

FY-2015 Basin Highlights Report & FY-2016 Coordinated Monitoring



RED RIVER BASIN ADVISORY COMMITTEE MEETING



MARCH 24, 2015 – WICHITA FALLS, TEXAS

**ALLEN M. PAPPAS
CLEAN RIVERS PROGRAM PROJECT MANAGER**

Presentation Overview



- **What is the Clean Rivers Program**
- **Surface Water Quality Data**
- **Water Quality Parameters**
- **Drought Implications**
- **Recreational Use Attainability Analysis**
- **Water Quality Monitoring in the Red River Basin**
- **Future Goals**

What is the Clean Rivers Program



- A partnership between the TCEQ and regional water authorities to coordinate and conduct water quality monitoring, assessment, and stakeholder participation to improve the quality of surface water within each river basin in Texas
 - Provide quality-assured data to the TCEQ for use in decision-making
 - Identify and evaluate water quality issues
 - Promote cooperative watershed planning
 - Recommend management strategies
 - Inform and engage stakeholders
 - Maintain efficient use of public funds

Water Quality Parameters



- Solids / Dissolved Solids
 - TSS / VSS / TDS / chloride / sulfate
- Nutrients
 - Ammonia / nitrate / total phosphorus / chlorophyll-*a*
- Bacteria
 - *E. coli* / *Enterococcus*
- Aquatic Health
 - Dissolved oxygen / pH

Water Quality Parameters - Assessed



- Water quality is assessed every two years by TCEQ
- *Texas Integrated Report (IR)*
- *2012 IR* is the most current approved assessment
 - *Currently working on the Draft 2014 IR*
- Impairments versus Concerns
 - *Impairments – 303(d)*
 - *Concerns – 305(b)*
- There are two types of Concerns
 - *CS – concern for water quality based on screening level*
 - *CN – concern for near non-attainment of the water quality standard*

Water Quality Parameters - Assessed



- Segments identify waterbodies
 - Classified – example 0214
 - Unclassified – example 0214B
- Segments are comprised of smaller units
 - Assessment Units (AUs) – 0214B_01
- Assessment Units contain monitoring stations
- This is where the water quality data used for assessments and trend analysis comes from
 - Monitoring Station 10094, Buffalo Creek at FM 1814

Drought Implications



- Prolonged drought conditions have drastically reduced stream flow
- Traditional monitoring techniques were not applicable in these conditions
- TCEQ released an Interim Drought Monitoring Guidance in November of 2011
- Provides additional parameters to help better characterize data collected during drought conditions

Drought Implications



- **Additional drought parameters (lake/reservoir)**
 - **00051** **Reservoir Stage**
 - **00052** **Reservoir Percent Full**
 - **00053** **Reservoir Access Not Possible**
 - **00054** **Reservoir Storage, Acre-Feet**
 - **82903** **Depth of Bottom of Water Body at Sample Site**
- **Additional drought parameters (stream)**
 - **89864** **Maximum Pool Width (m)**
 - **89865** **Maximum Pool Depth (m)**
 - **89869** **Pool Length (m)**
 - **89870** **% Pool Coverage**

Recreational Use Attainability Analysis



- First public meeting is held
- Field studies are conducted
- Second public meeting is held to present data and findings before publishing the report
- After the public comment period is closed, the final report is prepared and submitted to TCEQ
- TCEQ will evaluate the results of the RUAA and determine if a change to the assigned water quality standard is appropriate
- If so, a change will be reflected in the next revision to the *Texas Surface Water Quality Standards*
 - This change **MUST** be approved by the EPA

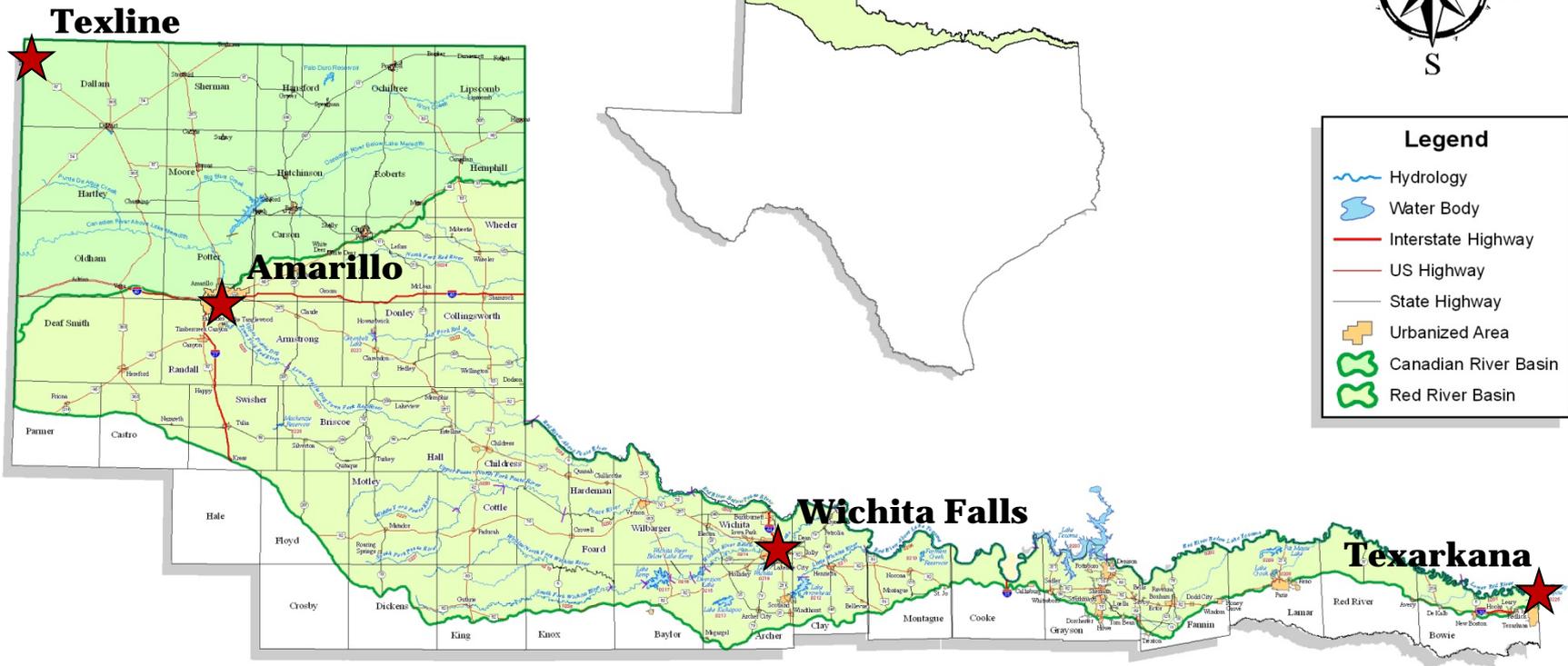
Water Quality Monitoring in the Red River Basin



Entity	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
RRA	33	52	64	67	71
TCEQ	20	19	19	19	17
USGS	30	34	31	30	30
City of Sherman	7	7	9	9	9
NTMWD	N/A	8	7	7	6
Total	90	120	130	132	133



Red and Canadian River Basins Vicinity Map



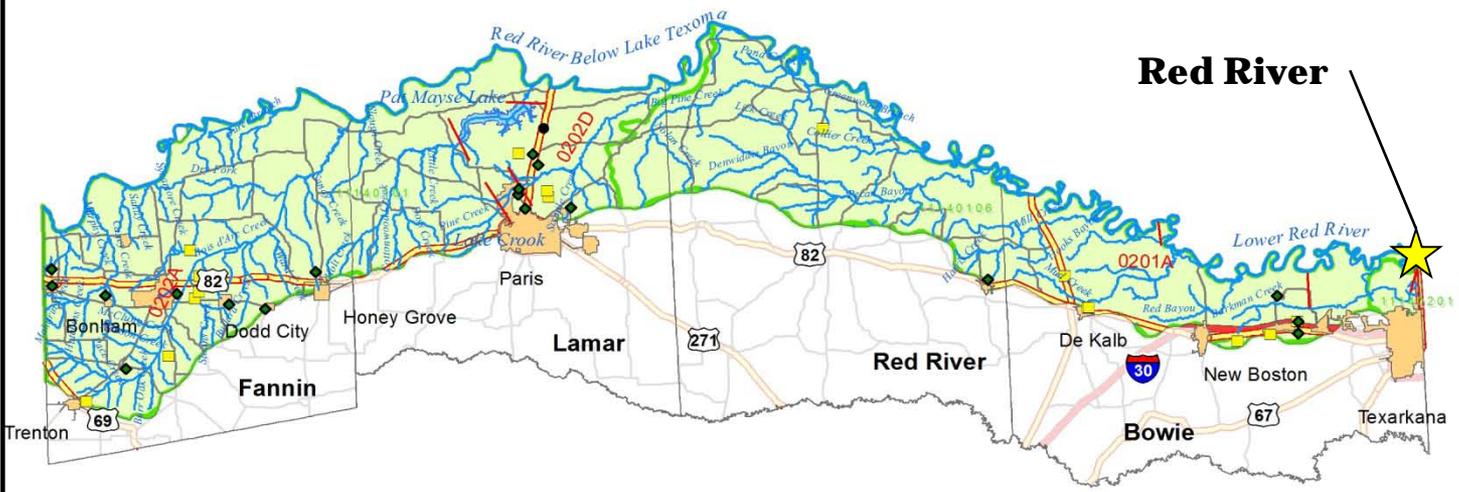
Red River Basin – Reach I Lower



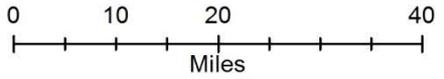
- Lower Red River (0201)
 - No impairments
 - Chlorophyll-*a* concern
- Mud Creek (0201A)
- Red River Below Lake Texoma (0202)
- Bois D' Arc Creek (0202A)
- Pecan Bayou (0202C)
- Pine Creek (0202D)
- Smith Creek (0202G)
- Big Pine Creek (0202H)
- Little Pine Creek (0202I)
- Honey Grove Creek (0202L)
- Lake Bonham (0202M)
- Lake Crook (0208)
- Pay Mayse Lake (0209)



Red River Basin Lower Reach I



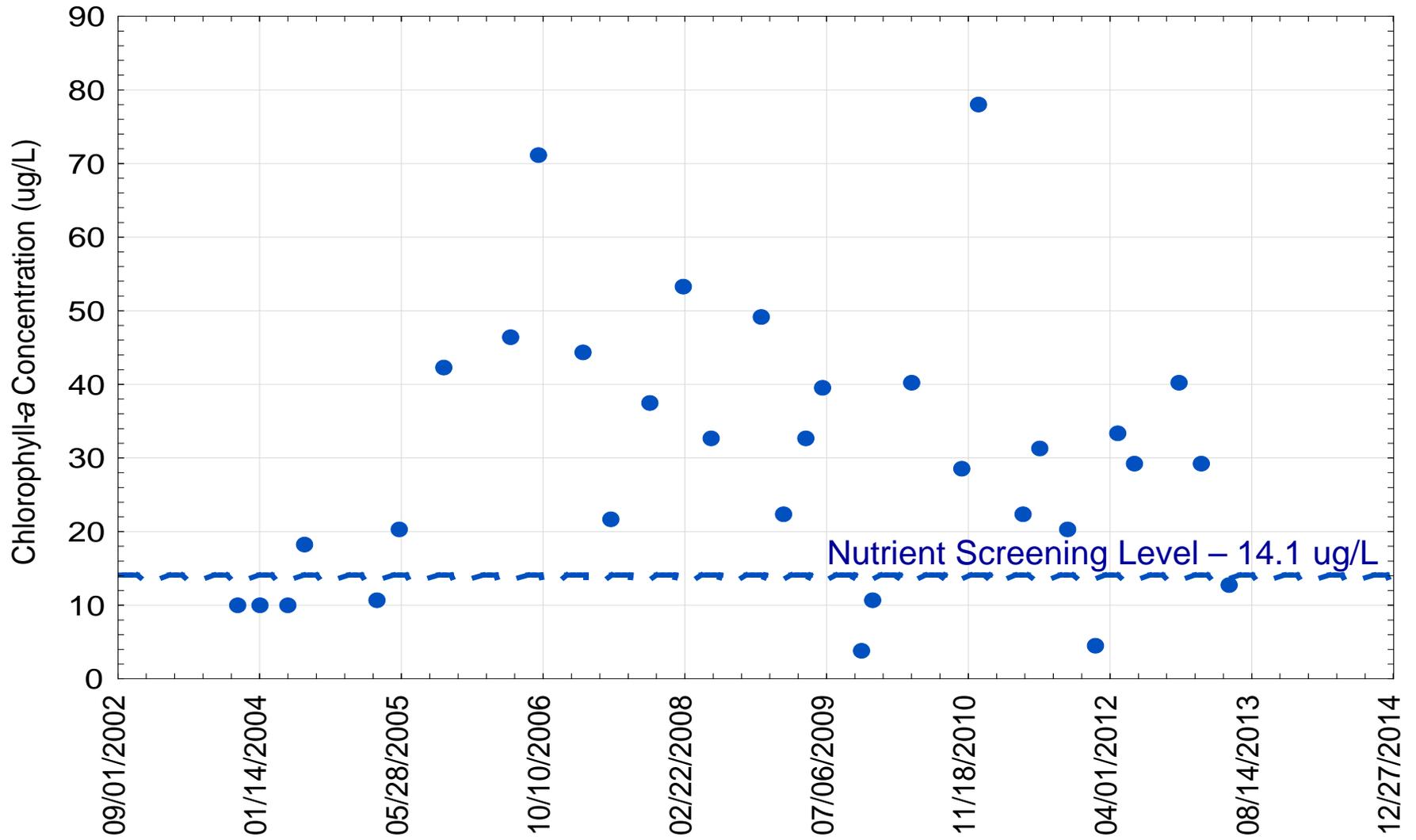
Red River



Legend

- MSW / Landfills
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Lower Reach I

Lower Red River
Segment 0201_01
Chlorophyll - a



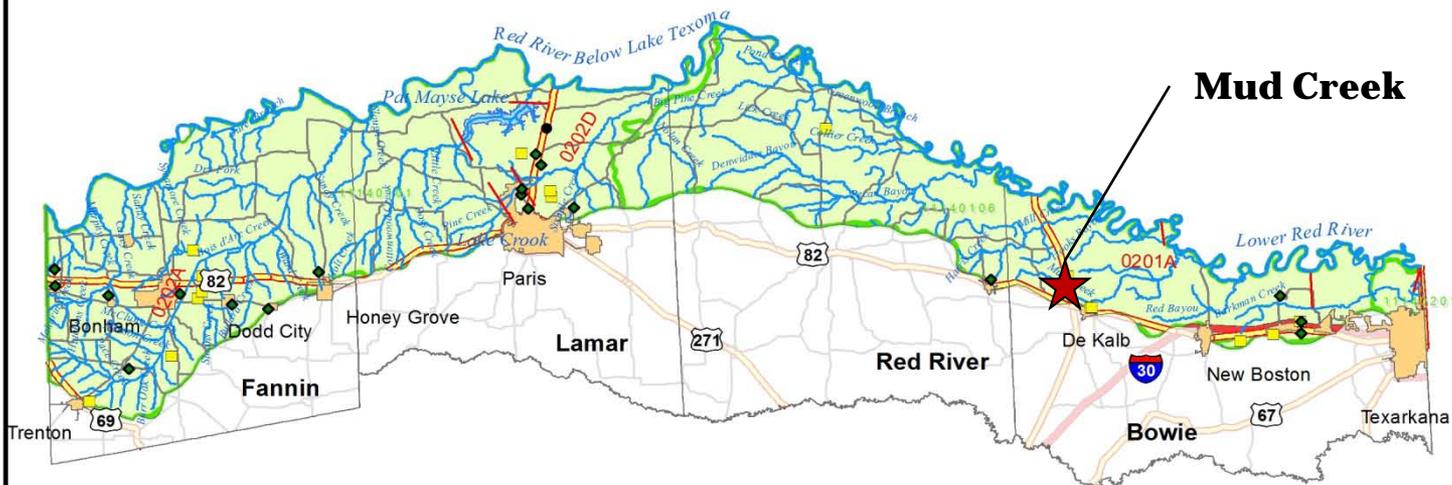
Red River Basin – Reach I Lower



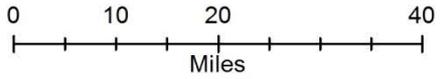
- Lower Red River (0201)
- Mud Creek (0201A)
 - Bacteria and depressed DO impairments
 - Ammonia and depressed DO concerns
 - RUAA is being conducted in this segment
- Red River Below Lake Texoma (0202)
- Bois D' Arc Creek (0202A)
- Pecan Bayou (0202C)
- Pine Creek (0202D)
- Smith Creek (0202G)
- Big Pine Creek (0202H)
- Little Pine Creek (0202I)
- Honey Grove Creek (0202L)
- Lake Bonham (0202M)
- Lake Crook (0208)
- Pay Mayse Lake (0209)



Red River Basin Lower Reach I



Mud Creek



Legend

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- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Lower Reach I

Mud Creek at US 259 – December 1, 2014



Red River Basin – Reach I Lower



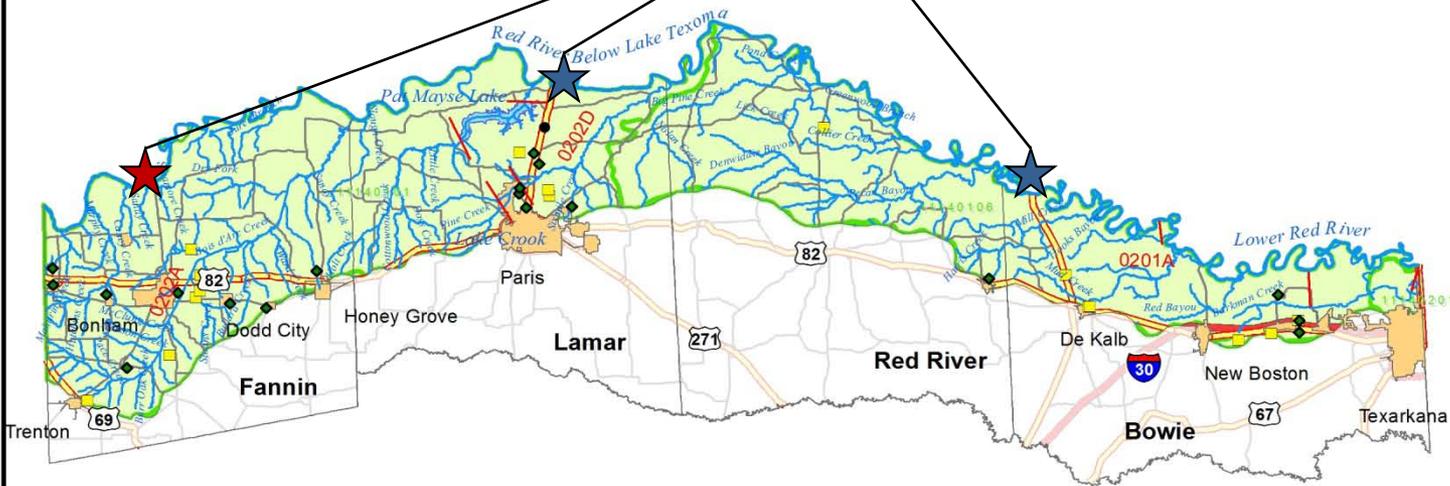
- Lower Red River (0201)
- Mud Creek (0201A)
- Red River Below Lake Texoma (0202)
 - No impairments
 - Chlorophyll-*a* concern
- Bois D' Arc Creek (0202A)
- Pecan Bayou (0202C)
- Pine Creek (0202D)
- Smith Creek (0202G)
- Big Pine Creek (0202H)
- Little Pine Creek (0202I)
- Honey Grove Creek (0202L)
- Lake Bonham (0202M)
- Lake Crook (0208)
- Pay Mayse Lake (0209)



Red River Basin Lower Reach I



Red River



Legend

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- 0201 Segment ID
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- Urbanized Area
- County Boundary
- HUA Boundary
- Red Lower Reach I

Red River Basin – Reach I Lower



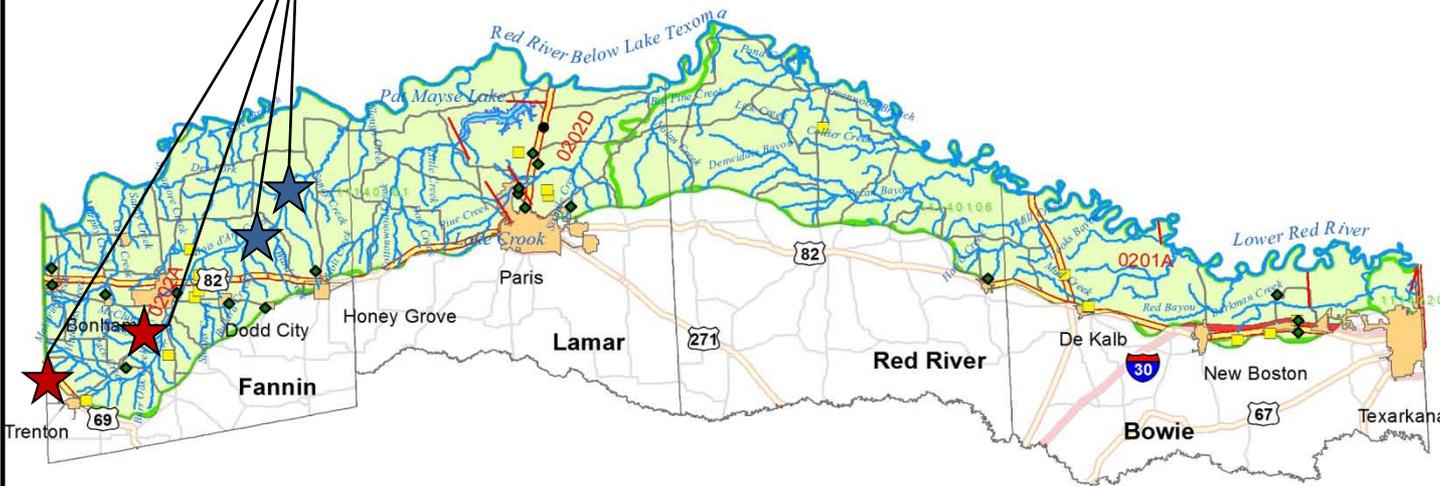
- Lower Red River (0201)
- Mud Creek (0201A)
- Red River Below Lake Texoma (0202)
- Bois D' Arc Creek (0202A)
 - No impairments – Bacteria delisted in *Draft 2014 IR*
 - No concerns
 - RUAA is being conducted in this segment
- Pecan Bayou (0202C)
- Pine Creek (0202D)
- Smith Creek (0202G)
- Big Pine Creek (0202H)
- Little Pine Creek (0202I)
- Honey Grove Creek (0202L)
- Lake Bonham (0202M)
- Lake Crook (0208)
- Pay Mayse Lake (0209)



Red River Basin Lower Reach I



Bois D' Arc Creek



Legend

- MSW / Landfills
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Lower Reach I

Bois D' Arc Creek at FM 1396 – September 17, 2014



Bois D' Arc Creek at FM 898 – December 2, 2014



Red River Basin – Reach I Lower



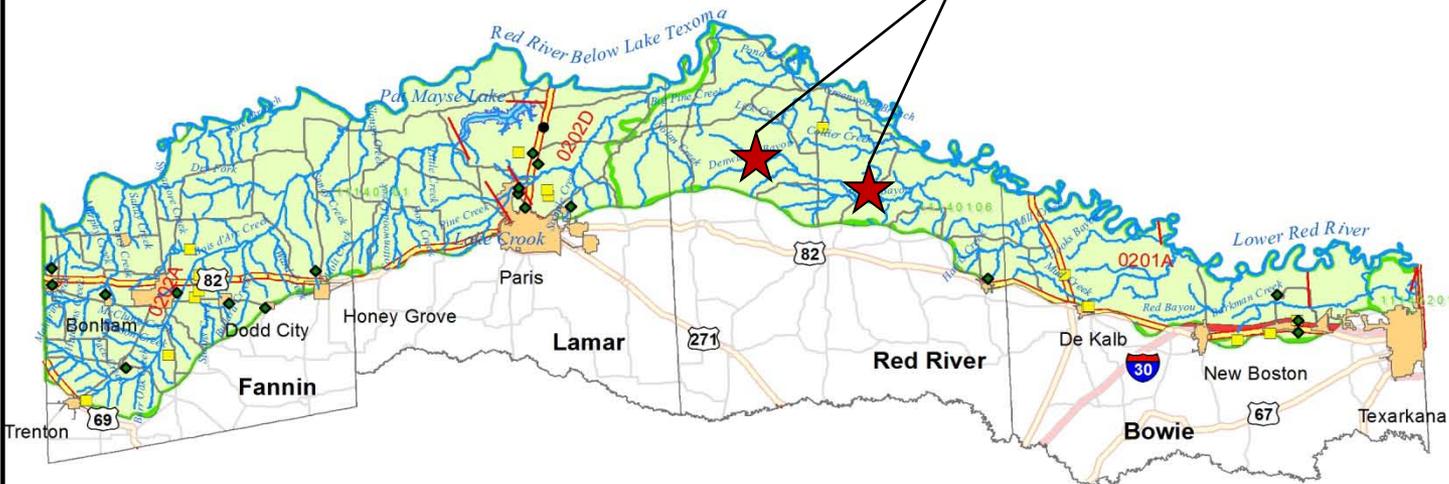
- Lower Red River (0201)
- Mud Creek (0201A)
- Red River Below Lake Texoma (0202)
- Bois D' Arc Creek (0202A)
- Pecan Bayou (0202C)
 - No impairments
 - Depressed DO concern
- Pine Creek (0202D)
- Smith Creek (0202G)
- Big Pine Creek (0202H)
- Little Pine Creek (0202I)
- Honey Grove Creek (0202L)
- Lake Bonham (0202M)
- Lake Crook (0208)
- Pay Mayse Lake (0209)



Red River Basin Lower Reach I



Pecan Bayou



Legend

- MSW / Landfills
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Lower Reach I

