAREDO WTP INTAKE | Map	**15839**	16	IB	LA	RT												12	12		12	
RIO GRANDE AT WORLD TRADE BRIDGE ON FM 3484 | Map	**17410**	16	IB	RN	RT								1	4			4	4		4	
RIO GRANDE AT APACHE RANCH WEST OF INTERSECTION OF PRIVATE ROAD AND EASTERN AIRSTRIP NO BETWEEN LARADO AND EAGLE PASS | Map	**17596**	16	IB	IB	RT								1	4			4	4		4	
RIO GRANDE AT KICKAPOO RESERVATION 1.92 KM SOUTH AND 2.02 KM WEST OF RR 1021 AT MAVERICK COUNTY HWY 523 SOUTH OF EAGLE PASS | Map	**18795**	16	IB	IB	RT								1	8			8	8		8	
RIO GRANDE 115 METERS SOUTH AND 304 METERS WEST FROM THE INTERSECTION OF RANCHO VIEJO DRIVE/ZEBU COURT AND RIENDA DRIVE | Map	**20650**	16	IB	LA	RT												12			12	ecoli and fecal
Segment 2306 Rio Grande Above Amistad Reservoir | Map | Hide/Show Header Bar																					
RIO GRANDE AT THE MOUTH OF SANTA ELENA CANYON | Map	**13228**	6	IB	BB	RT									8			8	8		8	
RIO GRANDE BELOW RIO CONCHOS CONFLUENCE NEAR PRESIDIO | Map	**13229**	6	IB	IB	RT								1	8			8	8		8	
RIO GRANDE AT BOAT RAMP AT RIO GRANDE VILLAGE IN BIG BEND NATIONAL PARK | Map	**16730**	6	IB	BB	RT							2		8			8	8		8	
RIO GRANDE RIVER AT COLORADO CANYON APPROX. 30KM SE OF REDFORD ON RR170 IN PRESIDIO COUNTY | Map	**16862**	6	IB	PW	RT									6			6			6	
RIO GRANDE AT PRESIDIO RAILROAD BRIDGE, 3.25KM DOWNSTREAM OF US67, SOUTH OF PRESIDIO | Map	17000	6	IB	IB	RT												8	8		8	
RIO GRANDE AT PRESIDIO/OJINAGA TOLL BRIDGE (INTERNATIONAL), 0.75KM DOWNSTREAM OF US67 IN PRESIDIO | Map	17001	6	IB	IB	RT												8	8		8	
RIO GRANDE AT LAJITAS RESORT/FM 170 BOAT RAMP 240 M UPSTREAM OF BLACK HILLS CREEK CONFLUENCE NEAR LAJITAS | Map	**18441**	6	IB	PW	RT									6			6			6	
Segment 2307 Rio Grande Below Riverside Diversion Dam | Map | Hide/Show Header Bar																					

Site Description	Station	Region	SE	CE	MT	24hr DO	AqHab	Benth	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tiss	Field	Comments
RIO GRANDE 2.4 MI. UPSTREAM FROM RIO CONCHOS CONFLUENCE | Map	**13230**	6	IB	IB	RT									8			8	8		8	
RIO GRANDE AT GUADALUPE POINT OF ENTRY BRIDGE AT FM 1109 WEST OF TORNILLO | Map	**15704**	6	IB	UE	RT								1	4			4	4		4	
RIO GRANDE AT ALAMO CONTROL STRUCTURE, 9.7KM UPSTREAM OF FT. HANCOCK PORT OF ENTRY | Map	**15795**	6	IB	EP	RT								1	3			3	3		3	
RIO GRANDE AT ALAMO CONTROL STRUCTURE, 9.7KM UPSTREAM OF FT. HANCOCK PORT OF ENTRY | Map	**15795**	6	IB	IB	RT									1			1	1		1	
RIO GRANDE AT SAN ELIZARIO, 500M UPSTREAM OF CAPOMO ROAD END OF PAVEMENT AND 10.2KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE | Map	**16272**	6	IB	UE	RT								1	4			4	4		4	
RIO GRANDE 1.47 KILOMETERS UPSTREAM OF THE CONFLUENCE WITH GREEN RIVER | Map	**20648**	6	IB	UE	RT									4			4			4	extremely remote site parameters with 48hr HT may not be reported at times
Segment 2308 Rio Grande Below International Dam | Map | Hide/Show Header Bar																					
RIO GRANDE AT RIVERSIDE CANAL 1.8 KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE | Map	**14465**	6	IB	IB	RT									12			12	12		12	partial conventional analysis
RIO GRANDE 1.3 KM DOWNSTREAM FROM HASKELL ST. WWTP OUTFALL | Map	**15528**	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 | Map	**15529**	6	IB	IB	RT									12			12	12		12	partial conventional analysis
Segment 2311 Upper Pecos River | Map | Hide/Show Header Bar																					
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 | Map	**20558**	6	IB	SL	RT						2		2	6			6			6	
Segment 2314 Rio Grande Above International Dam | Map | Hide/Show Header Bar																					
RIO GRANDE AT COURCHESNE BRIDGE, 1.7 MI UPSTREAM FROM AMERICAN DAM | Map	**13272**	6	IB	IB	RT									12			12	12		12	partial conventional analysis

Site Description	Station	Region	SE	CE	MT	24hr DO	AqHab	Benth	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tiss	Field	Comments
RIO GRANDE IMMED. UPSTREAM OF THE CONFL. WITH ANTHONY DRAIN EAST OF LA TUNA PRISON NEAR THE STATE LINE | Map	**13276**	6	IB	UE	RT									4			4			4	
RIO GRANDE AT ANAPRA BRIDGE ON SUNLAND PARK DRIVE, 4.2KM UPSTREAM FROM AMERICAN DAM (IN NEW MEXICO) | Map	**17040**	6	IB	EP	RT									3			3			3	
RIO GRANDE AT ANAPRA BRIDGE ON SUNLAND PARK DRIVE, 4.2KM UPSTREAM FROM AMERICAN DAM (IN NEW MEXICO) | Map	**17040**	6	IB	IB	RT									1			1			1	

Figure 4, Appendix B, Map of Upper Rio Grande Basin and Pecos Sub- basin

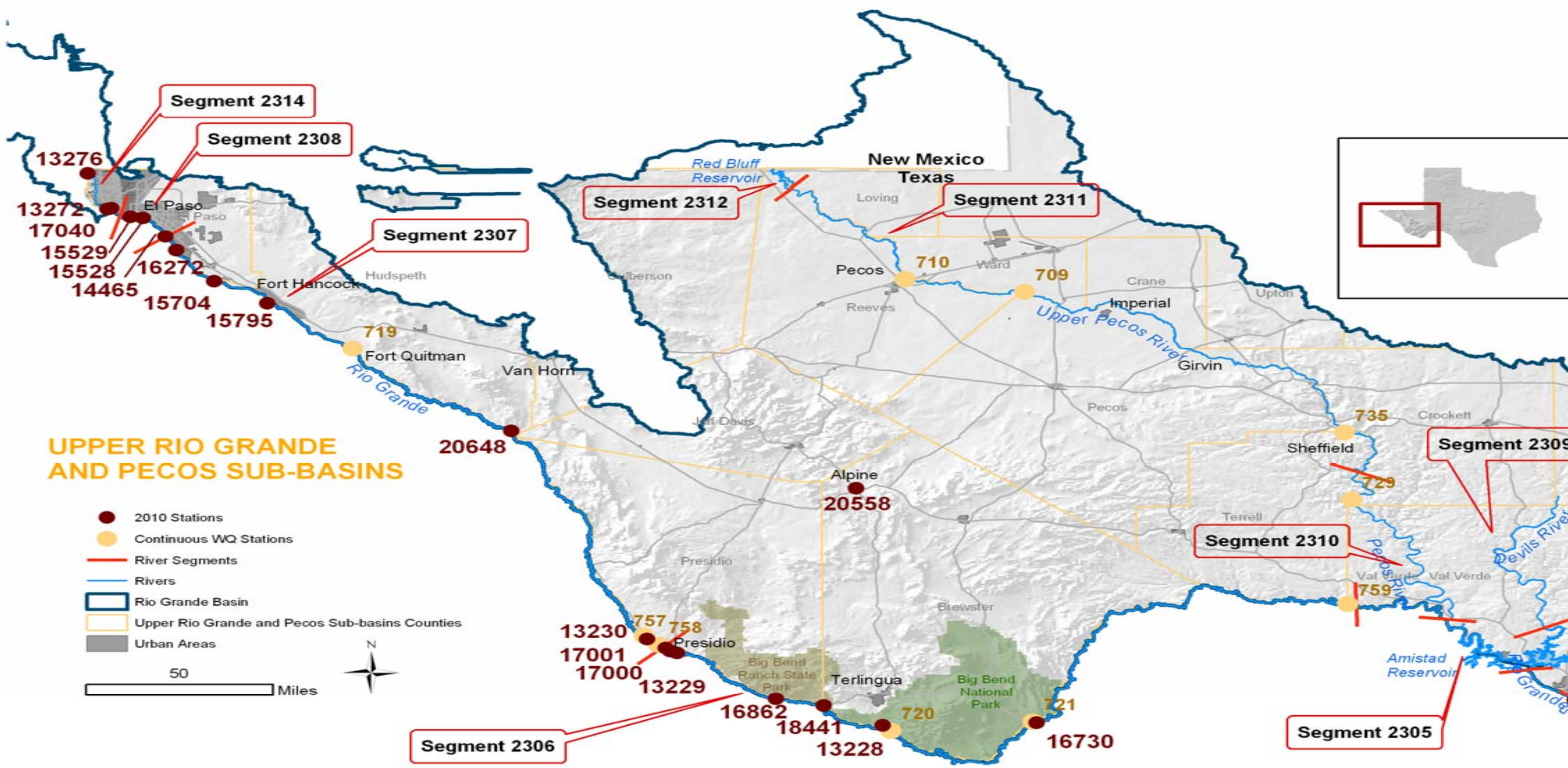
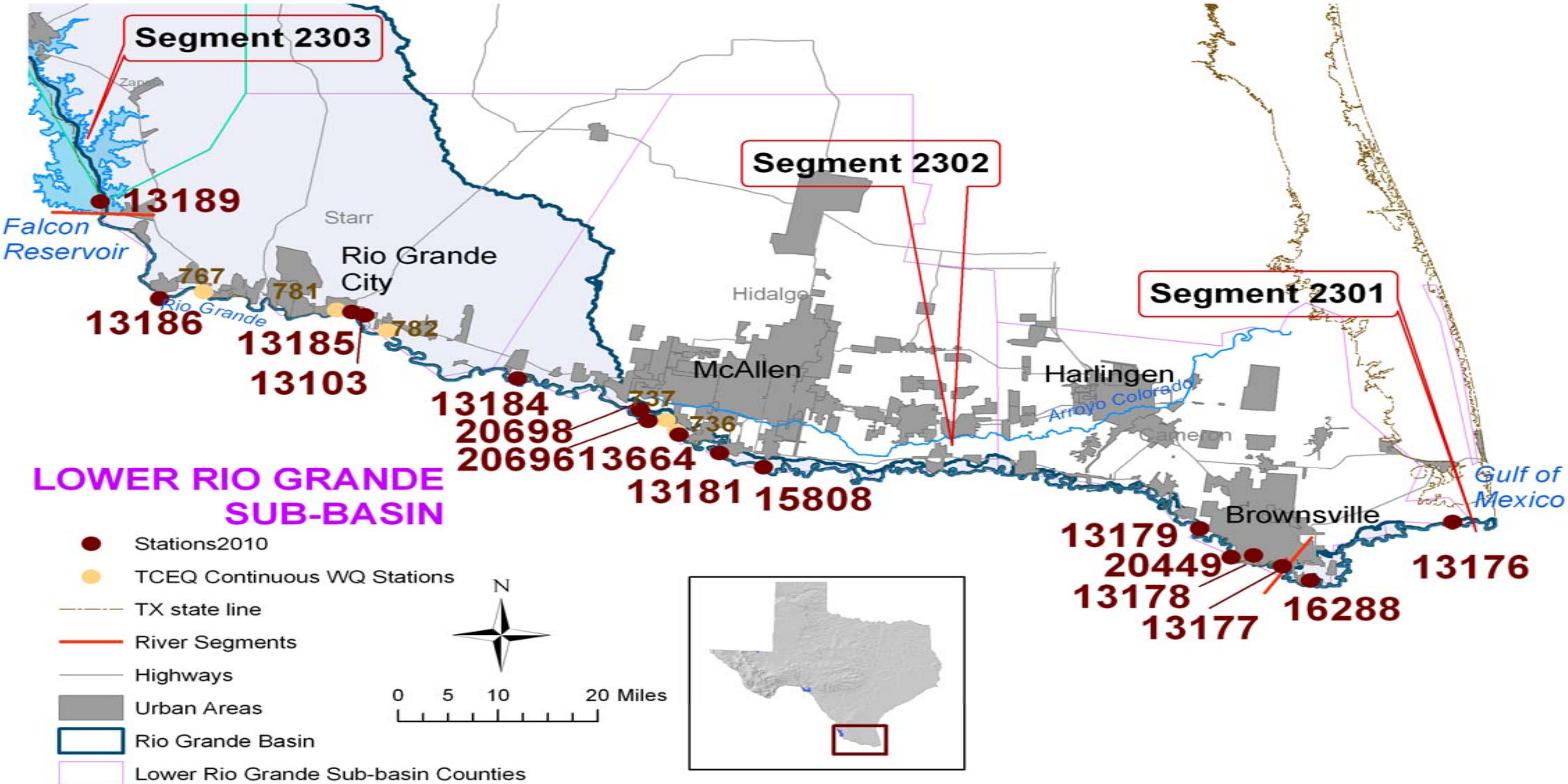


Figure 6, Appendix B, Map of Lower Rio Grande Basin



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

~~March 12, 2010~~
Sept 2010

Elizabeth Verdecchia
US IBWC
4171 N. Mesa, C100
El Paso, TX 79902

Re: Amendment #2 to the USIBWC Clean Rivers Program 2010-2011 QAPP

Dear Ms. Verdecchia:

Enclosed are the signatures to accompany your copy of the above-mentioned amendment, for your files and distribution.

Please ensure that copies of this document are distributed to each sub-tier participant as required by Section A3 of the QAPP. Please also secure written documentation from each sub-tier participant (e.g. subcontractors, other units of government, laboratories, etc.) stating the organization's awareness of and commitment to the requirements contained in the document. The documentation of QAPP distribution and subcontractor commitment to QAPP requirements must be available for review during monitoring system audits.

If you have any questions, please contact your TCEQ Clean Rivers Program project manager, or you may contact me at (512) 239-0011, or by email at dburke@tceq.state.tx.us.

Sincerely,

Daniel R. Burke
Daniel R. Burke
Lead CRP Quality Assurance Specialist

enclosure

cc: Julie McEntire, TCEQ CRP Project Manager, MC 234
Sharon Coleman, TCEQ Quality Assurance, MC 176

Amendment # 2
to the

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

Clean Rivers Program FY 2010/2011 QAPP

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

In Cooperation with the Texas Commission on Environmental Quality (TCEQ)

Questions concerning this amendment should be directed to:

Elizabeth Verdecchia
USIBWC
4171 N. Mesa, C-100
915-832-4701
915-832-4166
elizabeth.verdecchia@ibwc.gov

Effective: September 1, 2010

Justification: This document details the changes made to the basin-wide Quality Assurance Project Plan to update Appendix B for fiscal year 2011, including the addition or deletion of contacts, addition of partners, addition of parameters, an updated Table A7, additional stations and updated station maps.

Summary of Changes:

- The project/task organization and organizational chart in Section A4 have been changed to reflect the changes in CRP and partner personnel.
- Table A7.1 has been corrected to include turbidity.
- Table A7.4 has been updated to include a new parameter for one of our laboratories.
- Table B2.1 for ETC has a correction and a new addition for El Paso Water Utilities.
- Table B2. 3 for EPWU adds chlorophyll-a bottle.
- Two stations, 13275 and 13200, have been added.
- A partner, City of Laredo Health Department, has been added.
- The maps for the Middle and Upper Rio Grande, Figures 2 and 3, have been updated to include the stations that were added (13275 and 13200) and remove a station (station 13201).
- Appendix B is amended to include the monitoring sites table for the scheduled monitoring for FY2011.
- The Coordinated Monitoring Schedule has been updated to remove station 13201 and add stations 13200 and 13275.

Detail of Changes:

Section A4: The position of Chief of the Environmental Management Division at the USIBWC is vacant at this time. The individual listed is acting as Chief of this division until the position is filled. The position of Chief for the Operations and Maintenance division is currently vacant. The USIBWC CRP's data manager position is now vacant. Several contacts of the USIBWC field offices have changed. A partner has been added.

Figure 1. A4.1: Updated with Section A4 changes.

Table A7.1: Table corrected to include Turbidity. In the previous amendment, the parameter was accidently removed.

Table A7.4: Chlorophyll-a has been added to the list of parameters reported to TCEQ from the data analyzed by the El Paso Water Utilities.

Table B2.1 Chlorophyll-a parameter code corrected on the table for ETC.

Table B2.3: The containers for the El Paso Water Utilities have been changed to include containers needed for chlorophyll-a testing.

Monitoring Sites Table*:* The attached monitoring Table B1.1 in Appendix B is added to reflect monitoring for FY 2011.

Appendix B, Coordinated Monitoring Schedule: Station 13201 has been removed. Stations 13275 and 13200 have been added.

Appendix B, Figure 2: Updated to remove station 13201 and add 13200.

Appendix B, Figure 3: Updated to add station 13275.

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

APPROVAL PAGE 1 of 3

Changes to Table A7 must be reviewed by the corresponding lab. These changes will be incorporated into the QAPP document and the laboratory will acknowledge and accept these changes by signing this amendment.

El Paso Water Utilities, El Paso International Water Quality Laboratory

8-2-10

Paul R. Rivas, Laboratory Services Manager — Date

8-2-10

Richard Wilcox, Quality Assurance Chemist — Date

APPROVAL PAGE 2 of 3

City of Laredo Health Department

8/3/10

Samuel Gonzalez, Chief of Environmental Health Services — Date

8/4/10

Daniel Maldonado or Lupe Luna, Sanitation Inspectors — Date

APPROVAL PAGE 3 of 3

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

8/23/10

Elizabeth Verdecchia, USIBWC Project Manager Date

8-23-10

Leslie Grijalva, USIBWC Quality Assurance Officer Date

8/30/10

Julie McEntire, CRP Project Manager Date

8/31/10

Jennifer Delk, CRP Project QAS Date

8/31/10

Allison Woodall, CRP Group Leader Date

8/31/2010

Daniel R. Burke, CRP Lead QAS Date

The USIBWC will secure written documentation from each project participant (e.g., subcontractors, other units of government, laboratories) stating the organization's awareness of and commitment to requirements contained in this quality assurance project plan amendment. The USIBWC will maintain this documentation as part of the project's quality assurance records, and will be available for review.

A4 PROJECT/TASK ORGANIZATION

Description of Responsibilities

USIBWC

Vacant, Lisa Santana Acting
USIBWC Environmental Management Division Chief

Responsible for oversight of the USIBWC CRP Project 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. 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 is properly trained and that training records are maintained.

Elizabeth Verdecchia
USIBWC Acting Data Manager

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

RIO GRANDE BASIN CRP PARTNERS

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 or 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 Laboratory for analysis.

US International Boundary and Water Commission, Field Offices
Manages data collection activities and generates the work orders for water quality monitoring at six field offices along the Texas portion of the Rio Grande. The project manager's direct activities on the local level as follows: Tony Solo – American Dam, Pablo Garza – Amistad Dam, Mario Gomez – Falcon Dam, Rodolfo Montero – Mercedes, and Hector Hernandez – Presidio. The field office managers report to the Division Chief of the USIBWC Operations and Maintenance Division. Samples collected by the field offices are submitted to Environmental Testing and Consulting, Inc. for analysis.

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 type 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.

PROJECT ORGANIZATION CHART

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

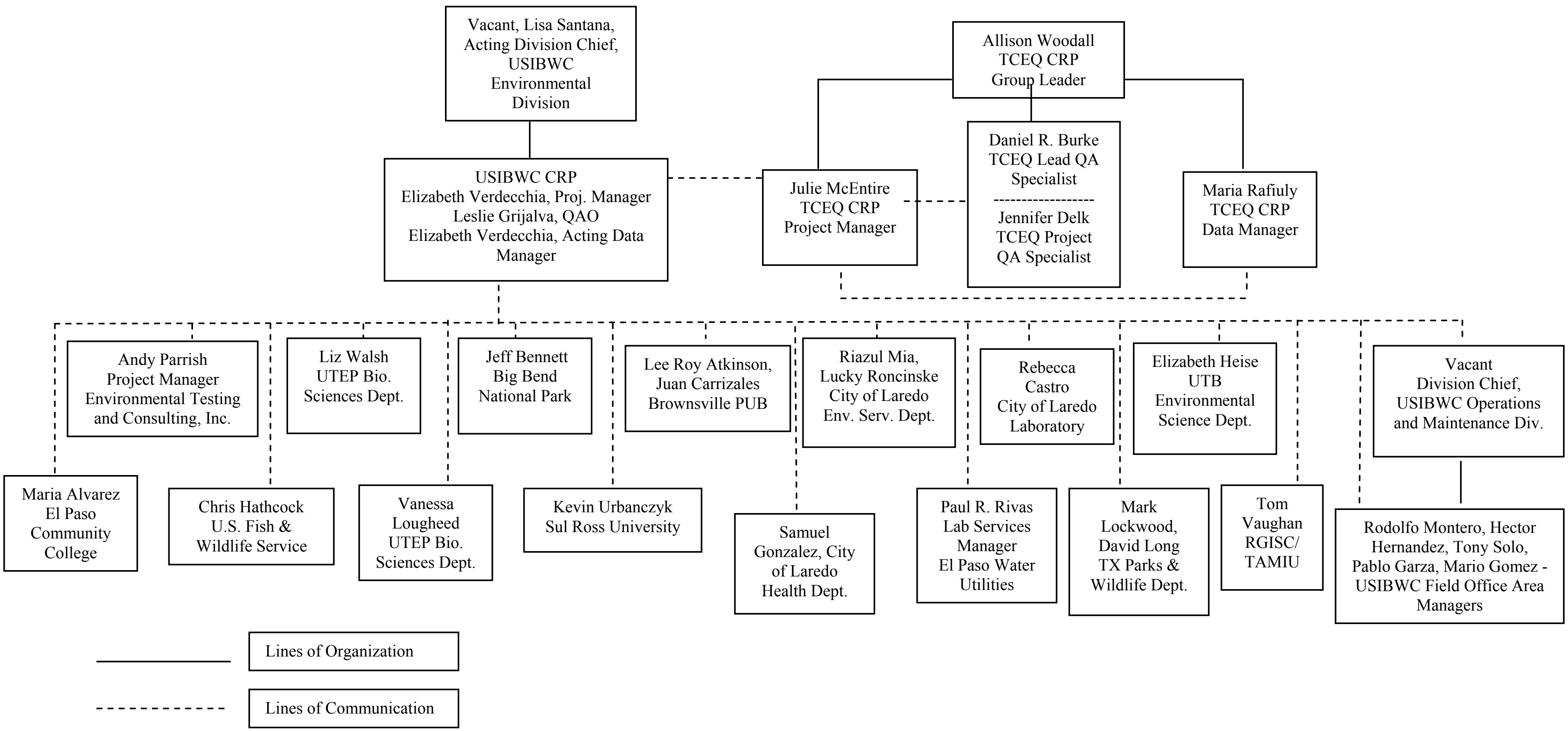


Table A7.1 Measurement Performance Specifications for Field and Laboratory Measurements for: U.S. International Boundary and Water Commission, Big Bend National Park, City of Laredo Environmental Engineering, Rio Grande International Study Center, U.T. Brownsville, Sul Ross, U.S. Fish & Wildlife, TX Parks & Wildlife, El Paso Community College, and U. T. El Paso (samples analyzed by Environmental Testing and Consulting, Inc.).

