Amendment # 3
to the Red River Authority of Texas'
Clean Rivers Program FY 2014-2015 QAPP

Prepared by the Red River Authority of Texas
In Cooperation with the
Texas Commission on Environmental Quality (TCEQ)

Questions concerning this QAPP should be directed to:

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Effective: Immediately Upon Approval by all Parties

JUSTIFICATION

This document details the changes made to the Authority's basin-wide Quality Assurance Project Plan to update **Appendix B** for FY-2015. Additionally, this document updates the field quality control activities and bacteria holding time requirements to match those of the TCEQ SWQM program, to ensure a consistent state-wide monitoring program.

SUMMARY OF CHANGES

Table B1.1 – Sample Design and Schedule

Table B1.1 is being modified to include the changes resulting from the Authority's annual Coordinated Monitoring Meeting, which was held at the Authority's Offices in Wichita Falls, Texas on March 26, 2014.

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

The maximum holding time for *E. coli* was updated to match changes to the TCEQ SWQM QAPP.

Section B5 – Quality Control

The language for Field Splits was updated to match changes to the TCEQ SWQM QAPP.

Appendix A – Measurement Performance Specifications

Appendix A was updated to reflect a new laboratory LOQ for ammonia and the maximum allowable holding time for *E. coli*.

Appendix B – Sample Design and Schedule

The following information in **Appendix B** is amended to reflect changes resulting from the Authority's annual Coordinated Monitoring Meeting, which was held at the Authority's Offices in Wichita Falls, Texas on March 26, 2014.

Appendix C – Station Location Maps

Canadian and Red River Basin Reach Maps were updated to reflect monitoring stations for FY 2015.

DETAIL OF CHANGES

Table B1.1 – Sample Design and Schedule

Table B1.1 is being modified to include the changes resulting from the Authority's annual Coordinated Monitoring Meeting, which was held at the Authority's Offices in Wichita Falls, Texas on March 26, 2014. The justification and summary of these changes have been compiled in the FY-2014 Coordinated Monitoring Meeting Summary.

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

The maximum holding time for *E. coli*, listed as Footnote 8 under **Table B2.1**, was changed from 48 hours to 30 hours.

Section B5 – Quality Control

The language for Field Splits in **Section B5** was reworded, removing the requirement for field splits during routine sampling.

Appendix A – Measurement Performance Specifications

The following table in **Appendix A** was amended to lower the laboratory LOQ for ammonia from 0.10 mg/L to 0.05 mg/L:

1. Table A7.1-C

The following tables in **Appendix A** were amended to allow a maximum holding time of 30 hours for *E. coli* samples:

1. Table A7.1-G
2. Table A7.1-H
3. Table A7.1-I

Appendix B – Sample Design and Schedule

The following information in **Appendix B** is amended to reflect changes to:

1. Sample design rationale FY-2015
2. Monitoring sites table with updated legends

Appendix C – Station Location Maps

Canadian and Red River Basin Reach Maps were updated to reflect monitoring stations for FY 2015.

These changes include removing the following stations from their respective reach maps:

1. Station 10106 from the Red River Basin Lower Reach I map
2. Station 21299 from the Red River Basin Reach II map
3. Station 10074 from the Red River Basin Reach V map

Additionally, the following stations were added to their respective reach maps:

1. Station 10137 to the Red River Basin Lower Reach I map
2. Station 18514 to the Red River Basin Lower Reach I map
3. Station 16037 to the Red River Basin Reach Reach IV map

DISTRIBUTION

These changes will be incorporated into the Authority's FY 2014-15 QAPP document and TCEQ, the Authority and all program participants will acknowledge and accept these changes by signing this amendment.

Red River Authority of Texas / Red River Authority of Texas Environmental Services Laboratory

Allen M. Pappas, Date 6/30/2014
Red River Authority Project Manager / Red River Authority CRP QA Officer
Red River Authority Laboratory QA Officer

Jill Simpson, Date 6/30/14
Red River Authority Laboratory Supervisor

City of Sherman / City of Sherman Laboratory

Wayne Kuse, Date 2 Jul 14
City of Sherman CRP Project Manager

Nathan Whiddon, Date 7-2-14
City of Sherman CRP QA Officer / City of Sherman Laboratory Supervisor

Nicole Moseley, Date 7-2-14
City of Sherman Laboratory QA Officer

North Texas Municipal Water District / North Texas Municipal Water District Laboratory

Elizabeth Turner, Date 7/7/14
NTMWD CRP Project Manager

Wayne Gilliland, Date 7/7/14
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North Texas Municipal Water District / North Texas Municipal Water District Laboratory (continued)

7/7/14
Ray Cotton, Date
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7/7/14
Russell Moody, Date
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Lower Colorado River Authority, ELS

7/9/14
Alicia Gill, Date
LCRA ELS Laboratory Manager

7/8/14
Roland Garcia, Date
LCRA ELS Quality Director

Texas Commission on Environmental Quality

7-18-2014
Allison Fischer, Date
CRP Project Manager / CRP Project QAS

7/18/2014
Patricia Wise, Date
CRP Group Leader

7/18/14
Daniel R. Burke, Date
CRP Lead QAS

The Authority 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 Authority 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.

B2 SAMPLING METHODS

Table B2.1 Sample Storage, Preservation and Handling Requirements

Parameter	Container[1]	Preservation[2]	Sample Volume[3]	Holding Time[4]
Bacteriological (Water)				
Enterococcus	I	Sodium Thiosulfate, Cool < 6°C	120mL/290 mL	6+2 Hours
Escherichia coli[8]	I	Sodium Thiosulfate, Cool < 6°C	120mL/290 mL	6+2 Hours
Conventionals and Minerals (Water)				
Alkalinity, Total	P or G	Cool < 6°C	1.0 L	14 Days
Chloride	P or G	Cool < 6°C	125 mL	28 Days
Solids (TSS and VSS)	P or G	Cool < 6°C	1.0 L	7 Days
Solids, Dissolved (TDS)	P or G	Cool < 6°C	250 mL	7 Days
Sulfate	P or G	Cool < 6°C	125 mL	28 Days
Turbidity	P or G	Cool < 6°C	250 mL	48 Hours
Nutrients (Water)				
Ammonia	P or G	Cool < 6°C,H2SO4 to pH<2	500 mL	28 Days
Chlorophyll *a* and Pheophytin	P or G Amber[6]	Unfiltered, Dark, Cool < 6°C	500 mL	48 Hours
		Filtered, Dark, Frozen - EPA		24 Days[7]
		Filtered, Dark, Frozen - SM		28 Days[7]
Chemical Oxygen Demand	P or G	Cool < 6°C, H2SO4 to pH<2	500 mL	28 Days
Nitrate +Nitrite	P or G	Cool < 6°C, H2SO4 to pH<2	500 mL	28 Days
Nitrate	P or G	Cool < 6°C	125 mL	48 Hours
Nitrite	P or G	Cool < 6°C	125 mL	48 Hours
Orthophosphate	P or G	Field Filtered[5], Cool < 6°C	125 mL	48 Hours
Total Organic Carbon[10]	P or G	Cool < 6°C, H2SO4 to pH<2	500 mL	28 Days
Total Kjeldahl Nitrogen	P or G	Cool < 6°C, H2SO4 to pH<2	500 mL	28 Days
Total Phosphorus	P or G	Cool < 6°C, H2SO4 to pH<2	500 mL	28 Days
Metals (Water)				
Hardness, Total	P or G	Cool < 6°C, HNO3 to pH<2	250 mL	6 Months
Iron, Total	P or G	Cool < 6°C, HNO3 to pH<2	500 mL	6 Months
Manganese, Total	P or G	Cool < 6°C, HNO3 to pH<2	500 mL	6 Months
Metals, Dissolved[9]	P or G	Cool < 6°C, HNO3 to pH<2	500 mL	6 Months

1. Glass (G), IDEXX (I) or Polyethylene (P).
2. Sample preservation is performed immediately upon sample collection.
3. Samples volumes are combined by preservative to minimize volumes and reduce container size and space.
4. Samples are analyzed as soon as possible after collection. The times listed are the maximum times that samples are held before sample preparation or analysis and still be considered valid.
5. Orthophosphate samples are field filtered within 15 minutes of sample collection. Individual filters are rinsed with collected sample prior to actual filling of the designated container.
6. Chlorophyll *a* and Pheophytin will be collected in amber containers.
7. Holding time for Chlorophyll-*a* was determined to be 24 days. EPA method 445, Section 8.3 states that samples can be analyzed up to 24 days after filtering, as long as they remain frozen. The 48 hours allotted for the samples to be filtered is not part of the 24 day holding time following filtration. NTMWD utilizes SM 10200 H for Chlorophyll-*a* and Pheophytin which has a different holding time compared to EPA method 445/446.
8. E.coli samples analyzed by SM 9223 B should always be processed as soon as possible and within 8 hours (6 hours transit/2 hours lab preparation) of sample collection. When transport conditions necessitate delays in delivery longer than 6 hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.
9. Metals, Dissolved includes aluminum, arsenic, copper, nickel and zinc.
10. NTMWD uses HCl for TOC preservation.

B5 QUALITY CONTROL

Field Split

Field split samples are not required as part of the routine Clean Rivers Program, but if needed, may be inserted into the sample regime. The frequency is determined by the needs of the project.

Red River Authority of Texas
Clean Rivers Program

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

Table A7.1-C Measurement Performance Specifications

Parameter	Units	Matrix	Method	Parameter Code	AWRL	Limit of Quantitation (LOQ)	LOQ Check Standard %Rec	Precision (RPD of LCS/LCSD)	Bias % Rec. of LCS	Lab
CONVENTIONAL PARAMETERS										
Alkalinity, Total (mg/L as $CaCO_3$)	mg/L	Water	SM 2320 B	00410	20	20	NA	20	NA	RR,
Carbon, Total Organic, NPOC (TOC) (mg/L)	mg/L	Water	SM 5310 B	00680	2	1	70-130	20	80-120	RR
Chemical Oxygen Demand, 0.025N $K_2CR_2O_7$ (mg/L)	mg/L	Water	HACH 8000	00335	10	10	70-130	20	80-120	RR
Chloride (mg/L as Cl)	mg/L	Water	EPA 300.0	00940	5	10[1]	70-130	20	80-120	RR
Chlorophyll-A, Fluorometric Method, (ug/L)	ug/L	Water	EPA 445.0	70953	3	2	NA	20	80-120	RR
Chlorophyll-A, Spectrophotometric Acid Method, (ug/L)	ug/L	Water	EPA 446.0	32211	3	2	NA	20	80-120	RR[3]
Nitrate Nitrogen, Total (mg/L as N)	mg/L		EPA 300.0	00620	0.05	0.05	70-130	20	80-120	RR
Nitrite Plus Nitrate-N, Total One Lab Determined Value (mg/L as N)	mg/L	Water	EPA 353.2	00630	0.05	0.05	70-130	15	90-110	RR
Nitrogen, Ammonia, Total (mg/L as N)	mg/L	Water	SM 4500-NH3D	00610	0.1	0.05	70-130	20	80-120	RR
Pheophytin-A, Fluorometric Method, (ug/L)	ug/L	Water	EPA 445.0	32213	3	2	NA	NA	NA	RR
Pheophytin-A, Spectrophotometric Acid Method, (ug/L)	ug/L	Water	EPA 446.0	32218	3	2	NA	NA	NA	RR[3]
Phosphorus, Total, Wet Method (mg/L as P)	mg/L	Water	SM 4500 P E	00665	0.06	0.06	70-130	20	80-120	RR
Residue, Total Dissolved, Unspec. Calculation Based on Conductivity (mg/L)	mg/L	Water	Calculation	70294	NA	NA	NA	NA	NA	RR
Residue, Total Filterable (Dried at 180°C) (mg/L)	mg/L	Water	SM 2540 C	70300	10	50[2]	NA	20	80-120	RR
Residue, Total Non-Filterable (mg/L)	mg/L	Water	SM 2540 D	00530	4	2.5	NA	20	NA	RR
Residue, Volatile Non-Filterable (mg/L)	mg/L	Water	EPA 160.4	00535	4	2.5	NA	NA	NA	RR
Sulfate (mg/L as SO_4)	mg/L	Water	EPA 300.0	00945	5	10[1]	70-130	20	80-120	RR
Turbidity, Lab Nephelometric Turbidity Units (NTU)	NTU	Water	SM 2130 B	82079	0.5	0.5	70-130	20	80-120	RR

RR – Red River Authority of Texas Notes

[1] The LOQ for chloride and sulfate is higher than the established AWRL since concentrations for these parameters are extremely high in both the Canadian and Red River Basins and values are typically not observed at concentrations below 10 mg/L.