Pecan Bayou at FM 1159 – March 2, 2015



Pecan Bayou at CR 2235 – March 2, 2015



Red River Basin – Reach I Lower



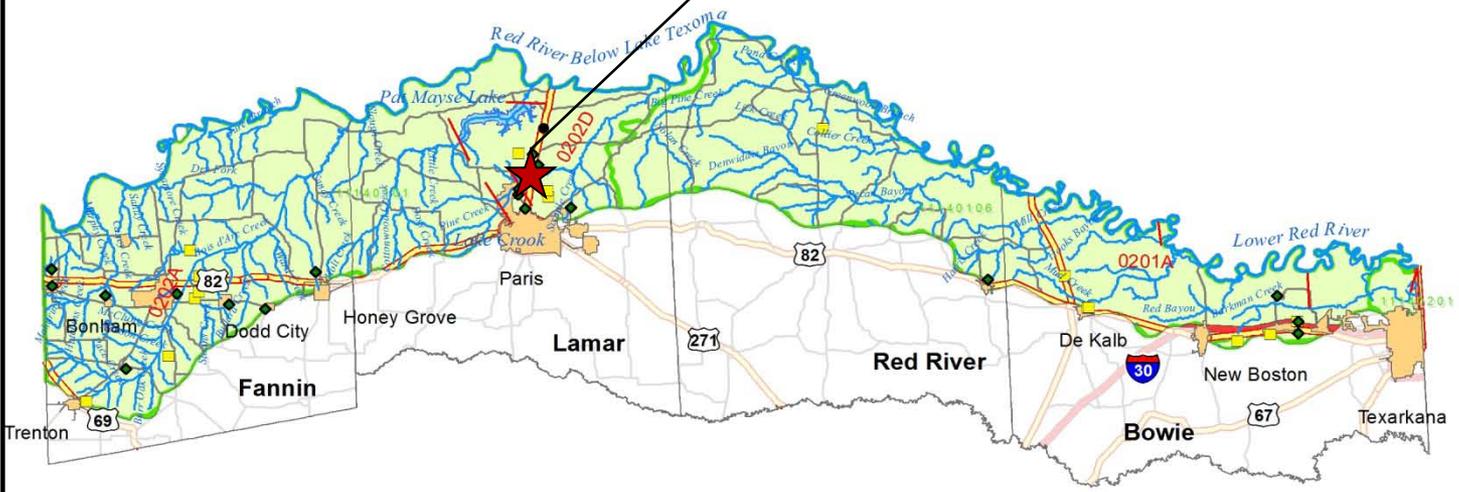
- Lower Red River (0201)
- Mud Creek (0201A)
- Red River Below Lake Texoma (0202)
- Bois D' Arc Creek (0202A)
- Pecan Bayou (0202C)
- Pine Creek (0202D)
 - No impairments
 - Chlorophyll-*a* concern
- Smith Creek (0202G)
- Big Pine Creek (0202H)
- Little Pine Creek (0202I)
- Honey Grove Creek (0202L)
- Lake Bonham (0202M)
- Lake Crook (0208)
- Pay Mayse Lake (0209)



Red River Basin Lower Reach I



Pine Creek



Legend

- MSW / Landfills
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Lower Reach I

Pine Creek at US 271 – September 9, 2014



Red River Basin – Reach I Lower



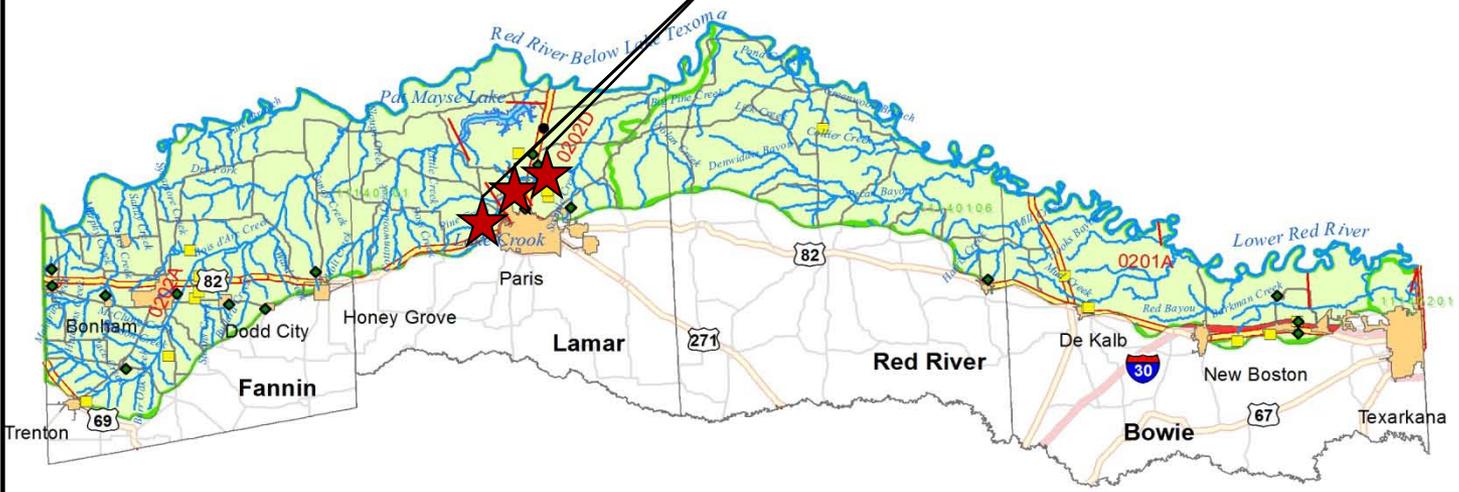
- Lower Red River (0201)
- Mud Creek (0201A)
- Red River Below Lake Texoma (0202)
- Bois D' Arc Creek (0202A)
- Pecan Bayou (0202C)
- Pine Creek (0202D)
- **Smith Creek (0202G)**
 - **Bacteria Impairment**
 - **Ammonia and total phosphorus concerns**
 - **RUAA is being conducted in this segment**
- Big Pine Creek (0202H)
- Little Pine Creek (0202I)
- Honey Grove Creek (0202L)
- Lake Bonham (0202M)
- Lake Crook (0208)
- Pay Mayse Lake (0209)



Red River Basin Lower Reach I



Smith Creek



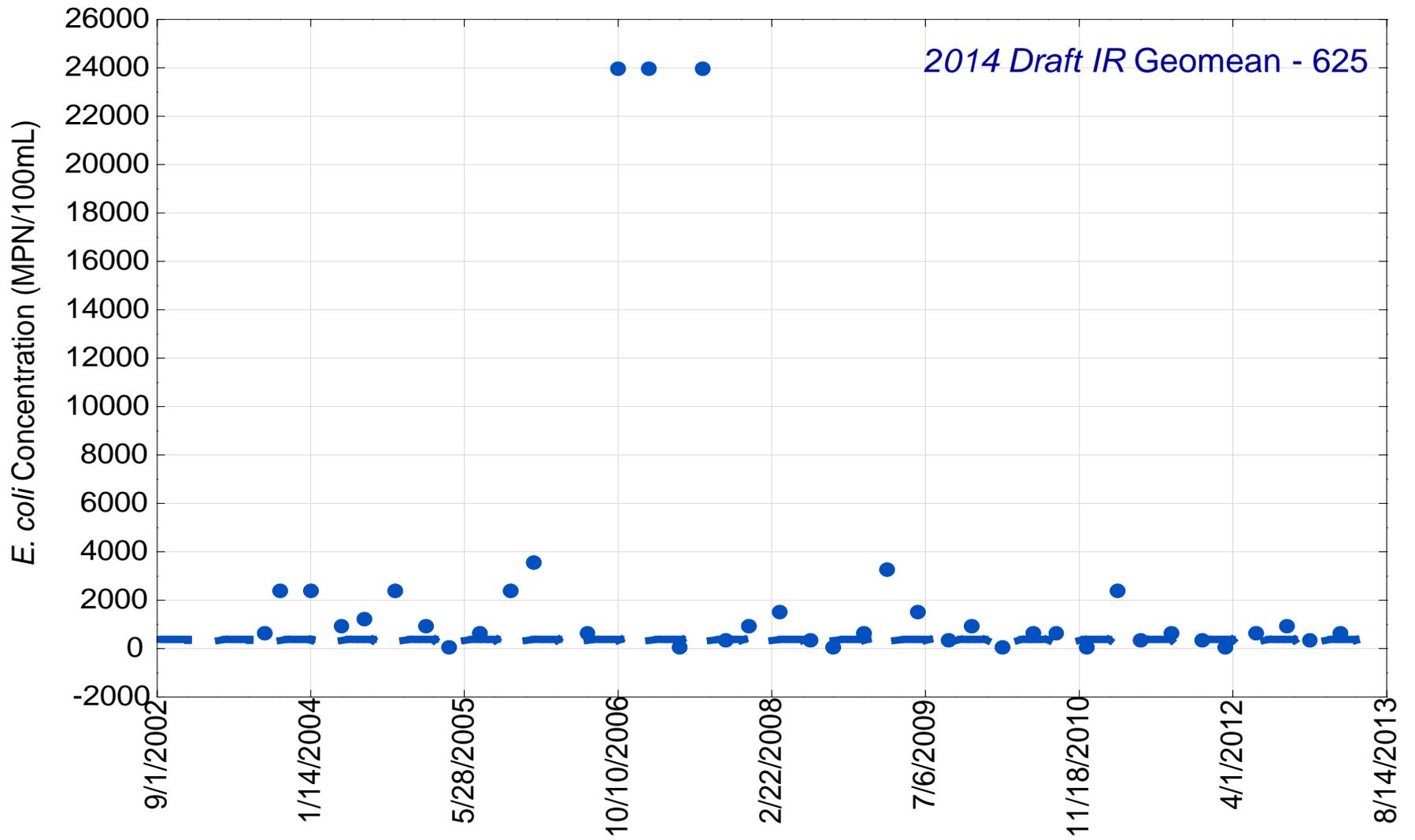
Legend

- MSW / Landfills
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Lower Reach I

Smith Creek at CR 31700 – December 9, 2014



Smith Creek
Segment 0202G_01
E. coli



Red River Basin – Reach I Lower



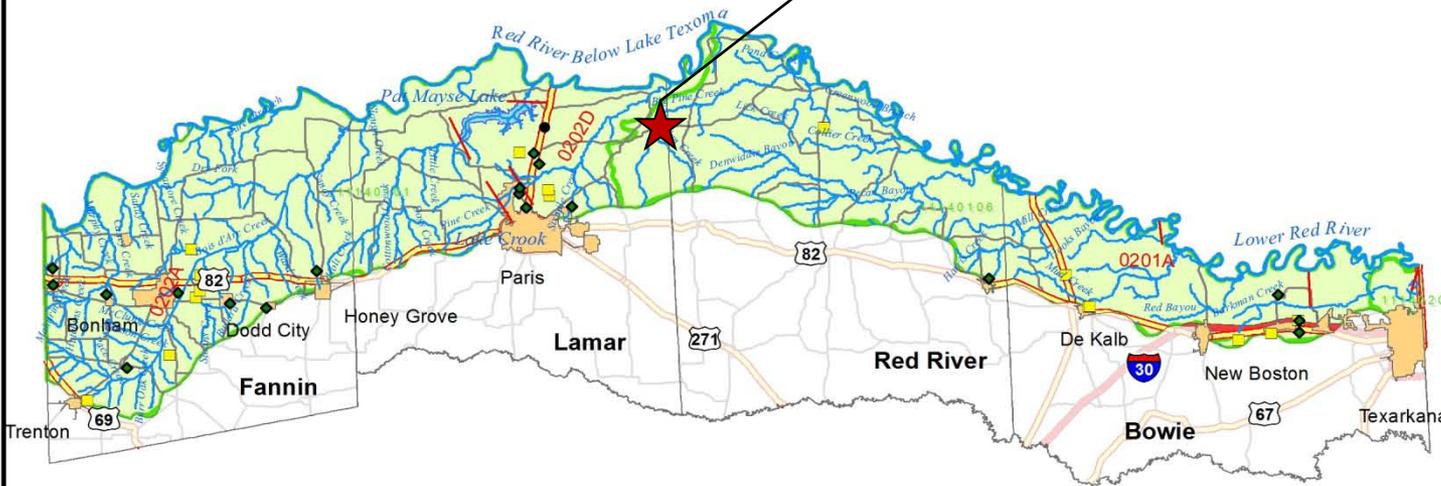
- Lower Red River (0201)
- Mud Creek (0201A)
- Red River Below Lake Texoma (0202)
- Bois D' Arc Creek (0202A)
- Pecan Bayou (0202C)
- Pine Creek (0202D)
- Smith Creek (0202G)
- **Big Pine Creek (0202H)**
 - No impairments or concerns
- **Little Pine Creek (0202I)**
 - **Depressed DO** impairment
 - Chlorophyll-*a* and depressed DO concerns
- Honey Grove Creek (0202L)
- Lake Bonham (0202M)
- Lake Crook (0208)
- Pay Mayse Lake (0209)



Red River Basin Lower Reach I



Little Pine Creek



Legend

- MSW / Landfills
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Lower Reach I

Little Pine Creek at FM 195 – December 2, 2014



Red River Basin – Reach I Lower



- Lower Red River (0201)
- Mud Creek (0201A)
- Red River Below Lake Texoma (0202)
- Bois D' Arc Creek (0202A)
- Pecan Bayou (0202C)
- Pine Creek (0202D)
- Smith Creek (0202G)
- Big Pine Creek (0202H)
- Little Pine Creek (0202I)
- Honey Grove Creek (0202L)
 - No impairments
 - Bacteria, chlorophyll-*a*, and total phosphorus
- Lake Bonham (0202M)
 - No impairments
 - Chlorophyll-*a* concern
- Lake Crook (0208)
- Pay Mayse Lake (0209)

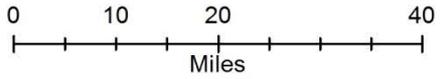
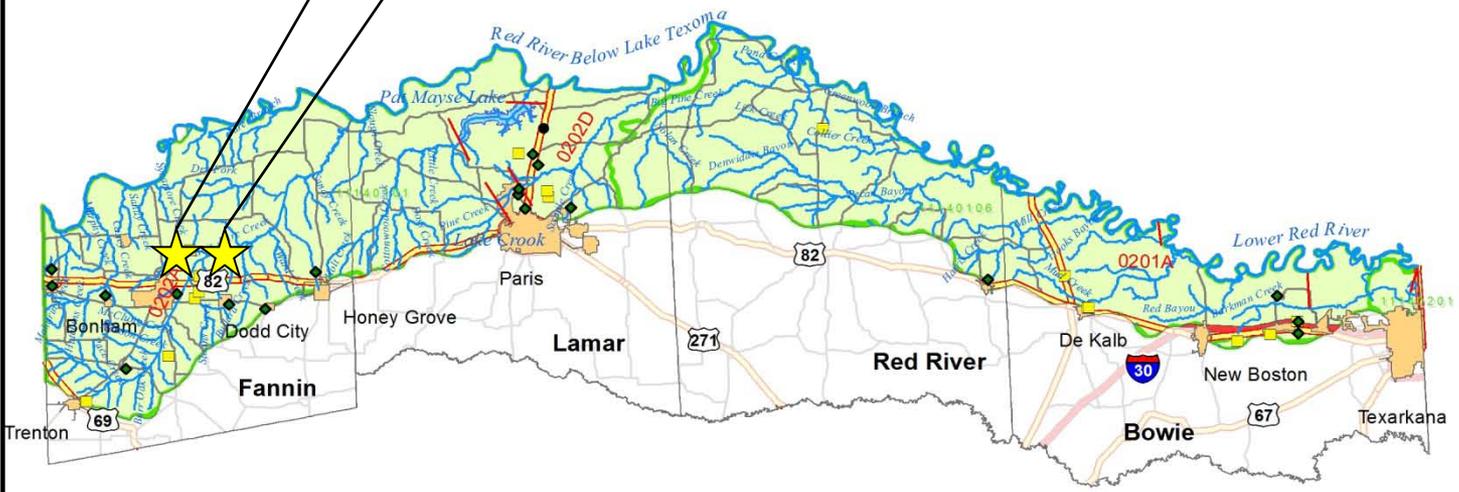


Red River Basin Lower Reach I



Lake Bonham

Honey Grove Creek



Legend

- MSW / Landfills
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Lower Reach I

Red River Basin – Reach I Lower



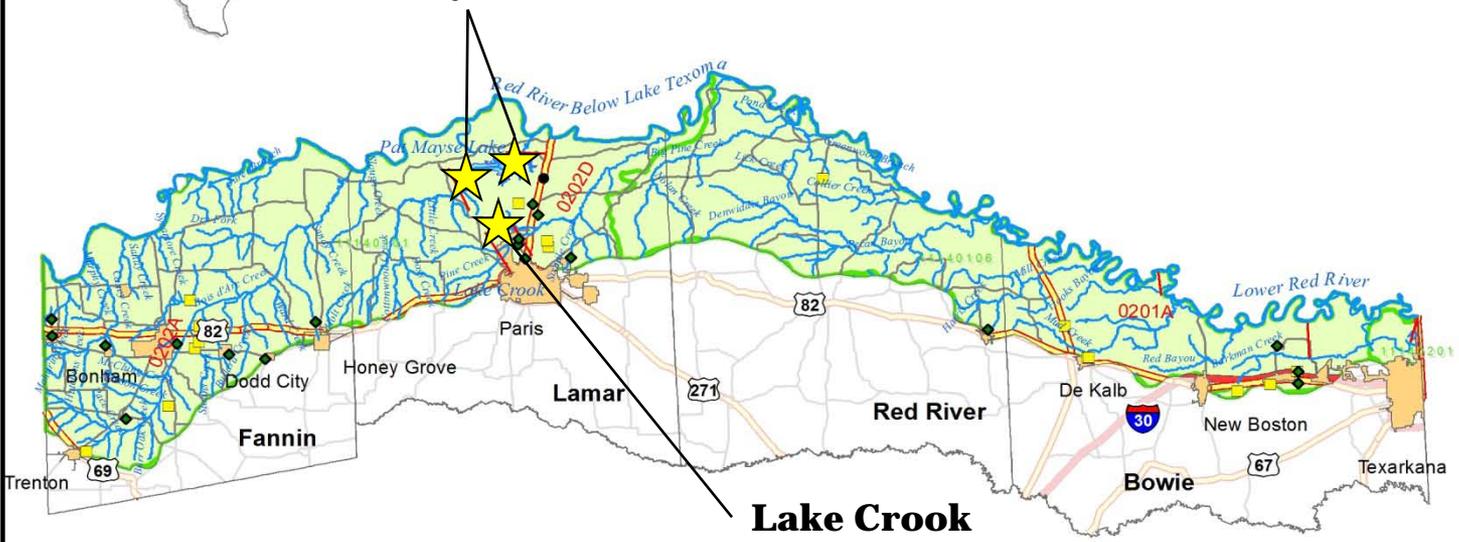
- Lower Red River (0201)
- Mud Creek (0201A)
- Red River Below Lake Texoma (0202)
- Bois D' Arc Creek (0202A)
- Pecan Bayou (0202C)
- Pine Creek (0202D)
- Smith Creek (0202G)
- Big Pine Creek (0202H)
- Little Pine Creek (0202I)
- Honey Grove Creek (0202L)
- Lake Bonham (0202M)
- Lake Crook (0208)
 - No impairments or concerns
- Pay Mayse Lake (0209)
 - No impairments
 - Chlorophyll-*a* and manganese in sediment concerns



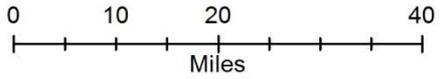
Red River Basin Lower Reach I



Pat Mayse Lake



Lake Crook



Legend

- MSW / Landfills
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Lower Reach I

Red River Basin – Reach I Upper



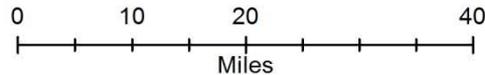
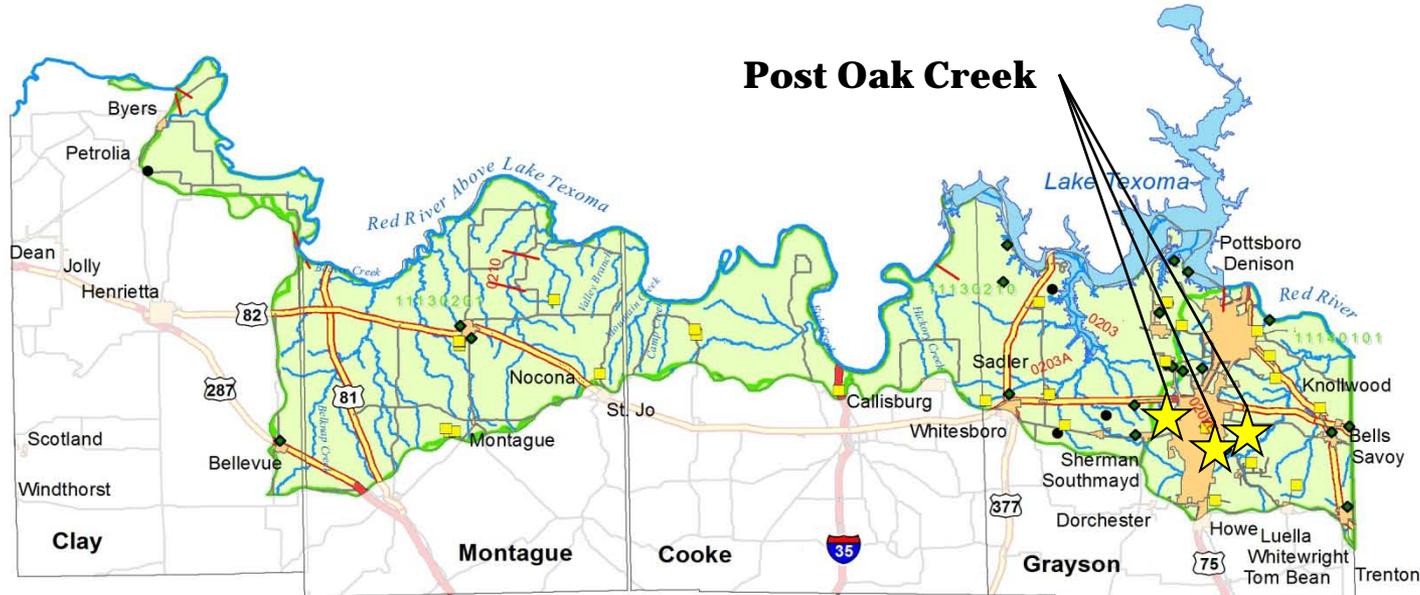
- **Post Oak Creek (0202E)**
 - **No impairments**
 - **Total phosphorus concern**
- **Choctaw Creek (0202F)**
- **Sand Creek (0202J)**
- **Iron Ore Creek (0202K)**
- **Lake Texoma (0203)**
- **Big Mineral Creek (0203A)**
- **Red River Above Lake Texoma (0204)**
- **Moss Lake (0204B)**
- **Farmer's Creek Reservoir (0210)**



Red River Basin Upper Reach I



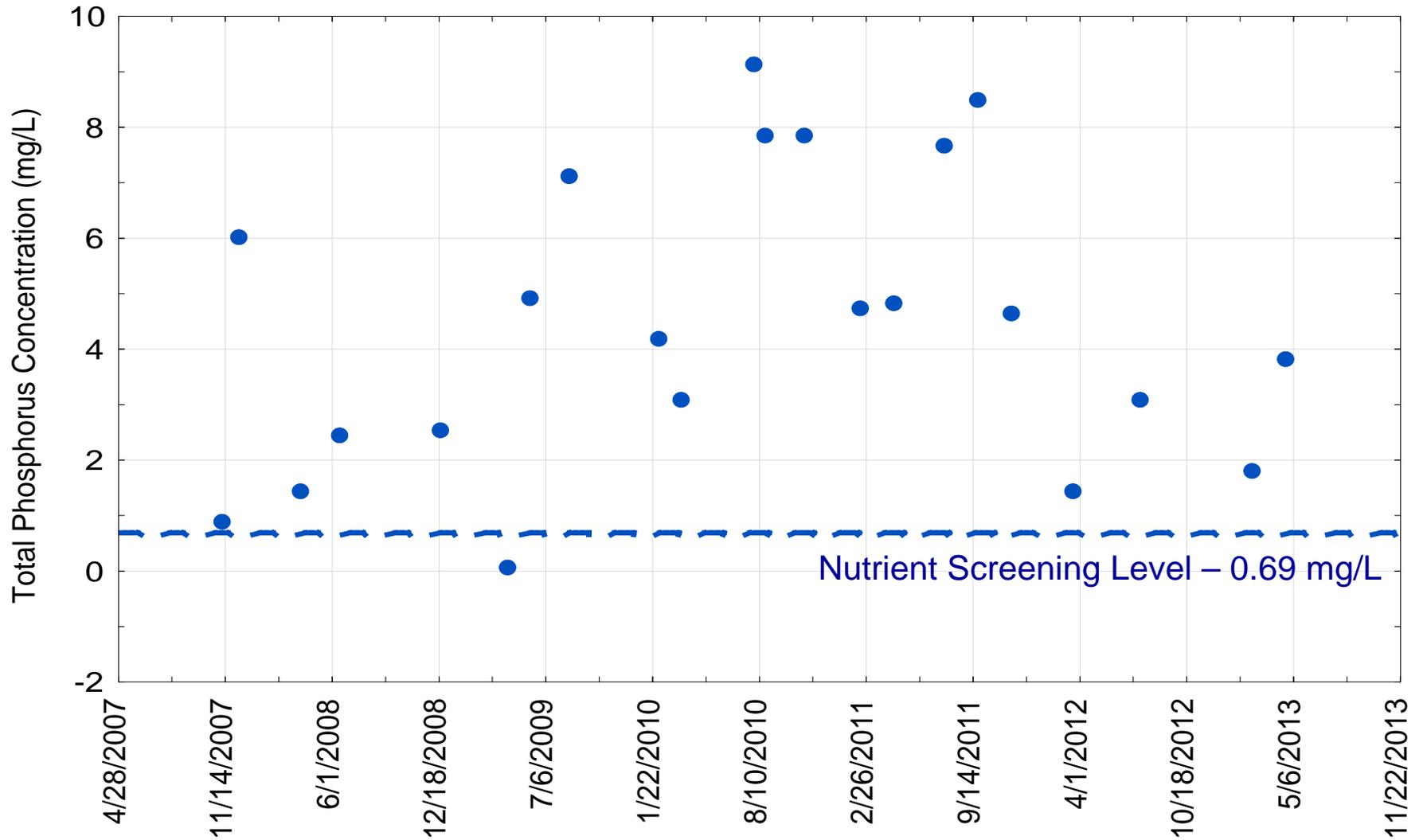
Post Oak Creek



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
- Segment Boundary
- Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Upper Reach I