Field Parameters

Parameter	UNITS	MATRIX	METHOD	STORET Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
pH	SU	water	EPA 150.1 & TCEQ-SWQM SOP, V1	00400	NA*	NA	NA	NA	NA	Field
DO	mg/L	water	EPA 360.1& TCEQ-SWQM SOP, V1	00300	NA*	NA	NA	NA	NA	Field
Conductivity	µS/cm	water	EPA 120.1 & TCEQ-SWQM SOP, V1	00094	NA*	NA	NA	NA	NA	Field
Air temperature	centigrade	air	TCEQ-SWQM SOP, V1	00020	NA*	NA	NA	NA	NA	Field
Water temperature	centigrade	water	EPA 170.1 & TCEQ-SWQM SOP, V1	00010	NA*	NA	NA	NA	NA	Field
Secchi depth	meters	water	TCEQ-SWQM SOP, V1	00078	NA*	NA	NA	NA	NA	Field
Turbidity	NTU	water	SM 2130- B	82078	NA*	NA	NA	NA	NA	Field
Days since last significant rainfall	days	NA	TCEQ-SWQM SOP, V1	72053	NA*	NA	NA	NA	NA	Field
Flow	cfs	water	TCEQ-SWQM SOP, V1	00061	NA*	NA	NA	NA	NA	Field
Flow estimate	cfs	water	TCEQ-SWQM SOP, V1	74069	NA*	NA	NA	NA	NA	Field
Flow method	1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler	water	TCEQ-SWQM SOP, V1	89835	NA*	NA	NA	NA	NA	Field
Flow severity	1-no flow 2-low flow 3-normal flow 4-flood 5- high 6- dry	water	TCEQ-SWQM SOP, V1	01351	NA*	NA	NA	NA	NA	Field
Stream width	meters	water	TCEQ-SWQM SOP, V1	89861	NA*	NA	NA	NA	NA	Field
Water depth	meters	water	TCEQ-SWQM SOP, V1	82903	0.1	NA	NA	NA	NA	Field
Weather	1- clear 2 - cloudy 3 - overcast 4 - rain	NA	Field Observation	89966	NA*	NA	NA	NA	NA	Field
Wind intensity	1 - calm 2 - slight 3 - moderate 4 - strong	air	Field Observation	89965	NA*	NA	NA	NA	NA	Field
Wind direction	1 - North 2 - South 3 - East 4 - West	air	Field Observation	89010	NA*	NA	NA	NA	NA	Field

Conventional Parameters

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
TDS, dried at 180º C	mg/L	water	EPA 160.1, SM2540C	70300	10	2	70-130	20	80-120	ETC
Chloride	mg/L	water	EPA 300.0	00940	5	2	70-130	20	80-120	ETC
TSS	mg/L	water	EPA 160.2, SM2540D	00530	4	2	70-130	20	80-120	ETC
VSS	mg/L	water	EPA 160.4	00535	4	2	70-130	20	80-120	ETC
Sulfate	mg/L	water	EPA 300.0	00945	5	1	70-130	20	80-120	ETC
TOC	mg/L	water	SM5310B, EPA 415.1	00680	2	1	70-130	20	80-120	ETC
Ammonia-N, total	mg/L	water	SM4500 NH3D, SM4500 NH3F, EPA 350.3	00610	0.1	0.1	70-130	20	80-120	ETC
T – Phosphorous-P	mg/L	water	SM 4500-P E	00665	0.06	0.05	70-130	20	80-120	ETC
Chlorophyll-a, spectrophotometric acid method	µg/L	water	SM 10200-H	32211	3	3	70-130	20	80-120	ETC
Pheophytin-a, spectrophotometric acid method	µg/L	water	EPA 446.0	32218	3	3	70-130	20	80-120	ETC
Fluoride	mg/L	water	EPA 300.0	00951	0.5	0.1	70-130	20	80-120	ETC
Bromide	mg/L	water	EPA 300.0	71870	0.5	0.5	70-130	20	80-120	ETC
BOD5 Day- 20ºC	mg/L	water	SM 5210 B	00310	2	2	70-130	20	80-120	ETC
T. Alkalinity as C_aCO_3	mg/L	water	SM 2320-B	00410	20	20	70-130	20	80-120	ETC
Nitrate+Nitrite-N	mg/L	water	EPA 300.0	00630	0.05	0.05	70-130	20	80-120	ETC
Calcium	mg/L	water	EPA 200.7	00916	0.5	0.1	70-130	20	80-120	ETC
Magnesium	mg/L	water	EPA 200.7	00927	0.5	0.1	70-130	20	80-120	ETC
Potassium	mg/L	water	EPA 200.7	00937	0.2	0.1	70-130	20	80-120	ETC
Sodium	mg/L	water	EPA 200.7	00929	NA	0.5	70-130	20	80-120	ETC
Hardness, Total as CaCO3	mg/L	water	SM2340B, EPA 130.2	00900	5	1	70-130	20	80-120	ETC
E. coli, Colilert, IDEXX Method	MPN/100 mL	water	SM 9223-B****	31699	1	1	NA	.5*****	NA	ETC
Holding time, E. coli IDEXX Colilert	hours	water	NA	31704	1	NA	NA	NA	NA	ETC

* Reporting to be consistent with SWQM guidance and based on measurement capability.

******** 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.
Quality Control Guidelines. This criterion applies to bacteriological duplicates with concentrations >10 MPN/100mL or >10 organisms/100mL.

***** Based on a range statistic as described in Standard Methods, 20th Edition, Section 9020-B, ΑQuality Assurance/Quality Control - Intralaboratory Quality Control Guidelines. This criterion applies to bacteriological duplicates with concentrations >10 MPN/100mL or >10 organisms/100mL.

Total Metals in Water

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Iron	µg/L	water	EPA 200.8, EPA 200.7	01045	300	100	70-130	20	80-120	ETC
Manganese	µg/L	water	EPA 200.8, EPA 200.7	01055	50	10	70-130	20	80-120	ETC
Selenium	µg/L	water	EPA 200.8, EPA 200.7	01147	2	2	70-130	20	80-120	ETC

Total Metals in Sediment

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Aluminum	mg/kg	sediment	EPA 6020	01108	n/a*	20	60-140	20	60-140	ETC
Aluminum	mg/kg	sediment	EPA 6010	01108	n/a*	20	60-140	20	60-140	ETC
Antimony	mg/kg	sediment	EPA 6020	01098	12.5	12.5	60-140	20	60-140	ETC
Antimony	mg/kg	sediment	EPA 6010	01098	12.5	12.5	60-140	20	60-140	ETC
Arsenic	mg/kg	sediment	EPA 6020	01003	16.5	5	60-140	20	60-140	ETC
Arsenic	mg/kg	sediment	EPA 6010	01003	16.5	5	60-140	20	60-140	ETC
Barium	mg/kg	sediment	EPA 6020	01008	n/a*	5	60-140	20	60-140	ETC
Barium	mg/kg	sediment	EPA 6010	01008	n/a*	5	60-140	20	60-140	ETC
Cadmium	mg/kg	sediment	EPA 6020	01028	2.49	0.2	60-140	20	60-140	ETC
Cadmium	mg/kg	sediment	EPA 6010	01028	2.49	0.2	60-140	20	60-140	ETC
Chromium	mg/kg	sediment	EPA 6020	01029	55.5	5	60-140	20	60-140	ETC
Chromium	mg/kg	sediment	EPA 6010	01029	55.5	5	60-140	20	60-140	ETC
Copper	mg/kg	sediment	EPA 6020	01043	74.5	5	60-140	20	60-140	ETC
Copper	mg/kg	sediment	EPA 6010	01043	74.5	5	60-140	20	60-140	ETC
Lead	mg/kg	sediment	EPA 6020	01052	64	5	60-140	20	60-140	ETC
Lead	mg/kg	sediment	EPA 6010	01052	64	5	60-140	20	60-140	ETC
Mercury	Mg/kg	Sediment	EPA 7471	71921	0.355	0.02	70-130	30	60-140	ETC
Nickel	mg/kg	sediment	EPA 6020	01068	24.3	5	60-140	20	60-140	ETC
Nickel	mg/kg	sediment	EPA 6010	01068	24.3	5	60-140	20	60-140	ETC
Selenium	mg/kg	sediment	EPA 6020	01148	n/a*	1	60-140	20	60-140	ETC
Selenium	mg/kg	sediment	EPA 6010	01148	n/a*	1	60-140	20	60-140	ETC
Silver	mg/kg	sediment	EPA 6020	01078	1.1	0.5	60-140	20	60-140	ETC
Silver	mg/kg	sediment	EPA 6010	01078	1.1	0.5	60-140	20	60-140	ETC
Zinc	mg/kg	sediment	EPA 6020	01093	205	10	60-140	20	60-140	ETC
Zinc	mg/kg	sediment	EPA 6010	01093	205	10	60-140	20	60-140	ETC

* AWRLs have not been developed for these parameters.
All soil samples in this table are screened by SW846 6010B method for low-level metals, which are rerun under SW846 6020

Organics in Sediment

Parameter	UNITS	MATRIX	METHOD	PARAMATER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
DDT	µg/kg	sediment	EPA 8081	39373	23	2	60-140	20	60-140	ETC
DDD	µg/kg	sediment	EPA 8081	39363	15.65	2	60-140	20	60-140	ETC
DDE	µg/kg	sediment	EPA 8081	39368	3.91	2	60-140	20	60-140	ETC
Aldrin	µg/kg	sediment	EPA 8081	39333	40	2	60-140	20	60-140	ETC
Chlordane (Tech Mix and Metabs)	µg/kg	sediment	EPA 8081	39351	2.4	2	60-140	20	60-140	ETC
Endrin	µg/kg	sediment	EPA 8081	39393	103.5	2	60-140	20	60-140	ETC
Heptachlor	µg/kg	sediment	EPA 8081	39413	n/a	2	60-140	20	60-140	ETC
Methoxychlor	µg/kg	sediment	EPA 8081	39481	n/a	2	60-140	20	60-140	ETC
Mirex	µg/kg	sediment	EPA 8081	79800	650	2	60-140	20	60-140	ETC
Dieldrin	µg/kg	sediment	EPA 8081	39383	2.15	2	60-140	20	60-140	ETC
Hexachlorobenzene	µg/kg	sediment	EPA 8081	39701	120	2	60-140	20	60-140	ETC
Aroclor 1016	µg/kg	sediment	EPA 8082	39514	265	35	60-140	20	60-140	ETC
Aroclor 1248	µg/kg	sediment	EPA 8082	39503	750	35	60-140	20	60-140	ETC
Aroclor 1254	µg/kg	Sediment	EPA 8082	39507	170	35	60-140	20	60-140	ETC
Aroclor 1260	µg/kg	Sediment	EPA 8082	39511	120	35	60-140	20	60-140	ETC
Endosulfan I	µg/kg	sediment	EPA 8081	34364	n/a	1	60-140	20	60-140	ETC
Demeton	µg/kg	sediment	EPA 8270	82400	n/a	40	60-140	20	60-140	ETC
Guthion/ Azinphos-methyl	µg/kg	sediment	EPA 8270	39581	n/a	40	60-140	20	60-140	ETC
Malathion	µg/kg	sediment	EPA 8270	39531	n/a	40	60-140	20	60-140	ETC
Parathion Ethyl	µg/kg	sediment	EPA 8270	39541	n/a	40	60-140	20	60-140	ETC
2,4-D	µg/kg	sediment	EPA 8151	39731	n/a	40	60-140	20	60-140	ETC
2,4,5-T	µg/kg	sediment	EPA 8151	39741	n/a	9	60-140	20	60-140	ETC

Silvex	µg/kg	sediment	EPA 8151	39761	n/a	7	60-140	20	60-140	ETC
Fluorene	µg/kg	sediment	EPA 8270C	34384	268	66.7	60-140	20	60-140	ETC
Fluoranthene	µg/kg	sediment	EPA 8270C	34379	1115	66.7	60-140	20	60-140	ETC
Benzo(a)pyrene	µg/kg	sediment	EPA 8270C	34250	725	66.7	60-140	20	60-140	ETC
Napthalene	µg/kg	sediment	EPA 8270C	34445	280.5	66.7	60-140	20	60-140	ETC
Benzene	µg/kg	sediment	EPA 8260B	34237	22,505	1	60-140	20	60-140	ETC
Toluene	µg/kg	sediment	EPA 8260B	34483	2,830	5	60-140	20	60-140	ETC
Ethylbenzene	µg/kg	sediment	EPA 8260B	34374	1,965	1	60-140	20	60-140	ETC

References for Table A7.1:

TCEQ SOP, V1 - TCEQ SWQM Procedures, Volume 1: Physical & Chemical Monitoring Methods for Water, Sediment, & Tissue, 2008 (RG-415).
TCEQ, SWQM QAPP, January 2008, Revision 12.
United States International Boundary and Water Commission "Field Manual for Hydrologic Technicians," November 1998.
United States International Boundary and Water Commission "Collection and Field Analysis of Water Quality Sample," August 1997.
Title 40 of the Code of Federal Regulations, Parts 136 or 141.
United States Environmental Protection Agency (EPA) "Methods For Chemical Analysis of Water and Wastes", Manual #EPA-600/4-79-020.
United States Environmental Protection Agency (EPA) "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Manual #EPA-SW-846.
CRP AWRL List, http://www.tceq.state.tx.us/assets/public/compliance/monops/crp/QA/awrlmaster.pdf
TCEQ NELAP - Recognized Laboratory Fields of Accreditation for ETC. Certificate T104704180- 09A TX, Issue Date 4/29/2009.

Organics in Water

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Benzene	µg/L	water	EPA 624	34030	2.5	1	60-140	20	60-140	ETC
Toluene	µg/L	water	EPA 624	34010	N/A	5	60-140	20	60-140	ETC
Ethylbenzene	µg/L	water	EPA 624	34371	N/A	2	60-140	20	60-140	ETC
Fluorene	µg/L	water	EPA 625	34381	5.5	2	60-140	20	60-140	ETC
Fluoranthene	µg/L	water	EPA 625	34376	3	2	60-140	20	60-140	ETC
Acenaphthylene	µg/L	water	EPA 625	34200	5	2	60-140	20	60-140	ETC
Napthalene	µg/L	water	EPA 625	34696	250	2	60-140	20	60-140	ETC

Table A7.2 Measurement Performance Specifications for Field and Laboratory Measurements for: Brownsville Public Utilities Board

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Ammonia, N	mg/L	water	EPA 350.3	00610	0.1	0.1	70-130	20	80-120	BPUB
BOD	mg/L	water	SM 5210B	00310	2	2	70-130	20	80-120	BPUB
E. Coli, Colilert, IDEXX Method	MPN/100mL	water	SM9223B	31699	1	1	NA	0.5	NA	BPUB
TDS	mg/L	water	SM 2540C	70300	10	10	80-120	25	75-125	BPUB
TSS	mg/L	water	EPA 160.2	00530	4	2	70-130	20	80-120	BPUB
VSS	mg/L	water	EPA 160.4	00535	4	2	70-130	20	80-120	BPUB

References for Table A7.2:

Quality Control lab documents from Brownsville PUB (BPUB) and NELAP certification.
TCEQ, SWQM QAPP, January 2008, Revision 12.

Table A7.3 Measurement Performance Specifications for Field and Laboratory Measurements for: City of Laredo Laboratory

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
E. Coli, Colilert, IDEXX Method	MPN/100mL	water	SM9223B	31699	1	1	NA	0.5	NA	Laredo
Fecal Coliform	CFU/100 mL	water	SM9222D	31616	1	1	NA	NA	NA	Laredo
Specific Conductance	µS/cm	water	EPA 120.1 & TCEQ-SWQM SOP, V1	00094	NA*	NA	NA	NA	NA	Field
Air temperature	centigrade	air	TCEQ-SWQM SOP, V1	00020	NA*	NA	NA	NA	NA	Field
Water temperature	centigrade	water	EPA 170.1 & TCEQ-SWQM SOP, V1	00010	NA*	NA	NA	NA	NA	Field
Days since last significant rainfall	days	NA	TCEQ-SWQM SOP, V1	72053	NA*	NA	NA	NA	NA	Field
Flow	cfs	water	TCEQ-SWQM SOP, V1	00061	NA*	NA	NA	NA	NA	Field
Flow method	1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler	water	TCEQ-SWQM SOP, V1	89835	NA*	NA	NA	NA	NA	Field
Flow severity	1-no flow 2-low flow 3-normal flow 4-flood 5- high 6- dry	water	TCEQ-SWQM SOP, V1	01351	NA*	NA	NA	NA	NA	Field
Present Weather	1- clear 2 – partly cloudy 3 - cloudy 4 – rain 5- other	NA	Field Observation	89966	NA*	NA	NA	NA	NA	Field
Wind intensity	1 - calm 2 - slight 3 - moderate 4 - strong	air	Field Observation	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	air	Field Observation	89010	NA*	NA	NA	NA	NA	Field

* AWRLs have not been developed for these parameters

Table A7.4 Measurement Performance Specifications for Field and Laboratory Measurements for: El Paso Water Utilities

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
BOD	mg/L	water	SM 5210B	00310	2	2	58-115	30	58-115	EPWU
E. Coli, Colilert, IDEXX Method	MPN/100mL	water	SM9223B	31699	1	1	NA	0.5	NA	EPWU
Turbidity	NTU	water	SM2130B	82079	0.5	0.1	70-130	20	80-120	EPWU
Chlorophyll-a, spectrophotometric acid method	µg/L	water	SM 10200-H	32211	3	3	70-130	20	80-120	EPWU

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

Routine Conventionals-in-Water Samples (9 containers: 4 unpreserved, 1 preserved with HNO_3, 2 preserved with HCl, 1 preserved with H_2SO_4, 1 preserved with $Na_2S_2O_3$)				
Parameters	Containers	Sample Volume (ml)	Preservation	Maximum Holding Time
CONTAINER 1				
	HDPE	1000	Cool to 4 C	
TSS (00530)/VSS (00535)		300	"	7 days
Chloride (Cl) (00940)		100	"	28 days
Sulfate (SO_4) (00945)		100	"	28 days
Fluoride (00951)		50	"	28 days
TDS (70300)		100	"	7 days
Bromide (71870)		50	"	28 days
Alkalinity (00410)		100	"	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 (00935)		50	"	6 months
Hardness (00900)		50	"	6 months
CONTAINER 3				
	HDPE	500	1-2 ml conc.H_2SO_4 to pH <2 and cool to 4 C	
Ammonia (NH_3) (00610)		150	"	28 days
Total Phosphorus (TPO_4) (00665)		150	"	28 days
Nitrate + Nitrite (00630) ($NO_3 + NO_2$)		150	"	28 days
CONTAINER 4 and 5				
Chlorophyll *a* (32211)	glass amber	1000	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 (32213)	glass amber	1000	dark and ice before filtration; dark and frozen after filtration	Filter within 48 hours Filters may be stored frozen up to 28 days
CONTAINER 6				
BOD (00310)	HDPE	1000	Cool to 4 C	2 days
CONTAINER 7 and 8				
Total Organic Carbon (TOC) (00680)	VOA glass vials (2)	40	0.5 ml conc. HCl to pH <2 and cool to 4 C	28 days
CONTAINER 9				
E. coli bacteria	Sterilized plastic container	500	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	180 days

			HNO_3 to pH<2	
Metals in Sediment				
Metals	glass jar with teflon lined lid	500 grams	Cool 4 C	180 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 B2.2 Sample Storage, Preservation and Handling Requirements, City of Laredo Laboratory

E.Coli and Fecal Coliform Analysis- City of Laredo 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 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				
E. coli bacteria (31699)	Sterilized plastic container	2X250	Cool to 4 C Sodium thiosulfate	6-8 hours
CONTAINER 3				
BOD (00310)	HDPE	1000	Cool to 4 C	2 days
CONTAINER 4				
Chlorophyll-a (32211)	HDPE (brown)	1000	Dark and ice before filtration; dark and frozen after filtration	Filter within 48 hours. Filters may be stored frozen up to 28 days

Table 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

Appendix B Sampling Process Design and Monitoring Schedule (plan)

Sample Design Rationale FY *2011*

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 305(b) assessment, 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.

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

1. Metals in water were removed from Station 13116 because samples were filtered in the lab and not in the field.
2. Bacteria, chlorophyll-a, Pheaophytin, and BOD were removed from Station 20648 monitoring. Due to this site's remote location, samples cannot be shipped in time to allow analysis of 48-hour parameters.
3. A new site has been added quarterly at Vinton bridge (station 13275). Monitoring at this site will include analysis of water downstream of a drain that flows into the Rio Grande.
4. All dissolved metals analyses have been removed from this QAPP. Metals analysis for stations 15704, 16272, 13272, and 17040 will be included under a different QAPP.
5. Station 17040 frequency of sampling was changed to remove CE IB sampling at that site and add CE EP sampling quarterly.
6. Station 13276 had the CE changed from UE to IB.
7. Frequency of sampling at 15815, 13196, and 15816 changed to 2, and at 15795 and 16272 changed to 1, due to security issues. Sites may not be sampled at all if unsafe.

Site 13201 dropped due to realization that site was being sampled at a different station location. Site 13200 added to the CMS. Data correction submitted to TCEQ to change data collected by LA from 13201 to 13200.

Table B1.1 Sample Design and Schedule, FY 2011

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
Segment 2301 Rio Grande Tidal																						
RIO GRANDE AT SABAL PALM SANCTUARY AT NORTHEAST BOUNDARY OFF PARK ROAD APPROX. 1MI SOUTH OF FM1419 NEAR PALM GROVE | **Map**	16288	2301	15	IB	UB	RT									4			4			4	
RIO GRANDE TIDAL AT SH 4 NEAR BOCA CHICA | **Map**	13176	2301	15	IB	UB	RT									4			4			4	
Segment 2302 Rio Grande Below Falcon Reservoir																						
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 | **Map**	20698	2302	15	IB	UF	RT									3			3			3	
RIO GRANDE 0.5 MI. BELOW ANZALDUAS DAM, 12.2 MI. FROM HIDALGO | **Map**	13664	2302	15	IB	IB	RT									8			8	8		8	
RIO GRANDE 200M UPSTREAM OF PHARR INTERNATIONAL BRIDGE (US281) |	15808	2302	15	IB	IB	RT									8			8	8		8	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
Map																						
RIO GRANDE AT FORT RINGGOLD 1 MI. DOWNSTREAM FROM RIO GRANDE CITY | Map	13185	2302	15	IB	IB	RT								1	12			12	12		12	
RIO GRANDE AT SH 886 NEAR LOS EBANOS | Map	13184	2302	15	IB	IB	RT									7			7	7		7	
RIO GRANDE AT THE EL MORILLO TRACT OF THE LOWER RIO GRANDE VALLEY NATIONAL WILDLIFE REFUGE 2.56 KILOMETERS SOUTH AND 817 METERS WEST OF THE INTERSECTION OF MILITARY ROAD AND SHUERBACH ROAD/AIRFIELD ROAD/ SOUTH BREYFOGLE ROAD | Map	20696	2302	15	IB	UF	RT									3			3			3	
RIO GRANDE BELOW RIO ALAMO NEAR FRONTON | Map	13186	2302	15	IB	IB	RT									8			8	8		8	
RIO GRANDE EL JARDIN PUMP STATION, AT LOW WATER DAM 300 FT. BELOW INTAKE | Map	13177	2302	15	IB	IB	RT								1	8			8	8		8	
RIO GRANDE INTERNATIONAL BRIDGE AT US 281 AT HIDALGO | Map	13181	2302	15	IB	IB	RT								1	8			8	8		8	
RIO GRANDE INTERNATIONAL BRIDGE ON US 77 AT BROWNSVILLE | Map	13178	2302	15	IB	UB	RT								1	4			4			4	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
RIO GRANDE NEAR RIVER BEND BOAT RAMP APPROXIMATELY 5 MI. WEST OF BROWNSVILLE ON US 281 | Map	13179	2302	15	IB	UB	RT								1	4			4			4	
RIO GRANDE RIVER AT BROWNSVILLE PUB WATER TREATMENT PLANT NUMBER 1 INTAKE BETWEEN WTP RESERVOIR AND RIO GRANDE LEVEE 910 METERS WEST AND 335 METERS SOUTH TO THE INTERSECTION OF WEST ELIZABETH STREET AND SOUTH MILITARY ROAD | Map	20449	2302	15	IB	BO	RT									12			12				
ARROYO LOS OLMOS BRIDGE ON US 83 SOUTH OF RIO GRANDE CITY | Map	13103	2302A	15	IB	IB	BF									3			3			3	Bacteria nitrates and field collected when flowing
Segment 2303 International Falcon Reservoir | Map																						
FALCON LAKE AT INTERNATIONAL BOUNDARY MONUMENT I | Map	13189	2303	16	IB	IB	RT									4			4			4	
FALCON RESERVOIR AT SAN YGNACIO WTP INTAKE, 350M DWNSTR FROM US B83 BRIDGE | Map	15818	2303	16	IB	RN	RT									2			2			2	
Segment 2304 Rio Grande Below Amistad Reservoir | Map																						
RIO GRANDE 115 METERS SOUTH AND 304 METERS WEST FROM THE INTERSECTION OF	20650	2304	16	IB	LA	RT												12			12	ecoli and fecal