[2] The LOQ for total dissolved solids (TDS) is higher than the established AWRL since concentrations for this parameter are extremely high in both the Canadian and Red River Basins and values are typically not observed at concentrations below 50 mg/L.

[3] Listed as a backup in case instrument error would prevent samples from being analyzed within specified holding times.

References:

1. United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
2. American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)
3. TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, 2012 (RG-415).
4. TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

Table A7.1-G Measurement Performance Specifications

Parameter	Units	Matrix	Method	Parameter Code	AWRL	Limit of Quantitation (LOQ)	LOQ Check Standard %Rec	Precision (RPD of LCS/LCSD)	Bias % Rec. of LCS	Lab
BACTERIOLOGICAL PARAMETERS										
E. coli, Colilert[2], IDEXX, Method, MPN/100mL	MPN/100 mL	Water	SM 9223 B	31699	1	1	NA	.5[1]	NA	RR
E. coli, Colilert[2] IDEXX, Holding Time	Hours	Water	NA	31704	NA	NA	NA	NA	NA	RR
Enterococci, Enteroloert, IDEXX, MPN/100 ML[3]	MPN/100 mL	Water	IDEXX Enterolert®	31701	10	10	NA	.5[1]	NA	RR

RR – Red River Authority of Texas Notes

1. This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B5.
2. *E. coli* samples analyzed by SM 9223-B should always be processed as soon as possible and within eight hours. When transport conditions necessitate delays in delivery longer than six hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.
3. Enterococcus Samples should be diluted 1:10 for all waters.

References:

1. United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
2. American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)
3. TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, 2012 (RG-415).
4. TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

Table A7.1-H Measurement Performance Specifications

Parameter	Units	Matrix	Method	Parameter Code	AWRL	Limit of Quantitation (LOQ)	LOQ Check Standard %Rec	Precision (RPD of LCS/LCSD)	Bias % Rec. of LCS	Lab
BACTERIOLOGICAL PARAMETERS										
E. coli, Colilert[2], IDEXX, Method, MPN/100mL	MPN/100 mL	Water	IDEXX Colilert®	31699	1	1	NA	.5[1]	NA	NM
E. coli, Colilert[2] IDEXX, Holding Time	Hours	Water	NA	31704	NA	NA	NA	NA	NA	NM

NM – North Texas Municipal Water District Notes

1. This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B5.
2. *E. coli* samples analyzed by SM 9223-B should always be processed as soon as possible and within eight hours. When transport conditions necessitate delays in delivery longer than six hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.

References:

1. United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
2. American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)
3. TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, 2012 (RG-415).
4. TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

Table A7.1-I Measurement Performance Specifications

Parameter	Units	Matrix	Method	Parameter Code	AWRL	Limit of Quantitation (LOQ)	LOQ Check Standard %Rec	Precision (RPD of LCS/LCSD)	Bias % Rec. of LCS	Lab
BACTERIOLOGICAL PARAMETERS										
E. coli, Colilert[2], IDEXX, Method, MPN/100mL	MPN/100 mL	Water	IDEXX Colilert®	31699	1	1	NA	.5[1]	NA	SH
E. coli, Colilert[2] IDEXX, Holding Time	Hours	Water	NA	31704	NA	NA	NA	NA	NA	SH

SH – City of Sherman Notes

1. This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B5.
2. *E. coli* samples analyzed by SM 9223-B should always be processed as soon as possible and within eight hours. When transport conditions necessitate delays in delivery longer than six hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.

References:

1. United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
2. American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)
3. TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, 2012 (RG-415).
4. TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2007 (RG-416)

Red River Authority of Texas
Clean Rivers Program

Appendix B:
Task 3 Work Plan and FY 2015 Sampling Process Design and Monitoring Schedule (Plan)

Sample Design Rationale FY 2015

The sample design is based on the legislative intent of the Clean Rivers Program. Under the legislation, the Basin Planning Agencies have been tasked with providing data to characterize water quality conditions in support of the *Texas Water Quality Integrated Report*, and to identify significant long-term water quality trends. Based on 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 Authority coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the Red and Canadian River Basins' watersheds.

Based on evaluations of previous assessments and screening efforts by the TCEQ and the Authority, the hydrologic subdivisions of each basin have been prioritized according to the level of concern. Utilizing the current *2012 Texas Water Quality Integrated Report*, a priority list was prepared and presented for discussion at the Authority's Annual Coordinated Monitoring Meeting with the other monitoring entities and the TCEQ. This meeting was based on the need to maximize monitoring efforts in an attempt to expend the limited resources as prudently as possible. This approach enables comprehensive monitoring to occur on a rotational reach basis and completely encompasses the basins within the five-year basin management cycle.

CANADIAN RIVER BASIN

Monitoring within the Canadian River Basin will remain the same as in FY-2014 for all participating entities. This is due to the lack of water present at other non-monitored stations and the need for additional data by the Texas Commission on Environmental Quality (TCEQ) at other monitoring stations in the Red River Basin. The Authority will not be adding any additional monitoring stations to its existing monitoring schedule. While it is the desire of the Authority to expand its monitoring efforts within the Canadian River Basin, the ongoing drought conditions have made water resources scarce, and have severely impacted the locations where water monitoring can be performed. It has been determined that a better use of CRP funds would be to expand monitoring within the Red River Basin where water is reliably present.

RED RIVER BASIN

While water is more prevalent in the Red River Basin, the monitoring stations for the basin will remain the same as in FY-2014 for all participating entities, with the following exceptions:

City of Sherman (SH)

The City of Sherman has no changes for FY-2015 and will follow the same monitoring schedule as in FY-2014.

North Texas Municipal Water District (NM)

The North Texas Municipal Water District has no changes for FY-2015 and will follow the same monitoring schedule as in FY-2014.

Red River Authority of Texas (RR)

The Authority will decrease monitoring events at three (3) monitoring stations. Data collection efforts at these three monitoring stations have been successful in determining potential sources of impairments and concerns within Segment 0214B and are no longer required on a monthly basis. Additionally, four (4) monitoring stations will be dropped from quarterly monitoring.

Sweetwater Creek at SH l52 is currently being monitored at two other locations (Station 10070 and Station

10072). Since there is only one assessment unit within Segment 0299A, the reduction in monitoring within this segment will not detract from future assessments. Panther Creek at US 82 has been monitored since September 2012 (FY-2013) with little success. The stream is typically not flowing or has very little flow. The Unnamed Tributary to Buffalo Creek below the City of Iowa Park WWTP has confirmed values previously obtained at Station 21172 and is no longer needed. Quarterly monitoring will continue at Station 21172 (Segment 0214F) and therefore the discontinuation of monitoring at Station 21299 will not detract from future assessments. Lastly, Lake Texoma near the South End of the Dam (Station 20545) will no longer be monitored by the Authority. Station 20545 is also monitored by the North Texas Municipal Water District (NM) on a monthly basis. NM's continued monitoring effort at Station 20545 will provide sufficient data during future assessments for 0203_01.

The following monitoring stations will have decreased monitoring visits:

Description	Station ID	FY-2014	FY-2015
Buffalo Creek at FM 1814	10097	12	4
Buffalo Creek at Coleman Park Road	16036	12	4
Unnamed Tributary of Buffalo Creek at Coleman Park Road	21172	12	4

The following monitoring stations will be removed from the Coordinated Monitoring Schedule:

Description	Station ID
Sweetwater Creek at SH 152	10074
Panther Creek at US 82	10106
Lake Texoma Near South End of Dam	20545
Unnamed Tributary to Buffalo Creek at WWTP	21299

The following monitoring stations will be added to the Coordinated Monitoring Schedule:

Description	Station ID
Lake Crook Mid-lake	10137
Little Pine Creek at FM 195	18514
LPDTF Red River at US 70	16037

FY 2014-15 Clean Rivers Program Work Plan Excerpt

TASK 3: WATER QUALITY MONITORING

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

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

Task Description: **Monitoring Description -** For FY 2014, the Authority will monitor and collect water quality samples for analysis from a minimum of 65 stations in the Canadian and Red River Basins. The monitoring schedule will be designed in such a way that a proportionate amount of sites will be visited each month allowing for the monitoring of each site once per season of the year.

In FY 2015, the Authority will monitor at a similar level of effort as in FY 2014. The actual number of sites, location, frequency, and parameters collected for FY 2014 will be based on priorities identified at the Basin Steering Committee and Coordinated Monitoring Meetings and included in the amended Appendix B schedule of the Authority's QAPP.

All monitoring procedures and methods will follow the guidelines prescribed in the most current versions of the Authority's 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 Authority will hold an annual Coordinated Monitoring meeting. Qualified monitoring organizations will be invited to attend the working meeting in which monitoring needs and purposes will be discussed segment by segment and station by station. Information from participants and stakeholders will be used to select stations and parameters that will enhance overall water quality monitoring coverage, eliminate duplication of effort, and address basin priorities. A summary of the changes will be provided to the participants within two weeks of the meeting. The changes to the monitoring schedule will be entered into the statewide database on the Internet (http://cms.lcra.org) and communicated to meeting attendees. Changes to monitoring 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.

Deliverables & Dues Dates:

September 1, 2013 through August 31, 2014

A. Conduct water quality monitoring, summarize activities, and submit with Progress Report – December 15, 2013; March 15 and June 15, 2014
B. Coordinated Monitoring Meeting – between March 15 and April 30, 2014
C. Coordinated Monitoring Meeting Summary of Changes – within 2 weeks of the meeting
D. Email notification that Coordinated Monitoring Schedule updates are complete – May 31, 2014

September 1, 2014 through August 31, 2015

A. Conduct water quality monitoring, summarize activities, and submit with Progress Report – September 15 and December 15, 2014; March 15 and June 15 and August 31, 2015
B. Coordinated Monitoring Meeting – between March 15 and April 30, 2015
C. Coordinated Monitoring Meeting Summary of Changes – within 2 weeks of the meeting
D. Email notification that Coordinated Monitoring Schedule updates are complete – May 31, 2015

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 TCEQ *SWQM Procedures Manual*. Overall consideration is given to accessibility and safety. All monitoring activities have been developed in coordination with the CRP Steering Committee and with the TCEQ. The site selection criteria set forth here may not apply to all programs. The site selection criteria specified are those the TCEQ would like considered in order to produce data which is complementary to that collected by the state and which can be used in assessments, etc. Other criteria may be considered and should be described.

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 in-stream 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.