Post Oak Creek
Segment 0202E_01 Station 10114
Total Phosphorus



Red River Basin – Reach I Upper



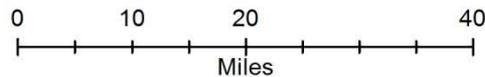
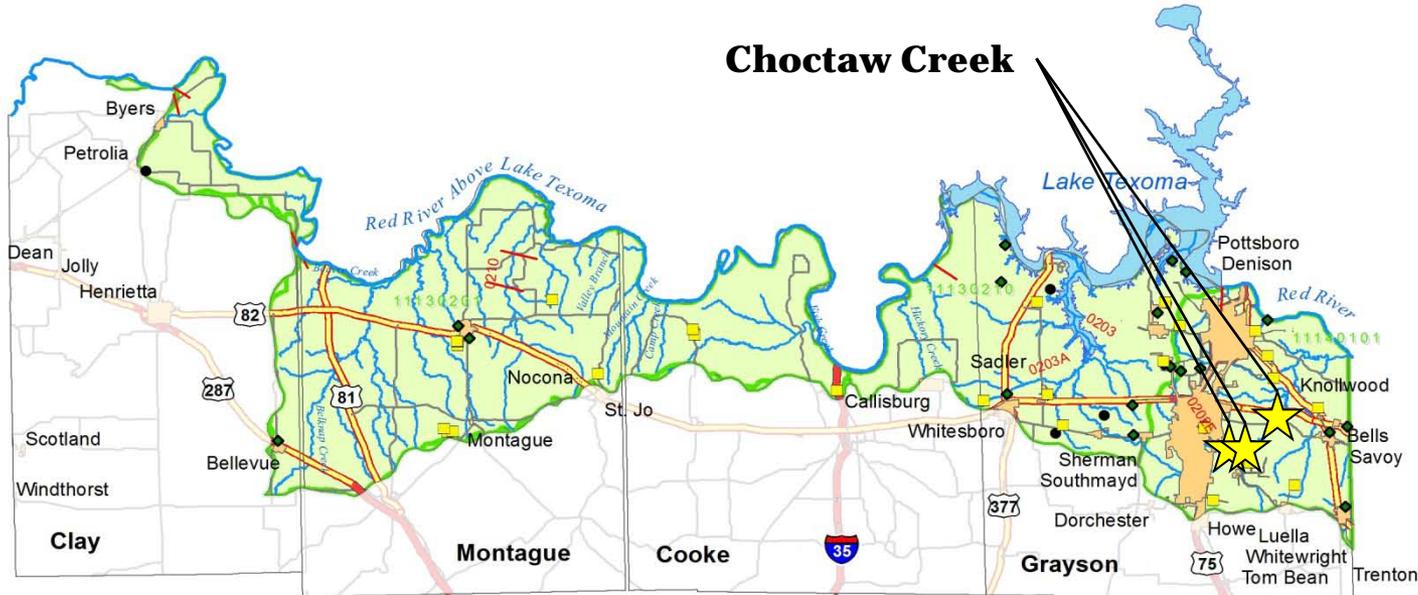
- Post Oak Creek (0202E)
- Choctaw Creek (0202F)
 - Bacteria impairment
 - Nitrate and total phosphorus concerns
 - RUAA is being conducted in this segment
- Sand Creek (0202J)
- Iron Ore Creek (0202K)
- Lake Texoma (0203)
- Big Mineral Creek (0203A)
- Red River Above Lake Texoma (0204)
- Moss Lake (0204B)
- Farmer's Creek Reservoir (0210)



Red River Basin Upper Reach I



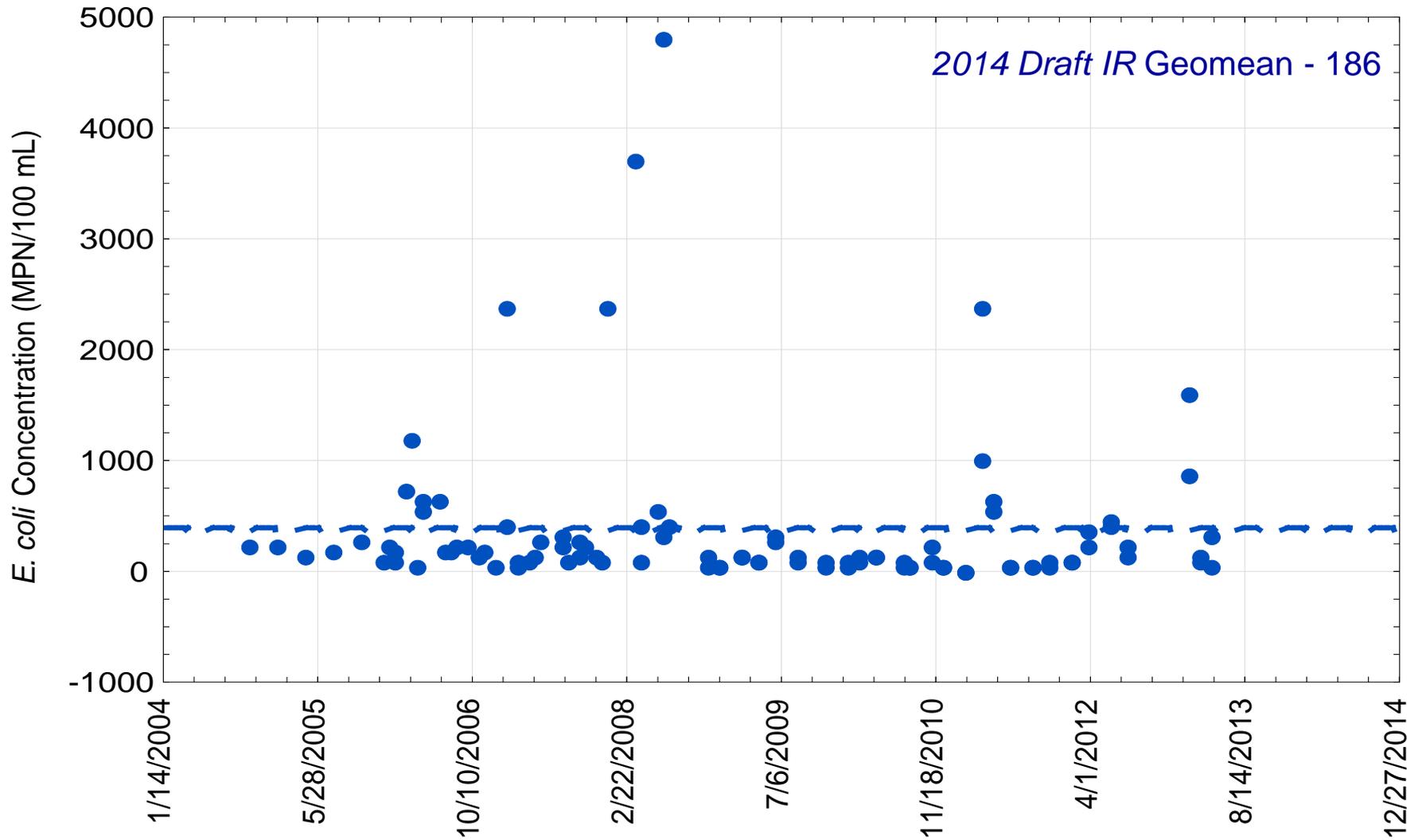
Choctaw Creek



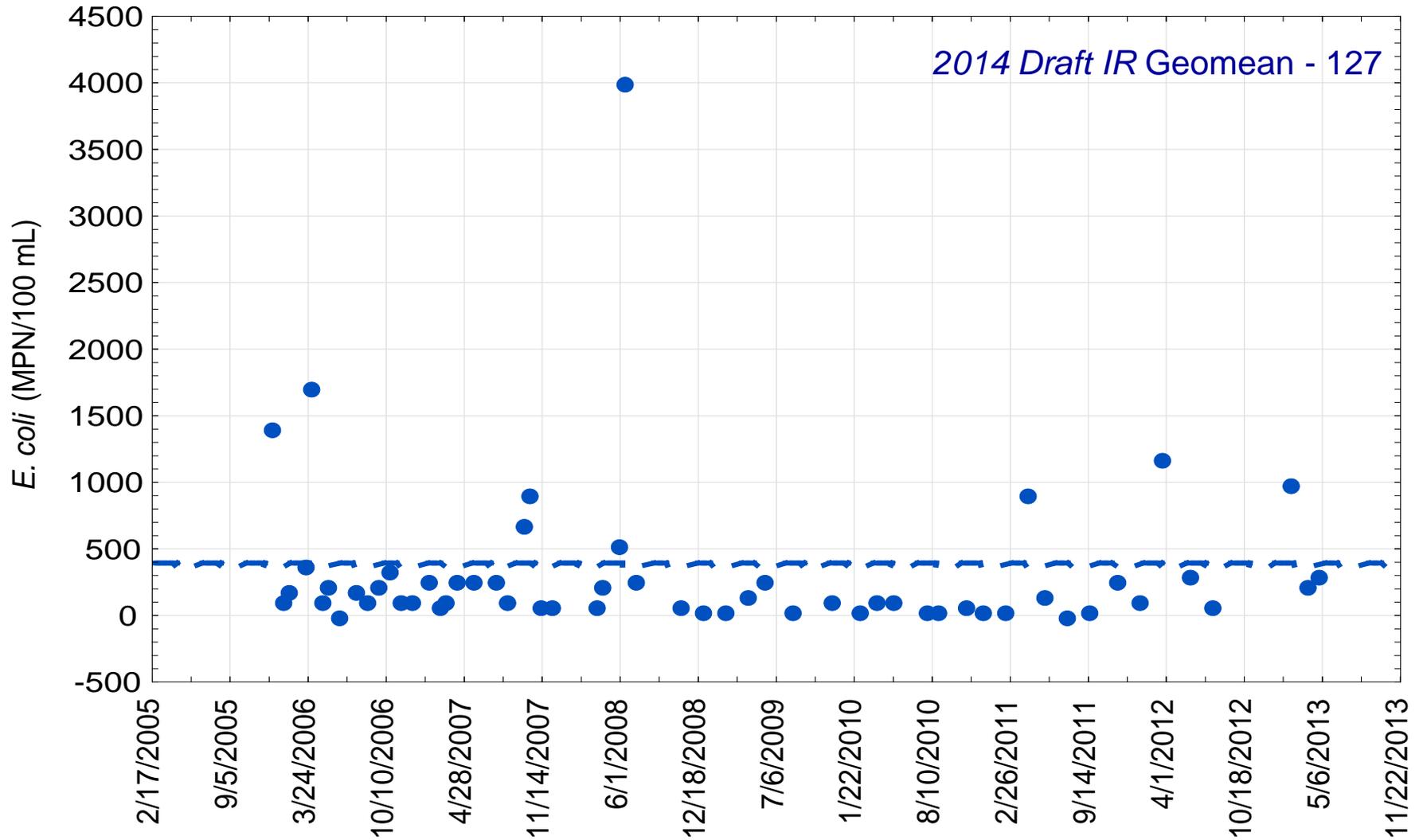
Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Upper Reach I

Choctaw Creek
Segment 0202F_01
E. coli



Choctaw Creek
Segment 0202F_02
E. coli



Red River Basin – Reach I Upper



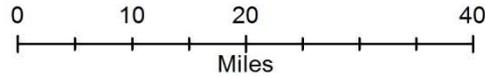
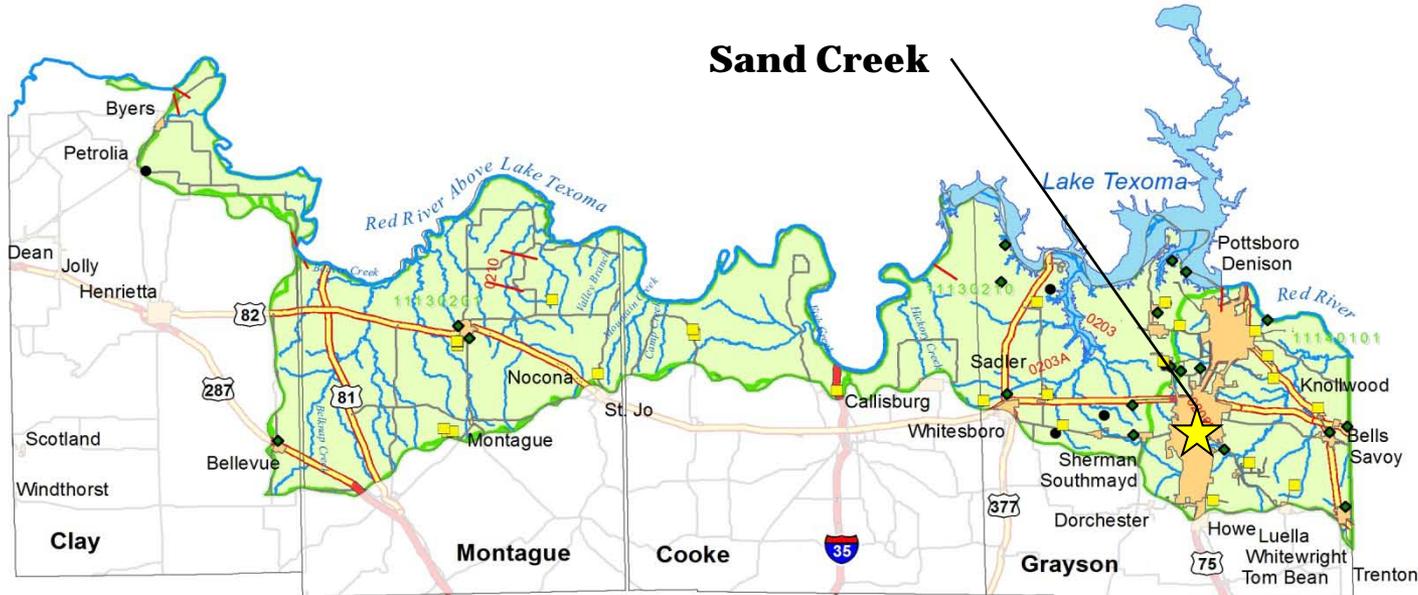
- Post Oak Creek (0202E)
- Choctaw Creek (0202F)
- Sand Creek (0202J)
 - No impairments or concerns
- Iron Ore Creek (0202K)
- Lake Texoma (0203)
- Big Mineral Creek (0203A)
- Red River Above Lake Texoma (0204)
- Moss Lake (0204B)
- Farmer's Creek Reservoir (0210)



Red River Basin Upper Reach I



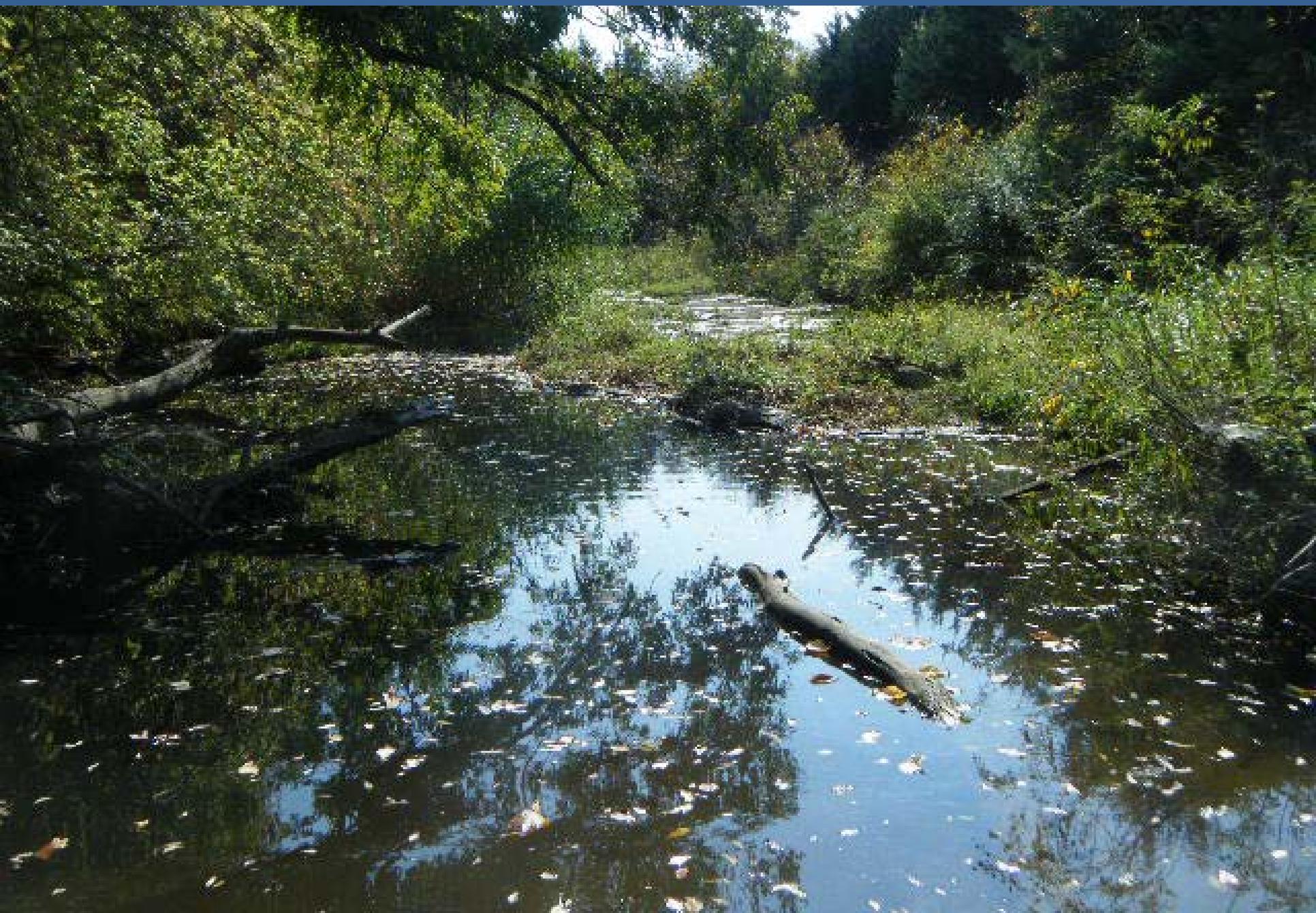
Sand Creek



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
- Segment Boundary
- Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Upper Reach I

Sand Creek at SH 56 – October 28, 2014



Red River Basin – Reach I Upper



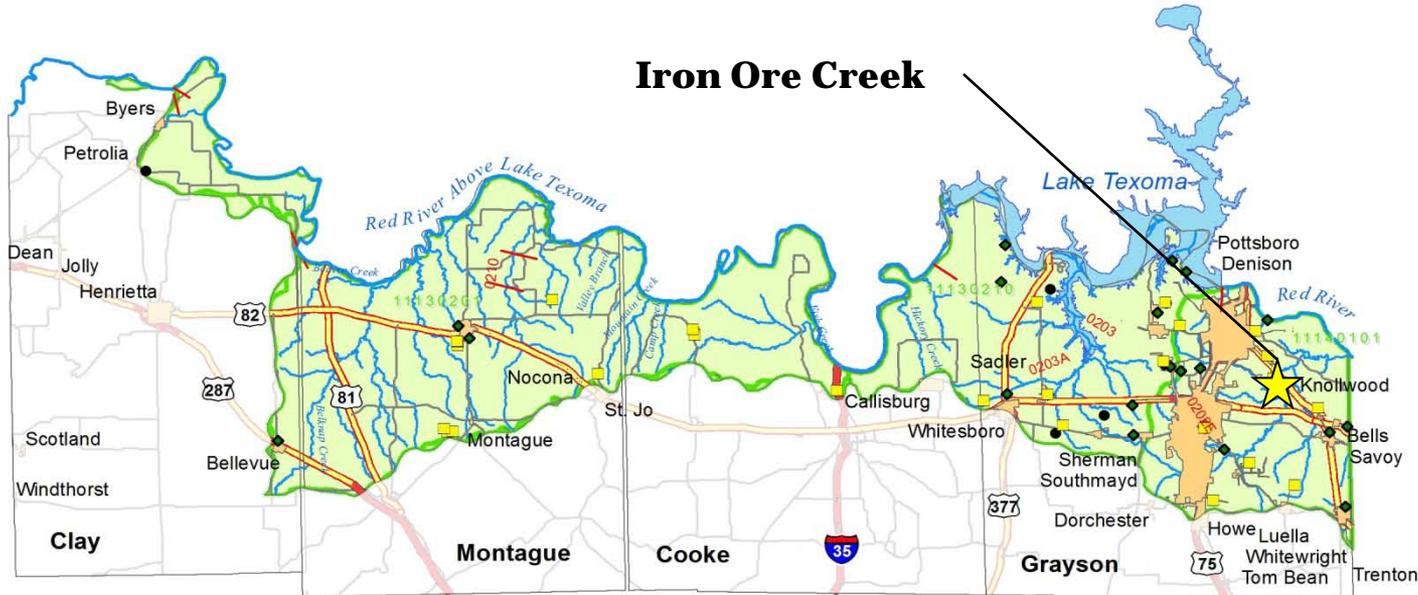
- Post Oak Creek (0202E)
- Choctaw Creek (0202F)
- Sand Creek (0202J)
- Iron Ore Creek (0202K)
 - Bacteria impairment
 - No concerns
 - RUAA is being conducted in this segment
- Lake Texoma (0203)
- Big Mineral Creek (0203A)
- Red River Above Lake Texoma (0204)
- Moss Lake (0204B)
- Farmer's Creek Reservoir (0210)



Red River Basin Upper Reach I



Iron Ore Creek



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
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- Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Upper Reach I

Red River Basin – Reach I Upper



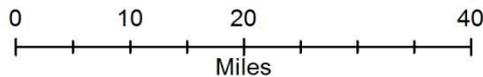
- Post Oak Creek (0202E)
- Choctaw Creek (0202F)
- Sand Creek (0202J)
- Iron Ore Creek (0202K)
- Lake Texoma (0203)
 - No impairments
 - Chlorophyll-*a* and harmful algal bloom
- Big Mineral Creek (0203A)
- Red River Above Lake Texoma (0204)
- Moss Lake (0204B)
- Farmer's Creek Reservoir (0210)



Red River Basin Upper Reach I



Lake Texoma



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
- Segment Boundary
- Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Upper Reach I

Zebra Mussel Warning at US 377 Boat Ramp

BOATERS' ADVISORY
ZEBRA MUSSELS HAVE BEEN
FOUND IN THESE WATERS



If your boat was in a lake that has Zebra Mussels, you may still be carrying live mussels with you. Adults, eggs and larvae can survive out of water for 5 days during summer and up to 30 days in cool, wet weather.

Zebra Mussels vary from 1/8 to 2 inches long and have a striped yellow-brown shell. Zebra Mussels are very prolific and harmful.

To prevent damage to your boat or transportation to non-infested water, please follow these guidelines:

- Pull all plugs and drain all water including traps, live well, motor and bilge buckets.
- Inspect the hull and trailer for attached Zebra Mussels.
- Scrub off any Zebra Mussels and remove all vegetation, mud or other debris.
- Dry boat and trailer for at least 1 week, starting at compartments and areas where there may be moisture.

OR

- Wash boat, motor and trailer with high-pressure (70-140 PSI) water. Use commercial pressure washers with nozzles # 108, # 109, # 110, # 111, # 112, # 113, # 114, # 115, # 116, # 117, # 118, # 119, # 120, # 121, # 122, # 123, # 124, # 125, # 126, # 127, # 128, # 129, # 130, # 131, # 132, # 133, # 134, # 135, # 136, # 137, # 138, # 139, # 140, # 141, # 142, # 143, # 144, # 145, # 146, # 147, # 148, # 149, # 150, # 151, # 152, # 153, # 154, # 155, # 156, # 157, # 158, # 159, # 160, # 161, # 162, # 163, # 164, # 165, # 166, # 167, # 168, # 169, # 170, # 171, # 172, # 173, # 174, # 175, # 176, # 177, # 178, # 179, # 180, # 181, # 182, # 183, # 184, # 185, # 186, # 187, # 188, # 189, # 190, # 191, # 192, # 193, # 194, # 195, # 196, # 197, # 198, # 199, # 200, # 201, # 202, # 203, # 204, # 205, # 206, # 207, # 208, # 209, # 210, # 211, # 212, # 213, # 214, # 215, # 216, # 217, # 218, # 219, # 220, # 221, # 222, # 223, # 224, # 225, # 226, # 227, # 228, # 229, # 230, # 231, # 232, # 233, # 234, # 235, # 236, # 237, # 238, # 239, # 240, # 241, # 242, # 243, # 244, # 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FOR MORE INFORMATION CONTACT:

Texas Parks and Wildlife Department:
• Lake Service Division
• Inland Fisheries Division
• Inland Fisheries Division

U.S. Army Corps of Engineers:
• District Office
• District Office

Fee Collection

If attendant is not present

1. Fill in all information on registration envelope.
2. Detach stub & display on vehicle dashboard.
3. Enclose fee in envelope and deposit in vault.
4. Make check payable to: FAO, USA, SWT.
5. Permit valid only for day of payment.