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
RANCHO VIEJO DRIVE/ZEBU COURT AND RIENDA DRIVE | **Map**																						
RIO GRANDE 12.8 MI. BELOW AMISTAD DAM, NEAR GAGE, 340 M UPSTREAM OF US 277 BRIDGE IN DEL RIO | **Map**	13208	2304	16	IB	IB	RT									2			2	2		2	
RIO GRANDE 50 YD UPSTREAM OF CONFLUENCE OF ZACATA CREEK AND RIO GRANDE IN LAREDO **Map**	13200	2304	16	IB	LA	RT												12			12	
RIO GRANDE AT APACHE RANCH WEST OF INTERSECTION OF PRIVATE ROAD AND EASTERN AIRSTRIP NO BETWEEN LARADO AND EAGLE PASS | **Map**	17596	2304	16	IB	IB	RT									4			4	4		4	
RIO GRANDE AT INTERNATIONAL BRIDGE #2 (EAST BRIDGE) IN LAREDO | **Map**	15814	2304	16	IB	LA	RT												12	12		12	
RIO GRANDE AT INTERNATIONAL BRIDGE #2 (EAST BRIDGE) IN LAREDO | **Map**	15814	2304	16	IB	RN	RT								1	4			4	4		4	
RIO GRANDE AT KICKAPOO RESERVATION 1.92 KM SOUTH AND 2.02 KM WEST OF RR 1021 AT MAVERICK COUNTY HWY 523 SOUTH OF EAGLE	18795	2304	16	IB	IB	RT								1	8			8	8		8	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
PASS | **Map**																						
RIO GRANDE AT MASTERSON RD IN LAREDO, 9.9KM DWNSTR INTL BRIDGE #1 (WEST BRIDGE), DWNSTR SOUTHSIDE WWTP AND UPSTR NUEVO LAREDO WWTP | **Map**	15815	2304	16	IB	LA	RT												2			2	
RIO GRANDE AT PIPELINE CROSSING 8.7 MI. BELOW LAREDO | **Map**	13196	2304	16	IB	LA	RT												2			2	
RIO GRANDE AT RIO BRAVO, 0.5KM DWNSTR OF THE COMMUNITY OF EL CENIZO | **Map**	15816	2304	16	IB	LA	RT												2			2	
RIO GRANDE AT THE COLOMBIA BRIDGE, 2.7KM UPSTREAM OF THE DOLORES PUMP STATION, 45.1KM UPSTREAM OF THE LAREDO WTP INTAKE | **Map**	15839	2304	16	IB	LA	RT												12	12		12	
RIO GRANDE AT WEBB/ZAPATA COUNTY LINE | **Map**	15817	2304	16	IB	RN	RT								1	12			12	12		12	
RIO GRANDE AT WORLD TRADE BRIDGE ON FM 3484 | **Map**	17410	2304	16	IB	RN	RT								1	4			4	4		4	
RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE | **Map**	13202	2304	16	IB	LA	RT												12			12	
RIO GRANDE LAREDO WATER TREATMENT	13202	2304	16	IB	RN	RT									4			4	4		4	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
PLANT PUMP INTAKE | Map																						
RIO GRANDE, 4.5 MI. DOWNSTREAM OF DEL RIO AT MOODY RANCH | Map	13560	2304	16	IB	IB	RT								1	8			8	8		8	
MANADAS CREEK AT FM 1472 NORTH OF LAREDO | Map	13116	2304B	16	IB	LE	RT							4	1	4			4			4	Also collecting metals in water lab-filtered not field filtered. therefore not submitted to SWQMIS but available on IBWC website.
Segment 2306 Rio Grande Above Amistad Reservoir | Map																						
RIO GRANDE AT BOAT RAMP AT RIO GRANDE VILLAGE IN BIG BEND NATIONAL PARK | Map	16730	2306	6	IB	BB	RT									8			8	8		8	Metals in water collected under SWQM QAPP
RIO GRANDE AT LAJITAS RESORT/FM 170 BOAT RAMP 240 M UPSTREAM OF BLACK HILLS CREEK CONFLUENCE NEAR LAJITAS | Map	18441	2306	6	IB	PW	RT									6			6			6	
RIO GRANDE AT PRESIDIO RAILROAD BRIDGE, 3.25KM DOWNSTREAM OF US67, SOUTH OF PRESIDIO | Map	17000	2306	6	IB	IB	RT												8	8		8	
RIO GRANDE AT PRESIDIO/OJINAGA TOLL BRIDGE (INTERNATIONAL),	17001	2306	6	IB	IB	RT												8	8		8	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
0.75KM DOWNSTREAM OF US67 IN PRESIDIO | Map																						
RIO GRANDE AT THE MOUTH OF SANTA ELENA CANYON | Map	13228	2306	6	IB	BB	RT									8			8	8		8	Metals in water collected under SWQM QAPP
RIO GRANDE BELOW RIO CONCHOS CONFLUENCE NEAR PRESIDIO | Map	13229	2306	6	IB	IB	RT								1	8			8	8		8	
RIO GRANDE RIVER AT COLORADO CANYON APPROX. 30KM SE OF REDFORD ON RR170 IN PRESIDIO COUNTY | Map	16862	2306	6	IB	PW	RT									6			6			6	
Segment 2307 Rio Grande Below Riverside Diversion Dam | Map																						
RIO GRANDE 1.47 KILOMETERS UPSTREAM OF THE CONFLUENCE WITH GREEN RIVER | Map	20648	2307	6	IB	UE	RT									4			4			4	extremely remote site 48hr HT parameters bacteria BOD chloropheo will not be reported
RIO GRANDE 2.4 MI. UPSTREAM FROM RIO CONCHOS CONFLUENCE | Map	13230	2307	6	IB	IB	RT									8			8	8		8	
RIO GRANDE AT ALAMO CONTROL STRUCTURE, 9.7KM UPSTREAM OF FT. HANCOCK PORT OF ENTRY | Map	15795	2307	6	IB	EP	RT								1	1			1	1		1	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
RIO GRANDE AT GUADALUPE POINT OF ENTRY BRIDGE AT FM 1109 WEST OF TORNILLO | Map	15704	2307	6	IB	UE	RT								1	4			4	4		4	metals in water collected under SWQM QAPP
RIO GRANDE AT SAN ELIZARIO, 500M UPSTREAM OF CAPOMO ROAD END OF PAVEMENT AND 10.2KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE | Map	16272	2307	6	IB	UE	RT								1	1			1	1		1	Metals in water collected under SWQM QAPP
Segment 2308 Rio Grande Below International Dam | Map																						
RIO GRANDE 1.3 KM DOWNSTREAM FROM HASKELL ST. WWTP OUTFALL | Map	15528	2308	6	IB	IB	RT									12			12	12		12	partial conventional analysis
RIO GRANDE 2.4 KM UPSTREAM FROM HASKELL ST. WWTP OUTFALL, SOUTH OF BOWIE HIGH SCHOOL FOOTBALL STADIUM IN EL PASO | Map	15529	2308	6	IB	IB	RT									12			12	12		12	partial conventional analysis
RIO GRANDE AT RIVERSIDE CANAL 1.8 KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE | Map	14465	2308	6	IB	IB	RT									12			12	12		12	partial conventional analysis
Segment 2311 Upper Pecos River | Map																						
INTERSECTION OF ALPINE CREEK AND HENDRYX DRIVE/HARRISON STREET/SH 223 AND 40 METERS	20558	2311	6	IB	SL	RT						2		2	6			6			6	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
EAST OF THE KOKERNOT LODGE ON SUL ROSS UNIVERSITY CAMPUS IN ALPINE | Map																						
Segment 2314 Rio Grande Above International Dam | Map																						
RIO GRANDE AT ANAPRA BRIDGE ON SUNLAND PARK DRIVE, 4.2KM UPSTREAM FROM AMERICAN DAM (IN NEW MEXICO) | Map	17040	2314	6	IB	EP	RT									4			4			4	Metals in water collected under SWQM QAPP
RIO GRANDE AT COURCHESNE BRIDGE, 1.7 MI UPSTREAM FROM AMERICAN DAM | Map	13272	2314	6	IB	IB	RT									12			12	12		12	partial conventional analysis
RIO GRANDE IMMED. UPSTREAM OF THE CONFL. WITH ANTHONY DRAIN EAST OF LA TUNA PRISON NEAR THE STATE LINE | Map	13276	2314	6	IB	IB	RT									4			4			4	In support of Paso del Norte Watershed Councils 319h grant
RIO GRANDE JUST DOWNSTREAM FROM VINTON BRIDGE NEAR ANTHONY | Map	13275	2314	6	IB	IB	RT									4			4			4	in support of Paso del Norte Watershed Councils 319h grant

Critical vs. non-critical measurement

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

Figure 1. Appendix B, Map of Lower Rio Grande Basin, including FY2011 monitoring station locations.
(Detailed station location information can be found at http://cms.lcra.org)

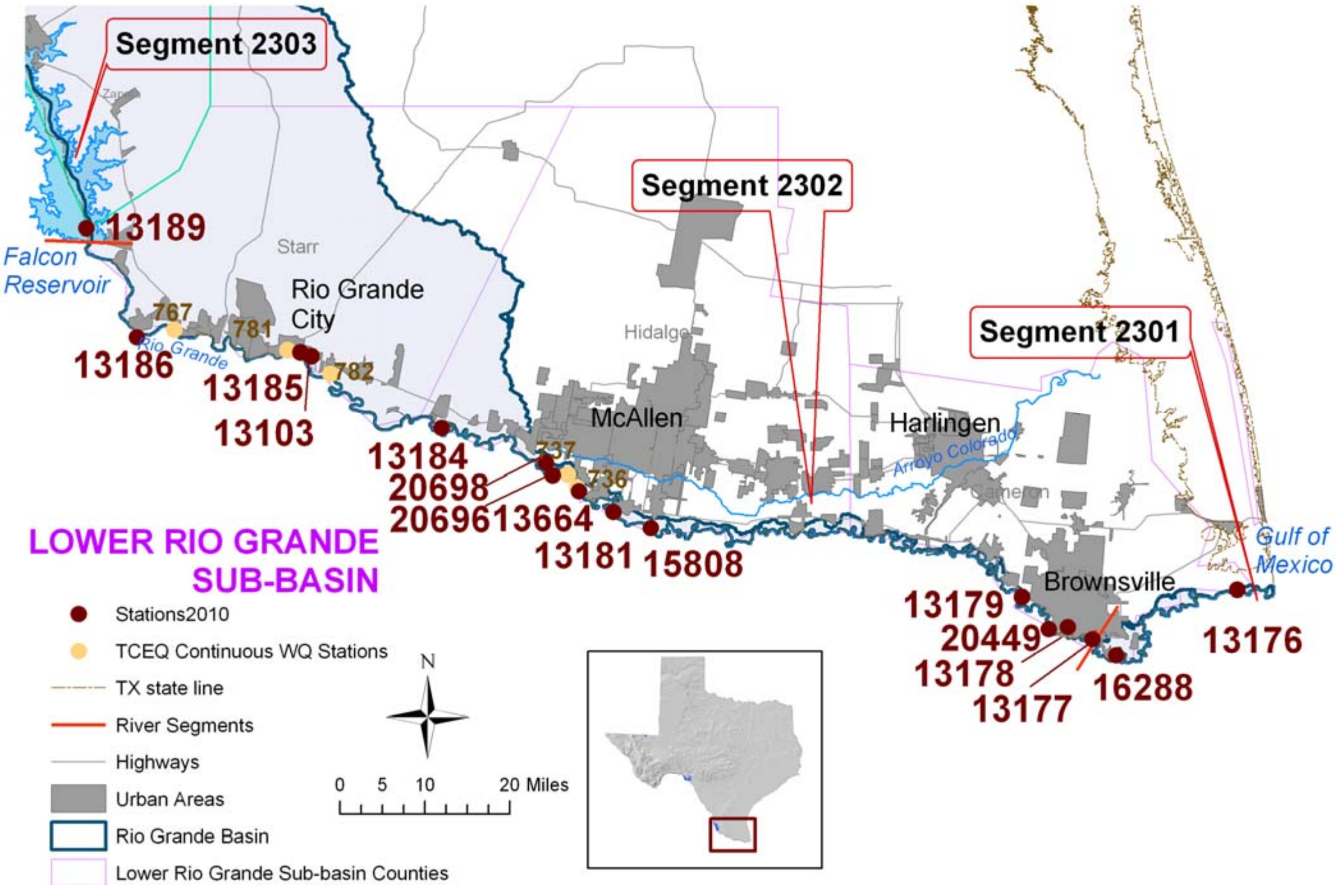


Figure 2. Appendix B, Map of Middle Rio Grande Basin, including FY2011 monitoring station locations.
(Detailed station location information can be found at http://cms.lcra.org)

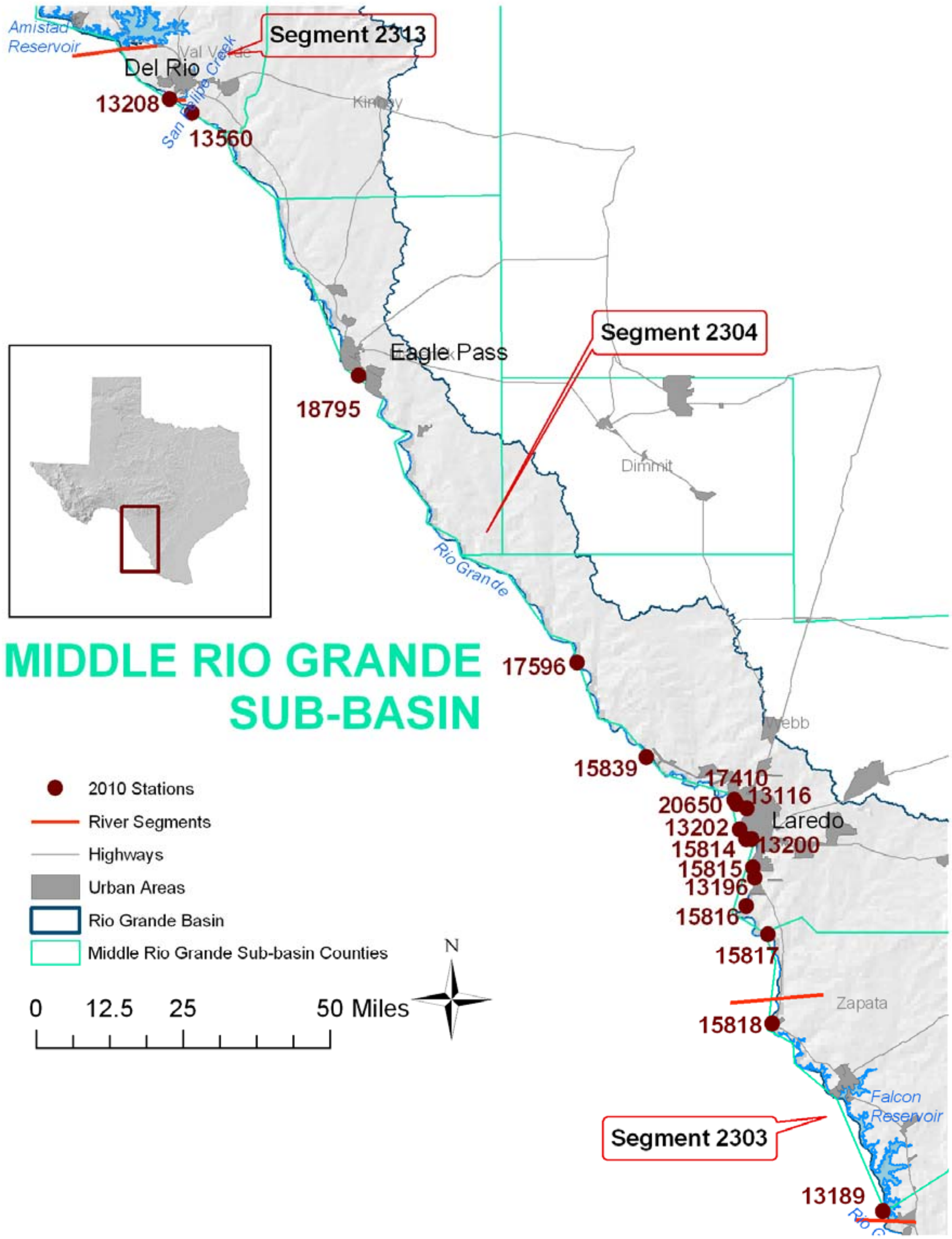


Figure 3. Appendix B, Map of Upper Rio Grande Basin and Pecos Sub-Basin, including FY2011 monitoring station locations.
(Detailed station location information can be found at http://cms.lcra.org)

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

November 9, 2010

Elizabeth Verdecchia
US IBWC
4171 N. Mesa, C100
El Paso, TX 79902

Re: Amendment #3 to the USIBWC Clean Rivers Program 2010-2011 QAPP

Dear Ms. Verdecchia:

Enclosed are the signatures to accompany your copy of the above-mentioned amendment, for your files and distribution.

Please ensure that copies of this document are distributed to each sub-tier participant as required by Section A3 of the QAPP. Please also secure written documentation from each sub-tier participant (e.g. subcontractors, other units of government, laboratories, etc.) stating the organization's awareness of and commitment to the requirements contained in the document. The documentation of QAPP distribution and subcontractor commitment to QAPP requirements must be available for review during monitoring system audits.

If you have any questions, please contact your TCEQ Clean Rivers Program project manager, or you may contact me at (512) 239-0011, or by email at dburke@tceq.state.tx.us.

Sincerely,

Daniel R. Burke
Lead CRP Quality Assurance Specialist

enclosure

cc: Julie McEntire, TCEQ CRP Project Manager, MC 234

Amendment # 3
to the

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

Clean Rivers Program FY 2010/2011 QAPP

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

In Cooperation with the Texas Commission on Environmental Quality (TCEQ)

Questions concerning this amendment should be directed to:

Elizabeth Verdecchia
USIBWC
4171 N. Mesa, C-100
915-832-4701
915-832-4166
elizabeth.verdecchia@ibwc.gov

Effective November 9, 2010

Justification: This document details the changes made to the basin-wide Quality Assurance Project Plan (QAPP) for fiscal year 2011, including the addition of a new contract laboratory, the addition or deletion of contacts, an updated Table A7, an updated Table B2, the addition and correction of stations, updated station maps and updated chains of custodies.

Summary of Changes:

- The project/task organization and organizational chart in Section A4 have been changed to reflect the changes in CRP, partner personnel, and a new contract laboratory.
- Table A7.1 has been updated with the information provided by and discussed with the new contract laboratory.
- Sections B1- B9 have been updated to remove the name of the previous contract laboratory and replace it with the name of the new laboratory.
- Table B2.1 has been updated with the container information provided by the new laboratory.
- Station 18795 has been changed to 18792 to accurately reflect the sampling site.
- Station 17407 has been added as a routine site for one of our partners.
- Appendix B is amended to include the monitoring sites table for the scheduled monitoring for FY2011.
- The Coordinated Monitoring Schedule has been updated to remove station 18795 and add stations 18792 and 17407.
- The maps for the middle and lower Rio Grande Basin have been updated to include Stations 17407 and 18792.
- An updated chain-of-custody has been included.

Detail of Changes:

Section A4: The position of Chief of the Environmental Management Division at the USIBWC is vacant at this time. The individual listed is acting as Chief of this division until the position is filled. Ms. Sheryl Franklin is the new Division Chief for the Operations and Maintenance division. A new contract laboratory has been contracted.

Figure 1. A4.1: Updated with Section A4 changes.

Table A7.1: Table has been updated with the data provided by the new contract laboratory.

Sections B1- B9: Sections have been updated to remove name of the previous contract laboratory and update them with the new contract laboratory.

Table B2.1 Table has been updated with the container information provided by the new contract laboratory.

Monitoring Sites Table: The attached monitoring Table B1.1 in Appendix B is added to reflect monitoring for FY 2011.

Appendix B, Coordinated Monitoring Schedule: Station 18795 has been changed to 18792 to indicate the correct sampling site. Station 17407 has been added as a routine monitoring station for partner Sul Ross University.

Appendix B, Figure 2: Updated to remove station 18795 and add 18792.

Appendix B, Figure 3: Updated to add station 17407.

Appendix D: Chain-of-custody forms have been updated to include the new contract laboratory.

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

APPROVAL PAGE 1 of 4

Changes to Table A7 must be reviewed by the corresponding lab. These changes will be incorporated into the QAPP document and the laboratory will acknowledge and accept these changes by signing this amendment.

USIBWC CONTRACT LABORATORY

Alamo Analytical Laboratories, Ltd.

10/11/10

Dr. Reddy Gosala, Laboratory Director/Manager — Date

10/11/10

Vijaya Gosala, Quality Assurance Manager — Date

APPROVAL PAGE 2 of 4

RIO GRANDE BASIN CRP PARTNERS

Sul Ross University

10-27-10

Dr. Kevin Urbanzcyk Date
Sul Ross University, Rio Grande Research Center

APPROVAL PAGE 3 of 4

RIO GRANDE BASIN CRP PARTNERS, cont.

USIBWC

______________________________ 10/12/10
Sheryl Franklin Date
Chief, Operations and Maintenance Division
US International Boundary and Water Commission, Field Offices

APPROVAL PAGE 4 of 4

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

10/18/10

Elizabeth Verdecchia, USIBWC Program Manager — Date

10-18-10

Leslie Grijalva, USIBWC Quality Assurance Officer — Date

11/9/10

Julie McEntire, CRP Project Manager — Date

11/9/10

Jennifer Delk, CRP Project QAS — Date

11/9/10

Allison Woodall, CRP Group Leader — Date

11/9/2010

Daniel R. Burke, CRP Lead QAS — Date

The USIBWC will secure written documentation from each project participant (e.g., subcontractors, other units of government, laboratories) stating the organization's awareness of and commitment to requirements contained in this quality assurance project plan amendment. The USIBWC will maintain this documentation as part of the project's quality assurance records, and will be available for review.

A4 PROJECT/TASK ORGANIZATION

Description of Responsibilities

USIBWC

Vacant, Wayne Belzer Acting
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. 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 is properly trained and that training records are maintained.

Elizabeth Verdecchia
USIBWC Acting Data Manager

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

ALAMO ANALYTICAL LABORATORY, LTD.

Dr. Reddy Gosala
Alamo Analytical Laboratory, Ltd. Director/Manager
Responsible for project coordination at Alamo, providing support to USIBWC 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 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 the Alamo staff 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 Laboratory, Ltd. Quality Assurance Manager
Responsible for the overall quality control and quality assurance of analyses performed by Alamo. 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

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 Laboratory, Ltd. for analysis.

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 manager's direct activities on the local level as follows: Tony Solo – American Dam, Pablo Garza – Amistad Dam, Mario Gomez – Falcon Dam, Rodolfo Montero – Mercedes, and Hector Hernandez – Presidio. The field office managers report to the Division Chief of the USIBWC Operations and Maintenance Division, Ms. Sheryl Franklin. Samples collected by the field offices are submitted to Alamo Analytical laboratory for analysis.

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 type 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.

PROJECT ORGANIZATION CHART

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

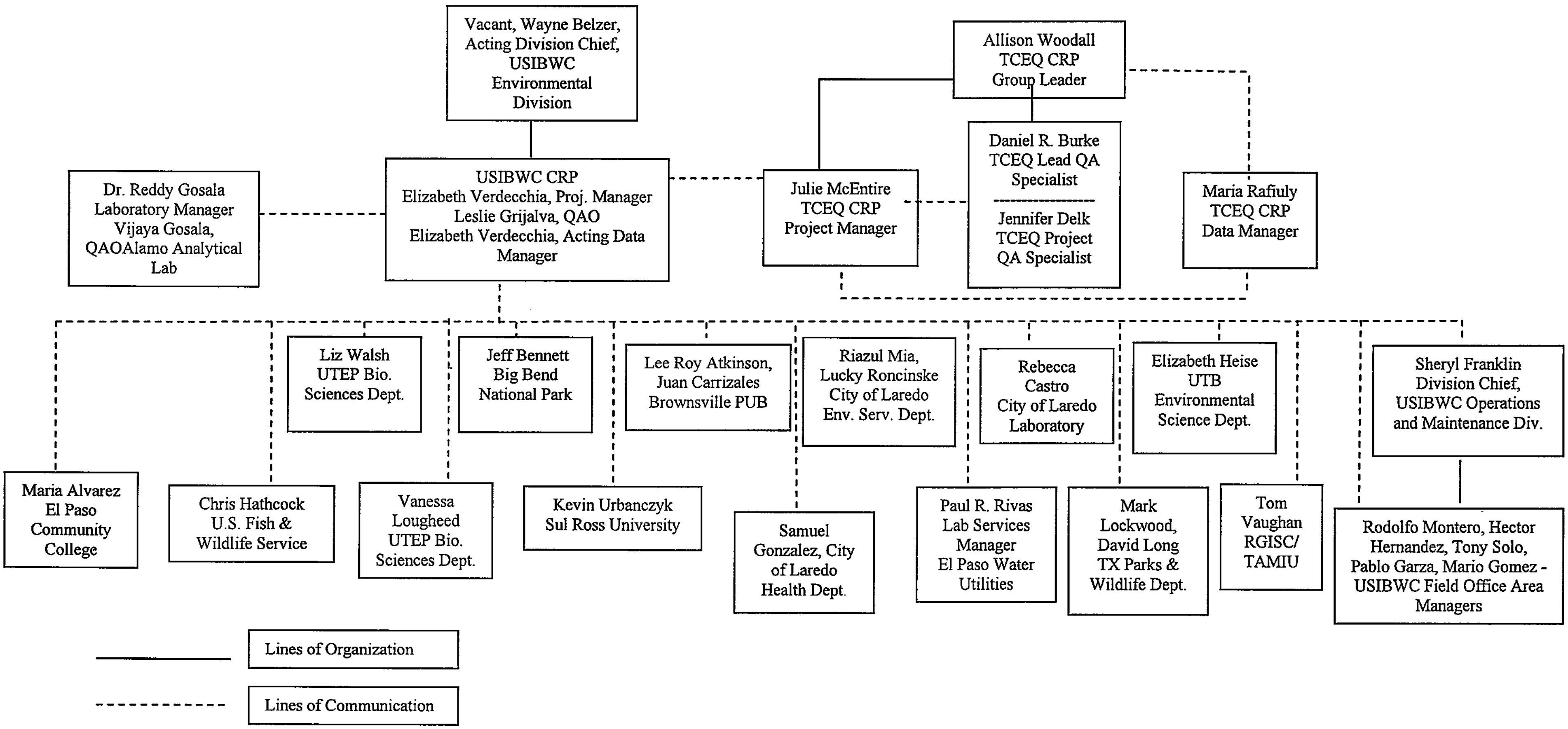


Table A7.1 Measurement Performance Specifications for Field and Laboratory Measurements for: U.S. International Boundary and Water Commission, Big Bend National Park, City of Laredo Environmental Engineering, Rio Grande International Study Center, U.T. Brownsville, Sul Ross, U.S. Fish & Wildlife, TX Parks & Wildlife, El Paso Community College, and U. T. El Paso (samples analyzed by Alamo Analytical Laboratory, Ltd.)