TABLE B1.1
Sample Design and Schedule
FY 2015

Segment	TCEQ Region	Basin	Site Description	Station ID	Collecting Entity	Submitting Entity	Monitoring Type	24 Hr DO	Aq Hab	Benthics	Nekton	Metals Water	Organics Water	Metals Sed	Organics Sed	Conventional	Amb Tox Water	Amb Tox Sed	Indicator Bacteria	Inst. Flow	Fish Tissue	Field
0101	1	1	CANADIAN RIVER BRIDGE AT US 60-83 AT CANADIAN	10032	RR	RR	RT									4			4	4		4
0101	1	1	CANADIAN RIVER BRIDGE ON SH 70 NORTH OF PAMPA	10033	RR	RR	RT									4			4	4		4
0101A	1	1	DIXON CREEK AT SH 152 WEST OF RR2171 EAST OF BORGER	17045	RR	RR	RT									4			4	4		4
0101A	1	1	DIXON CREEK 150 M UPSTREAM OF HUTCHINSON COUNTY ROAD, UPSTREAM OF CANADIAN RIVER CONFLUENCE NE OF BORGER	10016	RR	RR	RT	3											3	3		3
0101B	1	1	ROCK CREEK 15 M DOWNSTREAM OF CHICKASAW RD BRIDGE IN ELECTRIC CITY NEAR BORGER	10024	RR	RR	RT									4			4	4		4
0101C	1	1	WHITE DEER CREEK AT JEEP TRAIL CROSSING APPROX 0.45 KM EAST OF THE DUNCAN RANCH COMPLEX AT THE END OF HUTCHINSON COUNTY ROAD 26	21174	RR	RR	RT									4			4	4		4
0102A	1	1	BIG BLUE CREEK 250 YDS UPSTREAM OF FM 1913 APPROXIMATELY 21 MI SE OF DUMAS	15270	RR	RR	RT									4			4	4		4
0103	1	1	CANADIAN RIVER BRIDGE AT US 87-287 NORTH OF AMARILLO	10054	RR	RR	RT												4	4		4
0103A	1	1	EAST AMARILLO CREEK 15 METERS UPSTREAM OF CITY OF AMARILLO RIVER ROAD WWTP OUTFALL	10017	RR	RR	RT									4			4	4		4

TABLE B1.1
Sample Design and Schedule
FY 2015

Segment	TCEQ Region	Basin	Site Description	Station ID	Collecting Entity	Submitting Entity	Monitoring Type	24 Hr DO	Aq Hab	Benthics	Nekton	Metals Water	Organics Water	Metals Sed	Organics Sed	Conventional	Amb Tox Water	Amb Tox Sed	Indicator Bacteria	Inst. Flow	Fish Tissue	Field
0103A	1	1	EAST AMARILLO CREEK IMMEDIATELY DOWNSTREAM OF US 287 NORTH OF AMARILLO	10018	RR	RR	RT									4			4	4		4
0103A	1	1	EAST AMARILLO CREEK AT LOOP 335 AND US 287 IN AMARILLO	21024	RR	RR	RT									4			4	4		4
0103A	1	1	THOMPSON PARK LAKE NORTH END OF NORTH LAKE 213 M W OF US 87 FRONTAGE RD AND 1.34 KM NORTH OF NE 24TH ST IN AMARILLO	15775	RR	RR	RT									4			4			4
0103C	1	1	UNNAMED TRIBUTARY OF WEST AMARILLO CREEK AT LOOP 335 EASTBOUND ACCESS ROAD 470 M EAST OF ITS INTERSECTION WITH FM/RM 1061 NORTHWEST OF AMARILLO	17056	RR	RR	RT									4			4	4		4
0104	1	1	WOLF CREEK BRIDGE AT SH 305 NORTH OF LIPSCOMB	10058	RR	RR	RT									4			4	4		4
0104	1	1	WOLF CREEK 50 M UPSTREAM OF FM 1454 APPROXIMATELY 27.4 KM/17 MI EAST OF LIPSCOMB	10059	RR	RR	RT									4			4	4		4
0201D	5	2	BARKMAN CREEK 35 M EAST OF RICHMOND RD OVERPASS/FM 599 0.97 KM NW OF FM 559/HOLLY CREEK ROAD INTERSECTION 11.5KM NW OF TEXARKANA	15059	RR	RR	RT									4			4	4		4
0201A	5	2	MUD CREEK AT US 259 3.1 KM NORTH OF DE KALB	15319	RR	RR	RT	4								4			4	4		4
0202	5	2	RED RIVER DOWNSTREAM LAKE TEXOMA AT US 259 9.3 KM NORTH OF US 259/FM 114 INTERSECTION 21 KM NORTH OF DEKALB	10125	RR	RR	RT									4			4	4		4

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0202	5	2	RED RIVER AT NORTHBOUND US 271 IN ARTHUR CITY 0.75 KM NORTH OF FM 197/US 271 INTERSECTION	10126	RR	RR	RT									4			4	4		4
0202	4	2	RED RIVER AT SH 78 355 M NORTHWEST OF FANNIN CR 200/SH 78 INTERSECTION AT TEXAS STATE LINE 10 KM NORTHEAST OF CITY OF RAVENNA	10127	RR	RR	RT									4			4			4
0202	4	2	RED RIVER AT US 75 NORTH OF DENISON	21031	RR	RR	RT									4			4	4		4
0202A	4	2	BOIS D' ARC CREED AT FM 1396 NORTHWEST OF HONEY GROVE	20167	NM	RR	RT					12				12			12	12		12
0202A	4	2	BOIS D'ARC CREEK AT FM 409 NORTHWEST OF HONEY GROVE	21029	NM	RR	RT					12				12			12	12		12
0202A	4	2	BOIS DARC CREEK AT FM 898/OAK HILL ROAD 1.4 KM NORTHEAST OF CITY OF WHITEWRIGHT	15036	RR	RR	RT									4			4	4		4
0202A	4	2	BOIS D'ARC CREEK AT SH 78 SOUTH OF BONHAM	18652	RR	RR	RT									4			4	4		4
0202C	5	2	PECAN BAYOU AT FM 1159 9.62 KM NORTHEAST OF CLARKSVILLE IN RED RIVER COUNTY	16001	RR	RR	RT									4			4	4		4
0202C	5	2	PECAN BAYOU AT BLANTON CREEK CEMETARY ROAD/RED RIVER CR 2235 11.65 KM NORTH OF CITY OF BAGWELL	14472	RR	RR	RT									4			4	4		4

TABLE B1.1
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Segment	TCEQ Region	Basin	Site Description	Station ID	Collecting Entity	Submitting Entity	Monitoring Type	24 Hr DO	Aq Hab	Benthics	Nekton	Metals Water	Organics Water	Metals Sed	Organics Sed	Conventional	Amb Tox Water	Amb Tox Sed	Indicator Bacteria	Inst. Flow	Fish Tissue	Field
0202D	5	2	PINE CREEK AT SOUTHBOUND US 271 APPROX 7.8 KM NORTH OF THE CITY OF PARIS PERMIT WQ001012-000 CAMPBELL SOUP SUPPLY COMPANY	10120	RR	RR	RT									4			4	4		4
0202D	5	2	SIX MILE CREEK AT FM 195 NORTHEAST OF PARIS	21298	RR	RR	RT									4			4	4		4
0202E	4	2	DEAN GILBERT LAKE NEAR THE DAM SOUTHWEST OF THE HWY 82 AND FM 1417 INTERSECTION IN SHERMAN TEXAS	21130	SH	RR	RT									4			4			4
0202E	4	2	POST OAK CREEK AT FIRST COUNTY ROAD CROSSING DOWNSTREAM SHERMAN WWTP 0.33 KM SOUTH OF E FM 1417/SH 11 INTERSECTION 5.75 KM SE OF SHERMAN	10114	SH	RR	RT									4			6	6		6
0202E	4	2	POST OAK CREEK AT FM 1417 0.25 KM WEST OF SH 11/FM 1417 INTERSECTION 5.3 KM SOUTHEAST OF SHERMAN	10115	SH	RR	RT									4			6	6		6
0202E	4	2	POST OAK CREEK AT FM 1417 0.95 KM SOUTH OF FM 1417/US 82 INTERSECTION 4.75 KM NORTHWEST OF SHERMAN	17599	SH	RR	RT									2			4	4		4
0202F	4	2	CHOCTAW CREEK AT SH 11 1.6 KM SOUTHEAST OF FM 1417/SH 11 INTERSECTION 7 KM SOUTHEAST OF SHERMAN	10111	SH	RR	RT									4			6	6		6
0202F	4	2	CHOCTAW CREEK AT LUELLA ROAD 7.3 KM SSE OF SHERMAN FIRST CROSSING UPSTREAM CONFLUENCE WITH POST OAK CREEK	10112	SH	RR	RT									4			6	6		6
0202F	4	2	CHOCTAW CREEK AT US 82 5.07KM DOWNSTREAM OF SH 56 EAST OF SHERMAN	18370	SH	RR	RT									4			6	6		6

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0202G	5	2	SMITH CREEK AT SOUTHBOUND US 271 385 M UPSTREAM OF THE CONFLUENCE WITH PINE CREEK 7 KM NORTH OF CITY OF PARIS	17044	RR	RR	RT					4				4			4	4		4
0202G	5	2	SMITH CREEK AT LAMAR CR 31700 NEAR CITY OF PARIS	21026	RR	RR	RT					4				4			4	4		4
0202G	5	2	SMITH CREEK AT LOOP 286/US 82 IN THE CITY OF PARIS	21027	RR	RR	RT					4				4			4	4		4
0202I	5	2	LITTLE PINE CREEK AT FM 195	18514	RR	RR	RT									4			4	4		4
0202O	4	2	PICKENS LAKE MID LAKE AT HERMAN BAKER PARK 1.0 KM EAST OF FM 1417 AND 700 M NORTHEAST OF END OF SOUTHRIDGE LANE SOUTHWEST OF SHERMAN	16945	SH	RR	RT									4			4			4
0202J	4	2	SAND CREEK AT SH 56 1.35 KM WEST OF SH 56/US 75 INTERSECTION WEST OF SHERMAN	15446	SH	RR	RT									2			4	4		4
0203	4	2	LAKE TEXOMA NEAR BIG MINERAL ARM 4.1KM EAST OF US 377/OXFORD DRIVE INTERSECTION 1.5 KM E OF WEST SHORE 15 KM NORTHWEST OF POTTSBORO	10130	RR	RR	RT									4			4			4
0202L	4	2	HONEY GROVE CREEK AT FANNIN CR 2770	21030	NM	RR	RT					12				12			12	12		12
0202M	4	2	LAKE BONHAM APPROX 265 METERS NORTH AND 165 METERS EAST OF THE INTERSECTION OF FM 273 AND WESTVIEW DRIVE	21032	NM	RR	RT					12				12			12			12