NOTICE

INSERT COMPLETE ENVELOPE

INSERT COMPLETE ENVELOPE

INSERT COMPLETE ENVELOPE

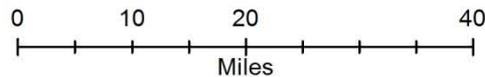
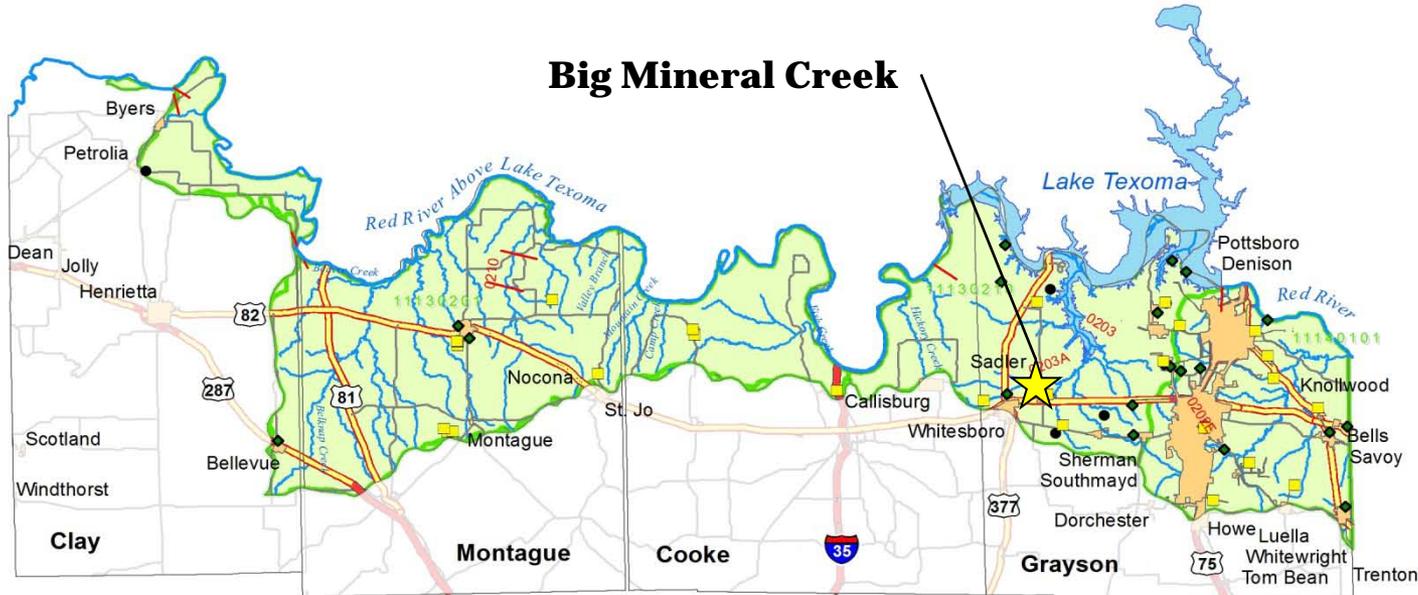
Red River Basin – Reach I Upper



- Post Oak Creek (0202E)
- Choctaw Creek (0202F)
- Sand Creek (0202J)
- Iron Ore Creek (0202K)
- Lake Texoma (0203)
- **Big Mineral Creek (0203A)**
 - **No impairments**
 - **Nitrate and total phosphorus concerns**
- Red River Above Lake Texoma (0204)
- Moss Lake (0204B)
- Farmer's Creek Reservoir (0210)



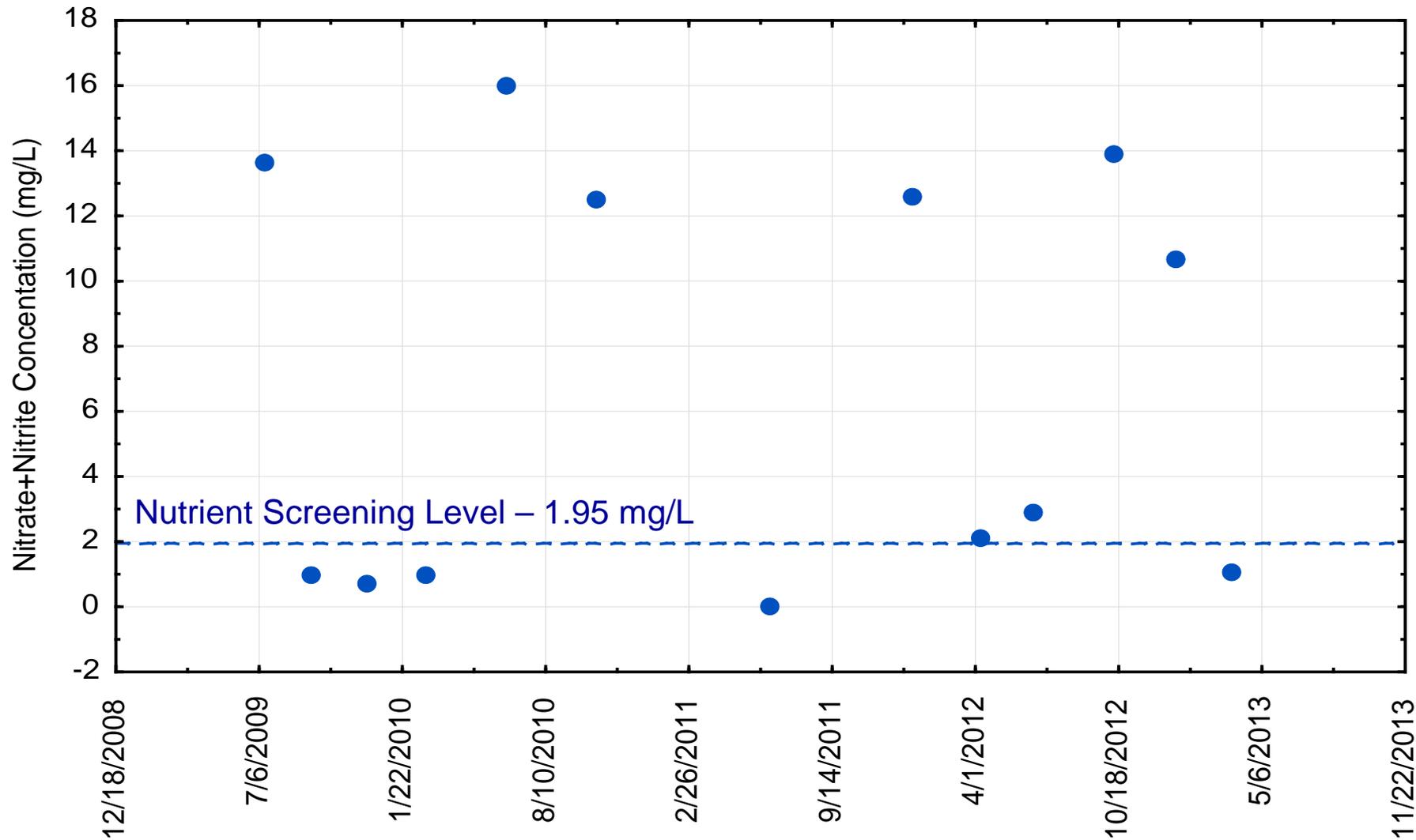
Red River Basin Upper Reach I



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
- Segment Boundary
- Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Upper Reach I

Big Mineral Creek
Segment 0203A_01
Nitrate+Nitrite



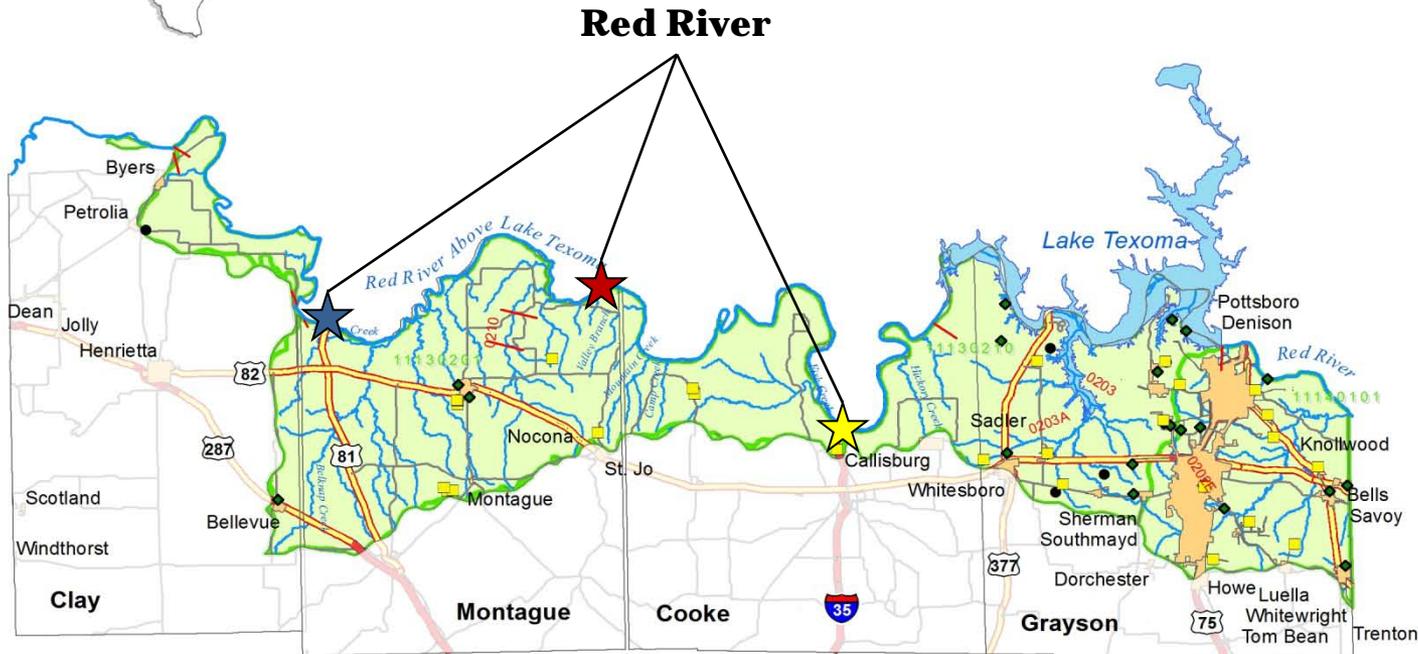
Red River Basin – Reach I Upper



- Post Oak Creek (0202E)
- Choctaw Creek (0202F)
- Sand Creek (0202J)
- Iron Ore Creek (0202K)
- Lake Texoma (0203)
- Big Mineral Creek (0203A)
- Red River Above Lake Texoma (0204)
 - No impairments
 - Chlorophyll-a concern
- Moss Lake (0204B)
- Farmer's Creek Reservoir (0210)



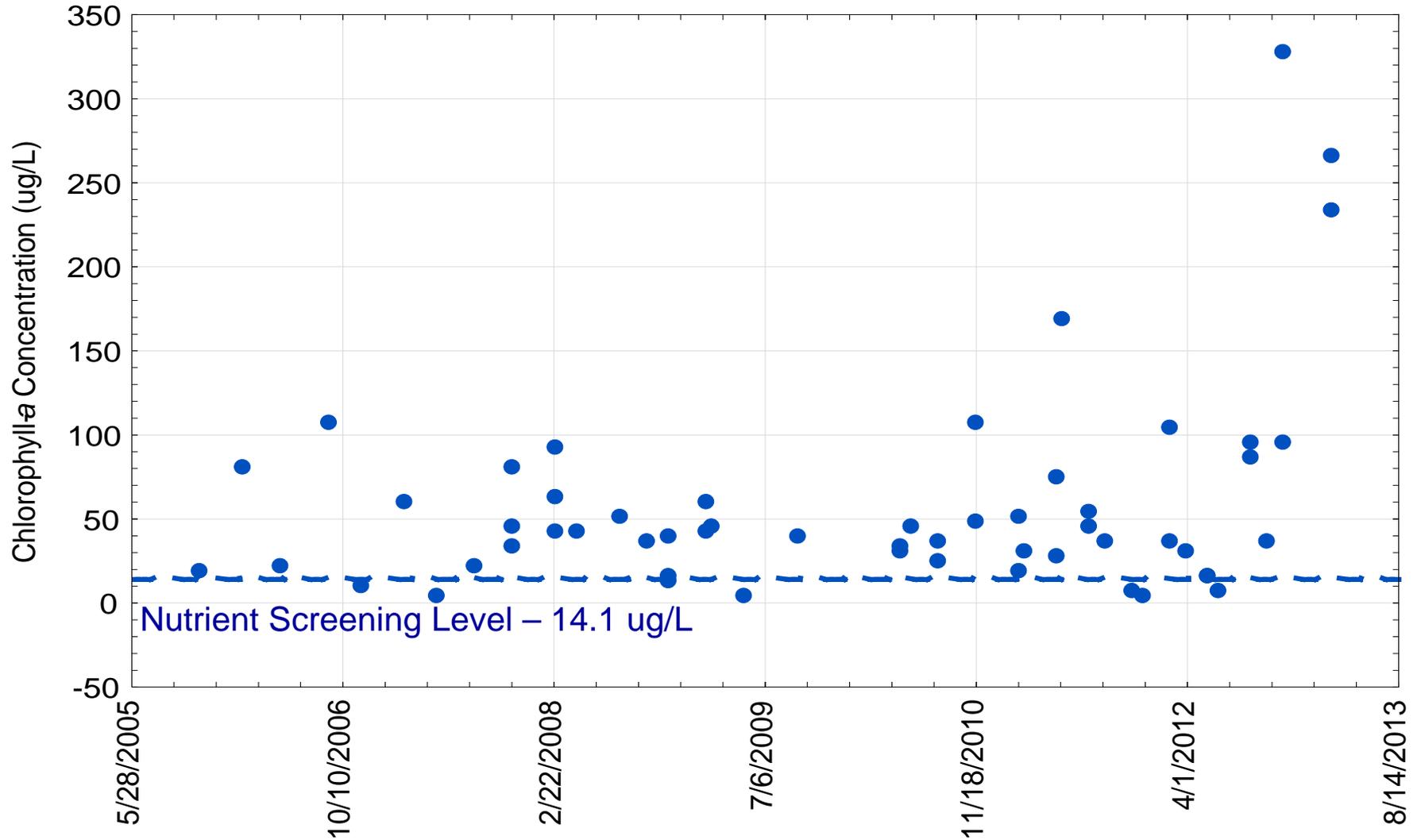
Red River Basin Upper Reach I



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Upper Reach I

Red River Above Lake Texoma
Segment 0204_01-03
Chlorophyll -a



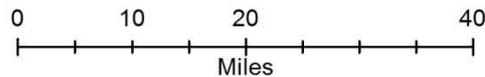
Red River Basin – Reach I Upper



- Post Oak Creek (0202E)
- Choctaw Creek (0202F)
- Sand Creek (0202J)
- Iron Ore Creek (0202K)
- Lake Texoma (0203)
- Big Mineral Creek (0203A)
- Red River Above Lake Texoma (0204)
- Moss Lake (0204B)
 - No impairments or concerns
- Farmer's Creek Reservoir (0210)



Red River Basin Upper Reach I



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Upper Reach I

Moss Lake – September 22, 2014



Red River Basin – Reach I Upper



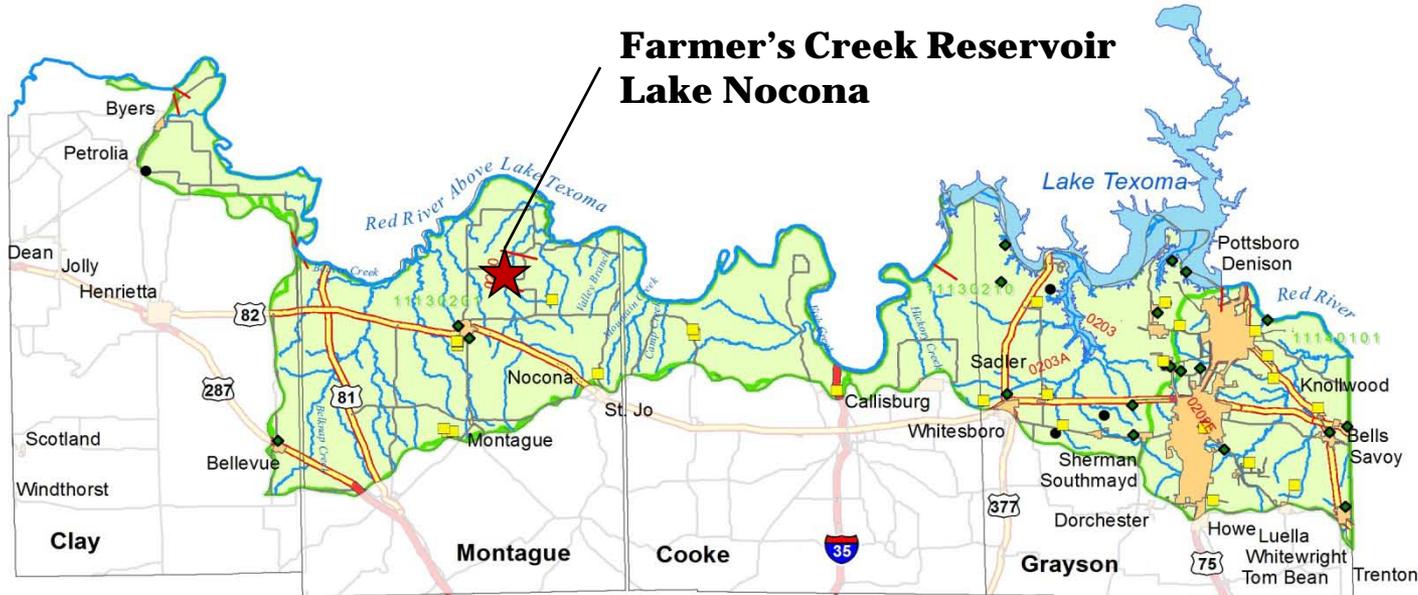
- Post Oak Creek (0202E)
- Choctaw Creek (0202F)
- Sand Creek (0202J)
- Iron Ore Creek (0202K)
- Lake Texoma (0203)
- Big Mineral Creek (0203A)
- Red River Above Lake Texoma (0204)
- Moss Lake (0204B)
- Farmer's Creek Reservoir (0210)
- No impairments or concerns



Red River Basin Upper Reach I



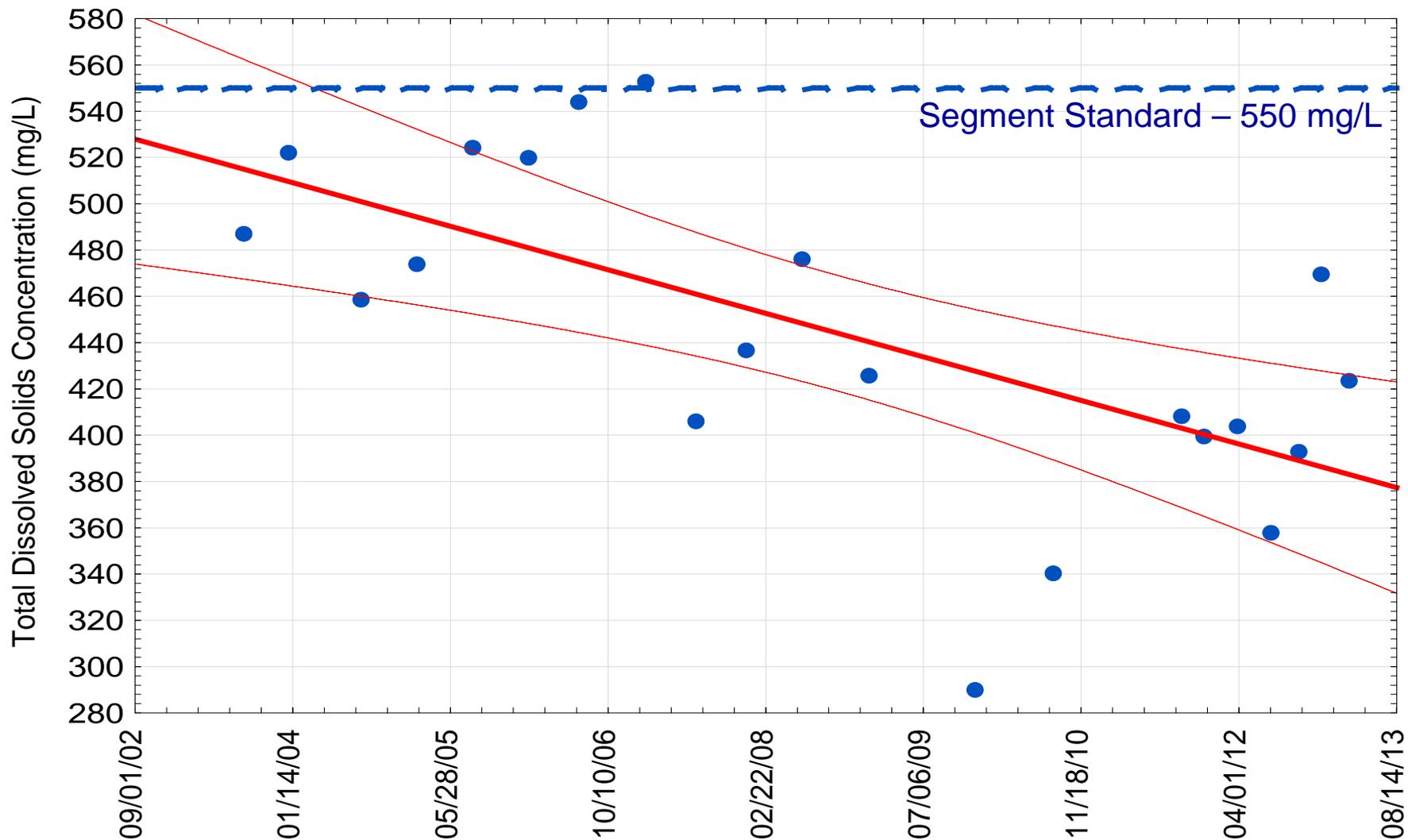
Farmer's Creek Reservoir Lake Nocona



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Upper Reach I

Farmers Creek Reservoir / Lake Nocona
Segment 0210_01
Total Dissolved Solids (TDS)



Red River Basin – Reach II



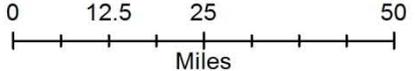
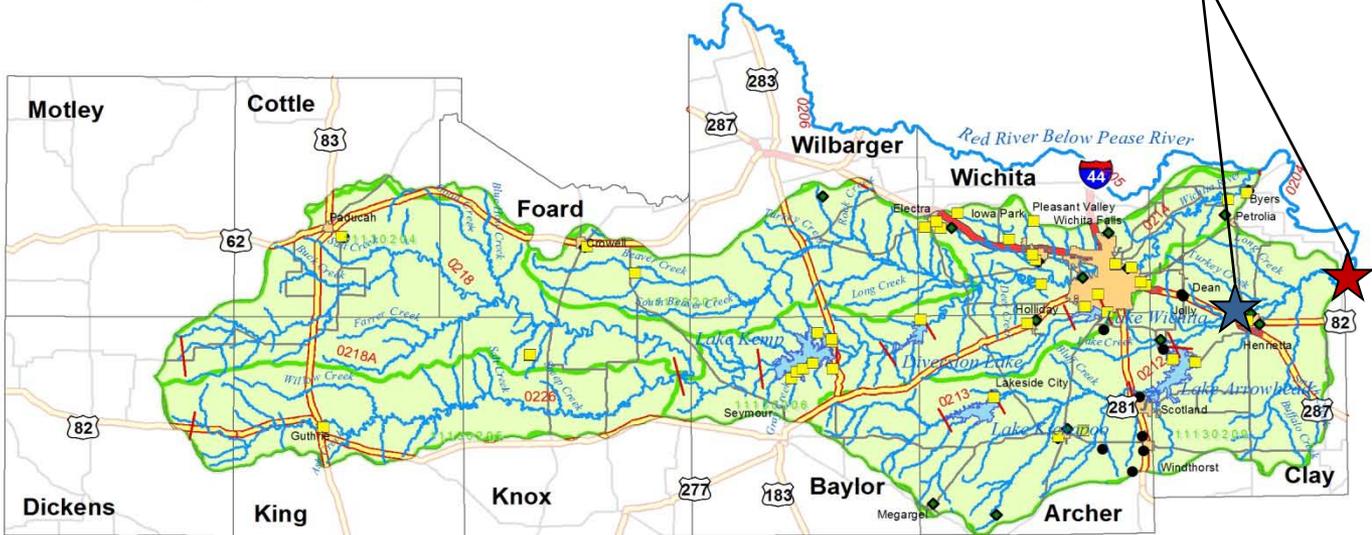
- **Little Wichita River (0211)**
 - Chloride, sulfate, TDS and depressed DO impairments
 - Bacteria and chlorophyll-*a* concerns
- **East Fork Little Wichita River (0211A)**
- **Lake Arrowhead (0212)**
- **Little Wichita River Above Lake Arrowhead (0212A)**
- **Lake Kickapoo (0213)**
- **Wichita River Below Lake Diversion Dam (0214)**
- **Beaver Creek (0214A)**
- **Buffalo Creek (0214B)**
- **Holliday Creek (0214C)**
- **Gordon Lake (0214D)**



Red River Basin Reach II



Little Wichita River



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II

Little Wichita River at FM 2332 – February 9, 2015



Red River Basin – Reach II



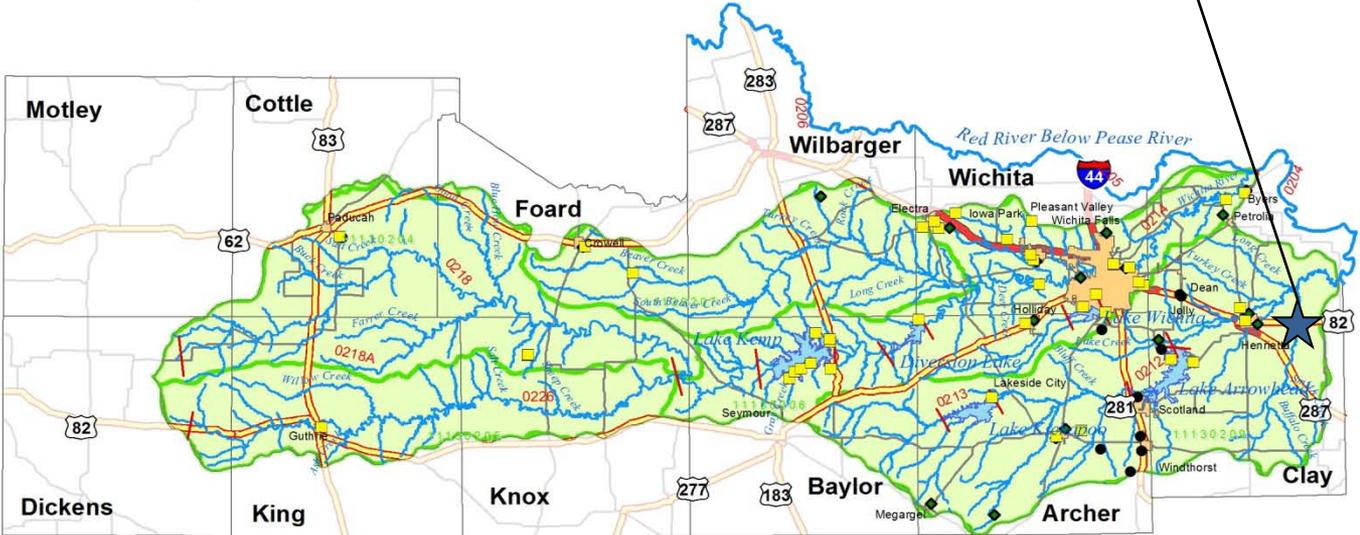
- Little Wichita River (0211)
- East Fork Little Wichita River (0211A)
 - No impairments or concerns
- Lake Arrowhead (0212)
- Little Wichita River Above Lake Arrowhead (0212A)
- Lake Kickapoo (0213)
- Wichita River Below Lake Diversion Dam (0214)
- Beaver Creek (0214A)
- Buffalo Creek (0214B)
- Holliday Creek (0214C)
- Gordon Lake (0214D)