Field Parameters

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
pH	SU	water	EPA 150.1 & TCEQ-SWQM SOP, V1	00400	NA*	NA	NA	NA	NA	Field
DO	mg/L	water	EPA 360.1& TCEQ-SWQM SOP, V1	00300	NA*	NA	NA	NA	NA	Field
Specific Conductance	µS/cm	water	EPA 120.1 & TCEQ-SWQM SOP, V1	00094	NA*	NA	NA	NA	NA	Field
Air temperature	centigrade	air	TCEQ-SWQM SOP, V1	00020	NA*	NA	NA	NA	NA	Field
Water temperature	centigrade	water	EPA 170.1 & TCEQ-SWQM SOP, V1	00010	NA*	NA	NA	NA	NA	Field
Secchi depth	meters	water	TCEQ-SWQM SOP, V1	00078	NA*	NA	NA	NA	NA	Field
Turbidity	NTU	water	SM 2130- B	82078	NA*	NA	NA	NA	NA	Field
Days since last significant rainfall	days	NA	TCEQ-SWQM SOP, V1	72053	NA*	NA	NA	NA	NA	Field
Flow, Instantaneous	cfs	water	TCEQ-SWQM SOP, V1	00061	NA*	NA	NA	NA	NA	Field
Stream Flow estimate	cfs	water	TCEQ-SWQM SOP, V1	74069	NA*	NA	NA	NA	NA	Field
Flow Measurement method	1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler	water	TCEQ-SWQM SOP, V1	89835	NA*	NA	NA	NA	NA	Field
Flow severity	1-no flow 2-low flow 3-normal flow 4-flood 5- high 6- dry	water	TCEQ-SWQM SOP, V1	01351	NA*	NA	NA	NA	NA	Field
Stream width	meters	water	TCEQ-SWQM SOP, V1	89861	NA*	NA	NA	NA	NA	Field
Water depth	meters	water	TCEQ-SWQM SOP, V1	82903	0.1	NA	NA	NA	NA	Field
Present Weather	1- clear 2 – partly cloudy 3 - cloudy 4 – rain 5- other	NA	Field Observation	89966	NA*	NA	NA	NA	NA	Field
Wind intensity	1 - calm 2 - slight 3 - moderate 4 - strong	air	Field Observation	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	air	Field Observation	89010	NA*	NA	NA	NA	NA	Field

Conventional Parameters

Parameters	Units	Matrix	Method	Parameter Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STAND ARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (%Rec of LCS)	Laboratory
Total Alkalinity as $CaCO_3$	mg/L	water	EPA 310.1 SM 2320B	00410	20	10	70-130	20	80-120	Alamo
TDS, dried at 180° C	mg/L	water	EPA 160.1 SM 2540C	70300	10	10	70-130	20	80-120	Alamo
TSS	mg/L	water	EPA 160.2 SM 2540C	00530	4	4	70-130	20	80-120	Alamo
Chloride	mg/L	water	EPA 300.0	00940	5	2	70-130	20	80-120	Alamo
Sulfate	mg/L	water	EPA 300.0, SM4500SO4-E	00945	5	5	70-130	20	80-120	Alamo
Ammonia-N	mg/L	water	EPA 350.2	00610	0.1	0.1	70-130	20	80-120	Alamo
T- Phosphorous-P	mg/L	water	EPA 365.2	00665	0.06	0.06	70-130	20	80-120	Alamo
Nitrate + Nitrite-N	mg/L	water	EPA 300.0	00630	0.05	0.05	70-130	20	80-120	Alamo
Sodium	mg/L	water	EPA 200.7	00929	n/a	0.5	70-130	20	80-120	Alamo
Magnesium, Total	mg/L	water	EPA 200.7	00927	0.5	0.25	70-130	20	80-120	Alamo
Potassium	mg/L	water	EPA 200.7	00937	n/a	0.5	70-130	20	80-120	Alamo
Fluoride	mg/L	water	EPA 300.0	00951	0.5	0.5	70-130	20	80-120	Alamo
Chlorophyll-a, spectrophotometric acid method	µg/L	water	SM 10200 H, EPA 446.0, EPA 445.1	32211	3	3	70-130	20	80-120	Alamo
Pheophytin-a, spectrophotometric acid method	µg/L	water	SM 10200 H, EPA 446.1	32218	3	3	70-130	20	80-120	Alamo
Hardness, Total as CaCO3	mg/L	water	EPA 130.2	00900	5	5	70-130	20	80-120	Alamo
Total Kjeldahl N	mg/L	water	EPA 351.3	00625	0.2	0.2	70-130	20	80-120	Alamo
Bromide	mg/L	water	EPA 300.0	71870	n/a	5	70-130	20	80-120	Alamo
Calcium	mg/L	water	EPA 200.7	00916	0.5	0.5	70-130	20	80-120	Alamo
E.Coli, Colilert IDEXX Method **	MPN/ 100 mL	water	SM9223B****	31699	1	1	n/a	1*****	n/a	Alamo
Holding time, E. coli IDEXX Colilert	hours	water	NA	31704	1	n/a	n/a	n/a	n/a	Alamo

* Reporting to be consistent with SWQM guidance and based on measurement capability.

** 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 exception of segments 2301, 2308, 2311, and 2312 is designated as a potable water source. Data from these segments will not be reported to TCEQ.

**** 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. Quality Control Guidelines. This criterion applies to bacteriological duplicates with concentrations >10 MPN/100mL or >10 organisms/100mL.

***** Based on a range statistic as described in Standard Methods, 20th Edition, Section 9020-B, AQuality Assurance/Quality Control - Intralaboratory Quality Control Guidelines. This criterion applies to bacteriological duplicates with concentrations >10 MPN/100mL or >10 organisms/100mL.

Total Metals in Water

Parameters	Units	Matrix	Lab Method	Parameter Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STAND % Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Selenium, Total	µg/l	water	EPA 200.7	01147	2	2	70-130	20	80-120	Alamo
Manganese, Total	µg/l	water	EPA 200.7	01055	50	50	70-130	20	80-120	Alamo
Iron, Total	µg/l	water	EPA 200.7	01045	300	100	70-130	20	80-120	Alamo

Total Metals in Sediment

Parameters	Units	Matrix	Lab Method	Parameter Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STAND % Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Aluminum	mg/kg	sediment	6010B	01108	n/a*	10	60-140	20	60-140	Alamo
Antimony	mg/kg	sediment	6010B	01098	12.5	5	60-140	20	60-140	Alamo
Arsenic	mg/kg	sediment	6010B	01003	16.5	5	60-140	20	60-140	Alamo
Barium	mg/kg	sediment	6010B	01008	n/a*	2	60-140	20	60-140	Alamo
Cadmium	mg/kg	sediment	6010B	01028	2.49	1	60-140	20	60-140	Alamo
Chromium	mg/kg	sediment	6010B	01029	55.5	2	60-140	20	60-140	Alamo
Copper	mg/kg	sediment	6010B	01043	74.5	5	60-140	20	60-140	Alamo
Lead	mg/kg	sediment	6010B	01052	64	5	60-140	20	60-140	Alamo
Nickel	mg/kg	sediment	6010B	01068	24.3	5	60-140	20	60-140	Alamo
Selenium	mg/kg	sediment	6010B	01148	n/a*	1	60-140	20	60-140	Alamo
Silver	mg/kg	sediment	6010B	01078	1.1	1	60-140	20	60-140	Alamo
Zinc	mg/kg	sediment	6010B	01093	205	5	60-140	20	60-140	Alamo

* AWRLs have not been developed for these parameters.
All soil samples in this table are screened by SW846 6010B method for low-level metals, which are rerun under SW846 6020

Organics in Sediment

Parameters	Units	Matrix	Method	Parameter Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STAND % Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
DDT	µg/kg	sediment	8081A	39373	23	3.5	60-140	20	60-140	Alamo
DDD	µg/kg	sediment	8081A	39363	3.91	3.5	60-140	20	60-140	Alamo
DDE	µg/kg	sediment	8081A	39368	15.65	7	60-140	20	60-140	Alamo
Aldrin	µg/kg	sediment	8081A	39333	40	40	60-140	20	60-140	Alamo
Chlordane, Total	µg/kg	sediment	8081A	39351	2.4	2	60-140	20	60-140	Alamo
Endrin	µg/kg	sediment	8081A	39393	103.5	50	60-140	20	60-140	Alamo
Heptachlor	µg/kg	sediment	8081A	39413	NA	3.5	60-140	20	60-140	Alamo
Methoxychlor	µg/kg	sediment	8081A	39481	NA	3.5	60-140	20	60-140	Alamo
Dieldrin	µg/kg	sediment	8081A	39383	2.15	2	60-140	20	60-140	Alamo
Hexachlorobenzene	µg/kg	sediment	8270	39701	120	50	60-140	20	60-140	Alamo
Total PCBs	µg/kg	sediment	8082	39519	90	50	60-140	20	60-140	Alamo
Endosulfan I	µg/kg	sediment	8081A	34364	n/a	5	60-140	20	60-140	Alamo
2,4-D	µg/kg	sediment	8151A	39731	n/a	5	60-140	20	60-140	Alamo
2,4,5-TP (Silvex)	µg/kg	sediment	8151A	39761	n/a	5	60-140	20	60-140	Alamo
2,4,5-T	µg/kg	sediment	8151A	39741	n/a	5	60-140	20	60-140	Alamo
Fluorene	µg/kg	sediment	8270	34384	268	200	60-140	20	60-140	Alamo
Fluoranthene	µg/kg	sediment	8270	34379	1115	200	60-140	20	60-140	Alamo
Benzo(a)pyrene	µg/kg	sediment	8270	34250	725	200	60-140	20	60-140	Alamo
Napthalene	µg/kg	sediment	8270	34445	280.5	200	60-140	20	60-140	Alamo
Benzene	µg/kg	sediment	8260	34237	22505	10	60-140	20	60-140	Alamo
Toluene	µg/kg	sediment	8260	34483	2830	10	60-140	20	60-140	Alamo
Ethylbenzene	µg/kg	sediment	8260	34374	1965	10	60-140	20	60-140	Alamo

Xylene	µg/kg	sediment	8021, 8260	45510	n/a	10	60-140	20	60-140	Alamo

References for Table A7.1:

TCEQ SOP, V1 - TCEQ SWQM Procedures, Volume 1: Physical & Chemical Monitoring Methods for Water, Sediment, & Tissue, 2008 (RG-415).
TCEQ, SWQM QAPP, January 2008, Revision 12.
United States International Boundary and Water Commission "Field Manual for Hydrologic Technicians," November 1998.
United States International Boundary and Water Commission "Collection and Field Analysis of Water Quality Sample," August 1997.
Title 40 of the Code of Federal Regulations, Parts 136 or 141.
United States Environmental Protection Agency (EPA) "Methods For Chemical Analysis of Water and Wastes", Manual #EPA-600/4-79-020.
United States Environmental Protection Agency (EPA) "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Manual #EPA-SW-846.
CRP AWRL List, http://www.tceq.state.tx.us/assets/public/compliance/monops/crp/QA/awrlmaster.pdf
TCEQ NELAP - Recognized Laboratory Fields of Accreditation for Alamo Analytical. Certificate T104704367- 10-2 TX, Issue Date 7/01/2010.

Organics in Water

Parameters	Units	Matrix	Method	Parameter Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STAND %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Benzene	µg/l	water	EPA 624	34030	2.5	2.5	60-140	20	60-140	Alamo
Toluene	µg/l	water	EPA 624	34010	n/a	5	60-140	20	60-140	Alamo
Ethylbenzene	µg/l	water	EPA 624	34371	n/a	5	60-140	20	60-140	Alamo
Xylene	µg/l	water	EPA 624 8021,8260	81551	n/a	15	60-140	20	60-140	Alamo
Fluorene	µg/l	water	EPA 625	34381	5.5	5	60-140	20	60-140	Alamo
Fluoranthene	µg/l	water	EPA 625	34376	3	2.5	60-140	20	60-140	Alamo
Acenaphthylene	µg/l	water	EPA 625	34200	5	5	60-140	20	60-140	Alamo
Napthalene	µg/l	water	EPA 625	34696	250	5	60-140	20	60-140	Alamo
1-4,Dichlorobenzene	µg/l	water	EPA 625	34571	38	5	60-140	20	60-140	Alamo
Hexachlorobutadiene	µg/l	water	EPA 8260	31391	1.5	1.5	60-140	20	60-140	Alamo
Hexachloroethane	µg/l	water	EPA 8260	34396	42	5	60-140	20	60-140	Alamo

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, 200810* (2008 or subsequent edition*) (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.

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

Table 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_2SO_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
Metals in Sediment				
Metals	glass jar with teflon lined lid	500 grams	Cool 4 C	180 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.

Sample Containers

Sample containers are purchased pre-cleaned for conventional parameters and are disposable. Containers used for bacteriological samples may have 1% sodium thiosulfate tablets added. Amber glass bottles are used routinely for chlorophyll and pheophytin 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. Certificates are maintained in a notebook by the USIBWC or by the laboratory supplying sample containers under the CRP. Alamo Analytical Laboratories supplies 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 as presented in Appendix C. Flow worksheets, aquatic life use monitoring checklists, habitat assessment forms, field biological assessment forms, and records of bacteriological analyses 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)
9. E. coli and fecal coliform analyses indicated on the field sheet in Appendix C are only applicable for USIBWC field offices and sampling partners that are continuing bacterial analysis. This data is used for USIBWC purposes only, and is in addition to the bacteria analyzed by an accredited laboratory.

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:

1. Write legibly in indelible ink
2. Changes should be made by crossing out original entries with a single line, entering the changes, and initialing and dating the corrections.
3. 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. Field splits/duplicates need a separate COC. USIBWC has different COC forms for organics in sediment samples. 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. Analyses required
7. Name of collector
8. Custody transfer signatures and dates and time of transfer
9. Bill of lading (*if applicable*)

Sample Labeling

Samples from the field are labeled with indelible marker or pen on labels provided by Alamo Analytical Laboratories and placed on the container. Label information includes:

1. Site identification
2. Date and time of collection
3. Preservative added, if applicable
4. Designation of field-filtered *(for metals)* as applicable

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, Sul Ross, City of Laredo Environmental Services, Big Bend National Park, Big Bend Ranch State Park, US Fish & Wildlife, El Paso Community College, and the University of Texas at El Paso samples will be collected and shipped to Alamo Analytical Laboratories. 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 put 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 Table A7.1 of Section A7. 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 will be in accordance with the most recently published edition of *Standard Methods for the Examination of Water and Wastewater*, the latest version of the *SWQM Procedures, Volume 1: Physical Methods for Water, Sediment, and Tissue*, 40 CFR 136, or other reliable procedures acceptable to the Executive Director.

Laboratories collecting data under this QAPP are compliant with the NELAC 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 USIBWC 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 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 "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). 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.

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

$$RPD = |(X_1 - X_2)/\{(X_1+X_2)/2\} * 100|$$

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 then 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 NELAC-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 on each day calibrations are performed. In addition, and LOQ check standard will be analyzed with each analytical batch. Calibrations including the standard at the LOQ 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 Areal-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 Table A7.1 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 Standard – An LOQ check standard 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 standard is spiked into the sample matrix at a level less than or near the LOQ for each analyte for each analytical batch of CRP samples run.

The LOQ check standard is carried through the complete preparation and analytical process. LOQ Check Standards are run at a rate of one per analytical batch.

The percent recovery of the LOQ check standard 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 standard:

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

Measurement performance specifications are used to determine the acceptability of LOQ Check Standard analyses as specified in Table A7.1.

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 mid point 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 Table A7.1.

Laboratory Duplicates – A laboratory duplicate is prepared by taking aliquots of a sample from the same container 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, precision is calculated by the relative percent difference (RPD) of LCS duplicate results as defined by 100 times the difference (range) of each duplicate set, divided by the average value (mean) of the set. For duplicate results, X_1 and X_2, the RPD is calculated from the following equation:

$$RPD = |(X_1 - X_2)/\{(X_1+X_2)/2\} * 100|$$

A bacteriological duplicate is considered to be a special type of laboratory duplicate and applies when bacteriological samples are run in the field as well as in the lab. Bacteriological duplicate analyses are performed on samples from the sample bottle on a 10% basis. Results of bacteriological duplicates are evaluated by calculating the logarithm of each result and determining the range of each pair.

Measurement performance specifications are used to determine the acceptability of duplicate analyses-as specified in Table A7.1. The specifications for bacteriological duplicates in Table A7.1 apply to samples with concentrations > 10 org./100mL.

Laboratory equipment blank - Laboratory equipment blanks are provided by the laboratory, and collection materials for metals sampling equipment are new and sterile. 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 are used, for example, to determine the effect of the matrix on a method's recovery efficiency.

Percent recovery of the known concentration of added analyte is used to assess accuracy of the analytical process. The spiking occurs prior to sample preparation and analysis. Spiked samples are routinely prepared and analyzed at a rate of 10% of samples processed, or one per preparation batch whichever is greater. The information from these controls is sample/matrix specific and is not used to determine the validity of the entire batch. To the extent possible, matrix spikes prepared and analyzed over the course of the project should be performed on samples from different sites. The MS is spiked at a level less than or equal to the midpoint of the calibration or analysis range for each analyte. Percent recovery (%R) is defined as 100 times the observed concentration, minus the sample concentration, divided by the true concentration of the spike.

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 laboratory shall document the calculation for %R. The percent recovery of the matrix spike is calculated using the following equation in which %R is percent recovery, SSR is the observed spiked sample concentration, SR is the sample result, and SA is the reference concentration of the spike added:

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

Measurement performance specifications for matrix spikes are not specified in this document.

The results are compared to the acceptance criteria as published in the mandated test method. Where there are no established criteria, the laboratory shall determine the internal criteria and document the method used to establish the limits. For matrix spike results outside established criteria, corrective action shall be documented or the data reported with appropriate data qualifying codes.

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 then 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 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 Laboratory QAO. The Laboratory 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 after 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 7. 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 ° 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 consumable, in order to satisfy the technical and quality objectives of this project, are documented in the individual laboratories' QMS.

B9 NON-DIRECT MEASUREMENTS

This QAPP does not include the use of routine data obtained from non-direct measurement sources. Only data collected directly under this QAPP is submitted to the SWQMIS database.

Appendix B Sampling Process Design and Monitoring Schedule (plan)

Sample Design Rationale FY *2011*

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 305(b) assessment, 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.

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

1. A new site has been added quarterly near Candelaria (station 17407). Monitoring at this site will fill a data gap in an impaired section of the river.
2. Bacteria, chlorophyll-a, Pheophytin- a, and BOD will not be analyzed at Station 17407. Due to this site's remote location, samples cannot be shipped in time to allow analysis of 48-hour parameters.
3. All dissolved metals analyses have been removed from this QAPP. Metals analysis for stations 15704, 16272, 13272, and 17040 will be included under a different QAPP.
4. Site 18795 dropped due to realization that site was being sampled at a different station location. Site 18792 added to the CMS. Data correction submitted to TCEQ to change data collected by IB from 18795 to 18792.

Table B1.1 Sample Design and Schedule, FY 2011

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
Segment 2301 Rio Grande Tidal																						
RIO GRANDE AT SABAL PALM SANCTUARY AT NORTHEAST BOUNDARY OFF PARK ROAD APPROX. 1MI SOUTH OF FM1419 NEAR PALM GROVE | Map	16288	2301	15	IB	UB	RT									4						4	
RIO GRANDE TIDAL AT SH 4 NEAR BOCA CHICA | Map	13176	2301	15	IB	UB	RT									4						4	
Segment 2302 Rio Grande Below Falcon Reservoir																						
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 | Map	20698	2302	15	IB	UF	RT									3			3			3	
RIO GRANDE 0.5 MI. BELOW ANZALDUAS DAM, 12.2 MI. FROM HIDALGO | Map	13664	2302	15	IB	IB	RT									8			8	8		8	
RIO GRANDE 200M UPSTREAM OF PHARR INTERNATIONAL BRIDGE (US281) |	15808	2302	15	IB	IB	RT									8			8	8		8	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
Map																						
RIO GRANDE AT FORT RINGGOLD 1 MI. DOWNSTREAM FROM RIO GRANDE CITY | Map	13185	2302	15	IB	IB	RT								1	12			12	12		12	
RIO GRANDE AT SH 886 NEAR LOS EBANOS | Map	13184	2302	15	IB	IB	RT									7			7	7		7	
RIO GRANDE AT THE EL MORILLO TRACT OF THE LOWER RIO GRANDE VALLEY NATIONAL WILDLIFE REFUGE 2.56 KILOMETERS SOUTH AND 817 METERS WEST OF THE INTERSECTION OF MILITARY ROAD AND SHUERBACH ROAD/AIRFIELD ROAD/ SOUTH BREYFOGLE ROAD | Map	20696	2302	15	IB	UF	RT									3			3			3	
RIO GRANDE BELOW RIO ALAMO NEAR FRONTON | Map	13186	2302	15	IB	IB	RT									8			8	8		8	
RIO GRANDE EL JARDIN PUMP STATION, AT LOW WATER DAM 300 FT. BELOW INTAKE | Map	13177	2302	15	IB	IB	RT								1	8			8	8		8	
RIO GRANDE INTERNATIONAL BRIDGE AT US 281 AT HIDALGO | Map	13181	2302	15	IB	IB	RT								1	8			8	8		8	
RIO GRANDE INTERNATIONAL BRIDGE ON US 77 AT BROWNSVILLE | Map	13178	2302	15	IB	UB	RT								1	4			4			4	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
RIO GRANDE NEAR RIVER BEND BOAT RAMP APPROXIMATELY 5 MI. WEST OF BROWNSVILLE ON US 281 | Map	13179	2302	15	IB	UB	RT								1	4			4			4	
RIO GRANDE RIVER AT BROWNSVILLE PUB WATER TREATMENT PLANT NUMBER 1 INTAKE BETWEEN WTP RESERVOIR AND RIO GRANDE LEVEE 910 METERS WEST AND 335 METERS SOUTH TO THE INTERSECTION OF WEST ELIZABETH STREET AND SOUTH MILITARY ROAD | Map	20449	2302	15	IB	BO	RT									12			12				
ARROYO LOS OLMOS BRIDGE ON US 83 SOUTH OF RIO GRANDE CITY | Map	13103	2302A	15	IB	IB	BF									3			3			3	Bacteria nitrates and field collected when flowing
Segment 2303 International Falcon Reservoir | Map																						
FALCON LAKE AT INTERNATIONAL BOUNDARY MONUMENT I | Map	13189	2303	16	IB	IB	RT									4			4			4	
FALCON RESERVOIR AT SAN YGNACIO WTP INTAKE, 350M DWNSTR FROM US B83 BRIDGE | Map	15818	2303	16	IB	RN	RT									2			2			2	
Segment 2304 Rio Grande Below Amistad Reservoir | Map																						
RIO GRANDE 115 METERS SOUTH AND 304 METERS WEST FROM THE INTERSECTION OF	20650	2304	16	IB	LA	RT												12			12	ecoli and fecal

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
RANCHO VIEJO DRIVE/ZEBU COURT AND RIENDA DRIVE | Map																						
RIO GRANDE 12.8 MI. BELOW AMISTAD DAM, NEAR GAGE, 340 M UPSTREAM OF US 277 BRIDGE IN DEL RIO | Map	13208	2304	16	IB	IB	RT									2			2	2		2	
RIO GRANDE 50 YD UPSTREAM OF CONFLUENCE OF ZACATA CREEK AND RIO GRANDE IN LAREDO Map	13200	2304	16	IB	LA	RT												12			12	
RIO GRANDE AT APACHE RANCH WEST OF INTERSECTION OF PRIVATE ROAD AND EASTERN AIRSTRIP NO BETWEEN LARADO AND EAGLE PASS | Map	17596	2304	16	IB	IB	RT									4			4	4		4	
RIO GRANDE AT INTERNATIONAL BRIDGE #2 (EAST BRIDGE) IN LAREDO | Map	15814	2304	16	IB	LA	RT												12	12		12	
RIO GRANDE AT INTERNATIONAL BRIDGE #2 (EAST BRIDGE) IN LAREDO | Map	15814	2304	16	IB	RN	RT								1	4			4	4		4	
RIO GRANDE AT KICKAPOO CASINO, 300 M SOUTH AND 70 M WEST OF KURT BLUEDOG ROAD AT RIVERSIDE DRIVE SOUTH OF EAGLE PASS | Map	18792	2304	16	IB	IB	RT								1	8			8	8		8	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
RIO GRANDE AT MASTERSON RD IN LAREDO, 9.9KM DWNSTR INTL BRIDGE #1 (WEST BRIDGE), DWNSTR SOUTHSIDE WWTP AND UPSTR NUEVO LAREDO WWTP | Map	15815	2304	16	IB	LA	RT												2			2	
RIO GRANDE AT PIPELINE CROSSING 8.7 MI. BELOW LAREDO | Map	13196	2304	16	IB	LA	RT												2			2	
RIO GRANDE AT RIO BRAVO, 0.5KM DWNSTR OF THE COMMUNITY OF EL CENIZO | Map	15816	2304	16	IB	LA	RT												2			2	
RIO GRANDE AT THE COLOMBIA BRIDGE, 2.7KM UPSTREAM OF THE DOLORES PUMP STATION, 45.1KM UPSTREAM OF THE LAREDO WTP INTAKE | Map	15839	2304	16	IB	LA	RT												12	12		12	
RIO GRANDE AT WEBB/ZAPATA COUNTY LINE | Map	15817	2304	16	IB	RN	RT								1	12			12	12		12	
RIO GRANDE AT WORLD TRADE BRIDGE ON FM 3484 | Map	17410	2304	16	IB	RN	RT								1	4			4	4		4	
RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE | Map	13202	2304	16	IB	LA	RT												12			12	
RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE | Map	13202	2304	16	IB	RN	RT									4			4	4		4	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
RIO GRANDE, 4.5 MI. DOWNSTREAM OF DEL RIO AT MOODY RANCH | Map	13560	2304	16	IB	IB	RT								1	8			8	8		8	
MANADAS CREEK AT FM 1472 NORTH OF LAREDO | Map	13116	2304B	16	IB	LE	RT							4	1	4			4			4	Also collecting metals in water lab-filtered not field filtered, therefore not submitted to SWQMIS but available on IBWC website.
Segment 2306 Rio Grande Above Amistad Reservoir | Map																						
RIO GRANDE AT BOAT RAMP AT RIO GRANDE VILLAGE IN BIG BEND NATIONAL PARK | Map	16730	2306	6	IB	BB	RT									8			8	8		8	Metals in water collected under SWQM QAPP
RIO GRANDE AT LAJITAS RESORT/FM 170 BOAT RAMP 240 M UPSTREAM OF BLACK HILLS CREEK CONFLUENCE NEAR LAJITAS | Map	18441	2306	6	IB	PW	RT									6			6			6	
RIO GRANDE AT PRESIDIO RAILROAD BRIDGE, 3.25KM DOWNSTREAM OF US67, SOUTH OF PRESIDIO | Map	17000	2306	6	IB	IB	RT												8	8		8	
RIO GRANDE AT PRESIDIO/OJINAGA TOLL BRIDGE (INTERNATIONAL), 0.75KM DOWNSTREAM OF	17001	2306	6	IB	IB	RT												8	8		8	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
US67 IN PRESIDIO | Map																						
RIO GRANDE AT THE MOUTH OF SANTA ELENA CANYON | Map	13228	2306	6	IB	BB	RT									8			8	8		8	Metals in water collected under SWQM QAPP
RIO GRANDE BELOW RIO CONCHOS CONFLUENCE NEAR PRESIDIO | Map	13229	2306	6	IB	IB	RT								1	8			8	8		8	
RIO GRANDE RIVER AT COLORADO CANYON APPROX. 30KM SE OF REDFORD ON RR170 IN PRESIDIO COUNTY | Map	16862	2306	6	IB	PW	RT									6			6			6	
Segment 2307 Rio Grande Below Riverside Diversion Dam | Map																						
RIO GRANDE 1.47 KILOMETERS UPSTREAM OF THE CONFLUENCE WITH GREEN RIVER | Map	20648	2307	6	IB	UE	RT									4			4			4	extremely remote site 48hr HT parameters bacteria BOD chloropheo will not be reported
RIO GRANDE 2.4 MI. UPSTREAM FROM RIO CONCHOS CONFLUENCE | Map	13230	2307	6	IB	IB	RT									8			8	8		8	
RIO GRANDE AT ALAMO CONTROL STRUCTURE, 9.7KM UPSTREAM OF FT. HANCOCK PORT OF ENTRY | Map	15795	2307	6	IB	EP	RT								1	1			1	1		1	
RIO GRANDE AT GUADALUPE	15704	2307	6	IB	UE	RT								1	4			4	4		4	metals in water