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Segment	TCEQ Region	Basin	Site Description	Station ID	Collecting Entity	Submitting Entity	Monitoring Type	24 Hr DO	Aq Hab	Benthics	Nekton	Metals Water	Organics Water	Metals Sed	Organics Sed	Conventional	Amb Tox Water	Amb Tox Sed	Indicator Bacteria	Inst. Flow	Fish Tissue	Field
0202N	5	2	HICKS CREEK APPROX 400 M UPSTREAM OF PINE CREEK CONFLUENCE AT PRIVATE ROAD 1.55 KM EAST OF US 271 10 KM NNE OF THE CITY OF PARIS	10121	RR	RR	RT									4			4	4		4
0202N	5	2	HICKS CREEK AT US 271 11 KM NORTH OF THE CITY OF PARIS	10122	RR	RR	RT									4			4	4		4
0203	4	2	LAKE TEXOMA AT US 377 O.42 KM NORTH OF TEXAS BANK ON US 377 8.05 KM NORTH OF GORDONVILLE	10131	RR	RR	RT									4			4			4
0203	4	2	LAKE TEXOMA-LITTLE MINERAL ARM AT BOAT RAMP AT SIMMONS SHORE IN PRESTON 4.5 KM E OF FM 120 5.5 KM N OF FM 406 12.5 KM NNW OF DENISON	15388	NM	RR	RT					12				12			12			12
0203	4	2	LAKE TEXOMA LITTLE MINERAL ARM SOUTHEAST OF PRESTON SHORE NEAR INTAKE STRUCTURE EQUIDISTANT BETWEEN SHORELINES 1.5 KM EAST OF FM 120	17480	RR	RR	RT									4			4			4
0203	4	2	LAKE TEXOMA 260 METERS DUE WEST FROM LAKE TEXOMA DAM 282 METERS EAST AND 392 METERS NORTH TO THE INTERSECTION OF FM 1310 AND NORTH SH 91 NORTH OF DENISON	20545	NM	RR	RT					12				12			12			12
0204	3	2	RED RIVER AT US 81 2.1 KM NORTH OF US 81/PARR ROAD INTERSECTION 6.5 KM NORTH OF RINGGOLD	10133	RR	RR	RT									4			4	4		4
0204	3	2	RED RIVER AT FM677 NORTHWEST OF SAINT JO	20168	RR	RR	RT									4			4	4		4
0204B	4	2	MOSS LAKE AT SPILLWAY 130 M WEST OF FM 1201 467 M NORTH OF FISH CREEK DAM INTAKE STRUCTURE 18.25 KM NORTHWEST OF GAINESVILLE	15447	RR	RR	RT									4			4			4

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0205	3	2	RED RIVER BRIDGE ON IH 44/US 277/US 281 313 M NORTHEAST OF TEXAS SHORE NEAR MID BRIDGE 4.0 KM NORTHEAST OF CITY OF BURKBURNETT	10134	RR	RR	RT									4			4	4		4
0205	3	2	RED RIVER AT US 183/US 70 N 10.5 KM NORTH NORTHEAST OF OKLAUNION	16733	RR	RR	RT									4			4	4		4
0205A	3	2	WILDHORSE CREEK AT US 281/277/IH44 3.1 KM NORTHEAST OF BURKBURNETT	10096	RR	RR	RT									4			4	4		4
0206	3	2	PRAIRIE DOG TOWN FORK RED RIVER AT SH 6 12.75 KM NORTH OF QUANAH	10135	RR	RR	RT									4			4	4		4
0206A	3	2	GROESBECK CREEK AT SH6 NORTH OF QUANAH	20166	RR	RR	RT									4			4	4		4
0206C	3	2	NORTH GROESBECK CREEK AT FM 1166 NORTHWEST OF QUANAH	21297	RR	RR	RT									4			4	4		4
0207	1	2	LOWER PRAIRIE DOG TOWN FORK RED RIVER AT US 62-83 3.4 KM NORTH OF US 83/RR 2465 INTERSECTION 16 KM NORTH OF CHILDRESS	10136	RR	RR	RT									4			4	4		4
0207	1	2	LOWER PRAIRIE DOG TOWN FORK RED RIVER AT SH 207 10 KM SOUTHWEST OF FM 2272/SH 207 INTERSECTION 30.45 KM SOUTH OF CLAUDE	13637	RR	RR	RT									4			4	4		4
0207	1	2	LOWER PRAIRIE DOG TOWN FORK RED RIVER AT US 70 70 M SOUTHWEST OF THE NORTHERN TIP OF SOUTHBOUND US 70 BRIDGE 26.4 KM NORTH OF TURKEY	16037	RR	RR	RT									4			4	4		4

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0207A	1	2	BUCK CREEK AT US 83 1.5 M NORTH OF US 83/SH 256 INTERSECTION 30.7 KM NORTH OF CHILDRESS 16.8 KM SOUTHWEST OF DODSON	15811	RR	RR	RT									4			4	4		4
0207A	1	2	BUCK CREEK IMMEDIATELY UPSTREAM OF RR 1547 IN COLLINGSWORTH COUNTY WEST OF WELLINGTON	20366	RR	RR	RT									4			4	4		4
0208	5	2	LAKE CROOK MID LAKE 0.88 KM SW OF 19TH STREET/OLD LAKE CROOK ROAD SOUTH INTERSECTION 200M W OF E SHORE 6.6 KM NNW OF CITY OF PARIS	10137	RR	RR	RT									4			4			4
0210	3	2	FARMERS CREEK RESERVOIR/NOCONA LAKE MID LAKE NEAR DAM 1.3 KM SW OF OAK SHORES ROAD/FM 2953 INTERSECTION 0.36 KM SOUTH OF MID DAM	10139	RR	RR	RT					4				4			4			4
0211	3	2	LITTLE WICHITA RIVER AT FM 2332 0.63 KM UPSTREAM FROM MOUTH AT RED RIVER CONFLUENCE 9.2 KM NORTHWEST OF RINGGOLD	10140	RR	RR	RT									4			4			4
0212	3	2	LAKE ARROWHEAD MID LAKE NEAR DAM 609 M SOUTH OF MID DAM 765 M SE OF LITTLE WICHITA R INTAKE STRUCTURE 14 KM NE OF SCOTLAND	10142	RR	RR	RT									4			4			4
0213	3	2	LAKE KICKAPOO NEAR MID DAM 521 M SOUTH OF NORTH FORK LITTLE WICHITA RIVER INTAKE STRUCTURE 13.8 KM SOUTH OF US 82/SH 25 INTERSECTION	10143	RR	RR	RT									4			4			4
0214	3	2	WICHITA RIVER AT FM 368 325 M NORTH OF FM 368/FM 1206 INTERSECTION 7.38 KM SOUTHWEST OF CITY OF IOWA PARK 9.15 KM NORTH OF HOLLIDAY	10154	RR	RR	RT									4			4	4		4
0214	3	2	WICHITA RIVER AT SH 25 1.3 KM NORTH OF SH 258/SH 25 INTERSECTION 14.5 KM NORTHWEST OF CITY OF HOLLIDAY	10155	RR	RR	RT									4			4	4		4

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0214	3	2	WICHITA RIVER AT FM 810 1.25 KM SOUTH OF FM 1740/FM 810 INTERSECTION 9.65 KM WEST OF BYERS	10145	RR	RR	RT									4			4	4		4
0214	3	2	WICHITA RIVER AT END OF EASTLAND LANE 0.75 KM SE OF RIVER ROAD/EASTLAND LANE INTERSECTION 5.5 KM NORTH NORTHEAST OF WICHITA FALLS	10148	RR	RR	RT									4			4	4		4
0214	3	2	WICHITA RIVER AT SH 240 345 M NORTHWEST OF SH 240/EASTSIDE DRIVE/FRONT STREET INTERSECTION IN WICHITA FALLS	10150	RR	RR	RT									4			4	4		4
0214A	3	2	BEAVER CREEK AT FM 2326 2.0 KM SOUTHWEST OF SH 25/FM 2326 INTERSECTION 22 KM NORTHWEST OF HOLLIDAY	15120	RR	RR	RT	5								4			4	4		4
0214A	3	2	BEAVER CREEK AT US 283/US183 2.23 KM SOUTH OF FM 1763/US 283 INTERSECTION 22.1 KM SOUTH SOUTHEAST OF VERNON	15121	RR	RR	RT									4			4	4		4
0214B	3	2	BUFFALO CREEK AT FM 1814/BELL ROAD 3.6 KM SOUTH OF CITY OF IOWA PARK	10097	RR	RR	RT									4			4	4		4
0214B	3	2	BUFFALO CREEK AT COLEMAN PARK ROAD2.95 KM SOUTHWEST OF IOWA PARK 1.7 KM UPSTREAM OF FM 368	16036	RR	RR	RT									4			4	4		4
0214C	3	2	HOLLIDAY CREEK AT HARDING STREET 97 M EAST OF WILLIAMS AVENUE/HARDING STREET INTERSECTION IN WICHITA FALLS	10095	RR	RR	RT									4			4	4		4
0214C	3	2	HOLLIDAY CREEK AT WICHITA FALLS COUNTRY CLUB GOLF COURSE APPROX 120 METERS NORTH AND 10 METERS WEST OF THE INTERSECTION OF BRIDWELL STREET AND 30TH STREET IN WICHITA FALLS	21025	RR	RR	RT									4			4	4		4

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0214E	3	2	SOUTH CANAL 80 M DOWNSTREAM OF LAKE DIVERSION SPILLWAY NEAR DUNDEE	18831	RR	RR	RT									4			4	4		4
0214F	3	2	UNNAMED TRIBUTARY OF BUFFLAO CREEK AT COLEMAN PARK ROAD DOWNSTREAM OF THE CITY OF IOWA PARK WWTP	21172	RR	RR	RT									4			4	4		4
0215	3	2	DIVERSION LAKE NEAR DAM 0.64 KM NORTHWEST OF SPILLWAY FACE 390 M WEST OF DAM EQUIDISTANT BETWEEN SHORELINES 22.8 KM WEST OF HOLLIDAY	10157	RR	RR	RT									4			4			4
0216	3	2	WICHITA RIVER AT US 183/US 283 NEAR LAKE KEMP DAM 10.7 KM NORTH US 82/US 283 INTERSECTION 9.8 KM NORTH OF MABELLE	10158	RR	RR	RT									4			4	4		4
0217	3	2	LAKE KEMP NEAR DAM 0.80 KM SW OF WATER INTAKE STRUCTURE AT WICHITA RIVER 0.72 KM NORTH OF WILLINGHAM LOOP 1.64 KM WEST OF US 283	10159	RR	RR	RT									4			4			4
0218	3	2	NORTH WICHITA RIVER AT FM 1919 5.25 KM NORTHWEST OF BAYLOR CR 129/FM 1919 INTERSECTION 16.8 KM NORTHWEST OF SEYMOUR	10161	RR	RR	RT									4			4	4		4
0218	3	2	NORTH WICHITA RIVER AT SH 6 19KM SOUTH OF CROWELL AND 7.5 KM NORTH OF TRUSCOTT	10162	RR	RR	RT									4			4	4		4
0218	3	2	NORTH FORK WICHITA RIVER 6 KM DOWNSTREAM OF COTTONWOOD CREEK 2.04KM UPSTREAM OF COTTLE CR 493 NEAR PADUCAH	15119	RR	RR	RT									4			4	4		4
0218A	3	2	MIDDLE WICHITA RIVER 240 M UPSTREAM OF FARRER CREEK 24.25KM EAST OF US 83/FM 1168 INTERSECTINO 30.15 KM NORTHEAST OF GUTHRIE	14900	RR	RR	RT									4			4	4		4