Red River Basin Reach II



East Fork of the Little Wichita River



Legend

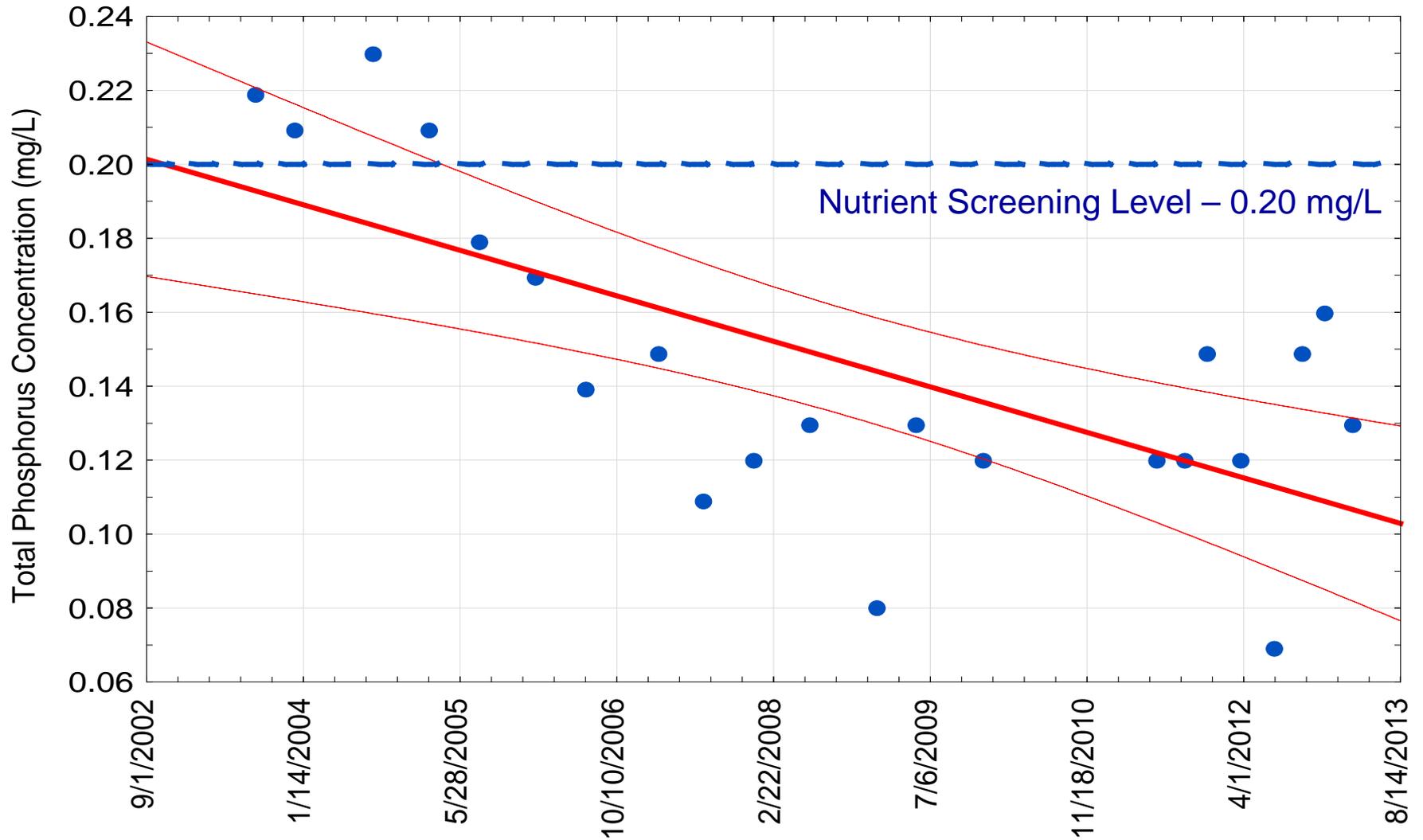
- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II

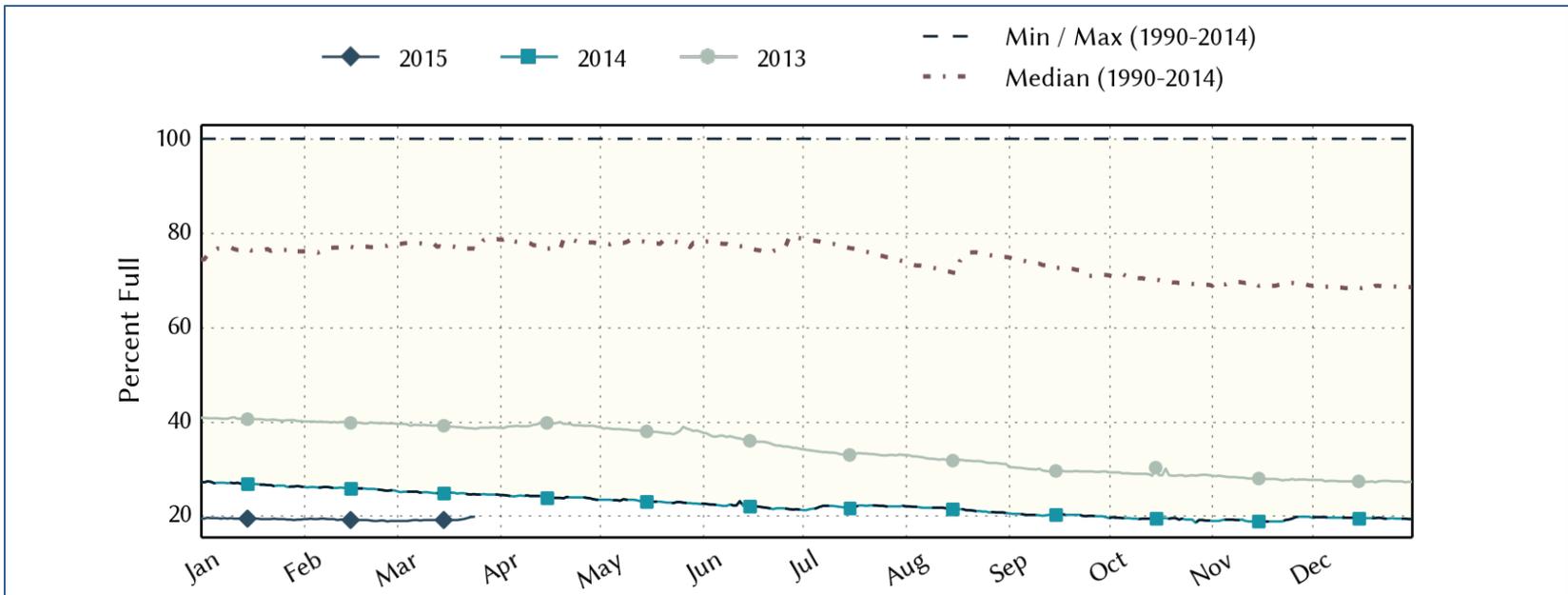
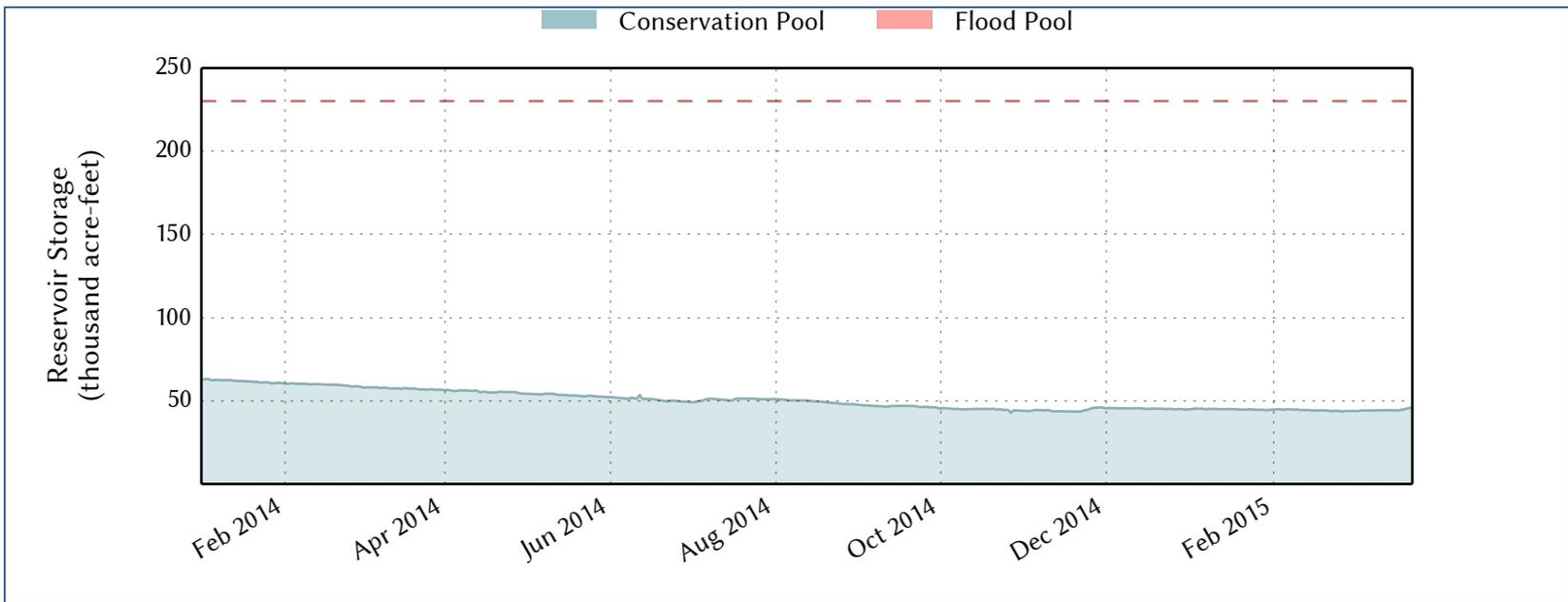
Red River Basin – Reach II



- Little Wichita River (0211)
- East Fork Little Wichita River (0211A)
- Lake Arrowhead (0212)
 - No impairments or concerns
- Little Wichita River Above Lake Arrowhead (0212A)
- Lake Kickapoo (0213)
- Wichita River Below Lake Diversion Dam (0214)
- Beaver Creek (0214A)
- Buffalo Creek (0214B)
- Holliday Creek (0214C)
- Gordon Lake (0214D)

Lake Arrowhead
Segment 0212_01
Total Phosphorus





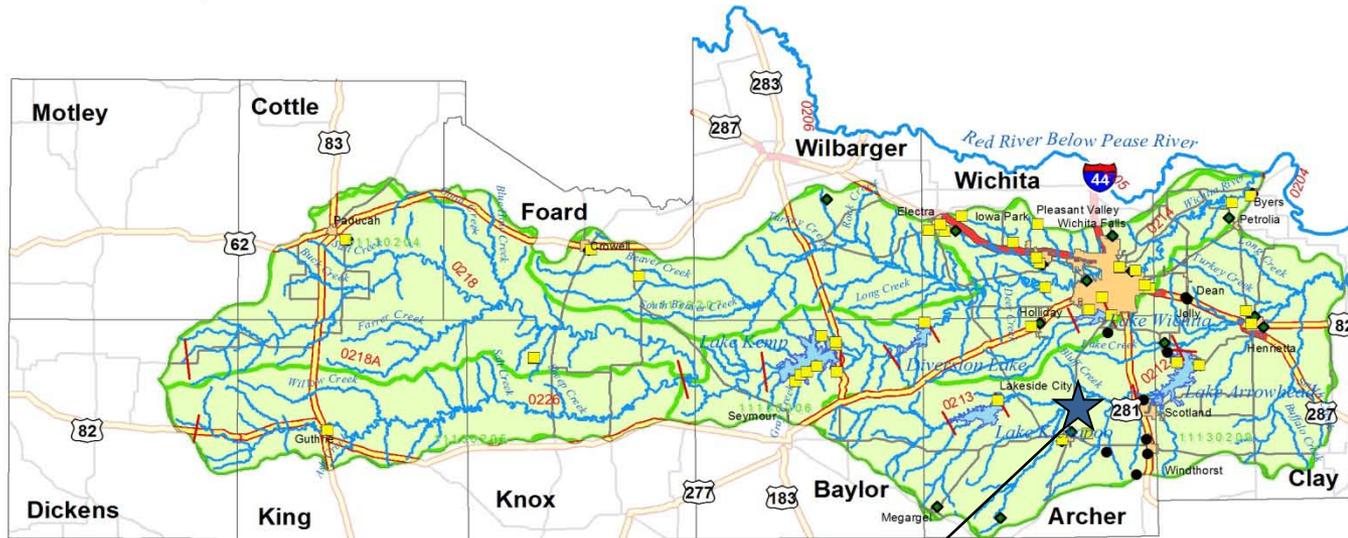
Red River Basin – Reach II



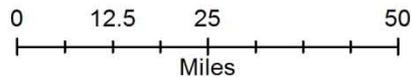
- Little Wichita River (0211)
- East Fork Little Wichita River (0211A)
- Lake Arrowhead (0212)
- Little Wichita River Above Lake Arrowhead (0212A)
 - No impairments or concerns
- Lake Kickapoo (0213)
- Wichita River Below Lake Diversion Dam (0214)
- Beaver Creek (0214A)
- Buffalo Creek (0214B)
- Holliday Creek (0214C)
- Gordon Lake (0214D)



Red River Basin Reach II



Little Wichita River Above Lake Arrowhead



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II

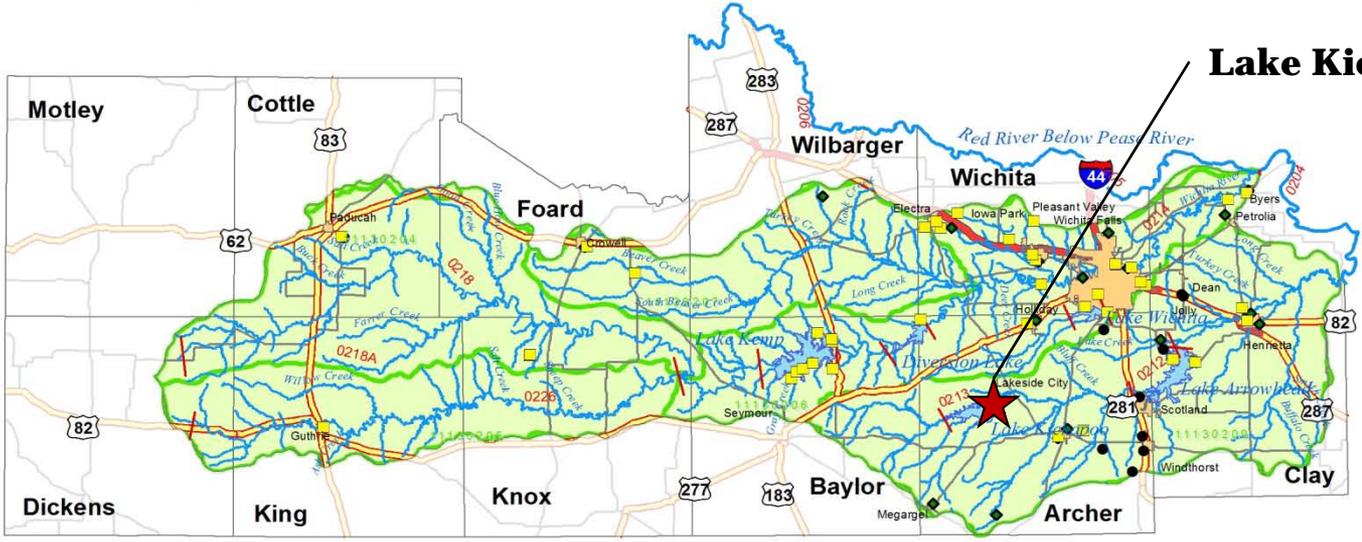
Red River Basin – Reach II



- Little Wichita River (0211)
- East Fork Little Wichita River (0211A)
- Lake Arrowhead (0212)
- Little Wichita River Above Lake Arrowhead (0212A)
- **Lake Kickapoo (0213)**
 - **No impairments or concerns**
- Wichita River Below Lake Diversion Dam (0214)
- Beaver Creek (0214A)
- Buffalo Creek (0214B)
- Holliday Creek (0214C)
- Gordon Lake (0214D)



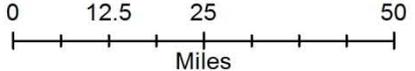
Red River Basin Reach II



Lake Kickapoo

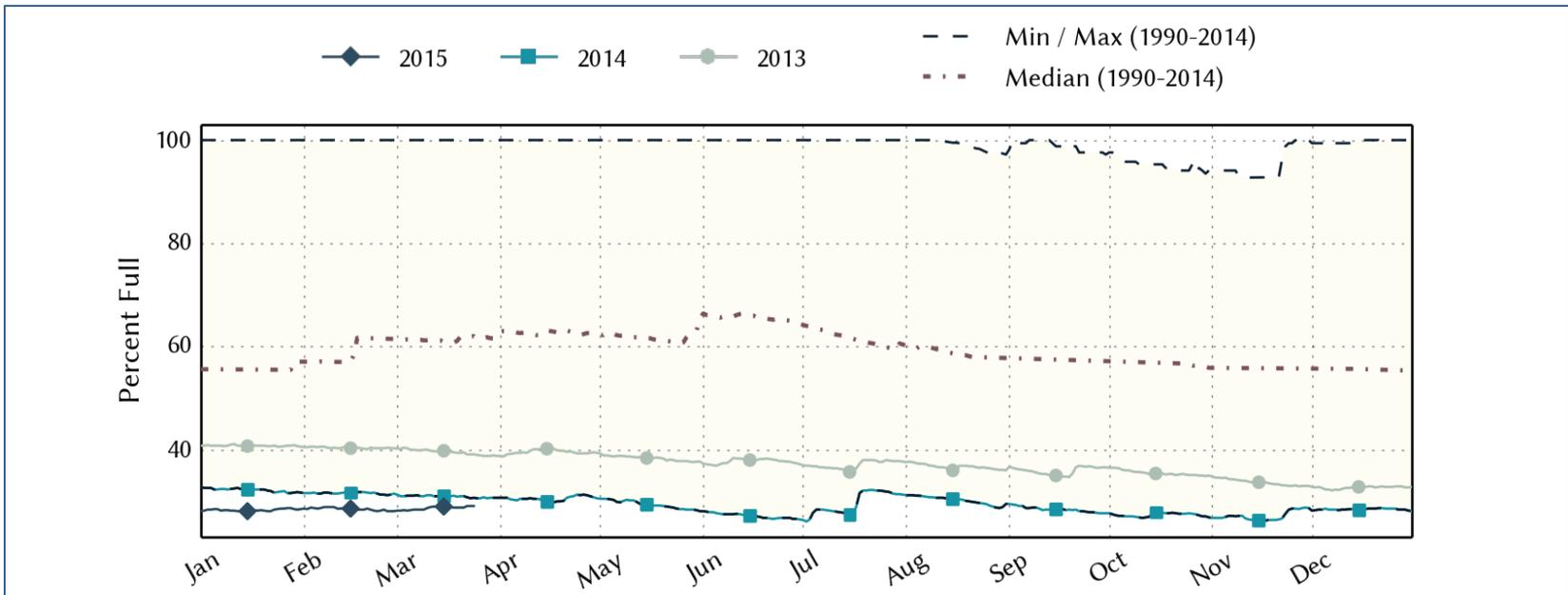
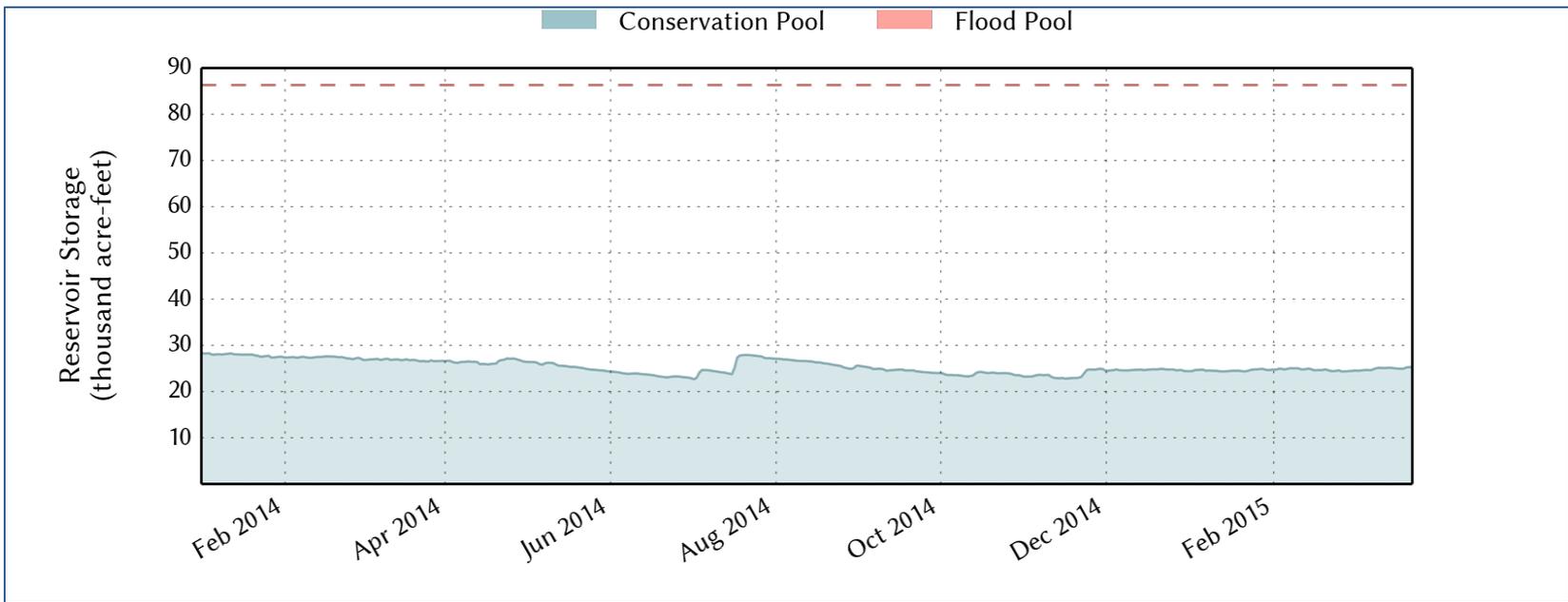
Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II



Lake Kickapoo – September 23, 2014





Red River Basin – Reach II



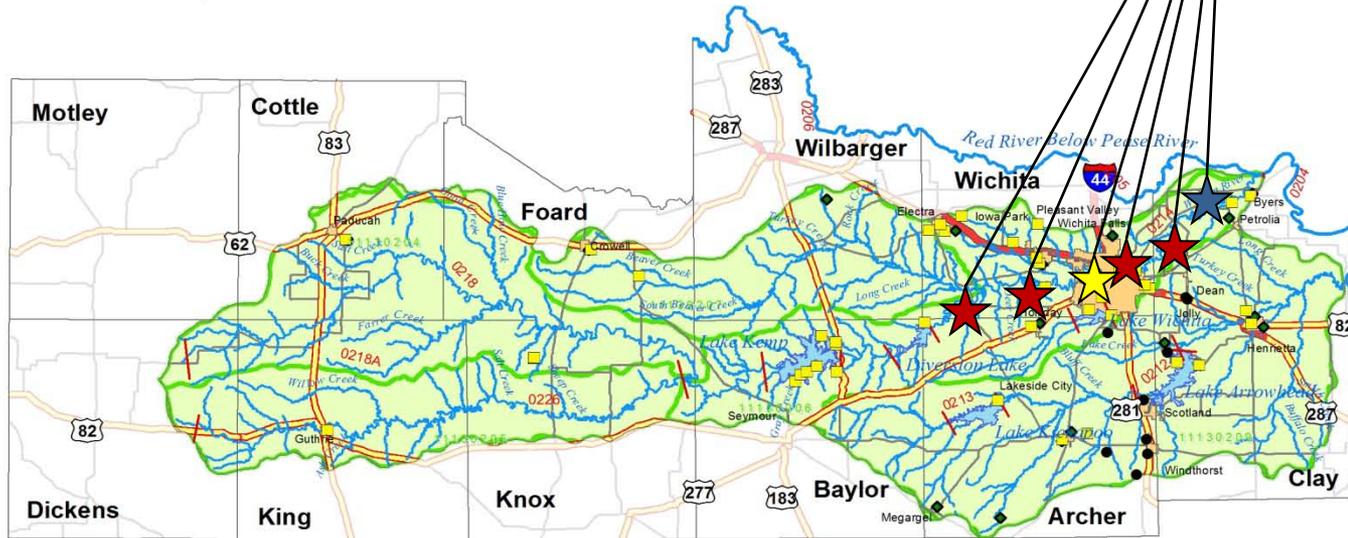
- Little Wichita River (0211)
- East Fork Little Wichita River (0211A)
- Lake Arrowhead (0212)
- Little Wichita River Above Lake Arrowhead (0212A)
- Lake Kickapoo (0213)
- **Wichita River Below Diversion Lake Dam (0214)**
 - **No impairments** – **Bacteria delisted in *Draft 2014 IR***
 - **Chlorophyll-*a*, nitrate and total phosphorus concerns**
- Beaver Creek (0214A)
- Buffalo Creek (0214B)
- Holliday Creek (0214C)
- Gordon Lake (0214D)



Red River Basin Reach II



Wichita River Below Diversion Lake Dam

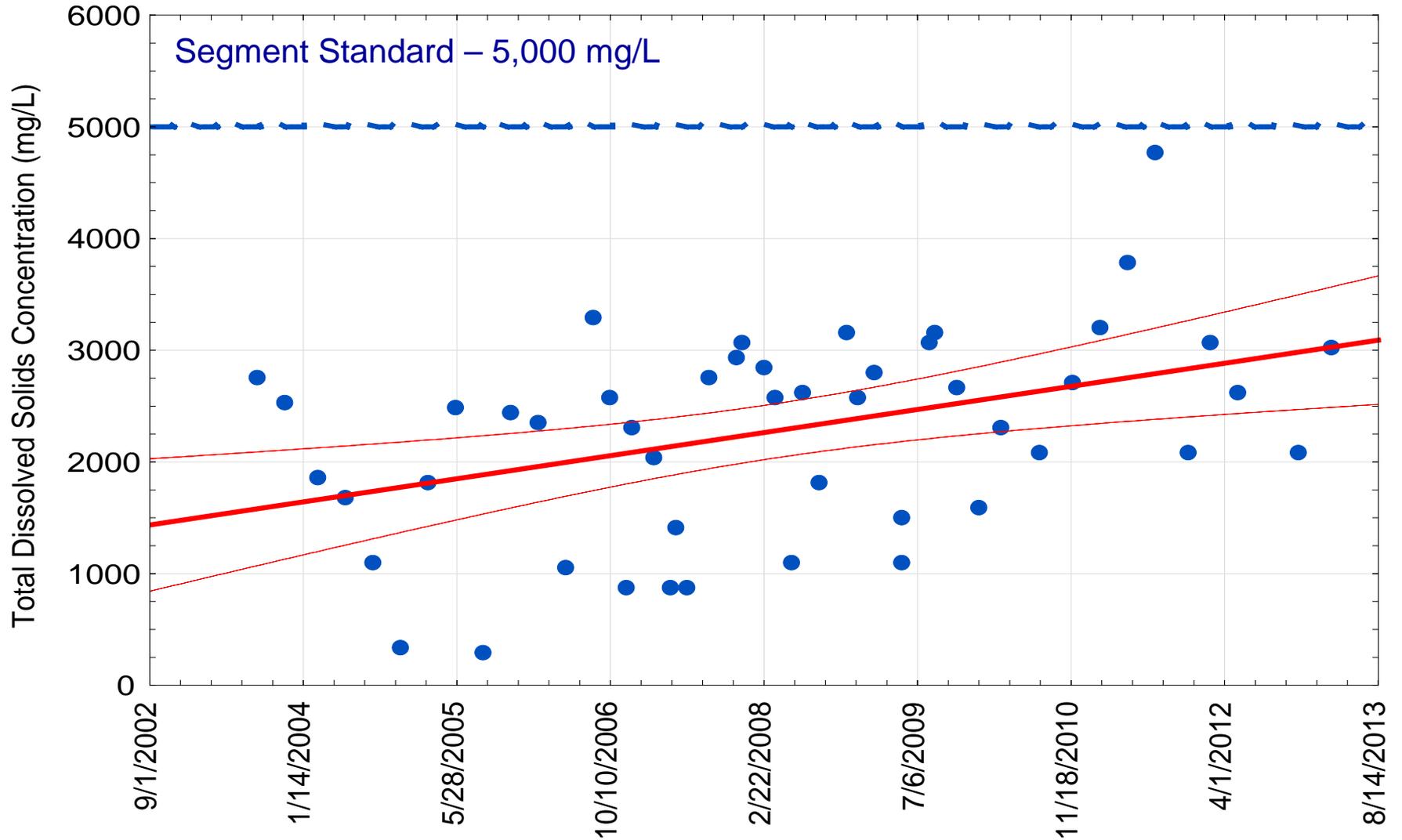


Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II



Wichita River Below Diversion Lake Dam
Segment 0214_01
Total Dissolved Solids (TDS)