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
POINT OF ENTRY BRIDGE AT FM 1109 WEST OF TORNILLO | Map																						collected under SWQM QAPP
RIO GRANDE AT SAN ELIZARIO, 500M UPSTREAM OF CAPOMO ROAD END OF PAVEMENT AND 10.2KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE | Map	16272	2307	6	IB	UE	RT								1	1			1	1		1	Metals in water collected under SWQM QAPP
RIO GRANDE UPSTREAM OF CANDELARIA, 0.5 KM UPSTREAM OF CAPOTE CREEK CONFLUENCE	17407	2307	6	IB	SL	RT									4						4	no 48 hour parameters (BOD, chloro/pheo, or bacteria) due to remoteness of site
Segment 2308 Rio Grande Below International Dam | Map																						
RIO GRANDE 1.3 KM DOWNSTREAM FROM HASKELL ST. WWTP OUTFALL | Map	15528	2308	6	IB	IB	RT									12			12	12		12	partial conventional analysis
RIO GRANDE 2.4 KM UPSTREAM FROM HASKELL ST. WWTP OUTFALL, SOUTH OF BOWIE HIGH SCHOOL FOOTBALL STADIUM IN EL PASO | Map	15529	2308	6	IB	IB	RT									12			12	12		12	partial conventional analysis
RIO GRANDE AT RIVERSIDE CANAL 1.8 KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE | Map	14465	2308	6	IB	IB	RT									12			12	12		12	partial conventional analysis
Segment 2311 Upper Pecos River | Map																						

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
KOKERNOT SPRINGS 105 METERS SOUTH 20 METERS EAST FROM THE INTERSECTION OF ALPINE CREEK AND HENDRYX DRIVE/HARRISON STREET/SH 223 | Map	20558	2311	6	IB	SL	RT						2		2	6						6	
Segment 2314 Rio Grande Above International Dam | Map																						
RIO GRANDE AT ANAPRA BRIDGE ON SUNLAND PARK DRIVE, 4.2KM UPSTREAM FROM AMERICAN DAM (IN NEW MEXICO) | Map	17040	2314	6	IB	EP	RT									4			4			4	Metals in water collected under SWQM QAPP
RIO GRANDE AT COURCHESNE BRIDGE, 1.7 MI UPSTREAM FROM AMERICAN DAM | Map	13272	2314	6	IB	IB	RT									12			12	12		12	partial conventional analysis
RIO GRANDE IMMED. UPSTREAM OF THE CONFL. WITH ANTHONY DRAIN EAST OF LA TUNA PRISON NEAR THE STATE LINE | Map	13276	2314	6	IB	IB	RT									4			4			4	In support of Paso del Norte Watershed Councils 319h grant
RIO GRANDE JUST DOWNSTREAM FROM VINTON BRIDGE NEAR ANTHONY | Map	13275	2314	6	IB	IB	RT									4			4			4	in support of Paso del Norte Watershed Councils 319h grant

Critical vs. non-critical measurement

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

Figure 2. Appendix B, Map of Middle Rio Grande Basin, including FY2011 monitoring station locations.
(Detailed station location information can be found at http://cms.lcra.org)

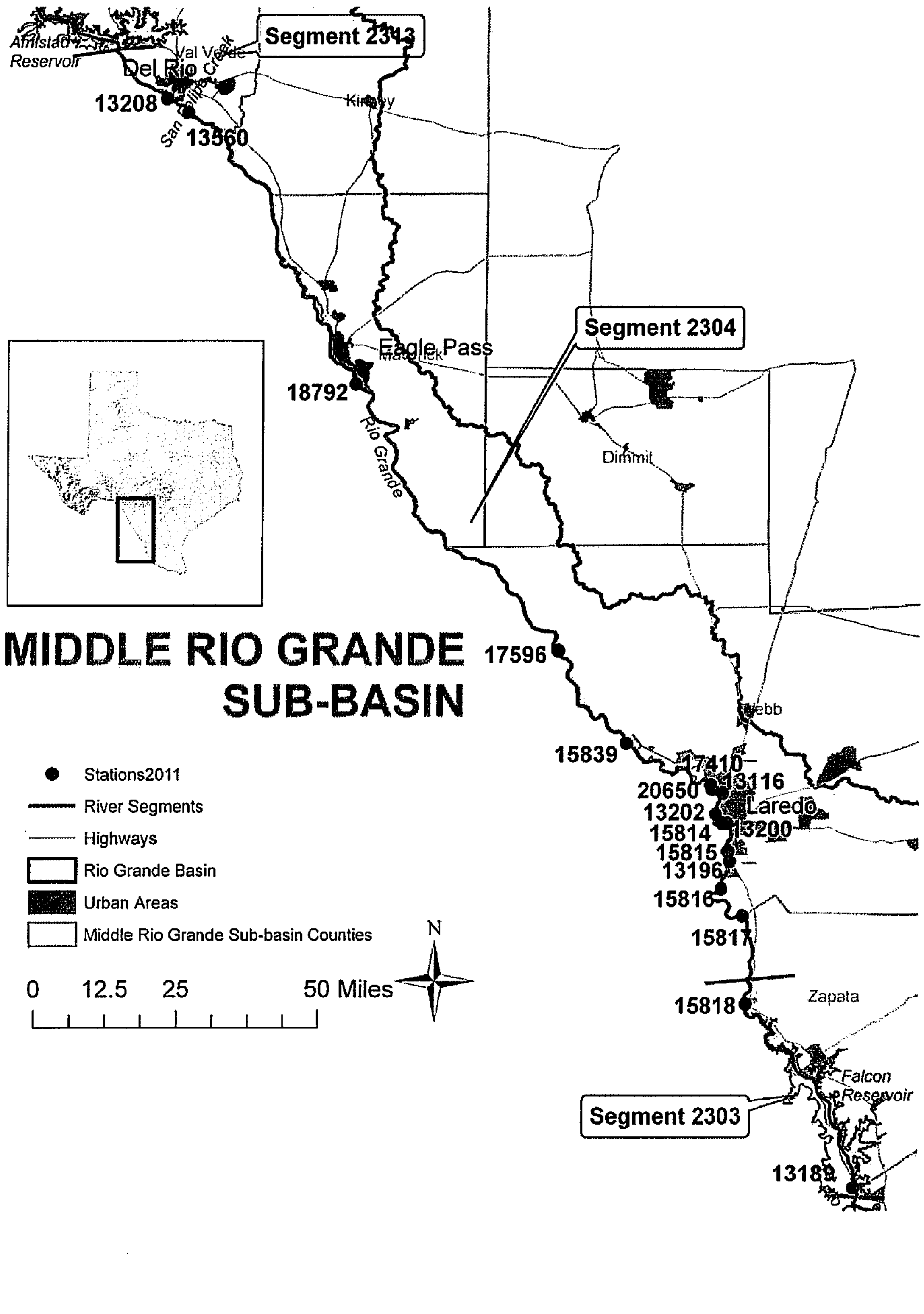
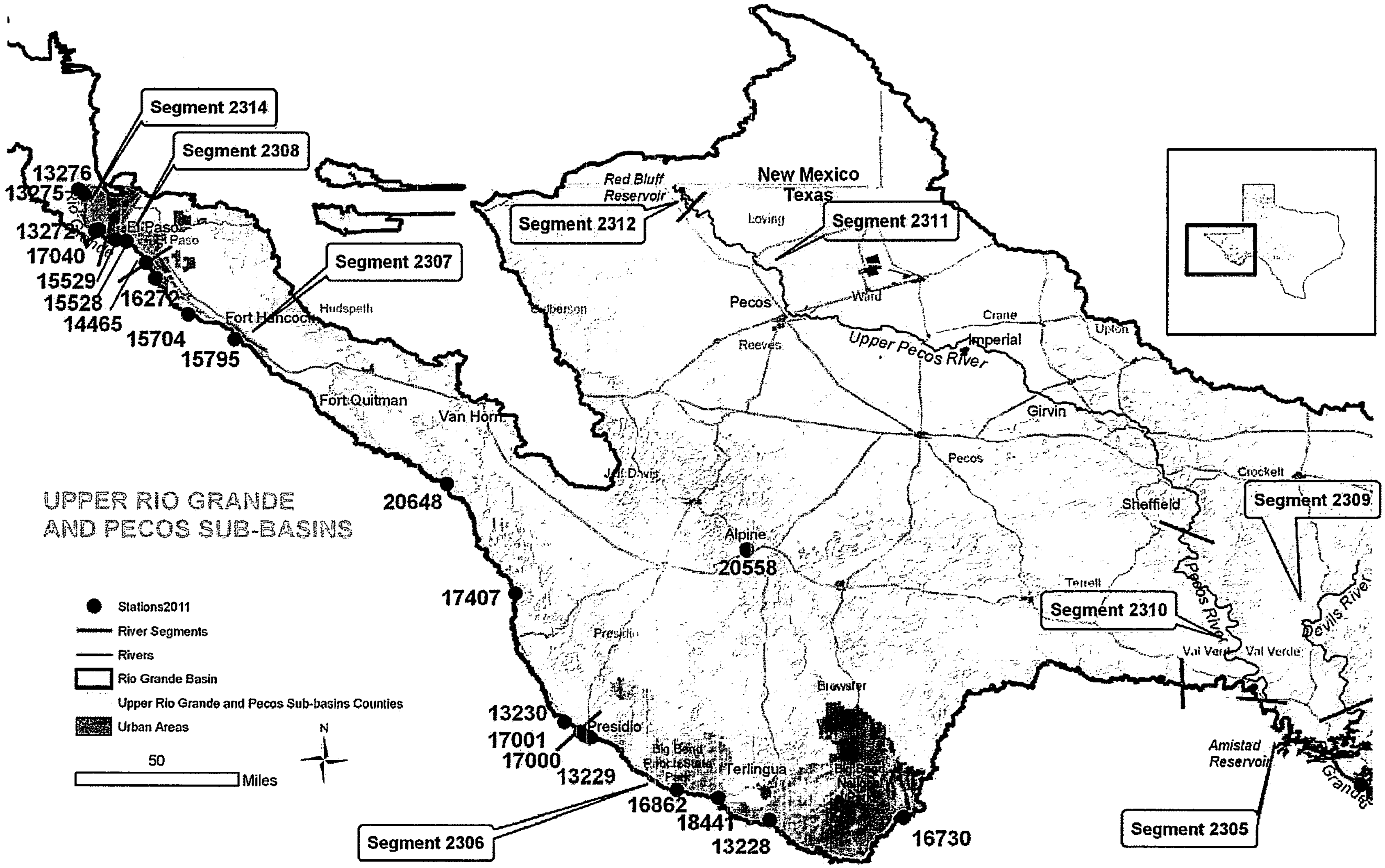


Figure 3. Appendix B, Map of Upper Rio Grande Basin, including FY2011 monitoring station locations.
(Detailed station location information can be found at http://cms.lcra.org)



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

TAG#: ______ LABORATORY: Alamo Analytical 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	Texas Clean Rivers Program
10526 Gulfdale	USIBWC
San Antonio, Texas 78216-3601	4171 N. Mesa, Suite C-100
Ph. (210) 340-8121, Fax. (210) 340-8123	El Paso, TX 79902

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

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

TAG#: ______ LABORATORY: Alamo Analytical 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

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

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.

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

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

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

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

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

Amendment # 4
to the

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

Clean Rivers Program FY 2010/2011 QAPP

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

In Cooperation with the Texas Commission on Environmental Quality (TCEQ)

Questions concerning this amendment should be directed to:

Elizabeth Verdecchia
USIBWC
4171 N. Mesa, C-100
915-832-4701
915-832-4166
elizabeth.verdecchia@ibwc.gov

Effective: February 1, 2011

Justification: This document details the changes made to the basin-wide Quality Assurance Project Plan (QAPP) for fiscal year 2011, including the re-establishment of a partner and the addition of contacts, the re-assignment of a station, the addition of an accreditted parameter to a partner laboratory, and an updated Coordinated Monitoring Schedule.

Summary of Changes:

- The project/task organization and organizational chart in Section A4 have been changed to reflect the changes in partner personnel.
- Station 16288 has been changed to accurately reflect that the sampling site has been re-established as a routine site for Sabal Palm Audubon Sanctuary.
- Table A7 has been updated to incorporate the re- established partner in the list of partners for sample analysis at Alamo Analytical and to include the Brownsville Public Utilities Board's (BPUB) new accreditation in the analysis of *Enterococcus*.
- Table B2 has been updated to include the container that BPUB will use for the collection and analysis of *Enterococcus.*
- Table B10.1 has been updated to include the collecting entity code for Sabal Palm Audubon Sanctuary.
- Appendix B has been amended to include the monitoring sites table for the scheduled monitoring for FY2011, which includes the change for Station 16288.
- The Coordinated Monitoring Schedule has been updated to show that station 16288 will no longer be sampled by U.T. Brownsville and will now be sampled by Sabal Palm Audubon Sanctuary.

Detail of Changes:
Section A4: Sabal Palm Audubon Sanctuary has been re- established as a partner.

Figure 1. A4.1: Updated with Section A4 changes.

Table A7.1: The table header has been updated to include Sabal Palm Audubon Sanctuary in the opening commentary as a partner that will be sending their samples for analysis to Alamo Analytical, Ltd. No changes were made to Table A7.1 other than the header and so the table was not included.

Table A7.2: Table has been updated to include the Brownville Public Utilities Board (BPUB) new accreditation in the analysis of *Enterococcus*.

Table B2.4: Table has been updated to include the container that Brownsville Public Utilities Board will use to collect and analyze for *Enterococcus.*

Table B10.1 Table has been updated to include the collecting entity code for Sabal Palm Audubon Sanctuary.

Monitoring Sites Table*:* The attached monitoring Table B1.1 in Appendix B is added to reflect monitoring for FY 2011.

Appendix B, Coordinated Monitoring Schedule: Station 16288 has been changed to indicate the correct sampling partner and has been added as a routine monitoring station for partner Sabal Palm Audubon Sanctuary.

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

APPROVAL PAGE 1 OF 3

Changes to Table A7 must be reviewed by the corresponding lab. These changes will be incorporated into the QAPP document and the laboratory will acknowledge and accept these changes by signing this amendment.

<u>RIO GRANDE BASIN CRP PARTNERS</u>

Brownsville Public Utilities Board

1/13/2011

LeeRoy Atkinson, Laboratory Director/Manager — Date

01/13/2011

Juan Carrizales, Quality Assurance Specialist — Date

APPROVAL PAGE 2 of 3

RIO GRANDE BASIN CRP PARTNERS

Sabal Palm Audubon Center and Sanctuary

Mr. Jimmy Paz Date

APPROVAL PAGE 3 of 3

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

1/28/11
Elizabeth Verdecchia, USIBWC Program Manager — Date

1-28-11
Leslie Grijalva, USIBWC Quality Assurance Officer — Date

02/01/11
Julie McEntire, CRP Project Manager — Date

2/1/11
Jennifer Delk, CRP Project QAS — Date

02/01/11
Allison Woodall, CRP Group Leader — Date

2/1/2011
Daniel R. Burke, CRP Lead QAS — Date

The USIBWC will secure written documentation from each project participant (e.g., subcontractors, other units of government, laboratories) stating the organization's awareness of and commitment to requirements contained in this quality assurance project plan amendment. The USIBWC will maintain this documentation as part of the project's quality assurance records, and will be available for review.

A4 PROJECT/TASK ORGANIZATION

Description of Responsibilities

USIBWC

Vacant, Wayne Belzer Acting
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. 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 is properly trained and that training records are maintained.

Elizabeth Verdecchia
USIBWC Acting Data Manager

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

RIO GRANDE BASIN CRP PARTNERS

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.

Jimmy Paz
Sabal Palm Audubon Center and Sanctuary
Responsible for water quality monitoring and data review of the Sabal Palm Sanctuary area of the Rio Grande. Samples collected are submitted to Alamo Analytical Laboratory, Ltd. for analysis.

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 type 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.

PROJECT ORGANIZATION CHART

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

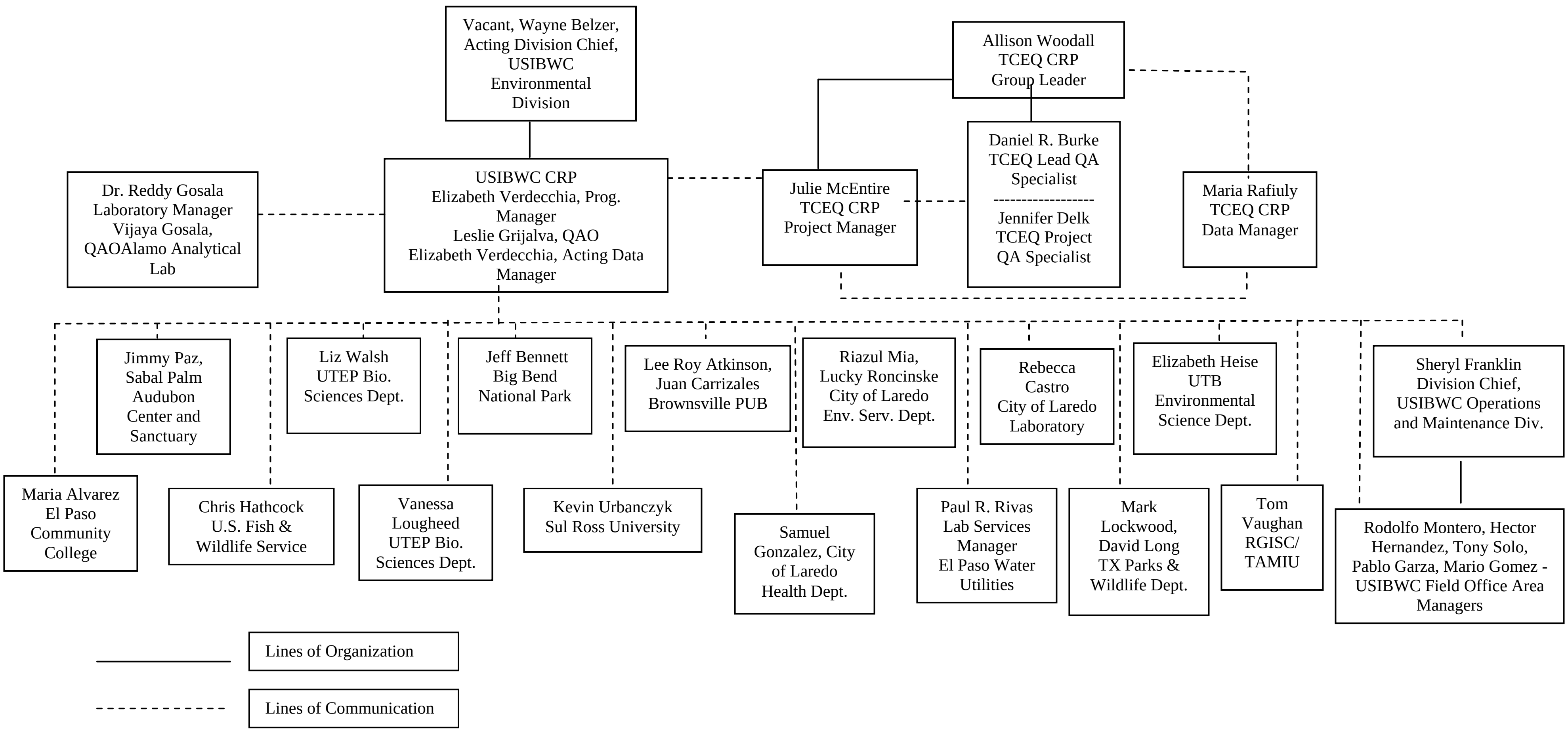


Table A7.1 Measurement Performance Specifications for Field and Laboratory Measurements for: U.S. International Boundary and Water Commission, Big Bend National Park, City of Laredo Environmental, Rio Grande International Study Center, U.T. Brownsville, Sul Ross, U.S. Fish & Wildlife, TX Parks & Wildlife, El Paso Community College, U. T. El Paso, and Sabal Palm Audubon Sanctuary (samples analyzed by Alamo Analytical Laboratory, Ltd.)

Table 3 A7.2 Measurement Performance Specifications for Field and Laboratory Measurements for: Brownsville PUB

Parameter	UNITS	MATRIX	METHOD	PARAMETER Code	AWRL	Limit of Quantitation (LOQ)	LOQ CHECK STANDARD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (% Rec of LCS)	Laboratory
Ammonia, N	mg/L	water	EPA 350.3	00610	0.1	0.1	70-130	20	80-120	BPUB
BOD	mg/L	water	SM 5210B	00310	2	2	70-130	20	80-120	BPUB
E. Coli, Colilert, IDEXX Method	MPN/100mL	water	SM9223B	31699	1	1	NA	0.5	NA	BPUB
TDS	mg/L	water	SM 2540C	70300	10	10	80-120	25	75-125	BPUB
TSS	mg/L	water	EPA 160.2	00530	4	2	70-130	20	80-120	BPUB
VSS	mg/L	water	EPA 160.4	00535	4	2	70-130	20	80-120	BPUB
Enterococcus, IDEXX Enterolert	MPN/100 mL	water	ASTM D-6503	31701	1	1	NA	0.5****	NA	BPUB

**** Based on a range statistic as described in Standard Methods, 20th Edition, Section 9020-B, AQuality Assurance/Quality Control – Intralaboratory Quality Control Guidelines. This criterion applies to bacteriological duplicates with concentrations >10 MPN/100mL or >10 organisms/100mL.

References for Table A7.2:
Quality Control lab documents from Brownsville PUB (BPUB) and NELAP certification.
TCEQ, SWQM QAPP, January 2008, Revision 12.

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, 200810* (2008 or subsequent edition*) (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.

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

Table 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

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

Appendix B Sampling Process Design and Monitoring Schedule (plan)

Sample Design Rationale FY *2011*
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 305(b) assessment, 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.

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

Site 16288 has been re-assigned to Sabal Palm Audubon Sanctuary. Monitoring at this site will still be held quarterly, as only the collecting entity has changed.