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0219	3	2	LAKE WICHITA NEAR MID DAM 376 M SE OF END OF CITY ACCESS RD IN WICHITA FALLS 2.94KM SW OF SOUTHWEST PKWY/LAKE PARK DR INTERSECTION	10163	RR	RR	RT									4			4			4
0220	3	2	PEASE RIVER AT FM 104/RR 104 16.7 KM SOUTH OF KIRKLAND	10167	RR	RR	RT									4			4	4		4
0222	1	2	SALT FORK RED RIVER 80 M DOWNSTREAMM OF US 83 AT SOUTH BANK 11 KM NORTH OF WELLINGTON	10171	RR	RR	RT									4			4	4		4
0224	1	2	NORTH FORK RED RIVER AT US 83 4.25 KM NORTH OF SHAMROCK	10178	RR	RR	RT									4			4	4		4
0224A	1	2	MCCLELLAN CREEK AT SH 273 0.22 KM SOUTH OF SH 273/HUDGINS ROAD INTERSECTION 10.5 KM NORTH OF CITY OF MCLEAN	10064	RR	RR	RT									4			4	4		4
0226	3	2	SOUTH FORK WICHITA RIVER AT SH 6 6.7 KM NORTH OF BENJAMIN	10185	RR	RR	RT									4			4	4		4
0230	3	2	PEASE RIVER AT US 287 0.91 KM SOUTHEAST OF RR 925/US 287 INTERSECTION 4.6 KM NORTHWEST OF DOWNTOWN VERNON	10166	RR	RR	RT									4			4	4		4
0230	3	2	UPPER PEASE/NORTH FORK PEASE RIVER AT US 283 3 KM NORTH OF VERNON	10165	RR	RR	RT									4			4	4		4
0230A	3	2	PARADISE CREEK AT US 287 3.75 KM EAST OF VERNON	10094	RR	RR	RT									4			4	4		4

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0299A	1	2	SWEETWATER CREEK AT RR 592/FM 592 3.33 KM NORTH OF SH 152/RR 592 INTERSECTION 14.15 KM EAST OF WHEELER	10070	RR	RR	RT									4			4	4		4
0299A	1	2	SWEETWATER CREEK AT US 83 6.25 KM NORTH NORTHWEST OF WHEELER	10072	RR	RR	RT									4			4	4		4

Segment: River Segment where station is located
TCEQ Region: TCEQ Region where station is located
Basin: (1) – Canadian River Basin / (2) – Red River Basin
Site Description: Description of sampling site
Station ID: TCEQ Station ID number
Collecting Entity: Entity conducting surface water quality monitoring activities
RR – Red River Authority of Texas
SH – City of Sherman
NM – North Texas Municipal Water District
Submitting Entity: Entity responsible for submitting water quality data provided by the Collecting Entity to TCEQ
Metals Water: Samples collected by NTMWD will be analyzed by NTMWD. Sample collected by the Red River Authority will be analyzed by LCRA
Conventional: Samples of nutrients and minerals collected and analyzed by the laboratory
Inst. Flow: Instantaneous flow measurement taken at the time of sampling
Field: Parameters measured in the field; i.e. temperature, pH, dissolved oxygen, conductivity, etc.

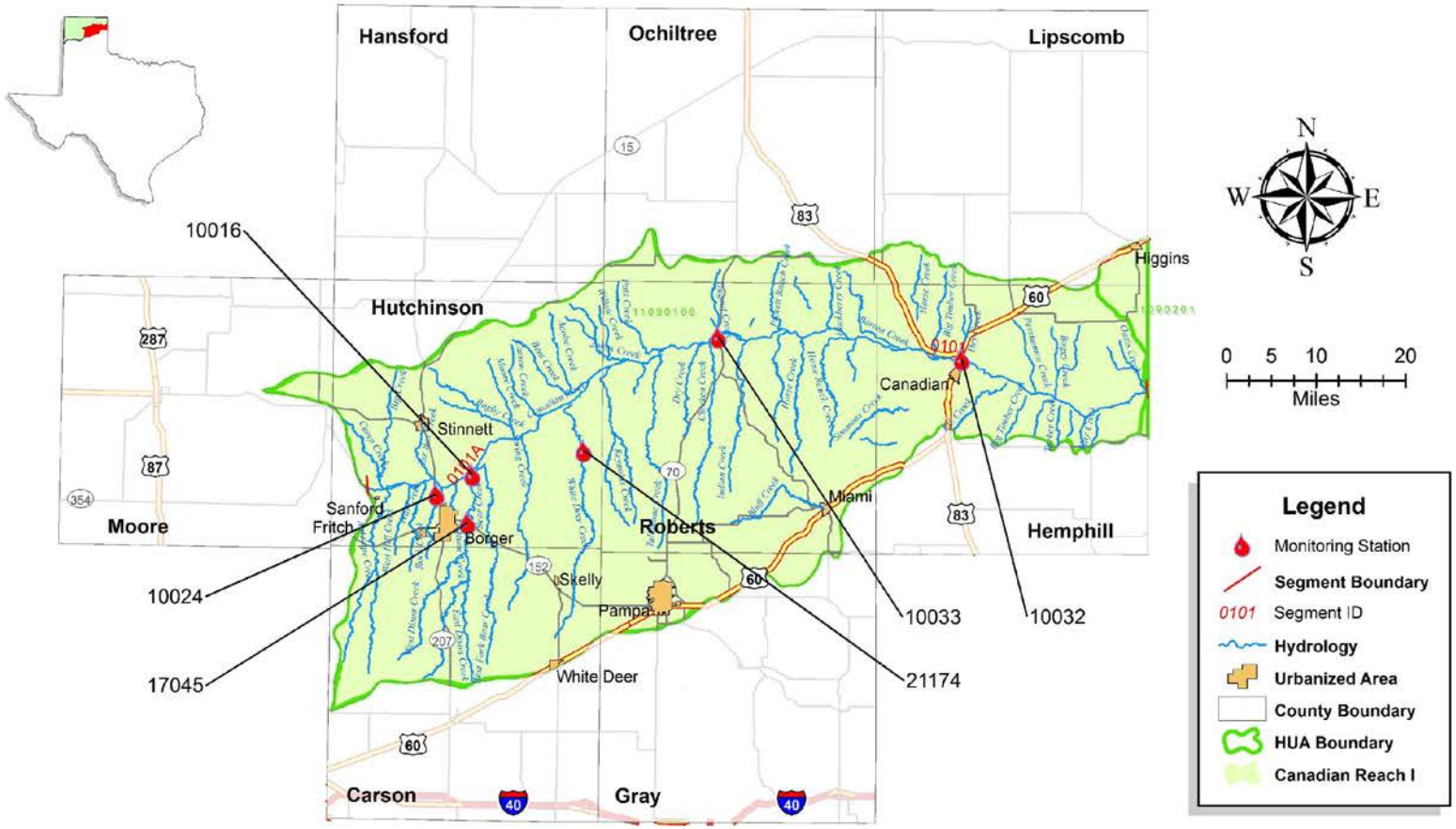
Critical vs. Non-critical Measurements

All data collected under this QAPP and entered into SWQMIS are considered critical.

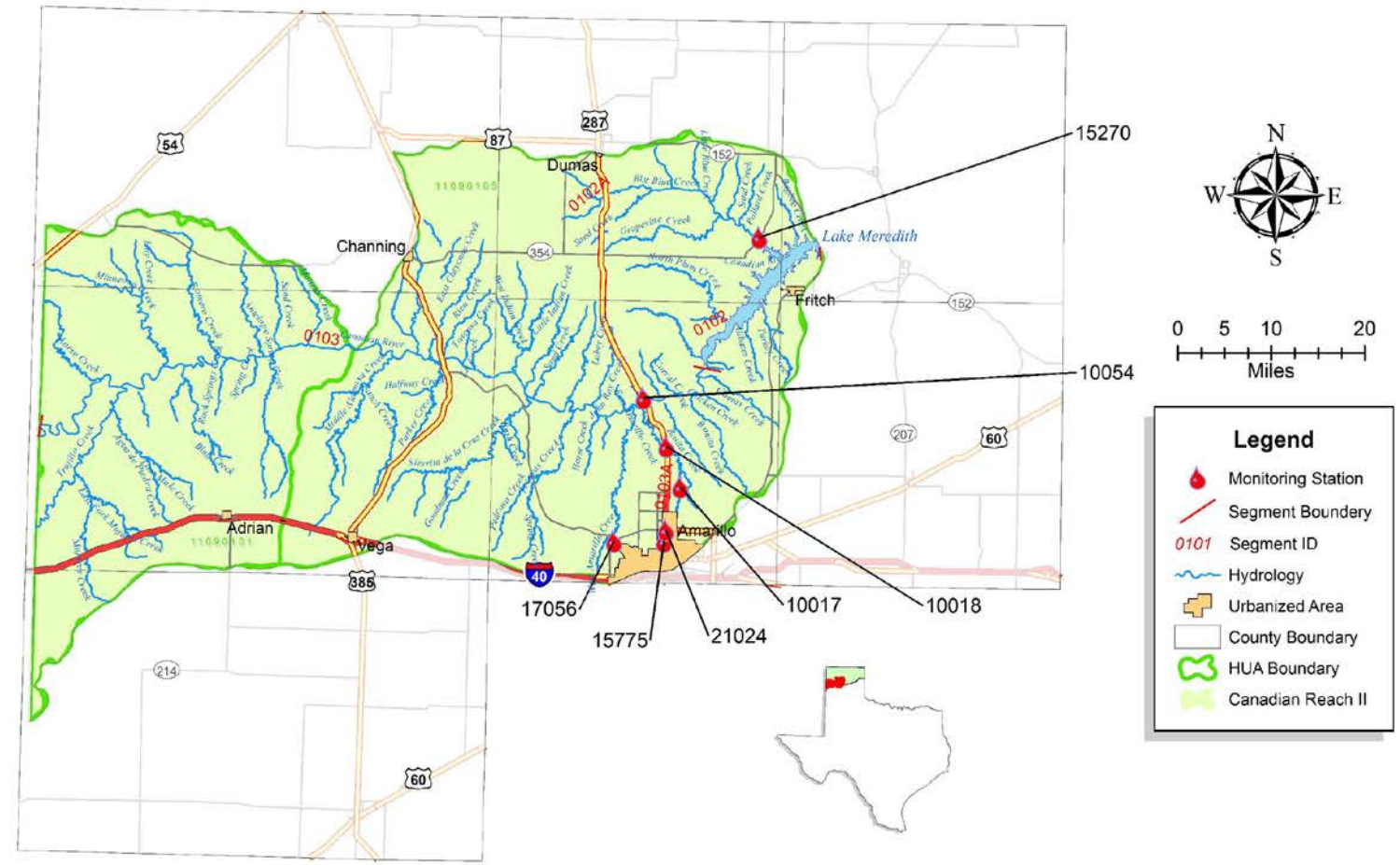
Red River Authority of Texas
Clean Rivers Program