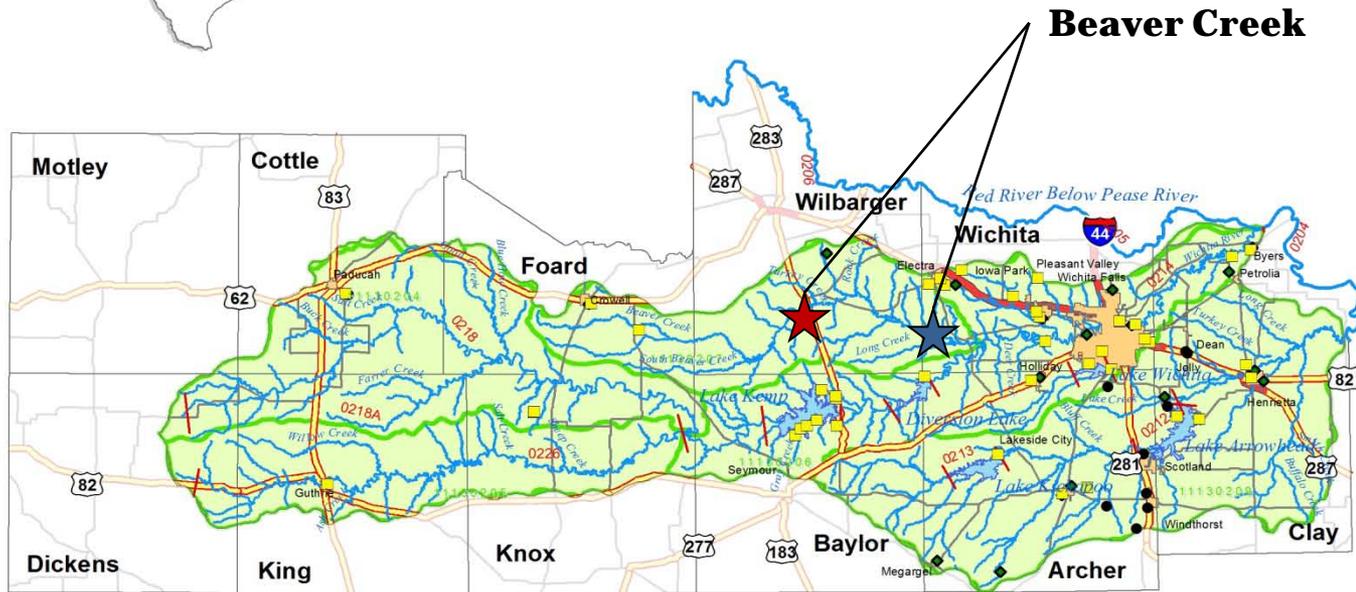
Red River Basin – Reach II



- Little Wichita River (0211)
- East Fork Little Wichita River (0211A)
- Lake Arrowhead (0212)
- Little Wichita River Above Lake Arrowhead (0212A)
- Lake Kickapoo (0213)
- Wichita River Below Diversion Lake Dam (0214)
- Beaver Creek (0214A)
 - Bacteria impairment
 - Chlorophyll-*a* and depressed DO concerns
- Buffalo Creek (0214B)
- Holliday Creek (0214C)
- Gordon Lake (0214D)



Red River Basin Reach II



Beaver Creek

Legend

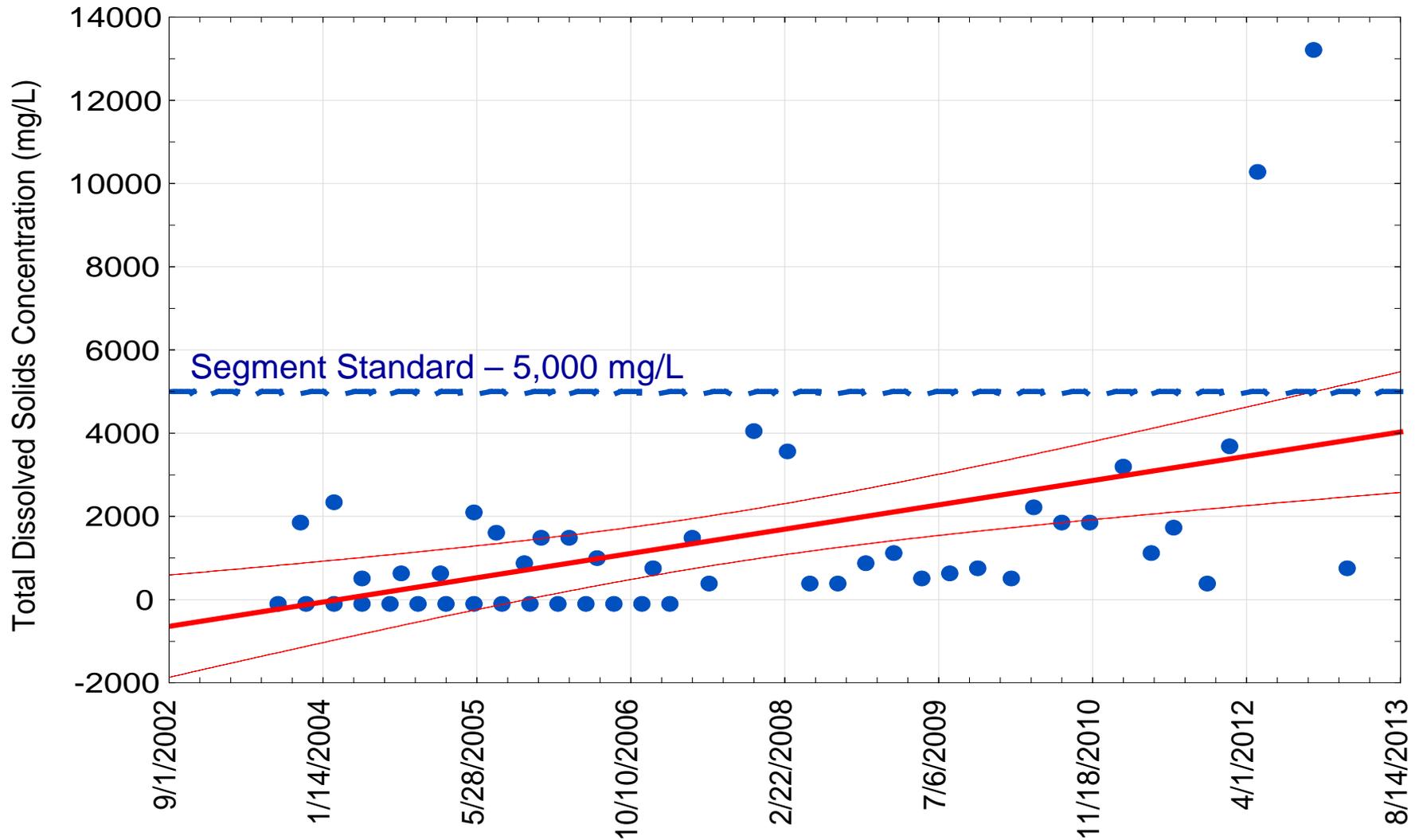
- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II



Beaver Creek at US 283 – August 7, 2014



Beaver Creek
Segment 0214A_01
Total Dissolved Solids (TDS)



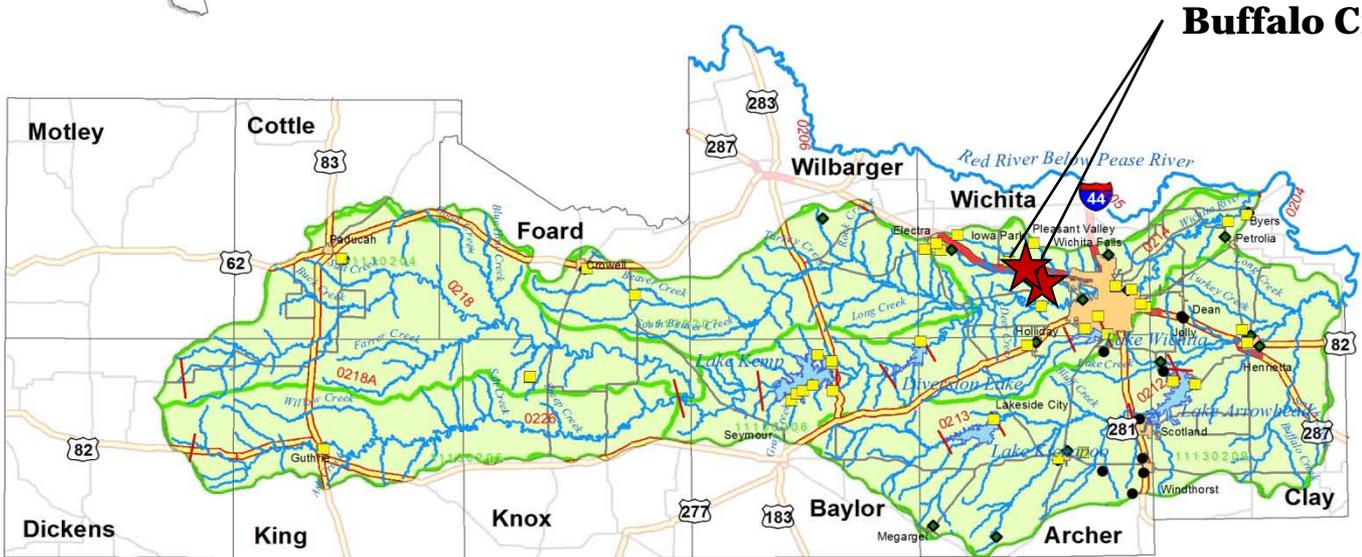
Red River Basin – Reach II



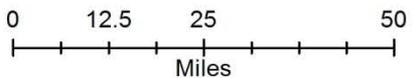
- Little Wichita River (0211)
- East Fork Little Wichita River (0211A)
- Lake Arrowhead (0212)
- Little Wichita River Above Lake Arrowhead (0212A)
- Lake Kickapoo (0213)
- Wichita River Below Diversion Lake Dam (0214)
- Beaver Creek (0214A)
- **Buffalo Creek (0214B)**
 - **Bacteria impairment**
 - **Ammonia, chlorophyll-a, nitrate, and total phosphorus concerns**
 - **RUAA has been completed and submitted to TCEQ**
- Holliday Creek (0214C)
- Gordon Lake (0214D)



Red River Basin Reach II



Buffalo Creek



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II

Buffalo Creek at FM 1814 – November 5, 2014



Buffalo Creek at Coleman Road – February 17, 2015



Red River Basin – Reach II



- Little Wichita River (0211)
- East Fork Little Wichita River (0211A)
- Lake Arrowhead (0212)
- Little Wichita River Above Lake Arrowhead (0212A)
- Lake Kickapoo (0213)
- Wichita River Below Diversion Lake Dam (0214)
- Beaver Creek (0214A)
- Buffalo Creek (0214B)
- Holliday Creek (0214C)
 - No impairments or concerns
- Gordon Lake (0214D)
 - No impairments or concerns

Holliday Creek – October 12, 2014

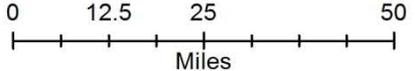
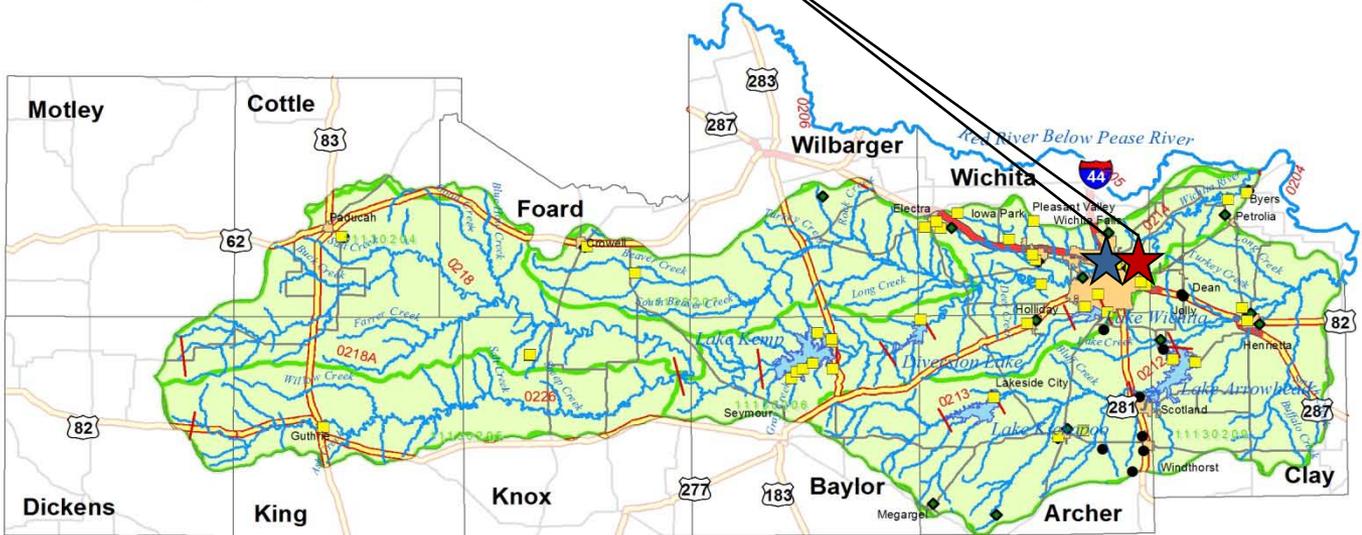




Red River Basin Reach II



Holliday Creek



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II

Red River Basin – Reach II



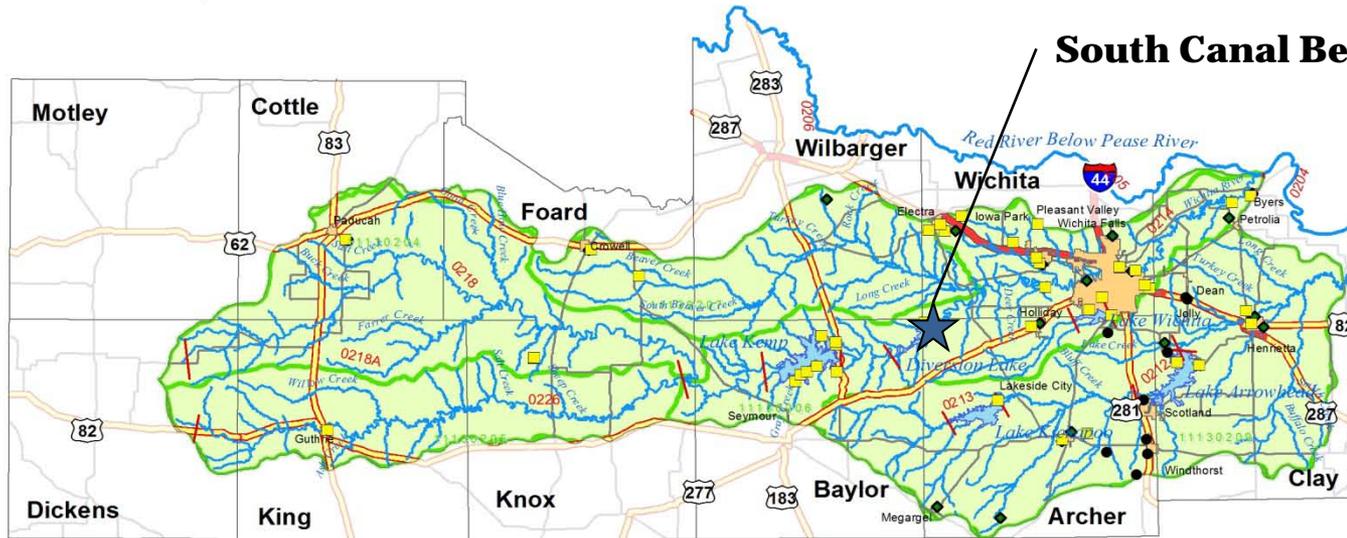
- **Wichita Valley Irrigation Project (0214E)**
 - **No impairments**
 - **Chlorophyll-a concern**
- **Unnamed Tributary of Buffalo Creek (0214F)**
- **Diversion Lake (0215)**
- **Wichita River Below Lake Kemp (0216)**
- **Lake Kemp (0217)**
- **Wichita/North Fork Wichita River (0218)**
- **Middle Fork Wichita River (0218A)**
- **Lake Wichita (0219)**
- **Holliday Creek Above Lake Wichita (0219A)**
- **South Fork Wichita River (0226)**



Red River Basin Reach II



South Canal Below Lake Diversion



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II



South Canal Below Lake Diversion – May 7, 2014



Red River Basin – Reach II



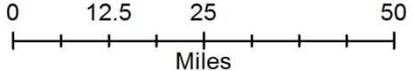
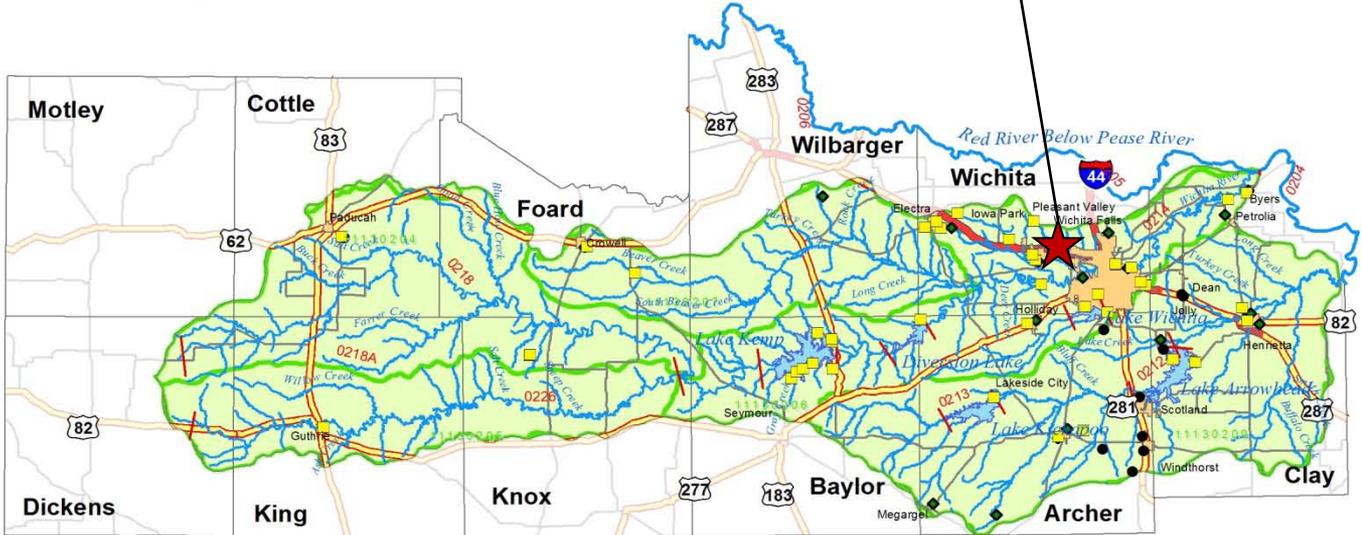
- Wichita Valley Irrigation Project (0214E)
- Unnamed Tributary of Buffalo Creek (0214F)
 - No impairments or concerns
- Diversion Lake (0215)
- Wichita River Below Lake Kemp (0216)
- Lake Kemp (0217)
- Wichita/North Fork Wichita River (0218)
- Middle Fork Wichita River (0218A)
- Lake Wichita (0219)
- Holliday Creek Above Lake Wichita (0219A)
- South Fork Wichita River (0226)



Red River Basin Reach II



Unnamed Tributary of Buffalo Creek



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II

Unnamed Tributary of Buffalo Creek— April 14, 2014



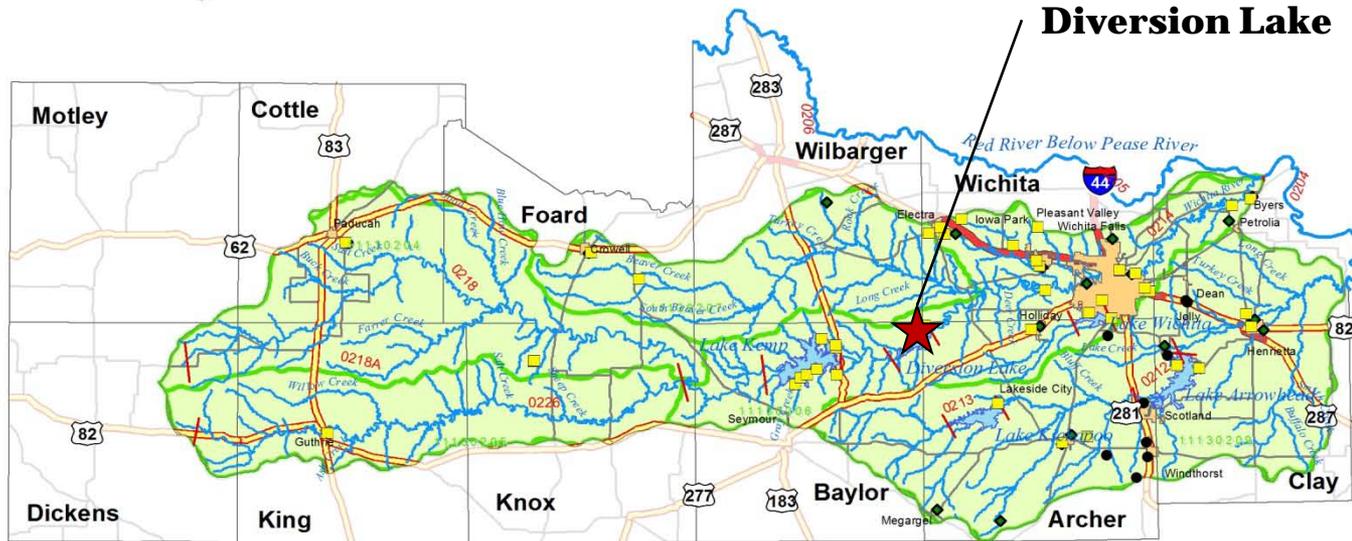
Red River Basin – Reach II



- Wichita Valley Irrigation Project (0214E)
- Unnamed Tributary of Buffalo Creek (0214F)
- Diversion Lake (0215)
 - No impairments
 - Harmful algal bloom concern
- Wichita River Below Lake Kemp (0216)
- Lake Kemp (0217)
- Wichita/North Fork Wichita River (0218)
- Middle Fork Wichita River (0218A)
- Lake Wichita (0219)
- Holliday Creek Above Lake Wichita (0219A)
- South Fork Wichita River (0226)

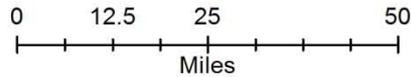


Red River Basin Reach II

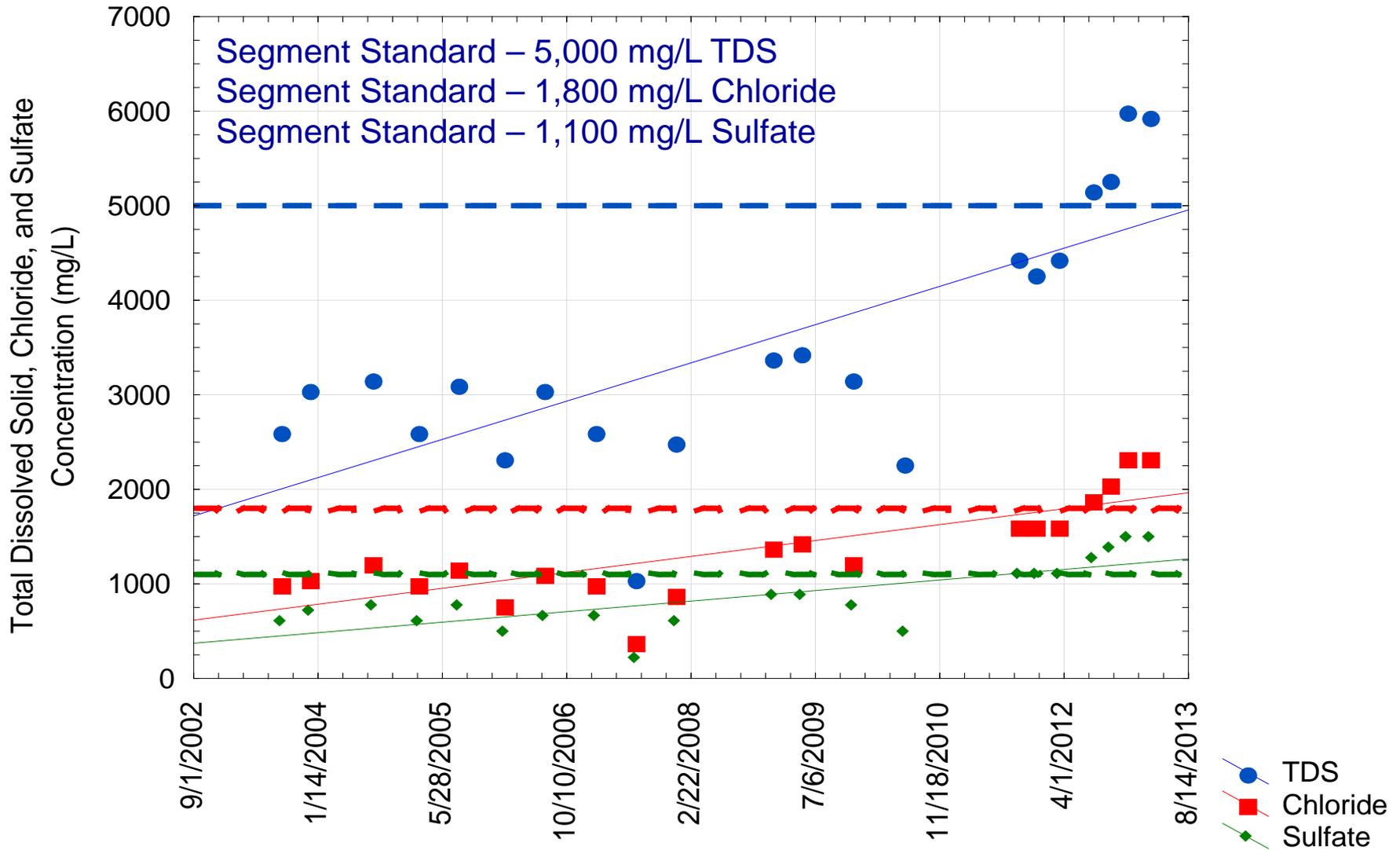


Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II



Diversion Lake
Segment 0215_01
Total Dissolved Solids (TDS), Chloride, and Sulfate