Table B1.1 Sample Design and Schedule, FY 2011

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
Segment 2301 Rio Grande Tidal																						
RIO GRANDE AT SABAL PALM SANCTUARY AT NORTHEAST BOUNDARY OFF PARK ROAD APPROX. 1MI SOUTH OF FM1419 NEAR PALM GROVE | Map	16288	2301	15	IB	SP	RT									4						4	
RIO GRANDE TIDAL AT SH 4 NEAR BOCA CHICA | Map	13176	2301	15	IB	UB	RT									4						4	
Segment 2302 Rio Grande Below Falcon Reservoir																						
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 | Map	20698	2302	15	IB	UF	RT									3			3			3	
RIO GRANDE 0.5 MI. BELOW ANZALDUAS DAM, 12.2 MI. FROM HIDALGO | Map	13664	2302	15	IB	IB	RT									8			8	8		8	
RIO GRANDE 200M UPSTREAM OF PHARR INTERNATIONAL BRIDGE (US281) |	15808	2302	15	IB	IB	RT									8			8	8		8	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
Map																						
RIO GRANDE AT FORT RINGGOLD 1 MI. DOWNSTREAM FROM RIO GRANDE CITY | Map	13185	2302	15	IB	IB	RT								1	12			12	12		12	
RIO GRANDE AT SH 886 NEAR LOS EBANOS | Map	13184	2302	15	IB	IB	RT									7			7	7		7	
RIO GRANDE AT THE EL MORILLO TRACT OF THE LOWER RIO GRANDE VALLEY NATIONAL WILDLIFE REFUGE 2.56 KILOMETERS SOUTH AND 817 METERS WEST OF THE INTERSECTION OF MILITARY ROAD AND SHUERBACH ROAD/AIRFIELD ROAD/ SOUTH BREYFOGLE ROAD | Map	20696	2302	15	IB	UF	RT									3			3			3	
RIO GRANDE BELOW RIO ALAMO NEAR FRONTON | Map	13186	2302	15	IB	IB	RT									8			8	8		8	
RIO GRANDE EL JARDIN PUMP STATION, AT LOW WATER DAM 300 FT. BELOW INTAKE | Map	13177	2302	15	IB	IB	RT								1	8			8	8		8	
RIO GRANDE INTERNATIONAL BRIDGE AT US 281 AT HIDALGO | Map	13181	2302	15	IB	IB	RT								1	8			8	8		8	
RIO GRANDE INTERNATIONAL BRIDGE ON US 77 AT BROWNSVILLE | Map	13178	2302	15	IB	UB	RT								1	4			4			4	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
RIO GRANDE NEAR RIVER BEND BOAT RAMP APPROXIMATELY 5 MI. WEST OF BROWNSVILLE ON US 281 | Map	13179	2302	15	IB	UB	RT								1	4			4			4	
RIO GRANDE RIVER AT BROWNSVILLE PUB WATER TREATMENT PLANT NUMBER 1 INTAKE BETWEEN WTP RESERVOIR AND RIO GRANDE LEVEE 910 METERS WEST AND 335 METERS SOUTH TO THE INTERSECTION OF WEST ELIZABETH STREET AND SOUTH MILITARY ROAD | Map	20449	2302	15	IB	BO	RT									12			12				
ARROYO LOS OLMOS BRIDGE ON US 83 SOUTH OF RIO GRANDE CITY | Map	13103	2302A	15	IB	IB	BF									3			3			3	Bacteria nitrates and field collected when flowing
Segment 2303 International Falcon Reservoir | Map																						
FALCON LAKE AT INTERNATIONAL BOUNDARY MONUMENT I | Map	13189	2303	16	IB	IB	RT									4			4			4	
FALCON RESERVOIR AT SAN YGNACIO WTP INTAKE, 350M DWNSTR FROM US B83 BRIDGE | Map	15818	2303	16	IB	RN	RT									2			2			2	
Segment 2304 Rio Grande Below Amistad Reservoir | Map																						
RIO GRANDE 115 METERS SOUTH AND 304 METERS WEST FROM THE INTERSECTION OF	20650	2304	16	IB	LA	RT												12			12	ecoli and fecal

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
RANCHO VIEJO DRIVE/ZEBU COURT AND RIENDA DRIVE | **Map**																						
RIO GRANDE 12.8 MI. BELOW AMISTAD DAM, NEAR GAGE, 340 M UPSTREAM OF US 277 BRIDGE IN DEL RIO | **Map**	13208	2304	16	IB	IB	RT									2			2	2		2	
RIO GRANDE 50 YD UPSTREAM OF CONFLUENCE OF ZACATA CREEK AND RIO GRANDE IN LAREDO **Map**	13200	2304	16	IB	LA	RT												12			12	
RIO GRANDE AT APACHE RANCH WEST OF INTERSECTION OF PRIVATE ROAD AND EASTERN AIRSTRIP NO BETWEEN LARADO AND EAGLE PASS | **Map**	17596	2304	16	IB	IB	RT									4			4	4		4	
RIO GRANDE AT INTERNATIONAL BRIDGE #2 (EAST BRIDGE) IN LAREDO | **Map**	15814	2304	16	IB	LA	RT												12	12		12	
RIO GRANDE AT INTERNATIONAL BRIDGE #2 (EAST BRIDGE) IN LAREDO | **Map**	15814	2304	16	IB	RN	RT								1	4			4	4		4	
RIO GRANDE AT KICKAPOO CASINO, 300 M SOUTH AND 70 M WEST OF KURT BLUEDOG ROAD AT RIVERSIDE DRIVE SOUTH OF EAGLE PASS | **Map**	18792	2304	16	IB	IB	RT								1	8			8	8		8	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
RIO GRANDE AT MASTERSON RD IN LAREDO, 9.9KM DWNSTR INTL BRIDGE #1 (WEST BRIDGE), DWNSTR SOUTHSIDE WWTP AND UPSTR NUEVO LAREDO WWTP | **Map**	15815	2304	16	IB	LA	RT												2			2	
RIO GRANDE AT PIPELINE CROSSING 8.7 MI. BELOW LAREDO | **Map**	13196	2304	16	IB	LA	RT												2			2	
RIO GRANDE AT RIO BRAVO, 0.5KM DWNSTR OF THE COMMUNITY OF EL CENIZO | **Map**	15816	2304	16	IB	LA	RT												2			2	
RIO GRANDE AT THE COLOMBIA BRIDGE, 2.7KM UPSTREAM OF THE DOLORES PUMP STATION, 45.1KM UPSTREAM OF THE LAREDO WTP INTAKE | **Map**	15839	2304	16	IB	LA	RT												12	12		12	
RIO GRANDE AT WEBB/ZAPATA COUNTY LINE | **Map**	15817	2304	16	IB	RN	RT								1	12			12	12		12	
RIO GRANDE AT WORLD TRADE BRIDGE ON FM 3484 | **Map**	17410	2304	16	IB	RN	RT								1	4			4	4		4	
RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE | **Map**	13202	2304	16	IB	LA	RT												12			12	
RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE | **Map**	13202	2304	16	IB	RN	RT									4			4	4		4	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
RIO GRANDE, 4.5 MI. DOWNSTREAM OF DEL RIO AT MOODY RANCH | **Map**	13560	2304	16	IB	IB	RT								1	8			8	8		8	
MANADAS CREEK AT FM 1472 NORTH OF LAREDO | **Map**	13116	2304B	16	IB	LE	RT							4	1	4			4			4	Also collecting metals in water lab-filtered not field filtered. therefore not submitted to SWQMIS but available on IBWC website.
Segment 2306 Rio Grande Above Amistad Reservoir | Map																						
RIO GRANDE AT BOAT RAMP AT RIO GRANDE VILLAGE IN BIG BEND NATIONAL PARK | **Map**	16730	2306	6	IB	BB	RT									8			8	8		8	Metals in water collected under SWQM QAPP
RIO GRANDE AT LAJITAS RESORT/FM 170 BOAT RAMP 240 M UPSTREAM OF BLACK HILLS CREEK CONFLUENCE NEAR LAJITAS | **Map**	18441	2306	6	IB	PW	RT									6			6			6	
RIO GRANDE AT PRESIDIO RAILROAD BRIDGE, 3.25KM DOWNSTREAM OF US67, SOUTH OF PRESIDIO | **Map**	17000	2306	6	IB	IB	RT												8	8		8	
RIO GRANDE AT PRESIDIO/OJINAGA TOLL BRIDGE (INTERNATIONAL), 0.75KM DOWNSTREAM OF	17001	2306	6	IB	IB	RT												8	8		8	

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
US67 IN PRESIDIO | **Map**																						
RIO GRANDE AT THE MOUTH OF SANTA ELENA CANYON | **Map**	13228	2306	6	IB	BB	RT									8			8	8		8	Metals in water collected under SWQM QAPP
RIO GRANDE BELOW RIO CONCHOS CONFLUENCE NEAR PRESIDIO | **Map**	13229	2306	6	IB	IB	RT								1	8			8	8		8	
RIO GRANDE RIVER AT COLORADO CANYON APPROX. 30KM SE OF REDFORD ON RR170 IN PRESIDIO COUNTY | **Map**	16862	2306	6	IB	PW	RT									6			6			6	
Segment 2307 Rio Grande Below Riverside Diversion Dam | Map																						
RIO GRANDE 1.47 KILOMETERS UPSTREAM OF THE CONFLUENCE WITH GREEN RIVER | **Map**	20648	2307	6	IB	UE	RT									4			4			4	extremely remote site 48hr HT parameters bacteria BOD chloropheo will not be reported
RIO GRANDE 2.4 MI. UPSTREAM FROM RIO CONCHOS CONFLUENCE | **Map**	13230	2307	6	IB	IB	RT									8			8	8		8	
RIO GRANDE AT ALAMO CONTROL STRUCTURE, 9.7KM UPSTREAM OF FT. HANCOCK PORT OF ENTRY | **Map**	15795	2307	6	IB	EP	RT								1	1			1	1		1	
RIO GRANDE AT GUADALUPE	15704	2307	6	IB	UE	RT								1	4			4	4		4	metals in water

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
POINT OF ENTRY BRIDGE AT FM 1109 WEST OF TORNILLO | **Map**																						collected under SWQM QAPP
RIO GRANDE AT SAN ELIZARIO, 500M UPSTREAM OF CAPOMO ROAD END OF PAVEMENT AND 10.2KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE | **Map**	16272	2307	6	IB	UE	RT								1	1			1	1		1	Metals in water collected under SWQM QAPP
RIO GRANDE UPSTREAM OF CANDELARIA, 0.5 KM UPSTREAM OF CAPOTE CREEK CONFLUENCE	17407	2307	6	IB	SL	RT									4						4	no 48 hour parameters (BOD, chloro/pheo, or bacteria) due to remoteness of site
Segment 2308 Rio Grande Below International Dam | Map																						
RIO GRANDE 1.3 KM DOWNSTREAM FROM HASKELL ST. WWTP OUTFALL | **Map**	15528	2308	6	IB	IB	RT									12			12	12		12	partial conventional analysis
RIO GRANDE 2.4 KM UPSTREAM FROM HASKELL ST. WWTP OUTFALL, SOUTH OF BOWIE HIGH SCHOOL FOOTBALL STADIUM IN EL PASO | **Map**	15529	2308	6	IB	IB	RT									12			12	12		12	partial conventional analysis
RIO GRANDE AT RIVERSIDE CANAL 1.8 KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE | **Map**	14465	2308	6	IB	IB	RT									12			12	12		12	partial conventional analysis
Segment 2311 Upper Pecos River | Map																						

Appendix G to the United States Section, International Boundary and Water Commission (USIBWC)
Clean Rivers Program FY 2010/2011 QAPP

Bacteria Characterization in Segment 2304 near Laredo, Texas

Prepared by the USIBWC

In Cooperation with the Texas Commission on Environmental Quality (TCEQ)

Effective March 28, 2011

Questions concerning this QAPP should be directed to:

Elizabeth Verdecchia
USIBWC - CRP
4171 N. Mesa C-100, El Paso TX 79902
915-832-4701
Fax 915-832-4166
Elizabeth.Verdecchia@ibwc.gov

S-A1a APPROVAL PAGE (page 1 of 5)

The following signatures are required for the special study:

3/20/11

Elizabeth Verdecchia, USIBWC Program Manager Date

3-21-11

Leslie Grijalva, USIBWC Quality Assurance Officer Date

3-23-11

Julie McEntire, TCEQ CRP Project Manager Date

3/24/11

Jennifer Delk, CRP Project QAS Date

3/25/11

Allison Woodall, CRP Work Leader Date

3/28/2011

Daniel R. Burke, CRP Lead QAS Date

S-A1a APPROVAL PAGE (page 2 of 5)

Rio Grande International Study Center/TX A&M International University

Tom Vaughan Digitally signed by Tom Vaughan
DN: cn=Tom Vaughan, o=TAMIU, ou=Biology and Chemistry, email=tvaughan@tamiu.edu, c=US
Date: 2011.02.09 17:00:46 -06'00'

Dr. Tom Vaughan Date
Professor

S-A1a APPROVAL PAGE (page 3 of 5)

Laredo Community College

Tom Miller ______________________________________ Date
L.B.V.E.S.C. Director

S-A1a APPROVAL PAGE (page 4 of 5)

City of Laredo Health Department Laboratory

Rebecca S. Castro 3/4/11

Rebecca Castro Date

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

S-A1a APPROVAL PAGE (page 5 of 5)

TCEQ Region 16 Office

Elsa Hull 01/24/2011

Elsa Hull Date

James D. Archer 1-24-11

James Archer Date

The USIBWC will secure written documentation from each sub-tier project participant (e.g., subcontractors, other units of government, laboratories) stating the organization's awareness of and commitment to requirements contained in this quality assurance project plan appendix and any amendments 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

Figures:

Tables:

LIST OF ACRONYMS

As described in Section A2 of the basin-wide QAPP

SS-A3 DISTRIBUTION LIST

As described in Section A3 of the basin-wide QAPP, and

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James Archer
TCEQ Region 16 Office
707 E. Calton Rd., Ste. 304
Laredo, TX 78041-3887

SS-A4 PROJECT/TASK ORGANIZATION

TCEQ

Julie McEntire
CRP Project Manager
As described in the basin-wide QAPP, FY 2010, Section A4.

Other TCEQ staff as described in the basin-wide QAPP, FY 2010, Section A4.

USIBWC

Elizabeth Verdecchia
USIBWC Program Manager
As described in the basin-wide QAPP, FY 2010, Section A4, and will also coordinate this special study. Will also assist in preparing a written report based on the findings of this study.

Leslie Grijalva
USIBWC QA Officer
As described in the basin-wide QAPP, FY 2010, Section A4, and will also review data to ensure it meets the requirements of this QAPP.

Elizabeth Verdecchia
Acting USIBWC Data Manager
As described in the basin-wide QAPP, FY 2010, Section A4, and will manage data resulting from the study.

RIO GRANDE BASIN CRP PARTNERS

Dr. Tom Vaughan
Rio Grande International Study Center (RGISC) and Texas A&M International University (TAMIU)
As described in the basin-wide QAPP, FY 2010, Section A4, and will coordinate with CRP to ensure that sample collection follows TCEQ sampling procedures. Will also coordinate logistics of sampling, including boat launch and boat safety. TAMIU will also provide a boat for sampling.

Tom Miller
Laredo Community College, Lamar Bruni Vergara Environmental Science Center (L.B.V.E.S.C)
Responsible for collecting samples and will also coordinate logistics of sampling, including boat launch and boat safety. Will coordinate with CRP to ensure samples are collected according to TCEQ sampling procedures.

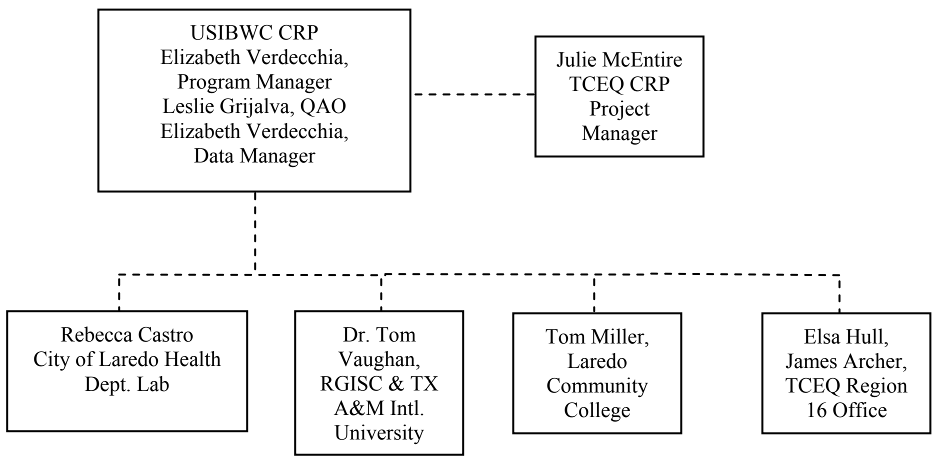
Rebecca Castro
City of Laredo Health Department Laboratory
Responsible for analysis of samples and reporting of data to USIBWC-CRP.

Rebecca Castro, Acting QAO, City of Laredo Health Department Laboratory
Responsible for quality assurance of laboratory analysis and data submittals to USIBWC.

Elsa Hull
TCEQ Region 16
Responsible for sample collection. Will ensure samples are collected according to TCEQ sampling procedures.

James Archer
TCEQ Region 16
Responsible for sample collection. Will ensure samples are collected according to TCEQ sampling procedures.

PROJECT ORGANIZATION CHART



SS-A5 PROBLEM DEFINITION

Introduction

The Rio Grande in the Laredo/Nuevo Laredo area has been plagued by high levels of bacteria for decades. In 1989, the International Boundary and Water Commission (IBWC) signed IBWC Minute No. 279, a formal international agreement setting forth measures to improve the quality of waters of the Rio Grande at Laredo, Texas and Nuevo Laredo, Tamaulipas. The Minute led to the construction of the Nuevo Laredo International Wastewater Treatment Plant (NLIWTP), through funding from NADBank and cooperation with the Border Environmental Cooperative Commission. NLIWTP began operations in 1996 with remaining construction finalized within the next several years. Water quality data from the Rio Grande basin show that bacteria levels in water downstream of the plant drastically improved in the years following the operation of the plant. However, high levels of bacteria continue to persist in waters throughout the Laredo/Nuevo Laredo stretch.

Data from 8.6 miles below Laredo from 1982 to 1989, as published in the IBWC Joint Report of Engineers that led to Minute 279, show that fecal coliform values typically ranged from 8,000 to 30,000 colonies/100ml, with a maximum of 102,000 measured in summer 1982. After the NLIWTP went online in 1996, bacteria values dropped significantly. At Station 13196 below the NLIWTP, for example, fecal bacteria values ranging from 10,000 to 76,000 colonies/100ml dropped to under 1,000, with some spikes at higher values. However, despite the improvement, bacteria levels in the urban areas remain above U.S. and Mexican standards.

The Texas Surface Water Quality Standards (TSWQS) for contact recreation are measured in *E. coli* bacteria. The standard for Rio Grande Segment 2304 from Falcon Dam to Amistad Reservoir is 126 colonies per 100 ml, using a geometric mean. Rio Grande Segment 2304 has been listed on the Clean Water Act Section 303(d) Impairment List by TCEQ since 1996. Specifically, in the Laredo/Nuevo Laredo area, 2010 Assessment Units 2304_03 to 2304_01 (from the City of Laredo water treatment plant intake downstream to the Arroyo Salado confluence) are impaired for bacteria, according to the *2010 Texas Draft Integrated Report*. However, due to the binational nature of the Rio Grande, implementing a Total Maximum Daily Load (TMDL) to address the impairment has not been possible.

The USIBWC Texas Clean Rivers Program (UISBWC CRP) for the Rio Grande Basin currently collects both fecal coliform and *E. coli* at 10 stations, spanning 40 miles upstream of Laredo to 30 miles downstream of Laredo. Data from the Rio Grande in Segment 2304 show that values of bacteria upstream of Laredo/Nuevo Laredo are extremely low and have been for the past 30 years. Bacteria counts increase in the downtown section of Laredo and Nuevo Laredo, somewhere between the City of Laredo water treatment plant on Jefferson Street and International Bridge #2. Bacteria counts remain high through Nuevo Laredo and past the NLIWTP plant. Figure 1 shows that values exceed TSWQS at stations 13200, 15814, 15815, 13196 and 15816. Figure 1 also shows that bacteria values spike between Stations 13202 and 15814. Figures 2 through 4 are graphs depicting historical background data on the bacteria levels of certain sites.