Appendix C:
Station Location Maps

Canadian River Basin
Reach I
FY2015



Canadian River Basin
Reach II
FY2015



Canadian River Basin
Reach III
FY2015

N
W E
S

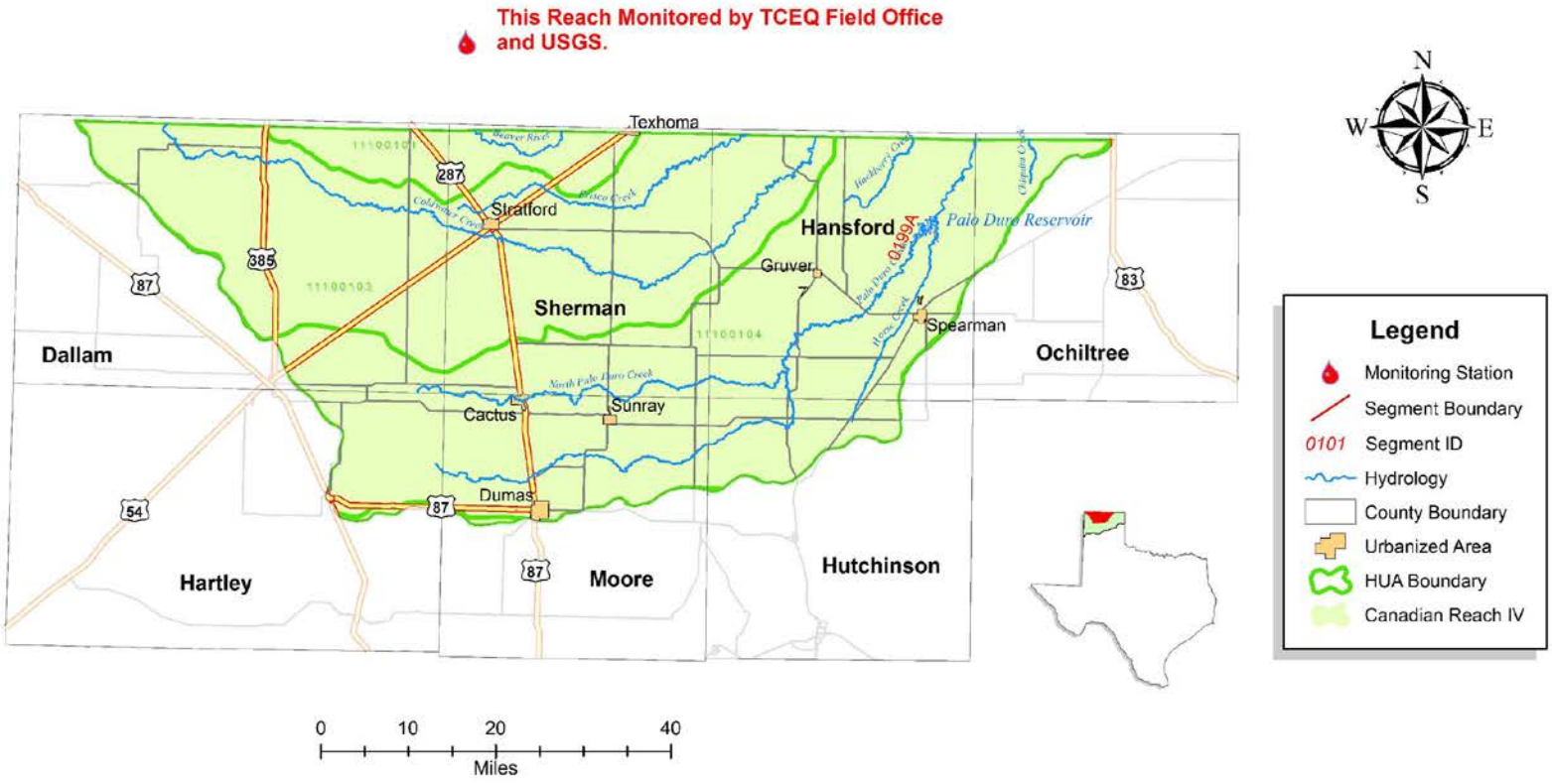
0 4.75 9.5 19
Miles

Legend

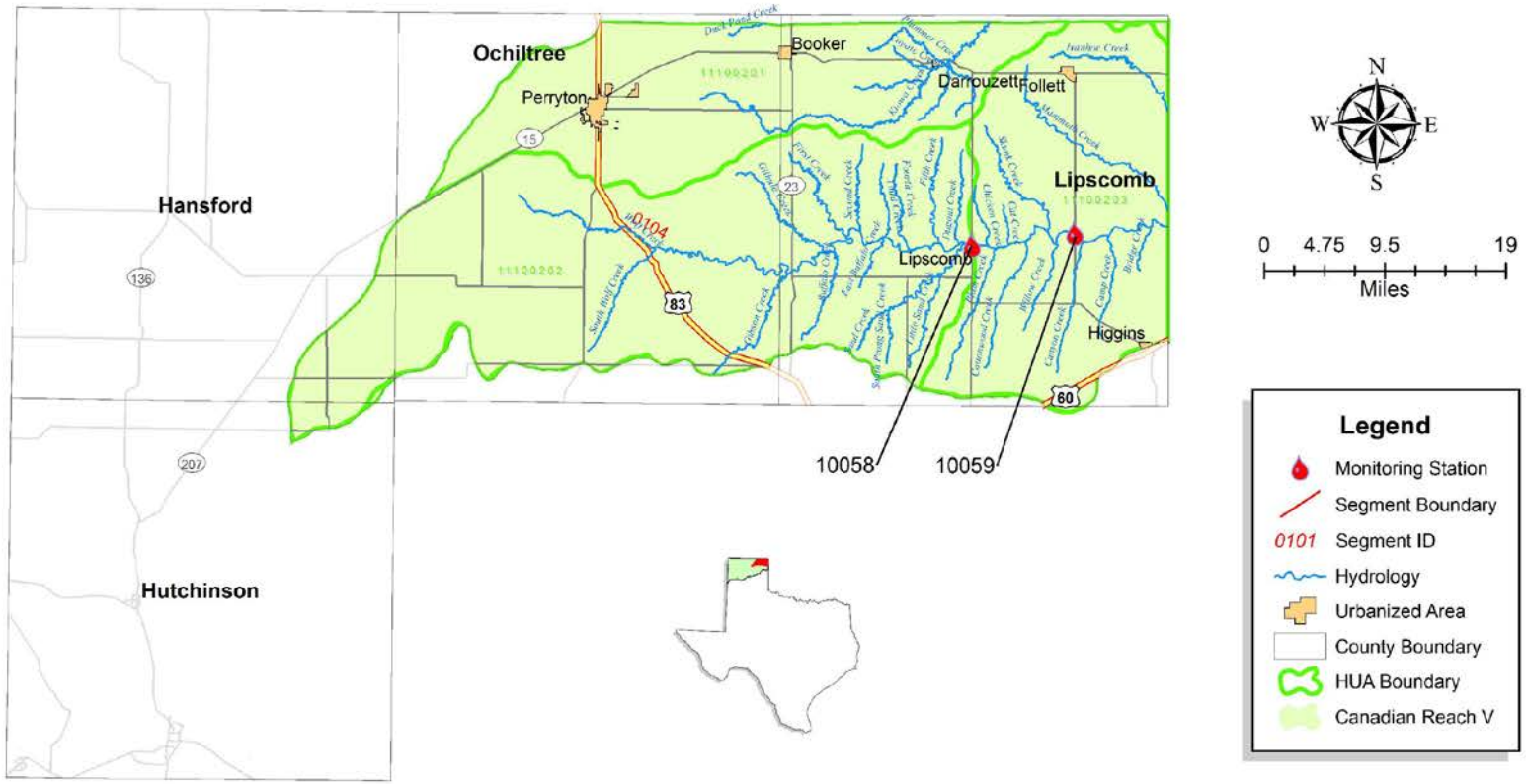
- Monitoring Station
- Segment Boundary
- 0101 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Canadian Reach III

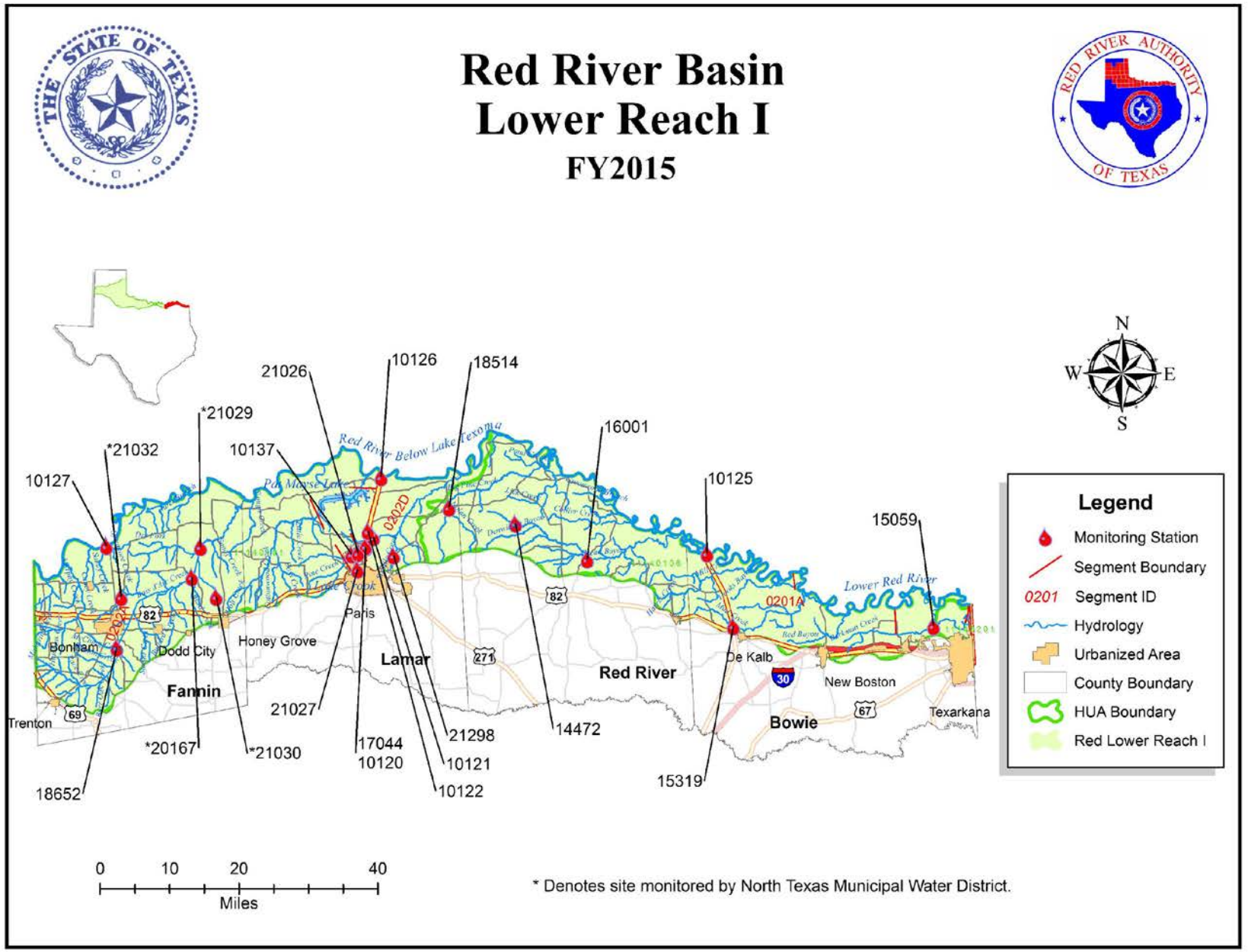
This Reach Monitored by TCEQ Field Office.