Red River Basin – Reach II



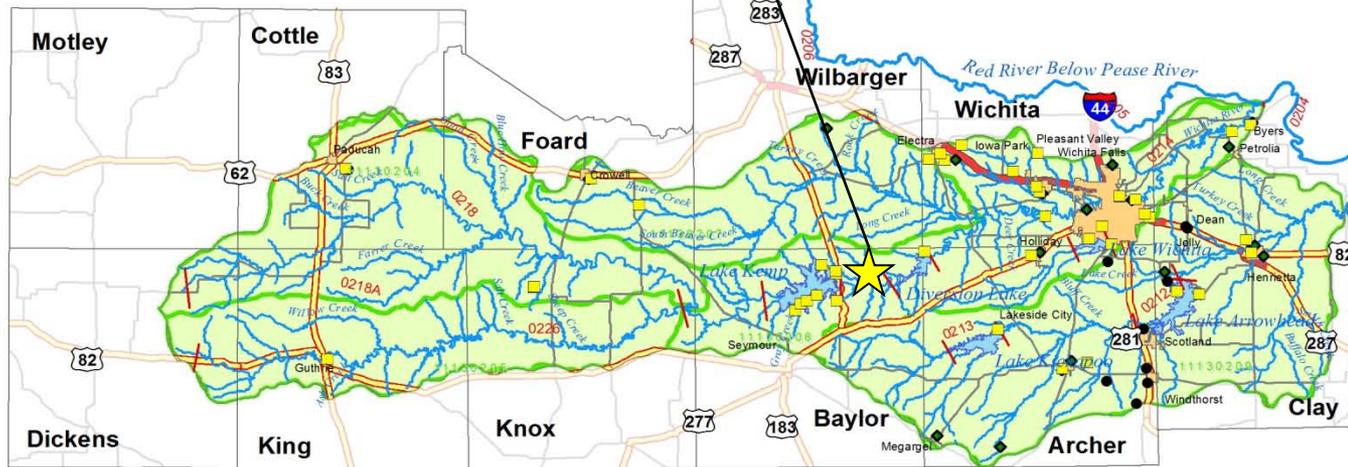
- Wichita Valley Irrigation Project (0214E)
- Unnamed Tributary of Buffalo Creek (0214F)
- Diversion Lake (0215)
- Wichita River Below Lake Kemp (0216)
 - No impairments or concerns
- Lake Kemp (0217)
- Wichita/North Fork Wichita River (0218)
- Middle Fork Wichita River (0218A)
- Lake Wichita (0219)
- Holliday Creek Above Lake Wichita (0219A)
- South Fork Wichita River (0226)



Red River Basin Reach II



Wichita River Below Lake Kemp



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II



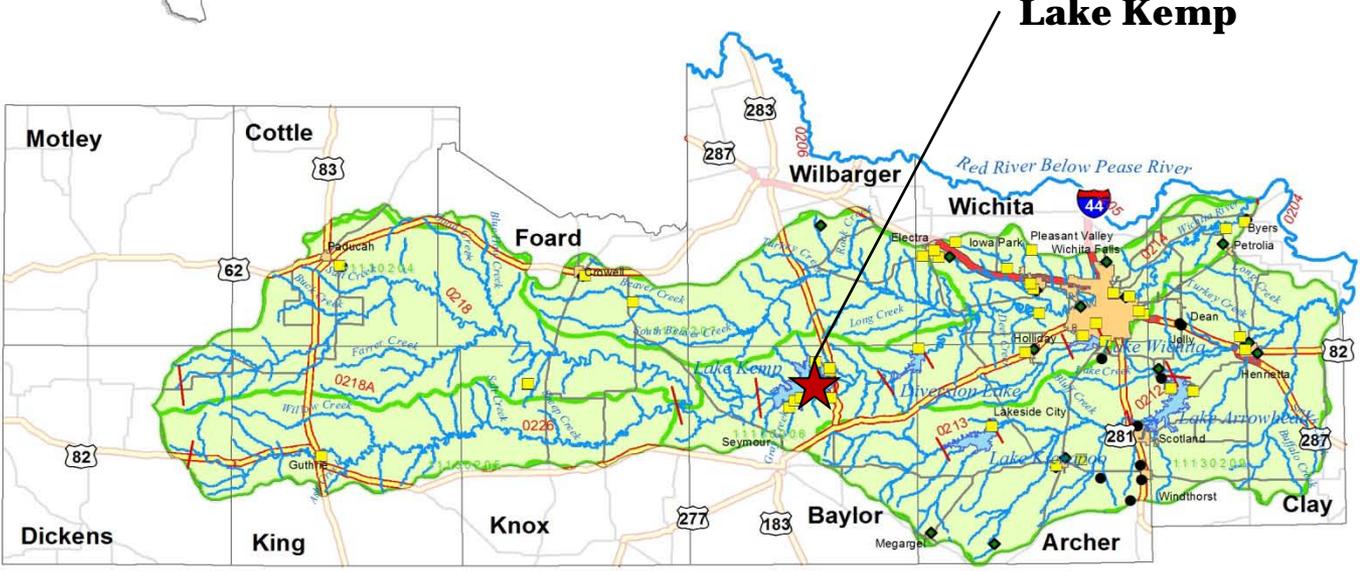
Red River Basin – Reach II



- Wichita Valley Irrigation Project (0214E)
- Unnamed Tributary of Buffalo Creek (0214F)
- Diversion Lake (0215)
- Wichita River Below Lake Kemp (0216)
- Lake Kemp (0217)
 - No impairments or concerns
- Wichita/North Fork Wichita River (0218)
- Middle Fork Wichita River (0218A)
- Lake Wichita (0219)
- Holliday Creek Above Lake Wichita (0219A)
- South Fork Wichita River (0226)



Red River Basin Reach II



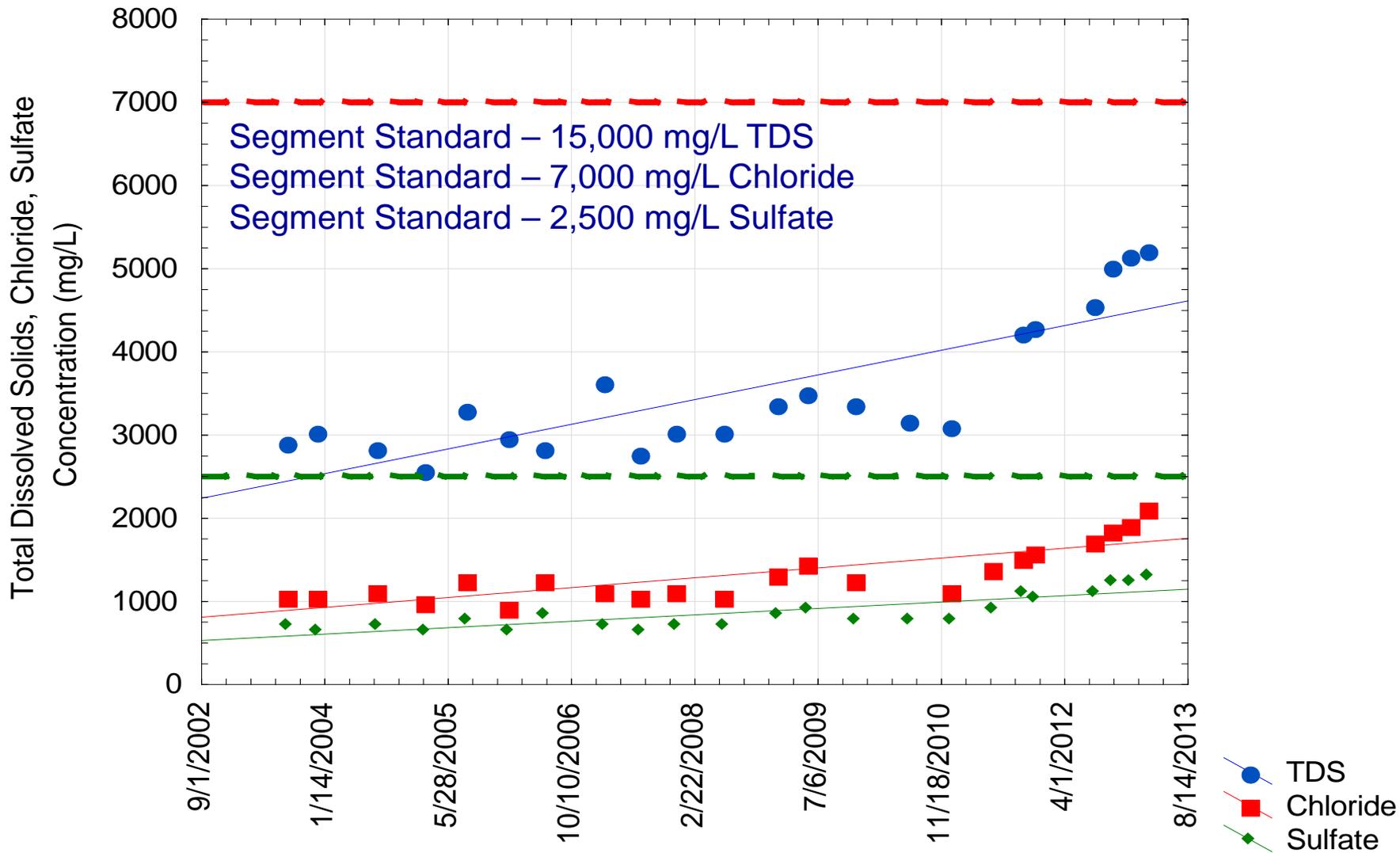
Lake Kemp

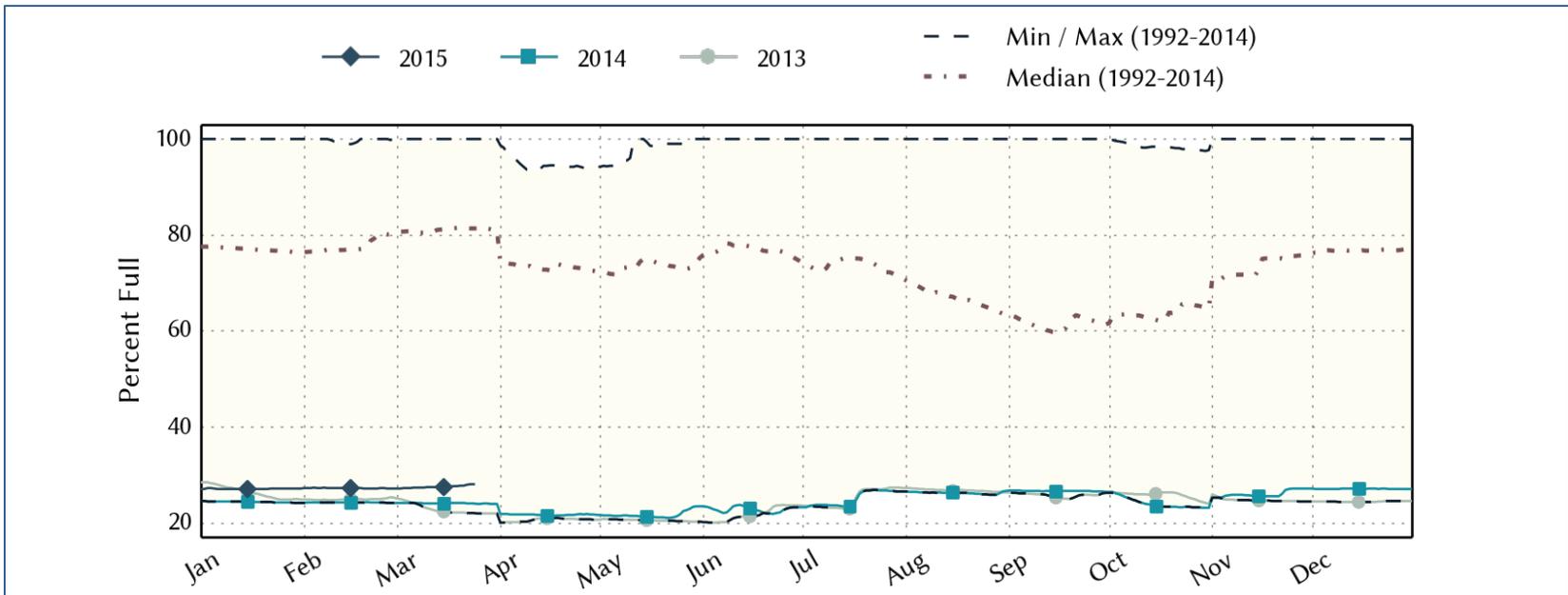
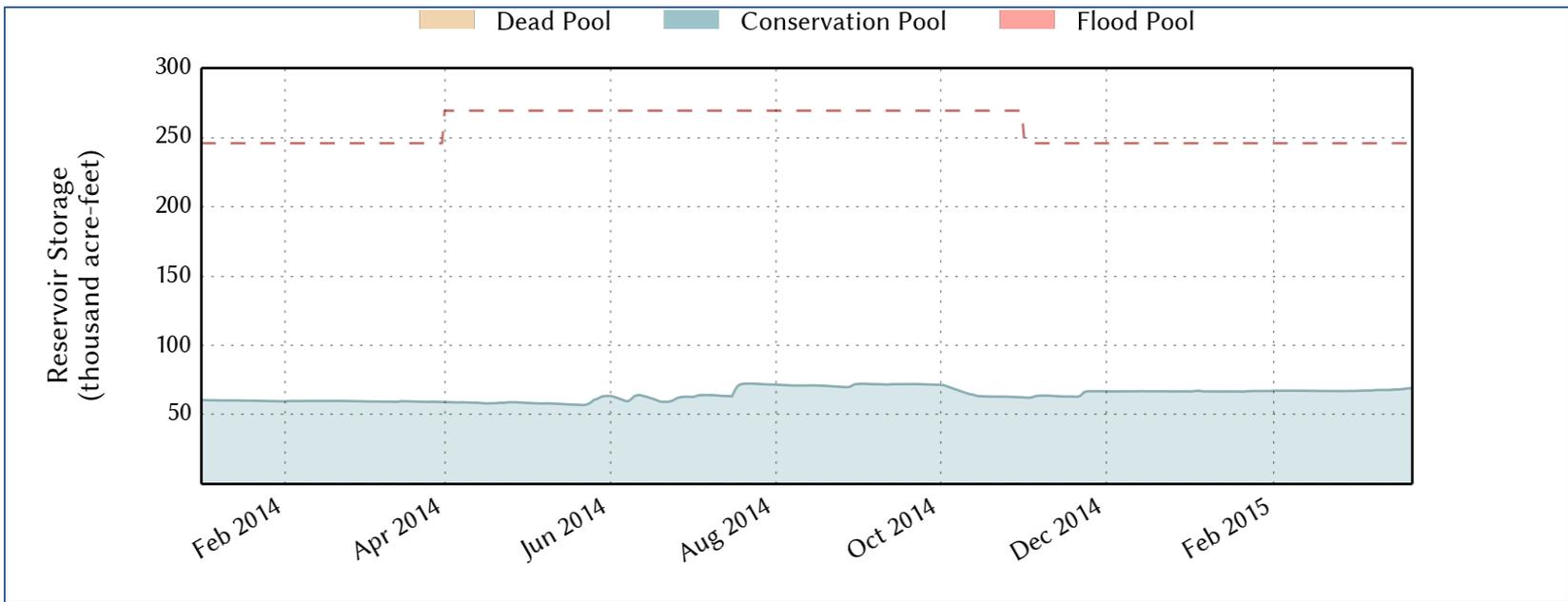
Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II



Lake Kemp
Segment 0217_01
Total Dissolved Solids (TDS), Chloride, Sulfate





Red River Basin – Reach II



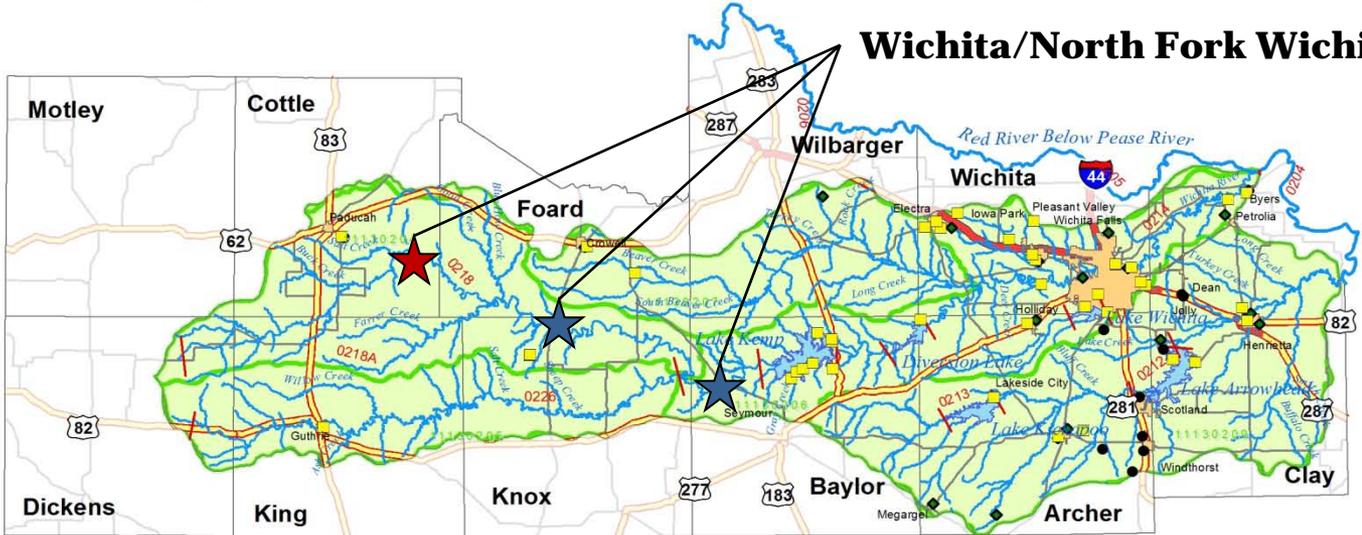
- Wichita Valley Irrigation Project (0214E)
- Unnamed Tributary of Buffalo Creek (0214F)
- Diversion Lake (0215)
- Wichita River Below Lake Kemp (0216)
- Lake Kemp (0217)
- Wichita/North Fork Wichita River (0218)
 - No impairments
- Middle Fork Wichita River (0218A)
- Lake Wichita (0219)
- Holliday Creek Above Lake Wichita (0219A)
- South Fork Wichita River (0226)



Red River Basin Reach II

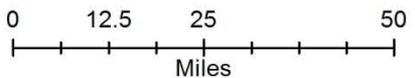


Wichita/North Fork Wichita River



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II



North Wichita River at FM 1919 – August 13, 2014



North Wichita River at SH 6 – February 18, 2015



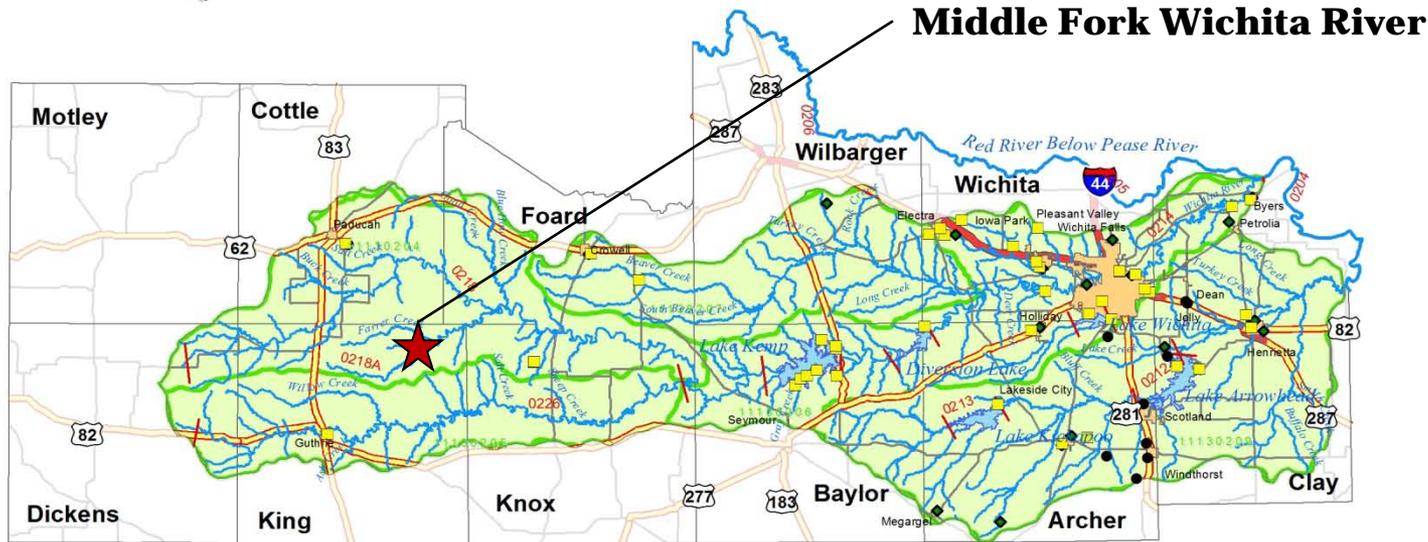
Red River Basin – Reach II



- Wichita Valley Irrigation Project (0214E)
- Unnamed Tributary of Buffalo Creek (0214F)
- Diversion Lake (0215)
- Wichita River Below Lake Kemp (0216)
- Lake Kemp (0217)
- Wichita/North Fork Wichita River (0218)
- Middle Fork Wichita River (0218A)
 - No impairments
 - Selenium in water concern
- Lake Wichita (0219)
- Holliday Creek Above Lake Wichita (0219A)
- South Fork Wichita River (0226)

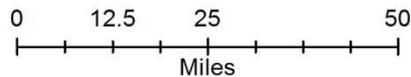


Red River Basin Reach II



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II



Middle Fork Wichita River NE of Guthrie – May 15, 2014



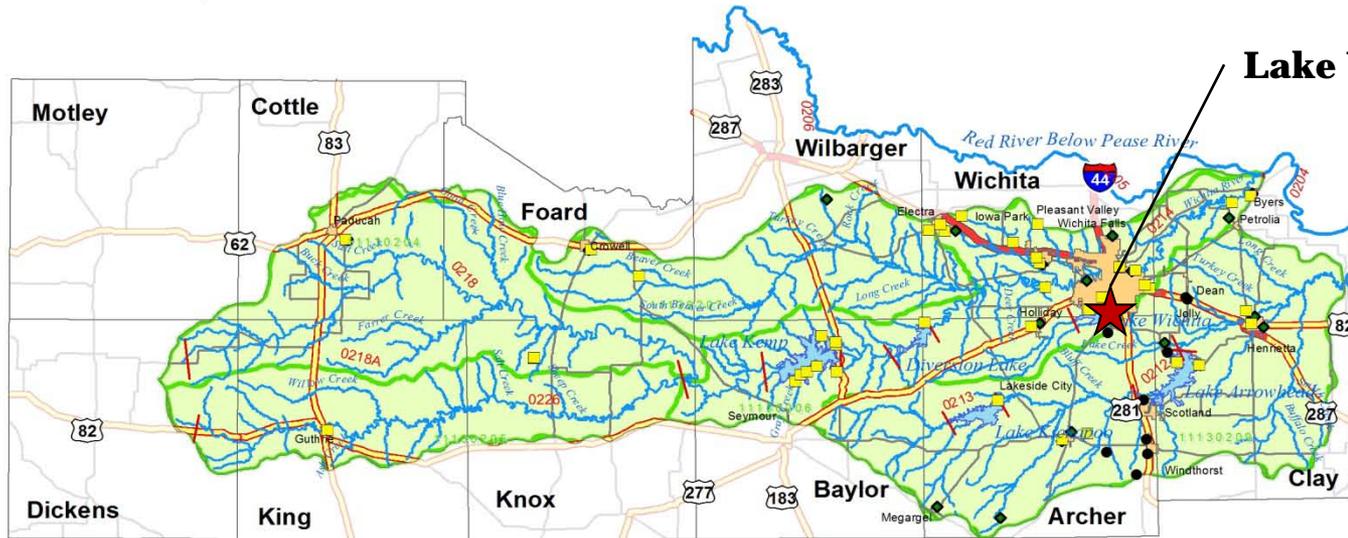
Red River Basin – Reach II



- Wichita Valley Irrigation Project (0214E)
- Unnamed Tributary of Buffalo Creek (0214F)
- Diversion Lake (0215)
- Wichita River Below Lake Kemp (0216)
- Lake Kemp (0217)
- Wichita/North Fork Wichita River (0218)
- Middle Fork Wichita River (0218A)
- **Lake Wichita (0219)**
 - **Chloride, sulfate, TDS** impairments
 - **Chlorophyll-a, harmful algal bloom, total phosphorus**
- Holliday Creek Above Lake Wichita (0219A)
- South Fork Wichita River (0226)