Figure 1 A5.1 Graphs of Background Data

Rio Grande bacteria values in the Laredo area, from upstream to downstream

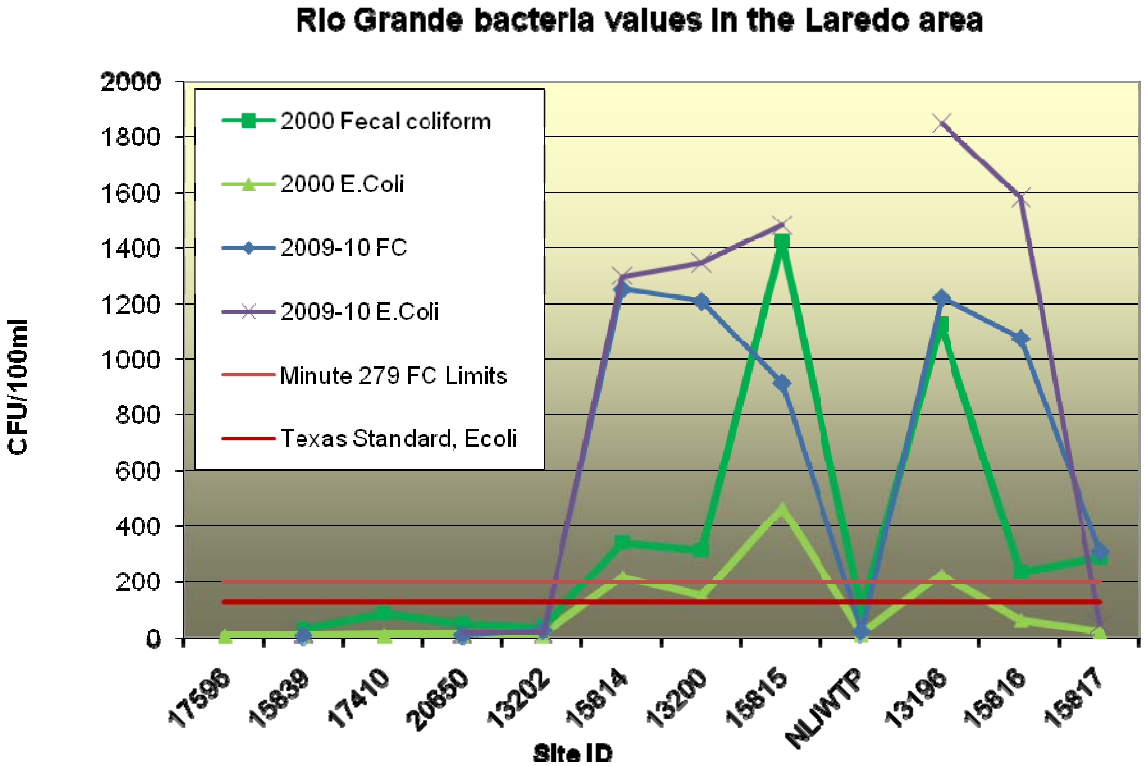


Figure 2 A5.2 Graphs of Background data, Upstream of Laredo

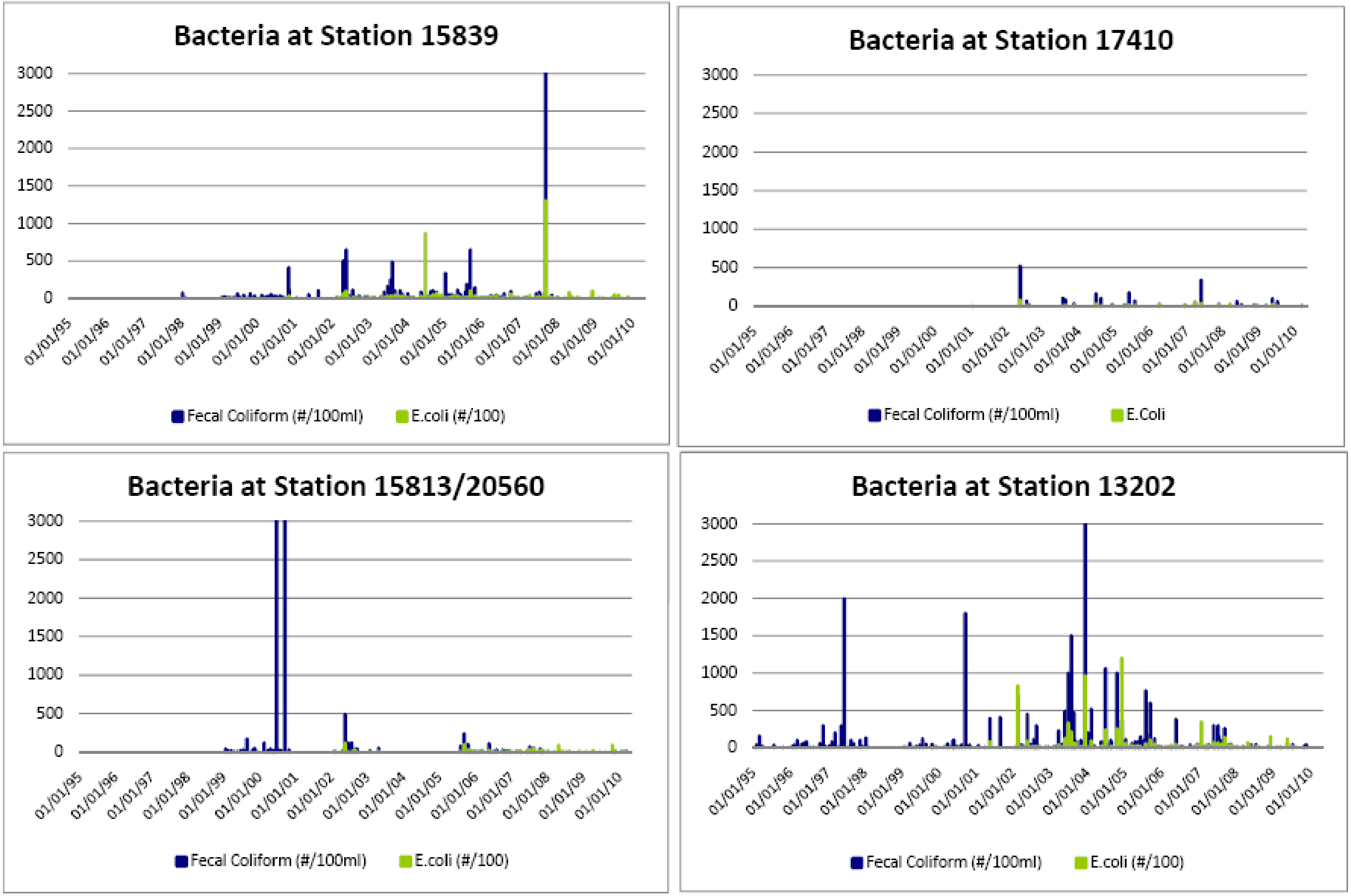


Figure 3 A5.3 Graphs of Background data, in Laredo

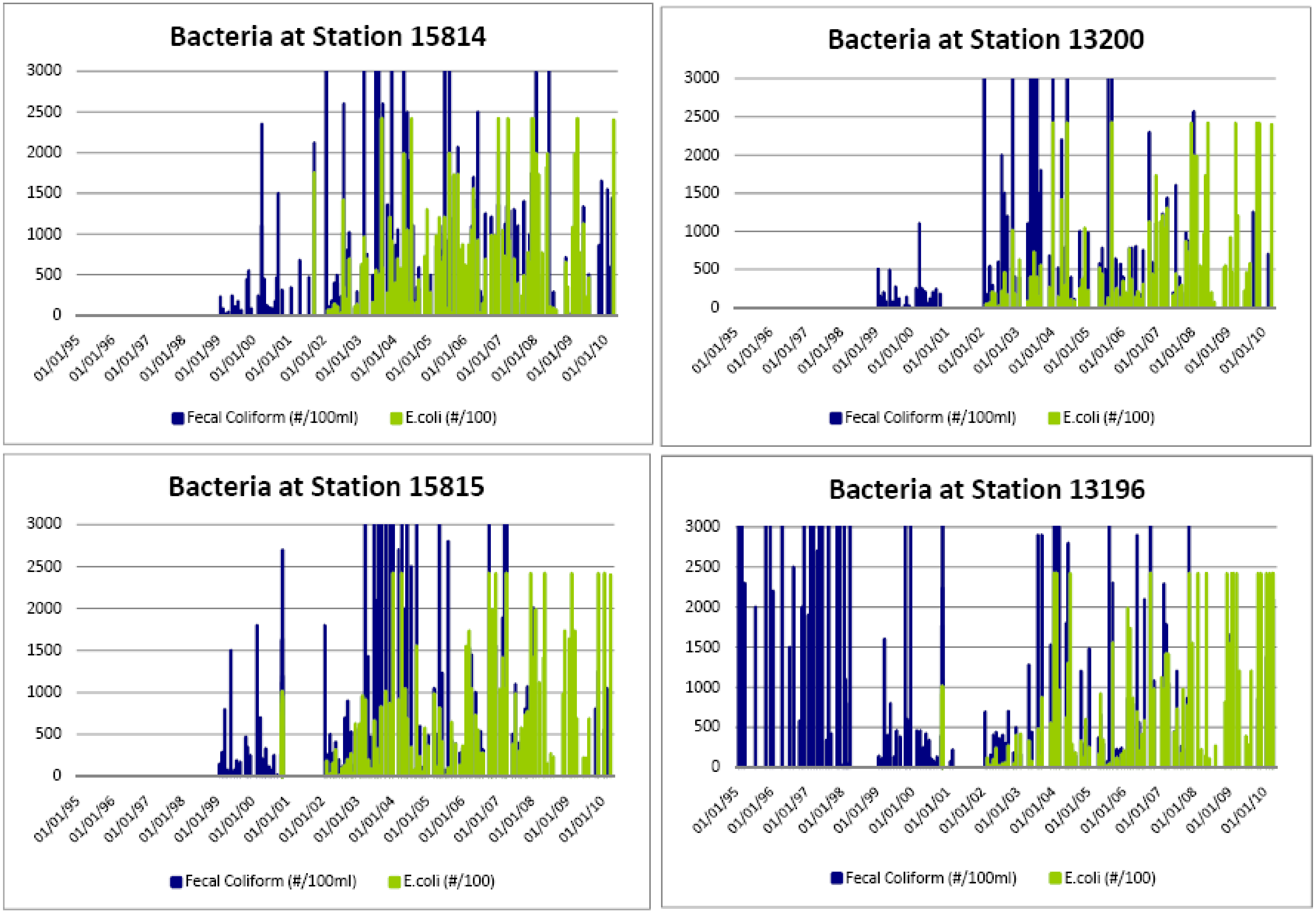
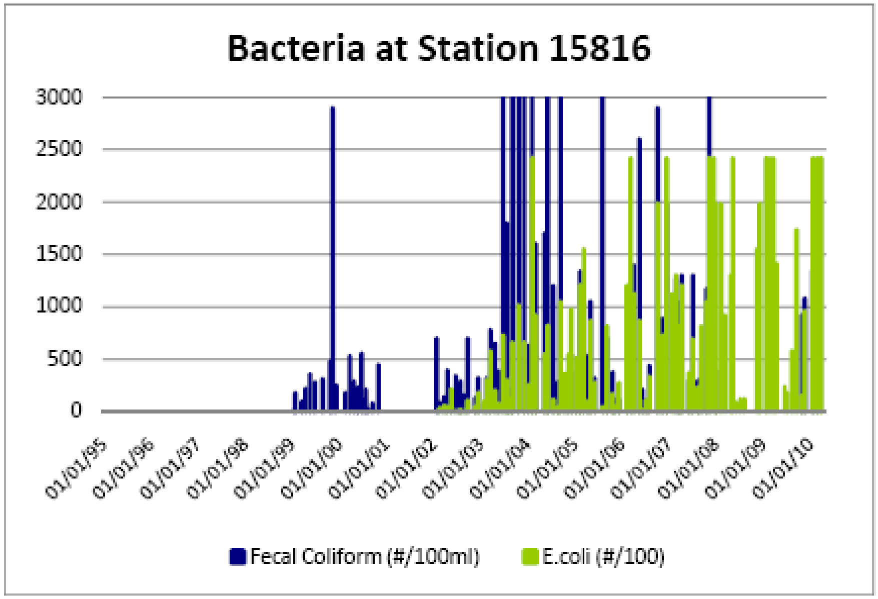
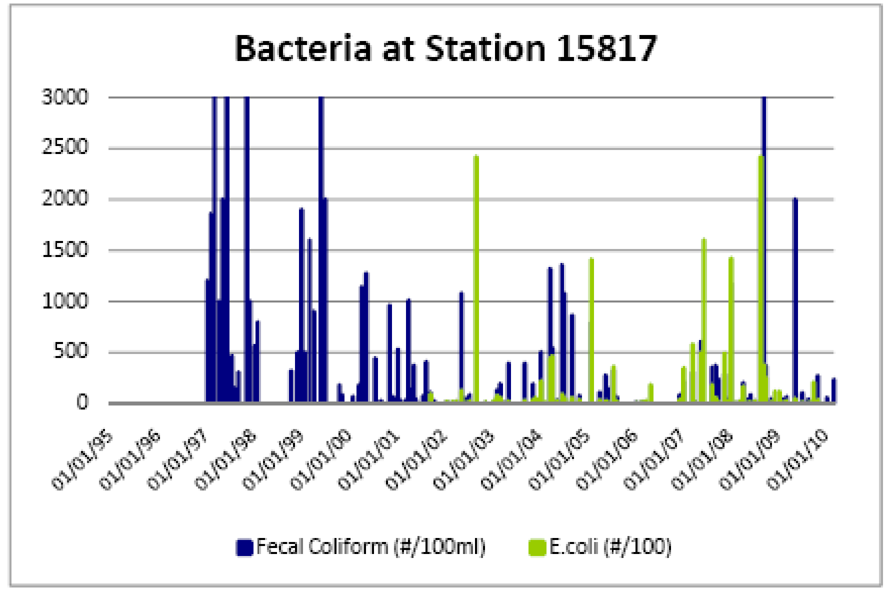


Figure 4 A5.4 Graphs of Background data, downstream of Laredo





Study Objectives

The USIBWC-CRP, in conjunction with the Rio Grande International Study Center (RGISC), Texas A&M International University (TAMIU), the Laredo Community College (LCC), the Texas Commission on Environmental Quality (TCEQ) Region 16 office, and the Laredo Department of Health Laboratory, propose conducting a special study to address the bacteria impairment in the Laredo area of Segment 2304. This special study will accomplish two goals:

a) evaluate and identify possible sources of bacteria contamination through a field survey via boat and spatial analysis of field survey results, and

b) characterize the bacteria contamination through intensive bacteria monitoring.

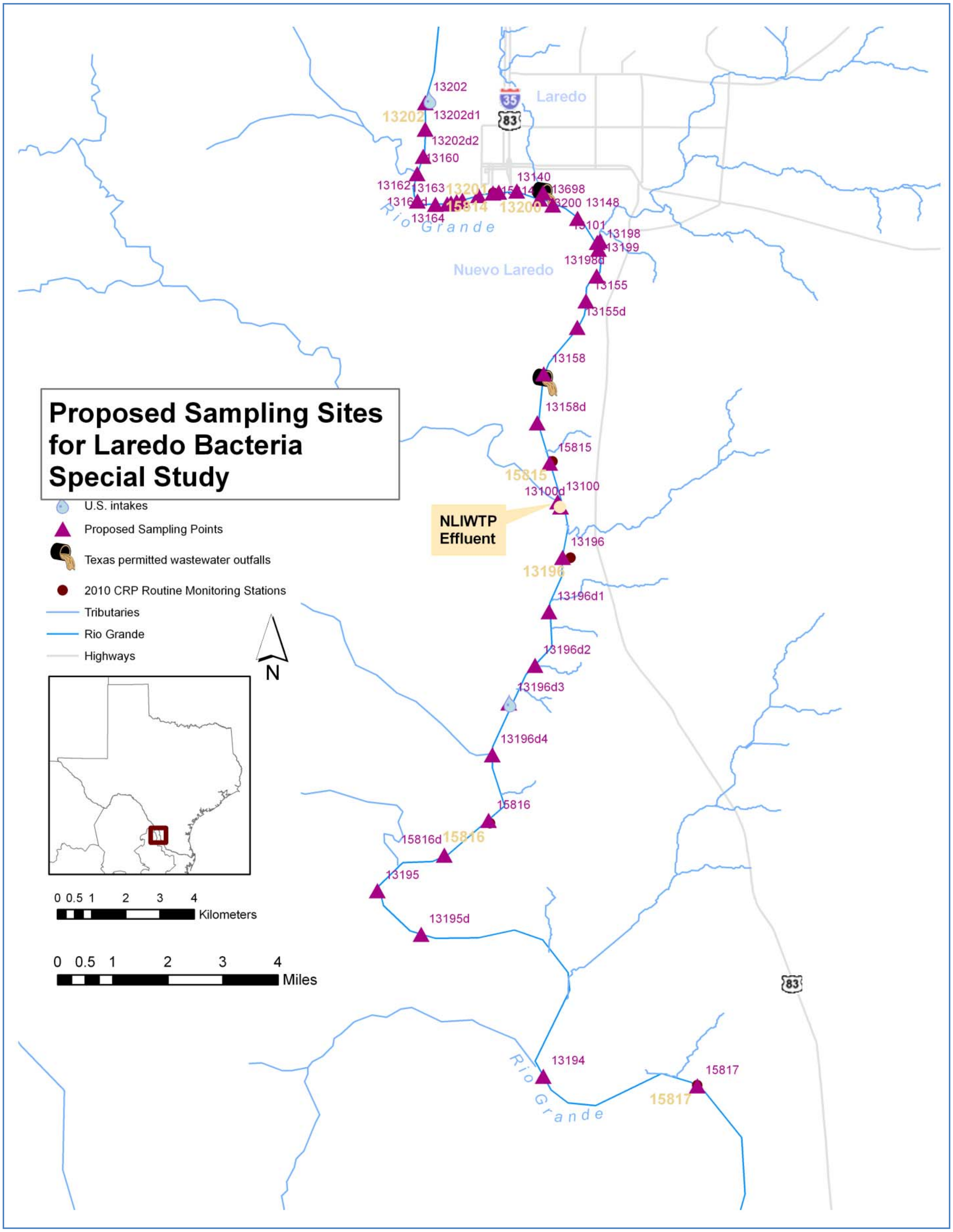
The information and data collected from the special study will provide the information necessary to begin steps to reduce pollutant loads and ultimately delist the impairment. This study is mimicked after the Brownsville Bacteria Special Study, documented in Appendix F of this QAPP.

Study Area

According to the 2010 *Texas Water Quality Inventory Water Bodies Evaluated*, impaired Assessment Units 2304_01 to 2304_03 use Stations 13201, 15814, 15815, 13196, 15816, and 15817, six of the 10 routine stations in the Laredo area. Sampling will focus on these AUs as well as the upstream AU of 2304_04. The study area encompasses the reach of the Rio Grande extending approximately 27 miles from TCEQ Station 13202 in AU 2304_04 downstream to Station 15817 in AU 2304_01. Figure 5 shows the stations and the extent of the proposed study area.

The “target area” will be the downtown area from the City of Laredo intake (13202) through the International Bridge #2 (15814) and downstream to the confluence of Zacate Creek (13200) where bacteria values initially spike, but the entire stretch down past the NLIWTP will be surveyed.

Figure 5 Proposed Sampling Sites



SS-A6 PROJECT/TASK DESCRIPTION

Proposed Sampling

40 sampling stations have been proposed for this study, as shown in Figure 5. The majority of the stations chosen were historical stations stored in the TCEQ Surface Water Quality Information System. Table 2 lists the stations and their corresponding information. “Target area” refers to the stretch from 13202 to downstream of downtown at Station 13200. In addition, Figures 6 and 7 include close-up maps for the proposed stations for a more detailed view of the area.

The sampling will begin at the intake (13202), and includes 22 stations at least every half mile in the 4 mile stretch downstream of the intake on the main stem of the Rio Grande and 2 in tributaries on the U.S. side (Zacate Creek and Chacon Creek). The remaining 23 miles down through the Webb/Zapata County line includes 18 stations, one roughly every mile or where there are existing stations. Sites in the target area may be spaced less than a half mile apart. This is due to several participating entities that have made observations in the past about discoloration in the water in these areas. Since there were existing stations in these areas, the special study sampling will maintain some of those sites. This study will be in addition to the USIBWC CRP routine monitoring of the 10 Laredo stations. Estimated flow will be collected at the 6 routine stations in the study area, with the exception of Station 15814 at Bridge 2, where instantaneous flow will be measured from an IBWC gage.

There will be two sampling events, where all 40 sampling stations will be collected over two consecutive days for each sampling event (four days of 20 samples each for a total of 80 samples. Both fecal coliform and *E. coli* will be collected at each station (Mexico uses fecal coliform as a bacteria indicator). These sampling trips should not be done within 48 hours of a major rain event. Sampling will take place from a boat. Entities that have available boats are TCEQ, IBWC (at Amistad), TAMIU, and possibly Border Patrol. Samples will be taken in batches to the laboratory to meet holding times. A team of “runners” will meet the boat at designated locations to pick up samples and deliver to the laboratory.

Boat logistics, including boat ramps and loading/unloading sites for samples, will be discussed with TCEQ, IBWC (at Amistad), TAMIU, and the Border Patrol so that the easiest access points are selected for boat and river access. Targeted dates for both sampling events are May and possibly July of 2011. These time periods were selected based on scheduling and personnel availability.

Survey of Structures

The fact that the contamination consistently begins to appear between two routine sampling stations is a strong indicator that the contamination is probably resulting from one or more point discharges. This study will therefore include a survey of all structures that exist along both banks of the river. The survey will include description of the structures, GPS locations, pictures and video, and any other noteworthy information such as whether the structure is discharging at the time and whether there is any discoloration in the water nearby. After the field survey is complete, participants of the study will compare surveyed structures with permitted wastewater discharges, stormwater drains, and agricultural drains in both countries.

Analysis of Bacteria

Both fecal coliform and *E. coli* bacteria samples will be analyzed by City of Laredo Health Laboratory for all 40 stations. USIBWC CRP will purchase all supplies needed for both fecal and *E. coli* analysis. The City of Laredo Health Laboratory is currently a USIBWC CRP partner and is also accredited by TCEQ in bacteria analysis of nonpotable water. Results will be sent to USIBWC CRP for quality assurance review and assessment.

Results Assessment and Final Report

USIBWC CRP, in conjunction with the other participating entities, will assess data and collaborate on a final report. The data from the different sampling events and all stations will be compared to locations of structures and any other possible source of contamination. The final report will include a summary and interpretation of the results and possible recommendations for action.

Revisions to the Special Study Appendix

Revisions to the Special Study Appendix may be necessary to address incorrectly documented information or to reflect changes in project organization, tasks, schedules, objectives, and methods. Requests for revisions will be directed from the USIBWC CRP Program Manager to the CRP Project Manager electronically. Revisions are effective immediately upon approval by the USIBWC CRP Program Manager, the USIBWC CRP QAO, the CRP Project Manager, the CRP Lead QA Specialist, and the CRP Project QA Specialist. They will be incorporated into the QAPP by way of attachment and distributed to personnel on the distribution list by the USIBWC CRP Program Manager.

SS-A7 QUALITY OBJECTIVES AND CRITERIA

The objective of this project is to characterize bacteria contamination in Segment 2304. Data that will be collected includes field parameters and *E. coli* bacteria through an intensive monitoring that will identify the source of bacteria contamination and help to better understand the nature of the bacteria spikes that have historically been recorded in this segment.

The measurement performance specifications to support the project objectives are specified in Table SS-A7.1.

Table 1 SS-A7.1 Measurement Performance Specifications

Parameter	Units	Matrix	Method	PARAMETER CODE	AWRL	Limit of Quantitation (LOQ	PRECISION (RPD of LCS/LCSD)	BIAS (%Rec. of LCS)	LOQ CHECK STANDARD %Rec	Lab
Field Parameters (Water Column)										
pH	pH units	water	EPA 150.1and TCEQ SOP	00400	1.0	NA	NA	NA	NA	Field
DO	mg/L	water	SM 4500-O G and TCEQ SOP, V1	00300	1.0	NA	NA	NA	NA	Field
Specific Conductance	µS/cm	water	EPA 120.1and TCEQ SOP	00094	1	NA	NA	NA	NA	Field
Water temperature	degrees centigrade	water	EPA 170.1 & TCEQ-SWQM SOP, V1	00010	NA*	NA	NA	NA	NA	Field

Flow estimate	cfs	water	TCEQ SOP	74069	NA	NA	NA	NA	NA	Field
Flow	cfs	Water	TCEQ-SWQM SOP, V1	00061	NA*	NA	NA	NA	NA	Field, Gage
Days since last significant rainfall	days	NA	TCEQ-SWQM SOP, V1	72053	NA*	NA	NA	NA	NA	Field
Flow method	1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler	water	TCEQ-SWQM SOP, V1	89835	NA*	NA	NA	NA	NA	Field
Present Weather	1-clear 2- partly cloudy 3-cloudy 4-rain 5- other	water	TCEQ-SWQM SOP, V1	89966	NA*	NA	NA	NA	NA	Field
Indicator Bacteria (Water)										
E. coli, IDEXX Colilert	MPN/100 mL	water	SM 9223-B	31699	1	1	0.5***	NA	NA	Laredo Health Lab
Fecal Coliform	CFU/100 mL	water	SM9222D	31616	1	1	NA	NA	NA	Laredo Health Lab

* Reporting to be consistent with SWQM guidance and based on measurement capability.
***Based on a range statistic as described in Standard Methods, 20th Edition, Section 9020-B, A Quality Assurance/Quality Control - Intralaboratory Quality Control Guidelines. This criterion applies to bacteriological duplicates with concentrations >10 MPN/100mL or >10 organisms/100mL.

References:

United States Environmental Protection Agency (USEPA) "Methods for Chemical Analysis of Water and Wastes," Manual #EPA-600/4-79-020
TCEQ SOP - Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2003.

Ambient Water Reporting Limits (AWRLs)

As described in Section A7 of the basin-wide QAPP.

Precision

As described in Section A7 of the basin-wide QAPP.

Bias

As described in Section A7 of the basin-wide QAPP.

Representativeness

Samples will be collected at half-mile intervals, beginning at Station 13202 down to Station 13200, and at one- mile intervals from Station 13200 to Station 15817. Because the objective is to identify possible sources, samples taken at half-mile intervals will narrow the spatial distance of a possible point source to within one mile.

Comparability

As described in Section A7 of the basin-wide QAPP.

Completeness

As described in Section A7 of the basin-wide QAPP.

SS-A8 SPECIAL TRAINING/CERTIFICATION

As described in Section A8 of the basin-wide QAPP. Also, sampling will be conducted by personnel who are already trained and conduct the routine sampling at stations in the area. Training and partner audits are maintained by the USIBWC CRP staff.

SS-A9 DOCUMENTS AND RECORDS

As described in Section A9 of the basin-wide QAPP. A report will be prepared by the USIBWC CRP staff documenting study findings.

SS-B1 SAMPLING PROCESS DESIGN

The data collection design is summarized in Table SS-B1 (Sampling Sites and Monitoring Frequencies) and in Figure SS-B1 (Sample Site Map).

Table 2 SS-B1. Proposed Sampling Sites and Monitoring Frequencies

Segment/ AU	Region	Station Description	StationID	Collecting Entity	Monitoring Type	Inst. Flow	Est. Flow	E. coli Bacteria	FC Bacteria	Field	Justification for Station	POINT_X	POINT_Y
2304_04	16	RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE	13202	IB	BS		2	2	2	2	Routine Station	-99.525107	27.523178
2304_03	16	0.5 mi downstream of 13202	13202d1	IB	BS			2	2	2	Target Area	-99.525143	27.51621
2304_03	16	1 mile downstream of 13202	13202d2	IB	BS			2	2	2	Target Area	-99.525648	27.509061
2304_03	16	UNNAMED MEXICAN TRIBUTARY TO RIO GRANDE APPROXIMATELY 2 RIVER KM UPSTREAM OF MISSOURI-PACIFIC RAILROAD BRIDGE IN LAREDO	13160	IB	BS			2	2	2	Existing station in Target Area	-99.527237	27.504512
2304_03	16	AVENIDA MONTERREY DRAIN 1 METER UPSTREAM OF CONFLUENCE WITH RIO GRANDE 1.1 KM UPSTREAM OF MISSOURI-PACIFIC RAILROAD BRIDGE IN LAREDO	13162	IB	BS			2	2	2	Existing station in Target Area	-99.52684	27.497399
2304_03	16	0.5 mile downstream of 13162	13162d	IB	BS			2	2	2	Target Area	-99.52245	27.496479
2304_03	16	NUEVO LAREDO WATER TREATMENT PLANT RETURN FLOW APPROXIMATELY 0.3 KM UPSTREAM OF MISSOURI-PACIFIC RAILROAD BRIDGE IN LAREDO	13163	IB	BS			2	2	2	Existing station in Target Area	-99.519257	27.49702
2304_03	16	AVENIDA AMERICA DRAIN 1 METER UPSTREAM OF CONFLUENCE WITH RIO GRANDE 0.2 KM UPSTREAM OF MISSOURI-PACIFIC RAILROAD BRIDGE IN LAREDO	13164	IB	BS			2	2	2	Existing station in Target Area	-99.518355	27.497472
2304_03	16	AVENIDA ABASOLO DRAIN 1 METER UPSTREAM OF CONFLUENCE WITH RIO GRANDE 0.06 KM UPSTREAM OF MISSOURI-PACIFIC RAILROAD BRIDGE IN LAREDO	13165	IB	BS			2	2	2	Existing station in Target Area	-99.516911	27.498013
2304_03	16	AVENIDA DONATO GUERRA DRAIN 1 METER FROM CONFLUENCE WITH RIO GRANDE 60 M DOWNSTREAM OF MISSOURI-PACIFIC RAILROAD BRIDGE IN LAREDO	13167	IB	BS			2	2	2	Existing station in Target Area	-99.51572	27.498447
2304_03	16	0.3 miles downstream of 13167	13167d	IB	BS			2	2	2	Target Area	-99.511026	27.49906
2304_03	16	RIO GRANDE AT INTERNATIONAL BRIDGE #2/EAST BRIDGE IN LAREDO	15814	IB	BS	2		2	2	2	Routine Station	-99.507343	27.499457

Segment/ AU	Region	Station Description	StationID	Collecting Entity	Monitoring Type	Inst. Flow	Est. Flow	E. coli Bacteria	FC Bacteria	Field	Justification for Station	POINT_X	POINT_Y
2304_02	16	UNNAMED MEXICAN DRAIN 1 METER UPSTREAM OF CONFLUENCE WITH RIO GRANDE APPROXIMATELY 145 METERS DOWNSTREAM OF US 81 BRIDGE IN LAREDO	13142	IB	BS			2	2	2	Existing station in Target Area	-99.505791	27.499674
2304_02	16	UNNAMED MEXICAN DRAIN 1 METER UPSTREAM OF CONFLUENCE WITH RIO GRANDE APPROXIMATELY 140 METERS DOWNSTREAM OF SAN DARIO BRIDGE LAREDO	13144	IB	BS			2	2	2	Existing station in Target Area	-99.501061	27.499963
2304_02	16	ZACATE CREEK 70 METERS UPSTREAM OF CONFLUENCE WITH RIO GRANDE WHICH IS 1.4 KM DOWNSTREAM OF US 81 BRIDGE CONVENT AVE	13140	IB	BS			2	2	2	U.S. Tributary in Target Area	-99.494143	27.499548
2304_02	16	RIO GRANDE 50 YD UPSTREAM OF CONFLUENCE OF ZACATE CREEK AND RIO GRANDE	13200	IB	BS		2	2	2	2	Routine Station	-99.494598	27.498808
2304_02	16	RIO GRANDE 1.1 MI DOWNSTREAM FROM HIGHWAY BRIDGE BETWEEN LAREDO AND NUEVO LAREDO	13698	IB	BS			2	2	2	Existing station downstream of Target Area	-99.491592	27.495873
2304_02	16	UNNAMED MEXICAN DRAIN 1 METER UPSTREAM OF CONFLUENCE WITH RIO GRANDE APPROXIMATELY 2.0 KM DOWNSTREAM OF SAN DARIO BRIDGE IN LAREDO	13148	IB	BS			2	2	2	Existing station downstream of Target Area	-99.485261	27.492543
2304_02	16	RIO GRANDE 50 METERS UPSTREAM OF CONFLUENCE WITH CHACON CREEK	13199	IB	BS			2	2	2	Existing station downstream of Target Area	-99.479918	27.486442
2304_02	16	CHACON CREEK 100 METERS UPSTREAM OF THE CONFLUENCE WITH RIO GRANDE IN SOUTHEAST LAREDO	13101	IB	BS			2	2	2	U.S. Tributary	-99.479196	27.486875
2304_02	16	RIO GRANDE 150 YD DOWNSTREAM OF CONFLUENCE OF CHACON CREEK AND RIO GRANDE	13198	IB	BS			2	2	2	Existing station downstream of Target Area	-99.479557	27.484654
2304_02	16	0.5 mile downstream of 13198	13198d	IB	BS			2	2	2	Downstream of Target Area	-99.480062	27.477668
2304_02	16	UNNAMED MEXICAN DRAIN 1 METER UPSTREAM OF CONFLUENCE WITH RIO GRANDE 5.1 KM DOWNSTREAM OF US 81 BRIDGE IN LAREDO	13155	IB	BS			2	2	2	Existing station downstream of Target Area	-99.482915	27.471079