Canadian River Basin
Reach IV
FY2015

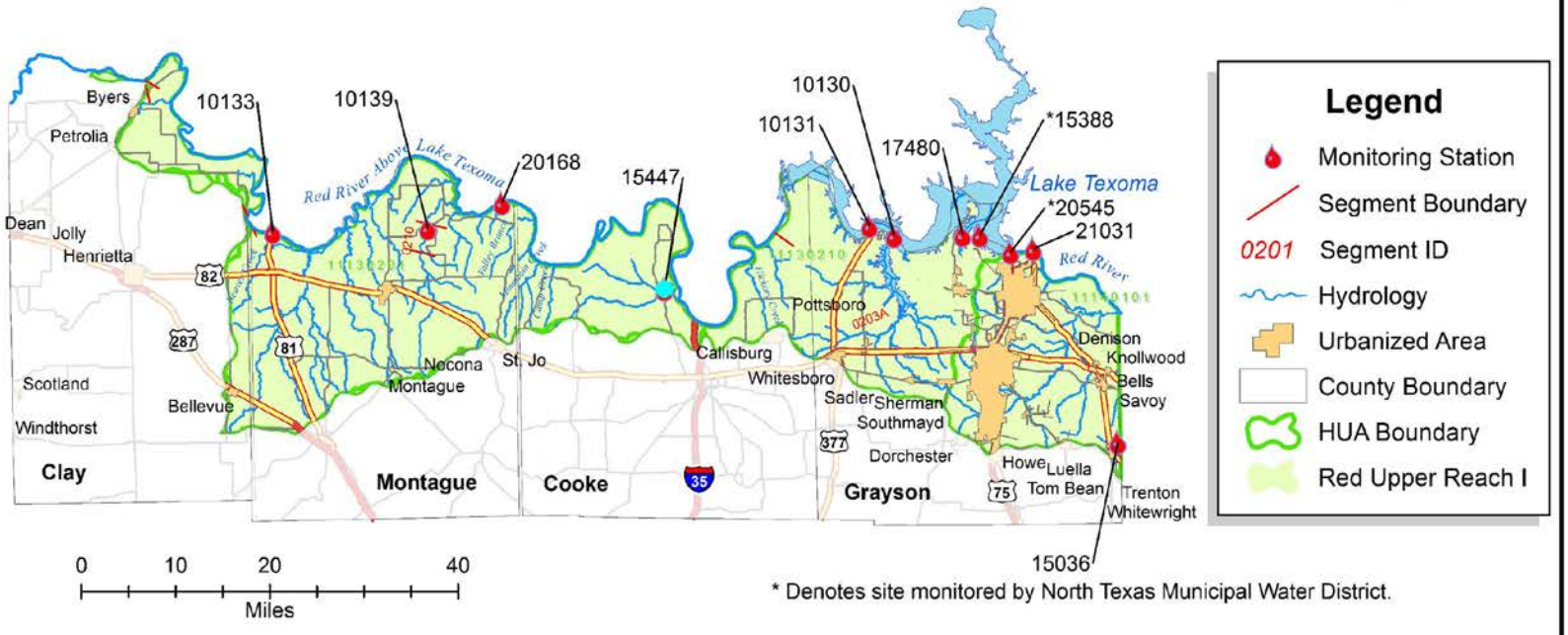


Canadian River Basin
Reach V
FY2015

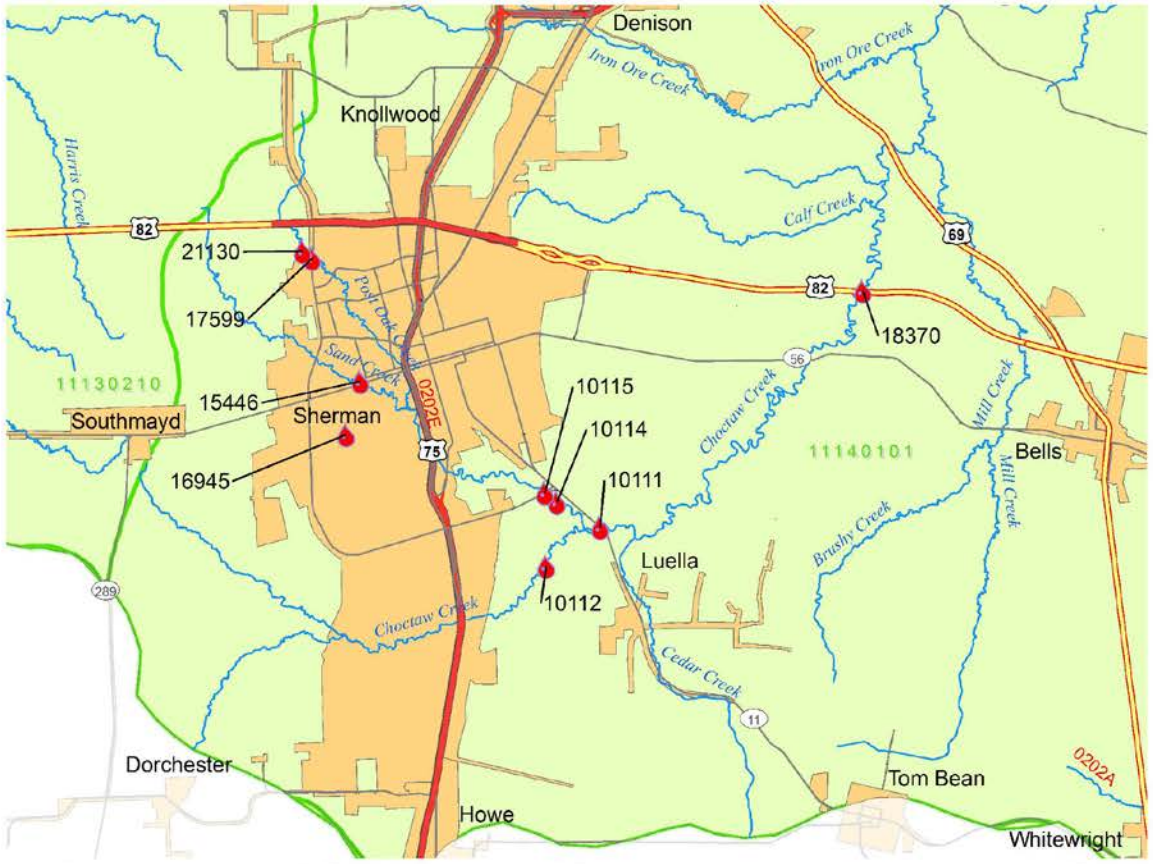



Red River Basin
Lower Reach I
FY2015
THE STATE OF TEXAS
RED RIVER AUTHORITY OF TEXAS
N
W
E
S
Legend
Monitoring Station
Segment Boundary
0201 Segment ID
Hydrology
Urbanized Area
County Boundary
HUA Boundary
Red Lower Reach I
21026
10126
18514
*21029
16001
*21032
10137
10125
10127
15059
Red River Below Lake Texoma
Lower Red River
0202D
0201A
Paris
Lamar
Red River
Fannin
Bonham
Dodd City
Honey Grove
De Kalb
New Boston
Bowie
Texarkana
Trenton
82
271
30
67
69
21027
*20167
*21030
17044
10120
21298
10121
10122
14472
18652
15319
0 10 20 40
Miles
* Denotes site monitored by North Texas Municipal Water District.

Red River Basin
Upper Reach I
FY2015



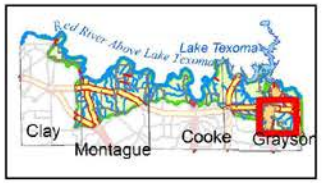
Red River Basin
Upper Reach I
(Sites Monitored by City of Sherman)
FY2015