Segment/ AU	Region	Station Description	StationID	Collecting Entity	Monitoring Type	Inst. Flow	Est. Flow	E. coli Bacteria	FC Bacteria	Field	Justification for Station	POINT_X	POINT_Y
2304_02	16	0.5 mile downstream of 13155	13155d	IB	BS			2	2	2	Downstream of Target Area	-99.485153	27.464147
2304_02	16	UNNAMED MEXICAN DRAIN 1 METER UPSTREAM OF CONFLUENCE WITH RIO GRANDE 7.6 KM DOWNSTREAM OF US 81 BRIDGE IN LAREDO	13158	IB	BS			2	2	2	Existing station downstream of Target Area	-99.493999	27.451907
2304_02	16	0.7 MILES DOWNSTREAM OF LAREDO NPDES PERMIT 10681-003	13158d	IB	BS			2	2	2	Downstream of Target Area	-99.49566	27.439072
2304_02	16	RIO GRANDE AT MASTERSON RD IN LAREDO 9.9KM DWNSTR INTL BRIDGE #1/WEST BRIDGE DWNSTR SOUTHSIDE WWTP AND UPSTREAM NUEVO LAREDO WWTP	15815	IB	BS		2	2	2	2	Routine Station	-99.49241	27.428475
2304_02	16	ARROYO EL COYOTE MEXICAN TRIBUTARY TO THE RIO GRANDE SAMPLED 1 METER UPSTREAM OF ITS CONFLUENCE WITH RIO GRANDE	13100	IB	BS			2	2	2	Mexican tributary	-99.490316	27.418312
2304_02	16	NLIWTP effluent	13100d	IB	BS			2	2	2	NLIWTP effluent	-99.489558	27.416976
2304_01	16	RIO GRANDE AT PIPELINE CROSSING 8.7 MI DOWNSTREAM LAREDO	13196	IB	BS		2	2	2	2	Routine Station	-99.489016	27.403689
2304_01	16	1 mile downstream of 13196	13196d1	IB	BS			2	2	2	Downstream of Target Area	-99.492591	27.389446
2304_01	16	2 miles downstream of 13196	13196d2	IB	BS			2	2	2	Downstream of Target Area	-99.496273	27.375347
2304_01	16	WEBB COUNTY WATER UTILITIES Intake	13196d3	IB	BS			2	2	2	Downstream of Target Area	-99.503169	27.365508
2304_01	16	1 mile downstream of Webb Intake at Mexican Tributary	13196d4	IB	BS			2	2	2	U.S. intake	-99.507502	27.351896
2304_01	16	RIO GRANDE AT RIO BRAVO 0.5KM DWNSTR OF THE COMMUNITY OF EL CENIZO	15816	IB	BS		2	2	2	2	Routine Station	-99.508477	27.33462
2304_01	16	1 mile downstream of 15816	15816d	IB	BS			2	2	2	Downstream of Target Area	-99.520135	27.325492
2304_01	16	RIO GRANDE NEAR ISLA MESTENO AT IRRIGATION PUMP 350 METERS DOWNSTREAM OF ISLA MESTENO 22.4 KM SOUTH OF LAREDO	13195	IB	BS			2	2	2	Existing station downstream of Target Area	-99.537686	27.316189
2304_01	16	1 mile downstream of 13195	13195d	IB	BS			2	2	2	Existing station downstream of Target Area	-99.526197	27.304689

Segment/ AU	Region	Station Description	StationID	Collecting Entity	Monitoring Type	Inst. Flow	Est. Flow	E. coli Bacteria	FC Bacteria	Field	Justification for Station	POINT_X	POINT_Y
2304_01	16	RIO GRANDE AT THE SAN ISIDRO PUMP STATION	13194	IB	BS			2	2	2	Existing station downstream of Target Area	-99.494096	27.267425
2304_01	16	RIO GRANDE AT WEBB/ZAPATA COUNTY LINE	15817	IB	BS		2	2	2	2	Routine Station	-99.45354	27.264922

Data for the stations already in SWQMIS will be reported to TCEQ for data upload and assessment. These stations are 13202, 13160, 13162, 13163, 13164, 13165, 13167, 15814, 13142, 13144, 13140, 13200, 13698, 13148, 13199, 13101, 13198, 13155, 13158, 15815, 13100, 13196, 15816, 13195, 13194, and 15817. All other points are temporary stations being sampled only for informational purposes for this study.

Figure 6 SS-B1.1 Sampling Site Map

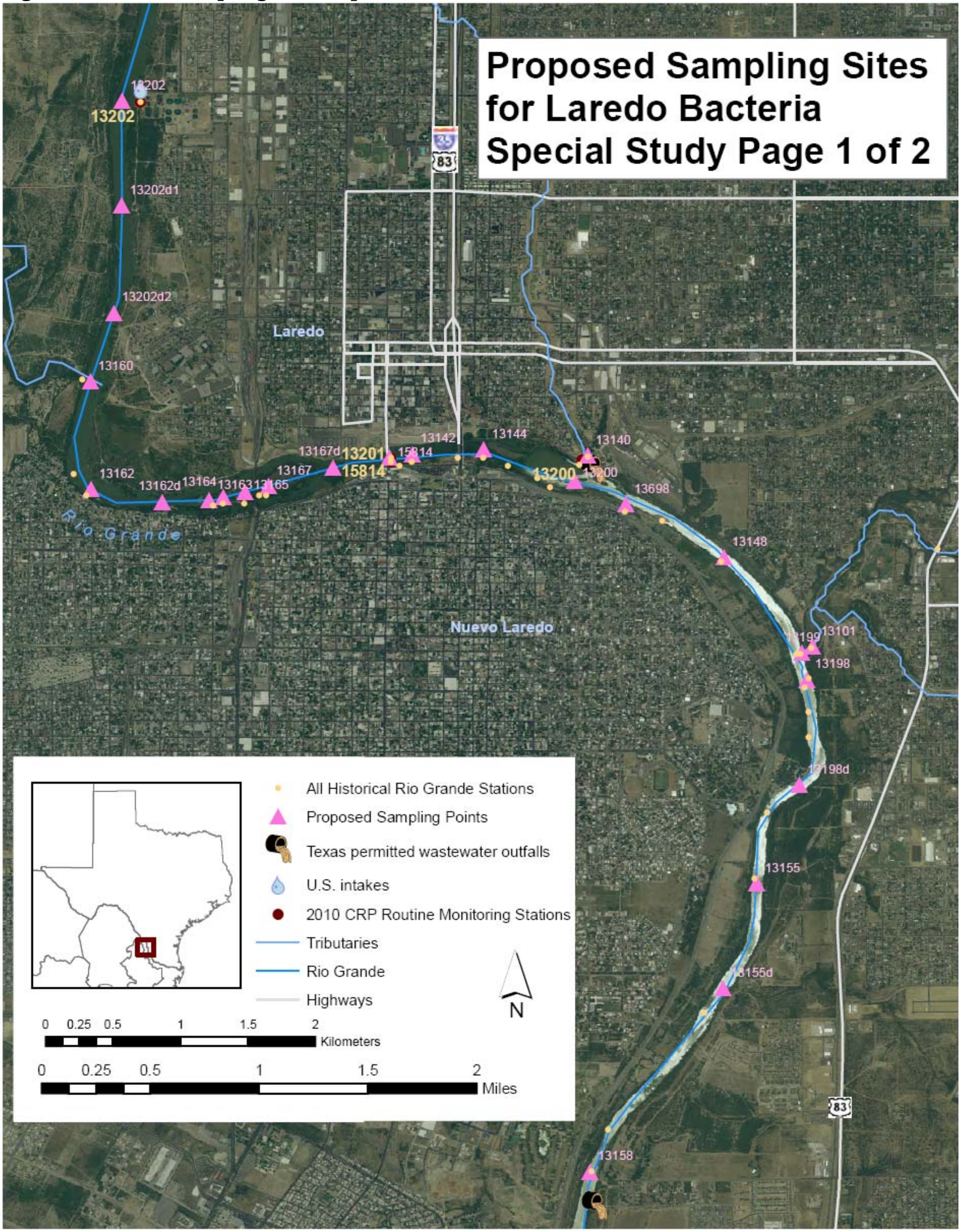
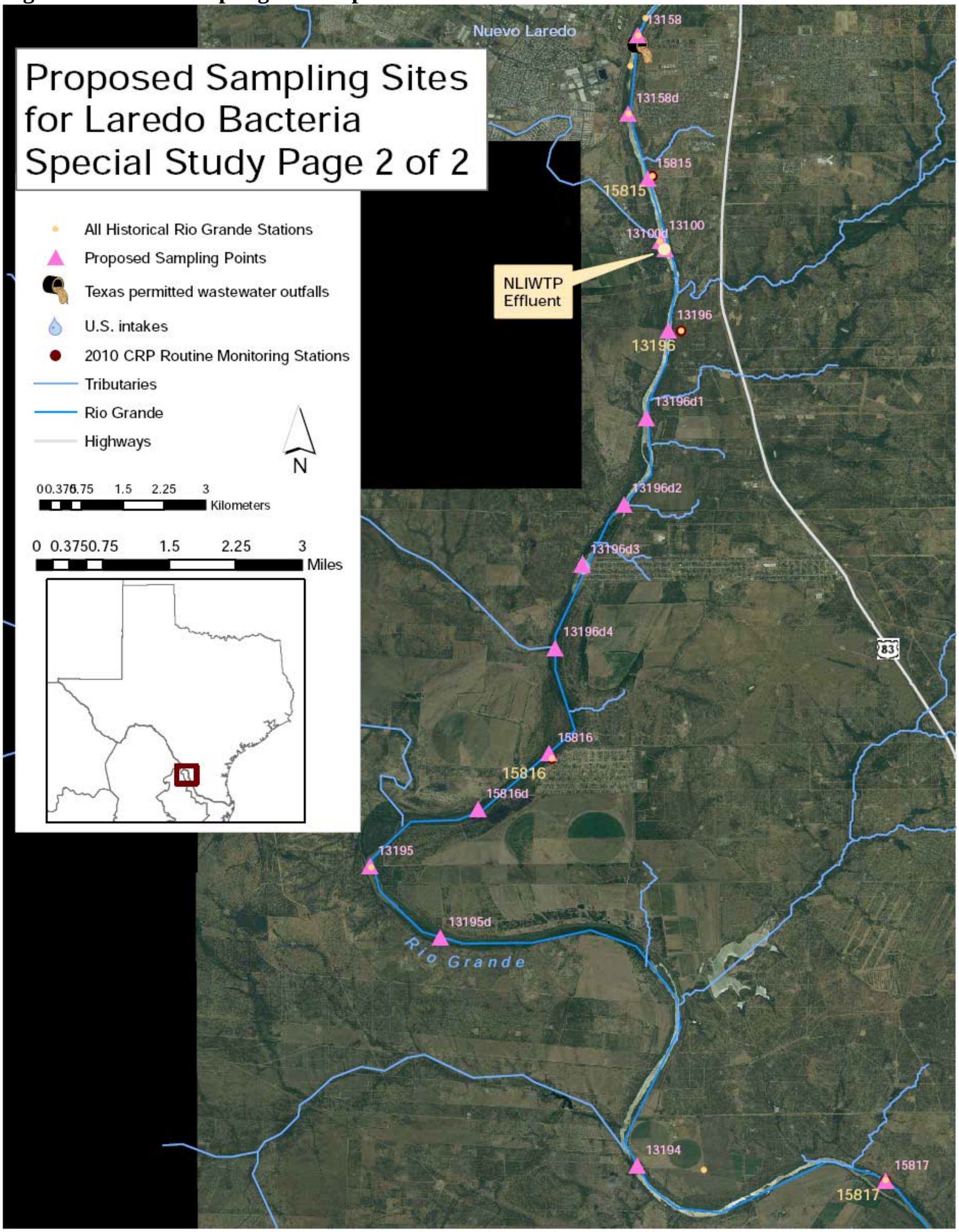


Figure 7 SS-B1.2 Sampling Site Map



Sample Design Rationale and Site Selection Criteria

The sample design rationale is based on the intent of the study to characterize the spatial distribution of the bacteria impairment in Segment 2304 by sampling at half-mile intervals between stations that have historically picked up high bacterial counts. To this end, 40 sites have been selected based on distance from beginning station 13202, with the intent to assess the progressive impairment along the water body and the impact of anthropogenic sources (i.e., wastewater and agricultural discharges). In addition, the study will include a survey of all structures and discharges in the study area.

SS-B2 SAMPLING METHODS

Field Sampling Procedures.

As described in Section B2 of the basin-wide QAPP.

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

As described below in Table SS-B2.

Table 3 SS-B2. Sample Storage, Preservation, and Handling Requirements

Parameter	Matrix	Container	Preservation	Sample Volume	Holding Time
E. coli bacteria (31699)	Water	Polystyrene	Cool to 4 C Sodium thiosulfate	120 ml	6-8 hours
Fecal Coliform (31616)	Water	Polystyrene	Cool to 4 C Sodium Thiosulfate	120 ml	6-8 hours

Sample Containers

Sample containers are delivered in coolers to Laredo by TAMIU staff or other study participant. Sterilized, shrink- banded 120 ml polystyrene vessels preserved with sodium thiosulfate.

Processes to Prevent Contamination

As described in Section B2 of the basin-wide QAPP.

Documentation of Field Sampling Activities

Field sampling activities are documented on the field data reporting forms shown on the next page. The following data will be recorded at each of the 34 stations:

1. Station ID and station description
2. GPS coordinates of special study station
3. Sampling Date and time
4. Sampling depth
5. Sample collector's name/signature
6. Values for field parameters shown in Table SS-A7.1
7. Detailed observational data such as water appearance, unusual odors, and more, as listed in the *TCEQ Surface Water Quality Monitoring Procedures Vol.1*

Recording Data

As described in Section B2 of the basin-wide QAPP.

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

As described in Section B2 of the basin- wide QAPP.

UNITED STATES INTERNATIONAL BOUNDARY AND WATER COMMISSION
TEXAS CLEAN RIVERS PROGRAM
RIO GRANDE BASIN
Special Study: Bacteria Characterization in Segment 2304

FIELD DATA REPORTING FORM

TAG#	SET #	SC1/SE	SC2/CE	MT
		I B	I B	B S

TCEQ STATION ID OR Special Study STATION ID	Latitude	Longitude	COLLECTOR (printed)
	Special Study Station GPS Coordinates		

Station Description____

GRAB SAMPLE

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

00010		WATER TEMP (deg C only)
00400		pH (SU)
00300		D.O. (mg/L)
00094		SPECIFIC CONDUCTANCE (uS/cm)
72053		DAYS SINCE LAST SIGNIFICANT PRECIPITATION
00061		INSTANTANEOUS FLOW (cfs)
89835		FLOW MEASUREMENT METHOD 1-Gage 2-Electric 3-Mechanical 4-Weir/flume 5-Doppler
74069		ESTIMATED FLOW (cfs)
89966		PRESENT WEATHER 1-clear 2- partly cloudy 3-cloudy 4-rain 5- other

Measurement Comments and Field Observations:

____

____

____

____

Signature of Collector: ___________________________________

Rev. 1/19/11

SS-B3 SAMPLING HANDLING AND CUSTODY

Sample Tracking

The Chain of Custody (COC) sheet for this study is shown on the following page. COC form will include date and time of collection, site identification, sample matrix, number of containers, preservative used, analyses required, name of collector, custody transfer signatures, and the shipping bill information. Additional information is provided in Section B3 of the basin-wide QAPP.

Sample Labeling

Samples from the field are labeled on the container or container label with a permanent marker. Label information includes: site identification and the date and time of sampling.

Sample Handling

As described in Section B3 of the basin-wide QAPP.

Sample Tracking Procedure Deficiencies and Corrective Action

As described in Section B3 of the basin-wide QAPP.

UNITED STATES INTERNATIONAL BOUNDARY AND WATER COMMISSION - TEXAS CLEAN RIVERS PROGRAM
RIO GRANDE BASIN PARTNER
WATER QUALITY CHAIN OF CUSTODY/REQUEST FOR ANALYSIS FORM
Special Study: Bacteria Characterization in Segment 2304

TAG#

Laredo Health Dept. Lab

LABORATORY

COC/LAB #

CHAIN OF CUSTODY

Released by (printed): ______________________

Signature: ________________________________

Date/Time: ________________________________

Received by (printed): ______________________

Signature: ________________________________

Date/Time: ________________________________

No. Of Containers: __________________________

Invoice Information: ________________________

CLIENT INFORMATION

Requested by: ______________________________

Collected by: ______________________________

Signature: ________________________________

Segment/Sequence: ____2304___________________

Matrix Type: ___water_______________________

Preservative used: __sodium thiosulfate________

Analysis Requested:

Conventionals			
Storet Code	Analyze if checked	Contract line no.	Parameter
31699	√		E. Coli bacteria
31619	√		Fecal coliform bacteria

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

Rev. 1/19/11

Special Study: Bacteria Characterization in Segment 2304 COC page 1 of 3

USIWBC - CRP CHAIN OF CUSTODY

Station ID	Site Description	Sample Collection Date	Sample Collection Time
13202	Rio Grande Laredo Water Treatment Plant Pump Intake		
13202d1	0.5 mi downstream of 13202		
13202d2	1 mile downstream of 13202		
13160	Unnamed Mexican Tributary to Rio Grande Approximately 2 River km Upstream of Missouri-Pacific Railroad Bridge in Laredo		
13162	Avenida Monterrey Drain 1 Meter Upstream of Confluence with Rio Grande 1.1 km Upstream of Missouri-Pacific Railroad Bridge in Laredo		
13162d	0.5 mile downstream of 13162		
13163	Nuevo Laredo Water Treatment Plant Return Flow Approximately 0.3 km Upstream of Missouri-Pacific Railroad Bridge in Laredo		
13164	Avenida America Drain 1 Meter Upstream of Confluence with Rio Grande 0.2 km Upstream of Missouri-Pacific Railroad Bridge in Laredo		
13165	Avenida Abasolo Drain 1 Meter Upstream of Confluence with Rio Grande 0.06 km Upstream of Missouri-Pacific Railroad Bridge in Laredo		
13167	Avenida Donato Guerra Drain 1 Meter From Confluence with Rio Grande 60 m Downstream of Missouri-Pacific Railroad Bridge in Laredo		
13167d	0.3 miles downstream of 13167		
15814	Rio Grande at International Bridge #2/East Bridge in Laredo		
13142	Unnamed Mexican Drain 1 meter Upstream of Confluence with Rio Grande Approximately 145 meters downstream of US 81 Bridge in Laredo		
13144	Unnamed Mexican Drain 1 meter Upstream of Confluence with Rio Grande Approximately 140 meters downstream of San Dario Bridge Laredo		
13140	Zacate Creek 70 meters Upstream of Confluence with Rio Grande Which is 1.4 km Downstream of US 81 Bridge Convent Ave.		
13200	Rio Grande 50 YD Upstream of Confluence of Zacate Creek and Rio Grande		
13698	Rio Grande 1.1 mile Downstream From Highway Bridge Between Laredo and Nuevo Laredo		
13148	Unnamed Mexican Drain 1 Meter Upstream of Confluence with Rio Grande Approximately 2.0 km Downstream of San Dario Bridge in Laredo		
13199	Rio Grande 50 Meters Upstream of Confluence with Chacon Creek		
13101	Chacon Creek 100 Meters Upstream of the Confluence with Rio Grande in Southeast Laredo		
13198	Rio Grande 150 YD Downstream of Confluence of Chacon Creek and Rio Grande		
13198d	0.5 mile downstream of 13198		
13155	Unnamed Mexican Drain 1 Meter Upstream of Confluence with Rio Grande 5.1 km Downstream of US 81 Bridge in Laredo		
13155d	0.5 mile downstream of 13155		
13158	Unnamed Mexican Drain 1 Meter Upstream of Confluence with Rio Grande 7.6 km Downstream of US 81 Bridge in Laredo		
13158d	0.7 Miles Downstream of Laredo NPDES Permit 10681-003		
15815	Rio Grande at Masterson Rd in Laredo 9.9 km Dwnstr of Intl Bridge #1/West Bridge Dwnstr Southside WWTP and Upstream Nuevo Laredo WWTP		

13100	Arroyo El Coyote Mexican Tributary to the Rio Grande Sampled 1 Meter Upstream of its Confluence with Rio Grande		
13100d	NLIWTP effluent		
13196	Rio Grande at Pipeline Crossing 8.7 mi Downstream Laredo		
13196d1	1 mile downstream of 13196		
13196d2	2 miles downstream of 13196		
13196d3	Webb County Water Utilities Intake		
13196d4	1 mile downstream of Webb Intake at Mexican Tributary		
15816	Rio Grande at Rio Bravo 0.5km Dwnstr of the Community of el Cenizo		
15816d	1 mile downstream of 15816		
13195	Rio Grande Near Isla Mesteno at Irrigation Pump 350 Meters Downstream of Isla Mesteno 22.4 km South of Laredo		
13195d	1 mile downstream of 13195		
13194	Rio Grande at the San Isidro Pump Station		
15817	Rio Grande at Webb/Zapata County Line		

Special Study: Bacteria Characterization in Segment 2304 COC page 3 of 3

SS-B4 ANALYTICAL METHODS

The analytical methods, associated matrices, and performing laboratories are listed in Table SS-A7.1 of Section SS-A7. 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. Laboratories collecting data under this QAPP are compliant with the NELAC standards. Copies of laboratory QMs and SOPs are available for review by the TCEQ.

Standards Traceability

As described in Section B4 of the basin-wide QAPP.

Analytical Method Deficiencies and Corrective Actions

As described in Section B4 of the basin-wide QAPP.

SS-B5 QUALITY CONTROL

Sampling Quality Control Requirements and Acceptability Criteria

As described in Section B5 of the basin-wide QAPP.

Laboratory Measurement Quality Control Requirements and Acceptability

As described in Section B5 of the basin-wide QAPP.

Quality Control or Acceptability Requirements Deficiencies and Corrective Actions

As described in Section B5 of the basin-wide QAPP.

SS-B6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION AND MAINTENANCE

As described in Section B6 of the basin-wide QAPP.

SS-B7 INSTRUMENT CALIBRATION AND FREQUENCY

As described in Section B7 of the basin-wide QAPP.

SS-B8 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

As described in Section B8 of the basin-wide QAPP.

SS-B9 NON-DIRECT MEASUREMENTS

This QAPP does not include the use of data obtained from non-direct measurement sources.

SS-B10 DATA MANAGEMENT

As described in Section B10 of the basin-wide QAPP.

SS-C1 ASSESSMENTS AND RESPONSE ACTIONS

As described in Section C1 of the basin-wide QAPP.

Corrective Action

As described in Section C1 of the basin-wide QAPP.

SS-C2 REPORTS TO MANAGEMENT

Reports to USIBWC Project Management

As described in Section C2 of the basin-wide QAPP.

Reports to TCEQ Project Management

As described in Section C2 of the basin-wide QAPP. A Report of this special study will be finalized after Phase II.

Reports by TCEQ Project Management

As described in Section C2 of the basin-wide QAPP.

SS-D1 DATA REVIEW, VERIFICATION, AND VALIDATION

As described in Section D1 of the basin-wide QAPP.

SS-D2 VERIFICATION AND VALIDATION

As described in Section D2 of the basin-wide QAPP.

SS-D3 RECONCILIATION WITH USER REQUIREMENTS

As described in Section D3 of the basin-wide QAPP.

Site Description	Station ID	sub seg	Region	SE	CE	MT	24 hr DO	AqHab	Benthics	Nekton	Met Wat	Org Wat	Met Sed	Org Sed	Conv	Amb Tox Wat	Amb Tox Sed	Bact	Flow	Fish Tissue	Field	Comments
KOKERNOT SPRINGS 105 METERS SOUTH 20 METERS EAST FROM THE INTERSECTION OF ALPINE CREEK AND HENDRYX DRIVE/HARRISON STREET/SH 223 | Map	20558	2311	6	IB	SL	RT						2		2	6						6	
Segment 2314 Rio Grande Above International Dam | Map																						
RIO GRANDE AT ANAPRA BRIDGE ON SUNLAND PARK DRIVE, 4.2KM UPSTREAM FROM AMERICAN DAM (IN NEW MEXICO) | Map	17040	2314	6	IB	EP	RT									4			4			4	Metals in water collected under SWQM QAPP
RIO GRANDE AT COURCHESNE BRIDGE, 1.7 MI UPSTREAM FROM AMERICAN DAM | Map	13272	2314	6	IB	IB	RT									12			12	12		12	partial conventional analysis
RIO GRANDE IMMED. UPSTREAM OF THE CONFL. WITH ANTHONY DRAIN EAST OF LA TUNA PRISON NEAR THE STATE LINE | Map	13276	2314	6	IB	IB	RT									4			4			4	In support of Paso del Norte Watershed Councils 319h grant
RIO GRANDE JUST DOWNSTREAM FROM VINTON BRIDGE NEAR ANTHONY | Map	13275	2314	6	IB	IB	RT									4			4			4	in support of Paso del Norte Watershed Councils 319h grant

Critical vs. non-critical measurement

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