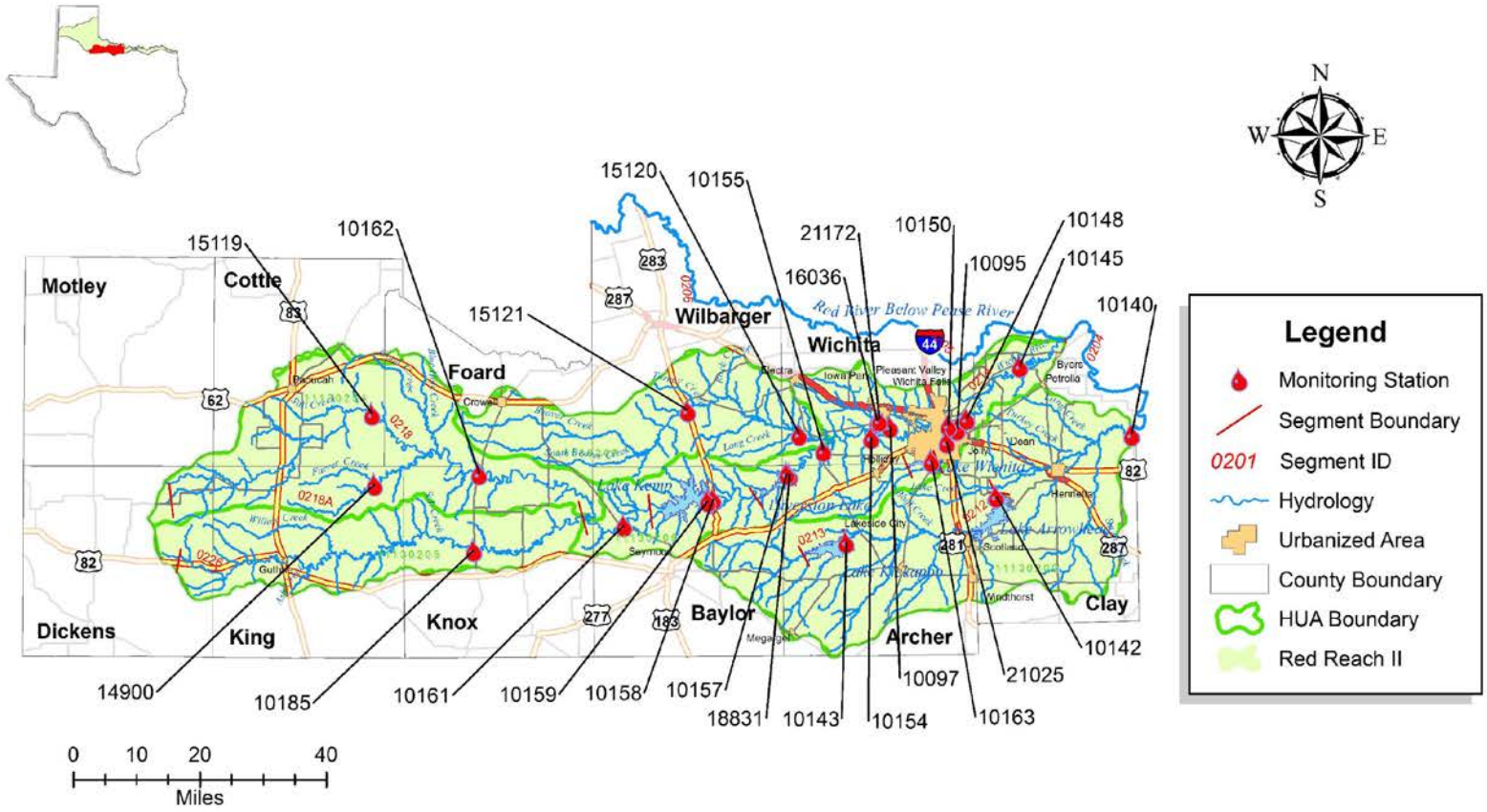
N
W E
S

Legend

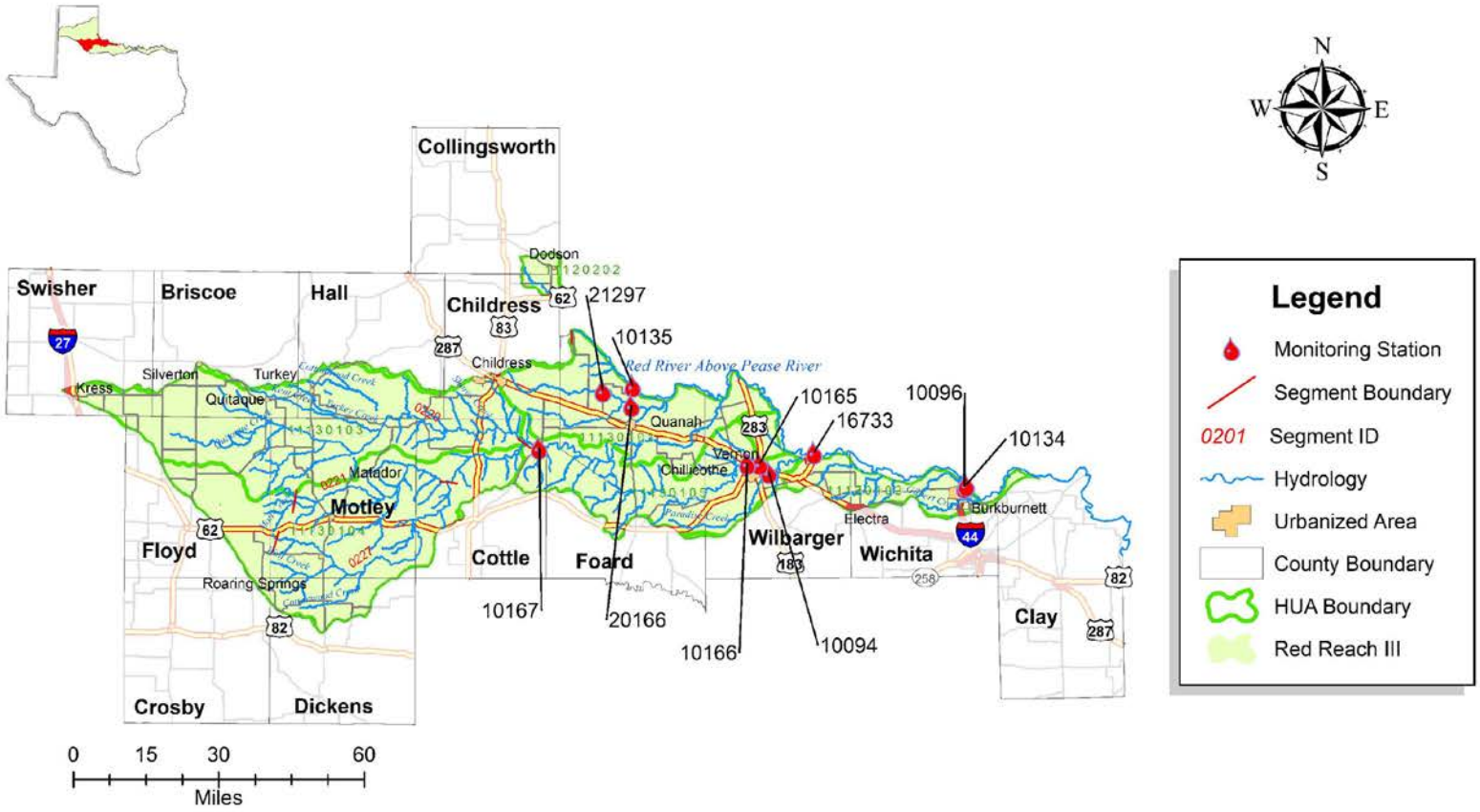
- Monitoring Station
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Upper Reach I

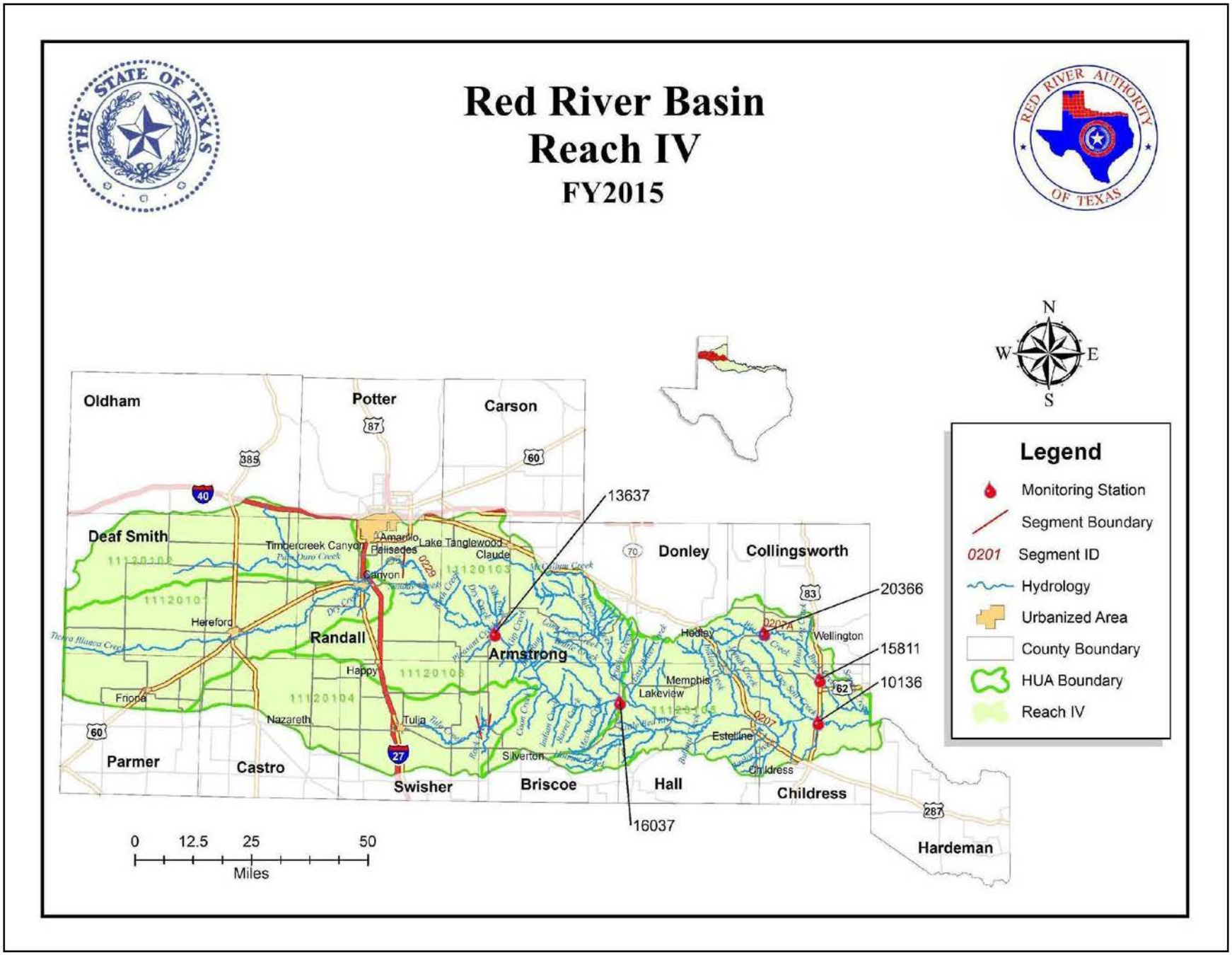


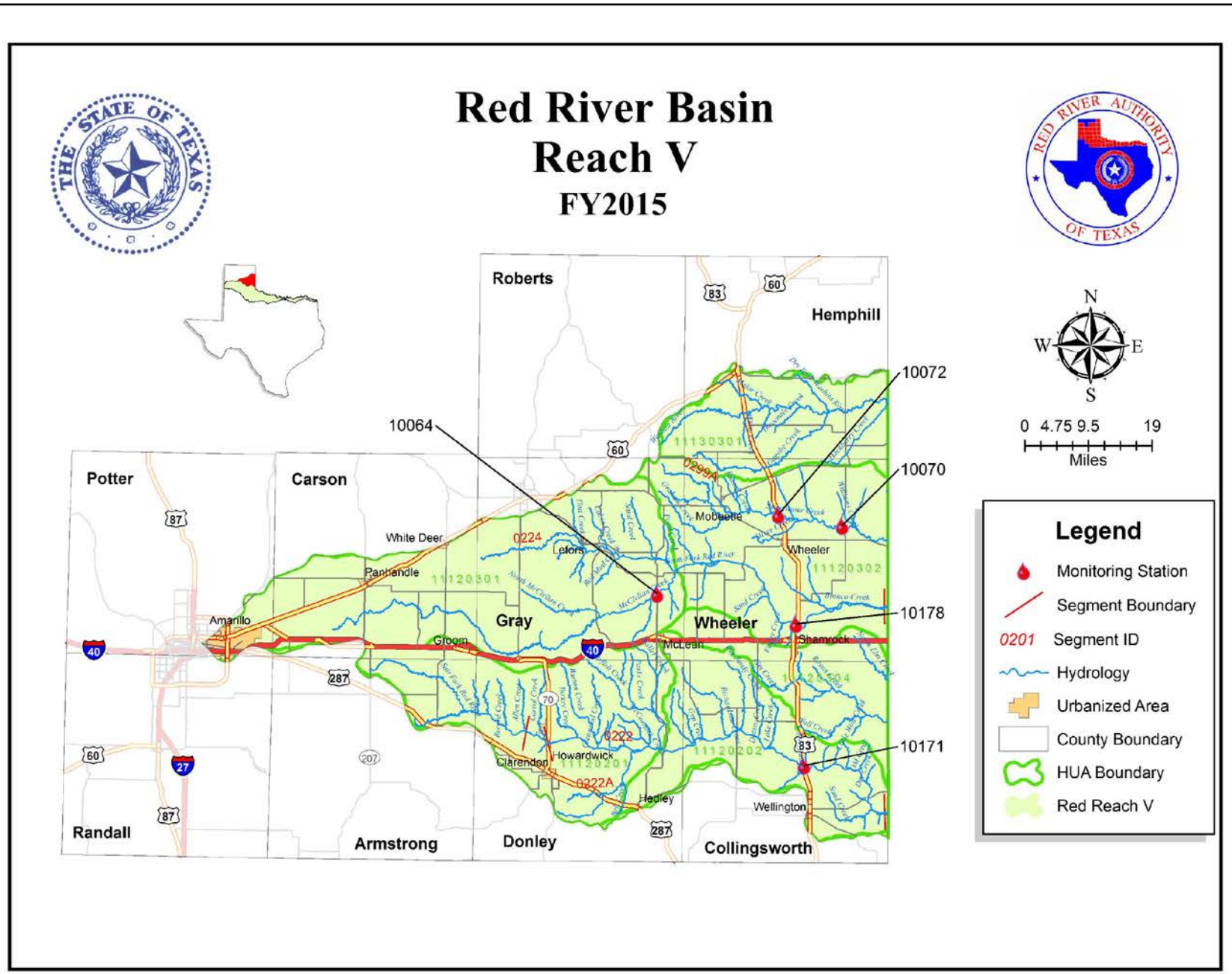
Red River Basin
Reach II
FY2015



Red River Basin
Reach III
FY2015




Red River Basin
Reach IV
FY2015
THE STATE OF TEXAS
RED RIVER AUTHORITY OF TEXAS
N
W
E
S
Legend
Monitoring Station
Segment Boundary
0201 Segment ID
Hydrology
Urbanized Area
County Boundary
HUA Boundary
Reach IV
13637
20366
15811
10136
16037
Oldham
Potter
Carson
Deaf Smith
Randall
Armstrong
Donley
Collingsworth
Hall
Childress
Hardeman
Briscoe
Swisher
Castro
Parmer
Hereford
Amarillo
Canyon
Claude
Memphis
Hedley
Wellington
Estelline
Silverton
Tulia
Nazareth
Happy
Friona
Timbercreek Canyon
Lake Tanglewood
Palisades
0 12.5 25 50
Miles


Red River Basin
Reach V
FY2015
THE STATE OF TEXAS
RED RIVER AUTHORITY OF TEXAS
N
W
E
S
0 4.75 9.5 19
Miles
Roberts
Hemphill
Potter
Carson
Gray
Wheeler
Randall
Armstrong
Donley
Collingsworth
Amarillo
White Deer
Pampa
Groom
McLean
Shamrock
Mobeetie
Wheeler
Lefors
Clarendon
Howardwick
Hedley
Wellington
10064
10072
10070
10178
10171
0224
0222
0222A
0299A
11130301
11120301
11120302
11120202
11120201
Legend
Monitoring Station
Segment Boundary
0201 Segment ID
Hydrology
Urbanized Area
County Boundary
HUA Boundary
Red Reach V