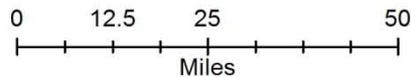
Red River Basin Reach II



Lake Wichita

Legend

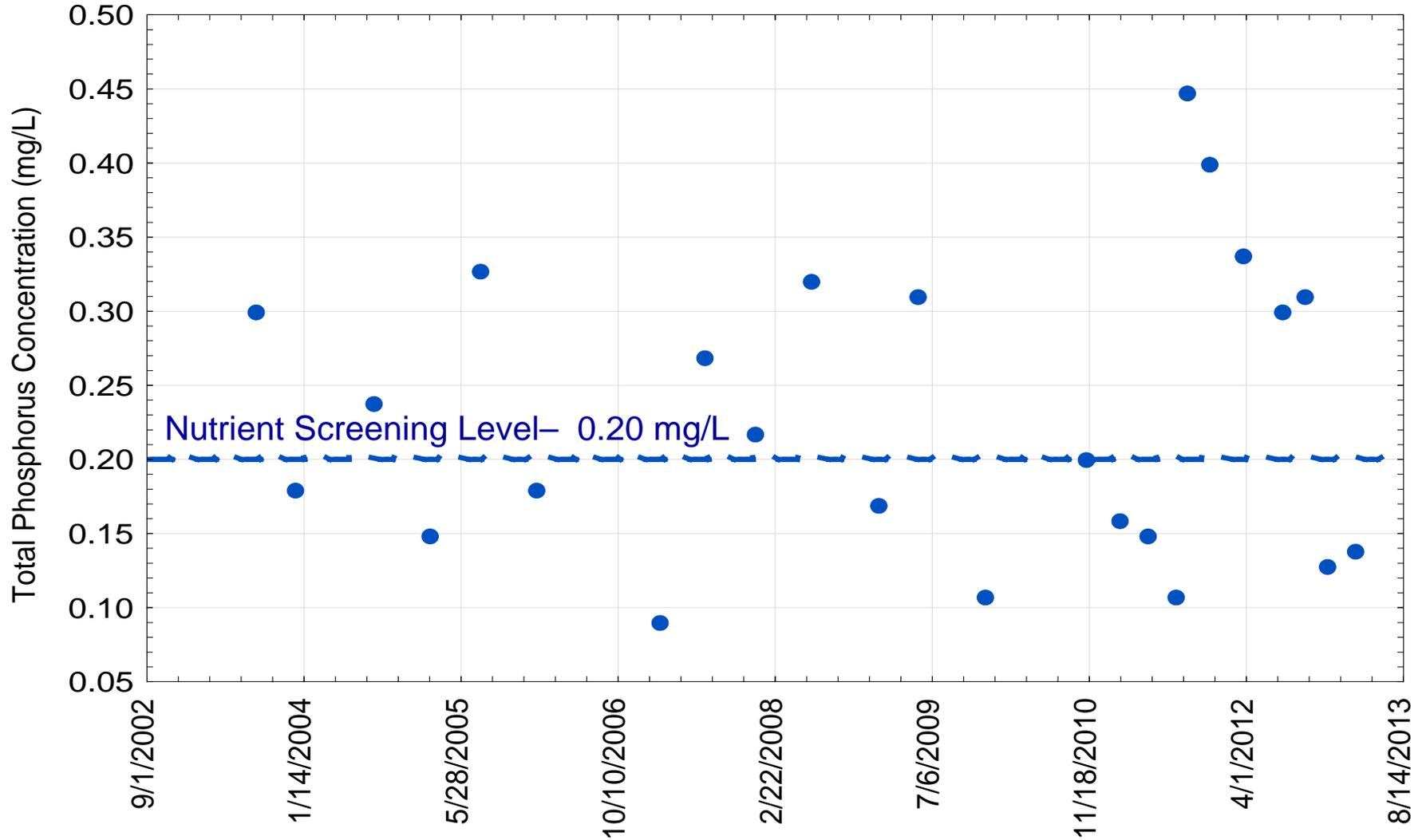
- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II



Lake Wichita – December 10, 2012



Lake Wichita
Segment 0219_01
Total Phosphorus



Red River Basin – Reach II



- Wichita Valley Irrigation Project (0214E)
- Unnamed Tributary of Buffalo Creek (0214F)
- Diversion Lake (0215)
- Wichita River Below Lake Kemp (0216)
- Lake Kemp (0217)
- Wichita/North Fork Wichita River (0218)
- Middle Fork Wichita River (0218A)
- Lake Wichita (0219)
- Holliday Creek Above Lake Wichita (0219A)
 - No impairments or concerns
- South Fork Wichita River (0226)

Red River Basin – Reach II



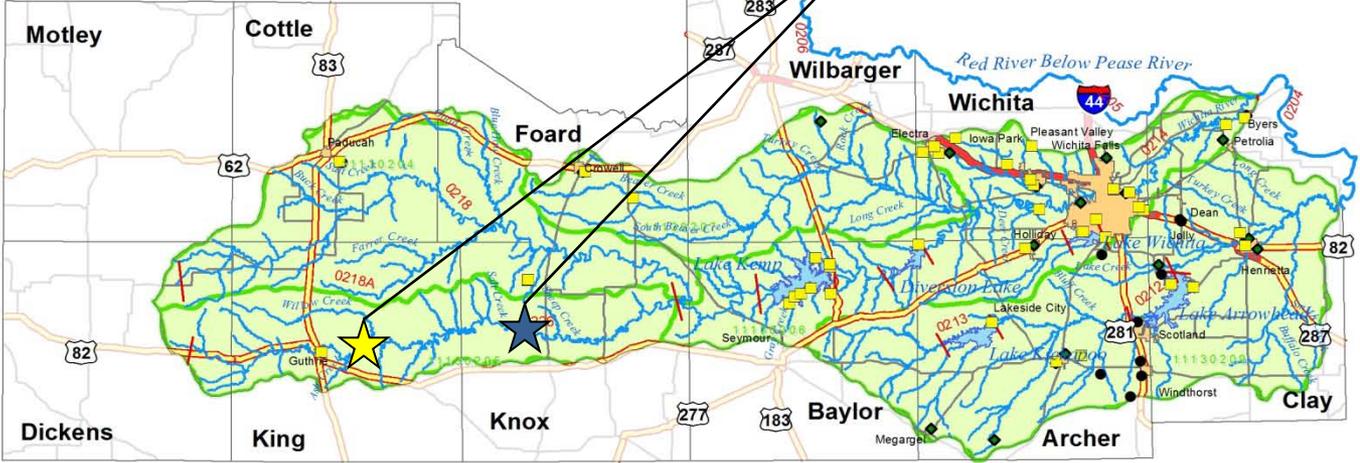
- Wichita Valley Irrigation Project (0214E)
- Unnamed Tributary of Buffalo Creek (0214F)
- Diversion Lake (0215)
- Wichita River Below Lake Kemp (0216)
- Lake Kemp (0217)
- Wichita/North Fork Wichita River (0218)
- Middle Fork Wichita River (0218A)
- Lake Wichita (0219)
- Holliday Creek Above Lake Wichita (0219A)
- South Fork Wichita River (0226)
 - No impairments
 - Ammonia concern



Red River Basin Reach II

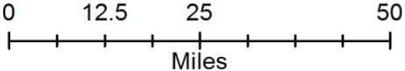


South Fork Wichita River



Legend

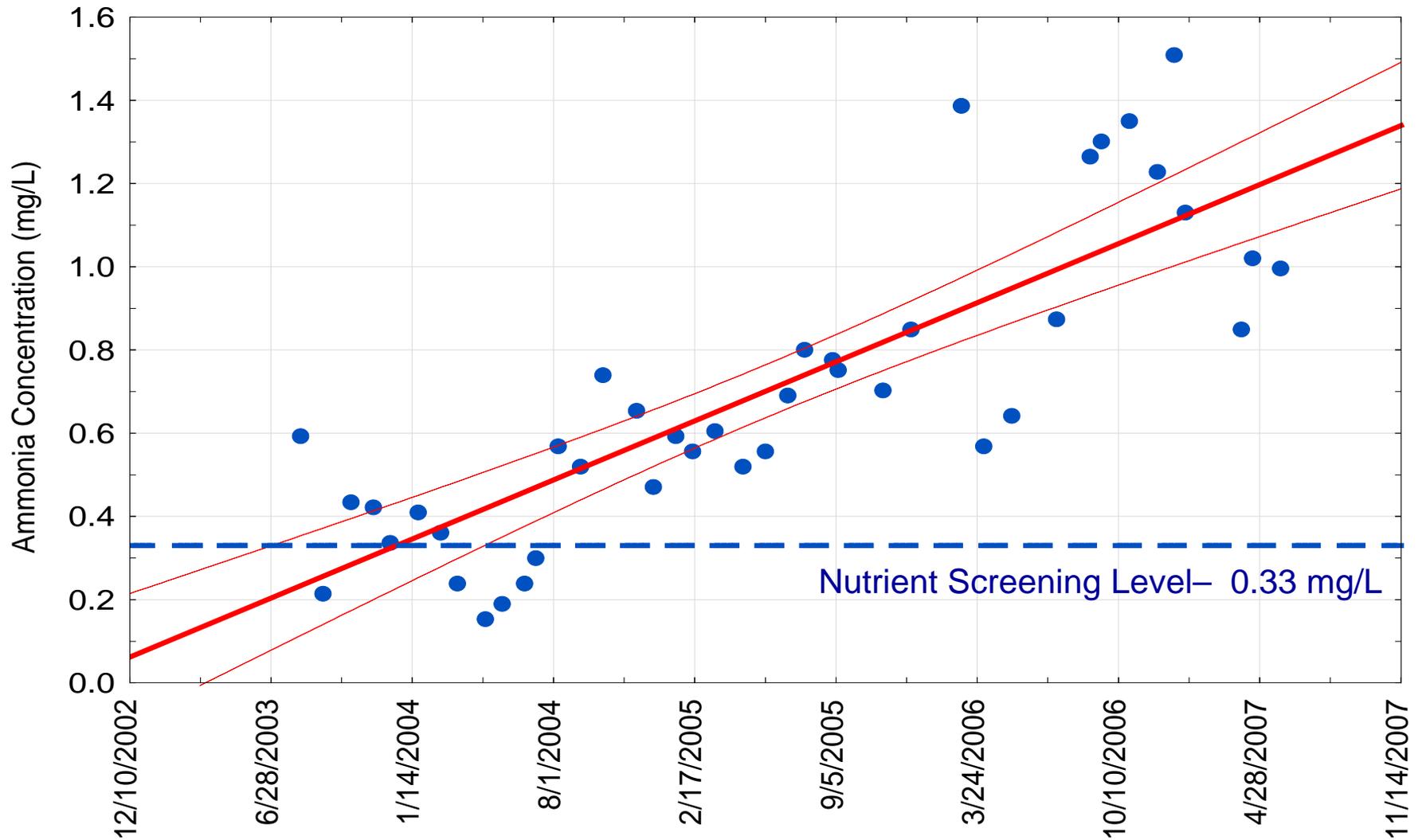
- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach II



South Fork Wichita River at SH 6 – August 13, 2014



South Fork of the Wichita River
Segment 0226_03
Ammonia



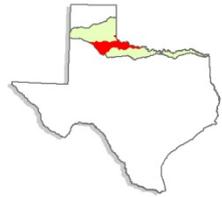
Red River Basin – Reach III



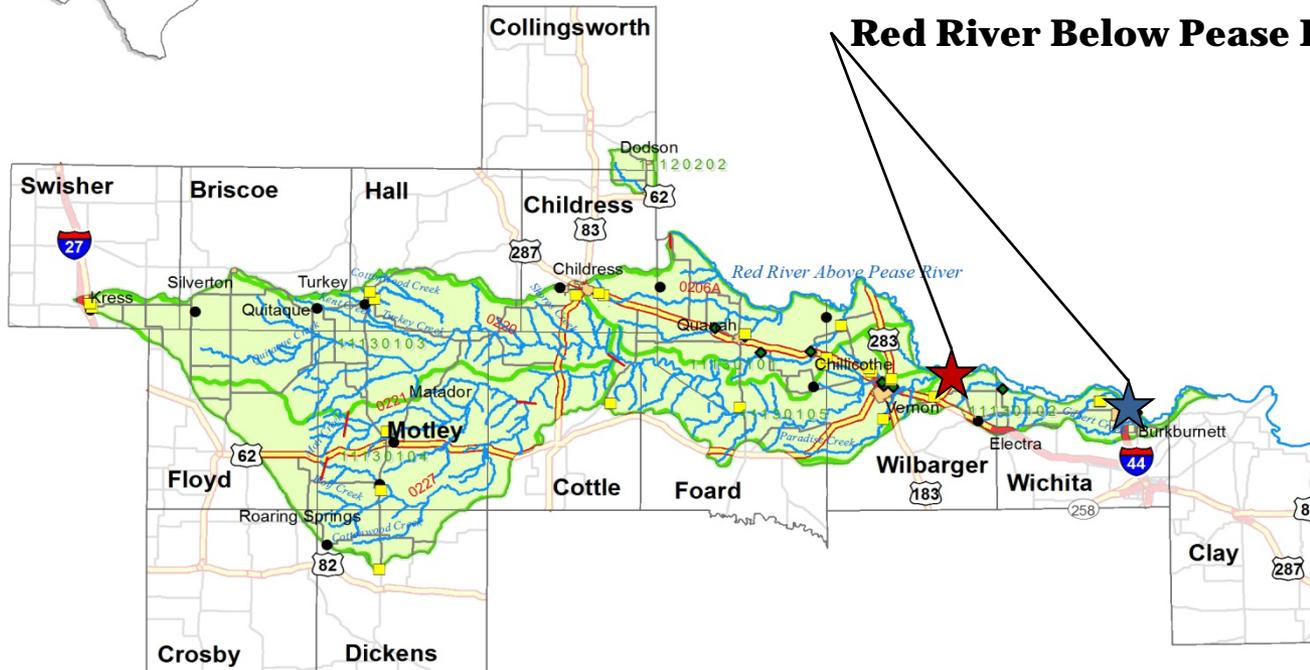
- Red River Below Pease River (0205)
 - No impairments – Bacteria delisted in *Draft 2014 IR*
 - Chlorophyll-a concern
- Wildhorse Creek (0205A)
- Red River Above Pease River (0206)
- South Groesbeck Creek (0206B)
- Upper/North Fork Pease River (0220)
- Middle Fork Pease River (0221)
- Pease River (0230)
- Paradise Creek (0230A)



Red River Basin Reach III



Red River Below Pease River



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach III

Red River at US 277/281 – November 7, 2013



Red River at US 183 – May 14, 2014



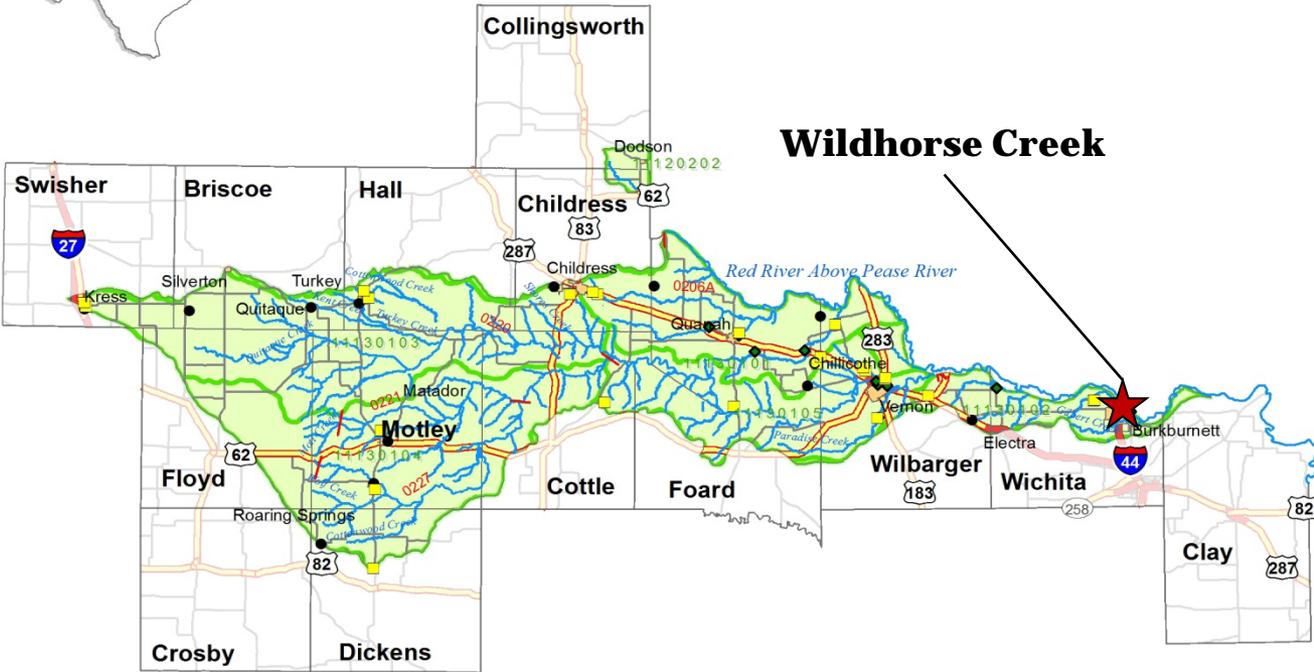
Red River Basin – Reach III



- Red River Below Pease River (0205)
- Wildhorse Creek (0205A)
 - No impairments or concerns
- Red River Above Pease River (0206)
- South Groesbeck Creek (0206B)
- Upper/North Fork Pease River (0220)
- Middle Fork Pease River (0221)
- Pease River (0230)
- Paradise Creek (0230A)



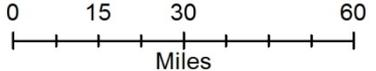
Red River Basin Reach III



Wildhorse Creek

Legend

- MSW / Landfill
- ◆ Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- ~ Hydrology
- ⊕ Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach III



Wildhorse Creek at US 277/281 – May 6, 2014



Red River Basin – Reach III



- Red River Below Pease River (0205)
- Wildhorse Creek (0205A)
- Red River Above Pease River (0206)
 - No impairments or concerns
- South Groesbeck Creek (0206B)
- Upper/North Fork Pease River (0220)
- Middle Fork Pease River (0221)
- Pease River (0230)
- Paradise Creek (0230A)

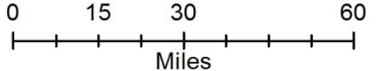
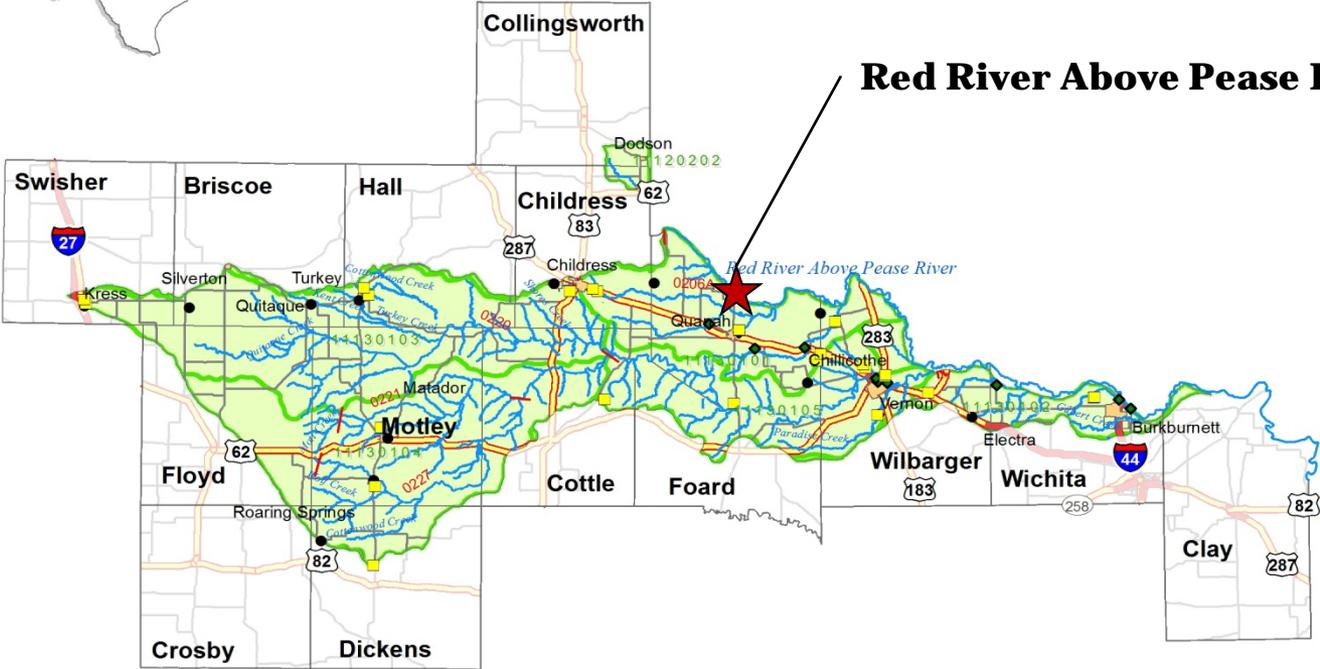


Red River Basin

Reach III



Red River Above Pease River



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach III

Red River Above Pease River at SH 6 – August 6, 2012



Red River Basin – Reach III

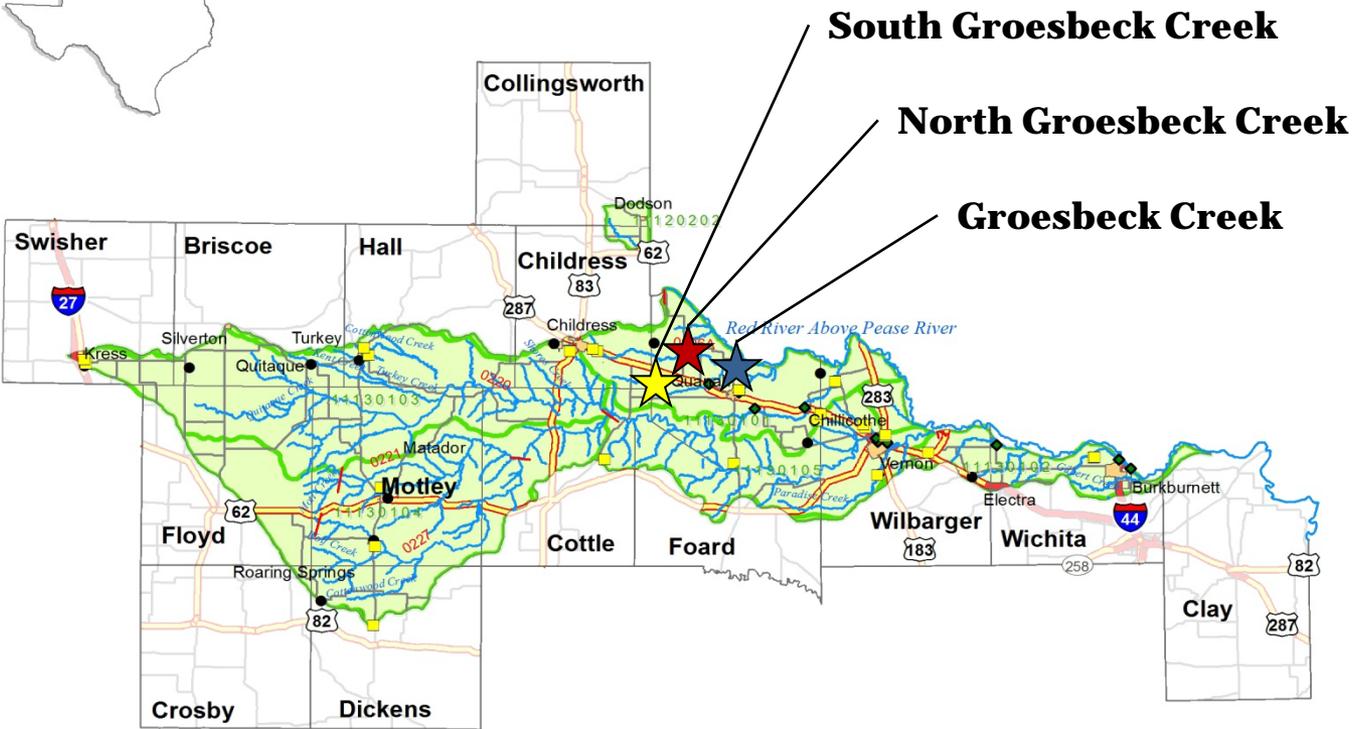
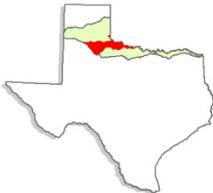


- Red River Below Pease River (0205)
- Wildhorse Creek (0205A)
- Red River Above Pease River (0206)
- South Groesbeck Creek (0206B)
 - Bacteria impairment
 - Nitrate concern
- Upper/North Fork Pease River (0220)
- Middle Fork Pease River (0221)
- Pease River (0230)
- Paradise Creek (0230A)



Red River Basin

Reach III



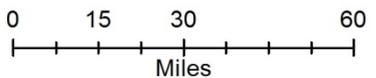
South Groesbeck Creek

North Groesbeck Creek

Groesbeck Creek

Legend

- MSW / Landfill
- ◆ Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- ~ Hydrology
- ⊕ Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach III



Groesbeck Creek at SH 6 – November 11, 2013



North Groesbeck Creek at FM 1166 – November 11, 2013



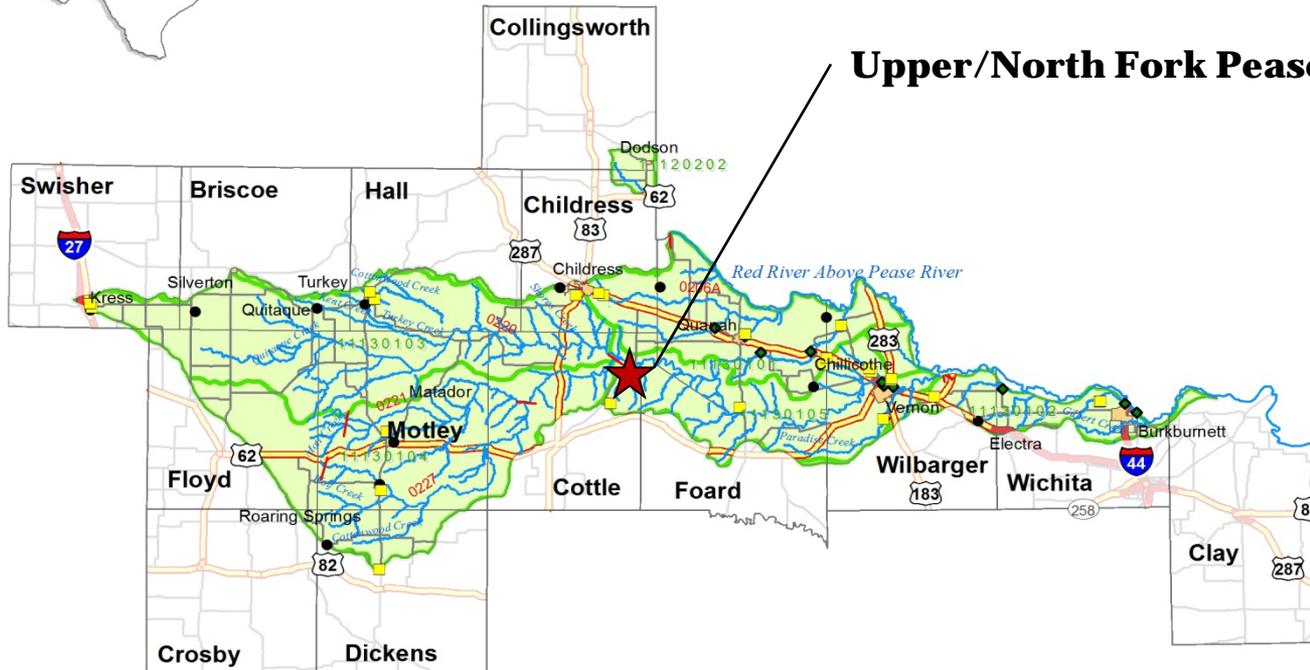
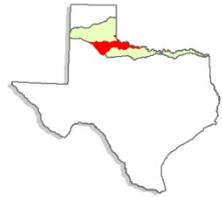
Red River Basin – Reach III



- Red River Below Pease River (0205)
- Wildhorse Creek (0205A)
- Red River Above Pease River (0206)
- South Groesbeck Creek (0206B)
- Upper/North Fork Pease River (0220)
 - No impairments or concerns
- Middle Fork Pease River (0221)
- Pease River (0230)
- Paradise Creek (0230A)



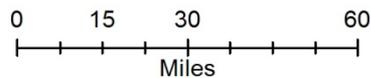
Red River Basin Reach III



Upper/North Fork Pease River

Legend

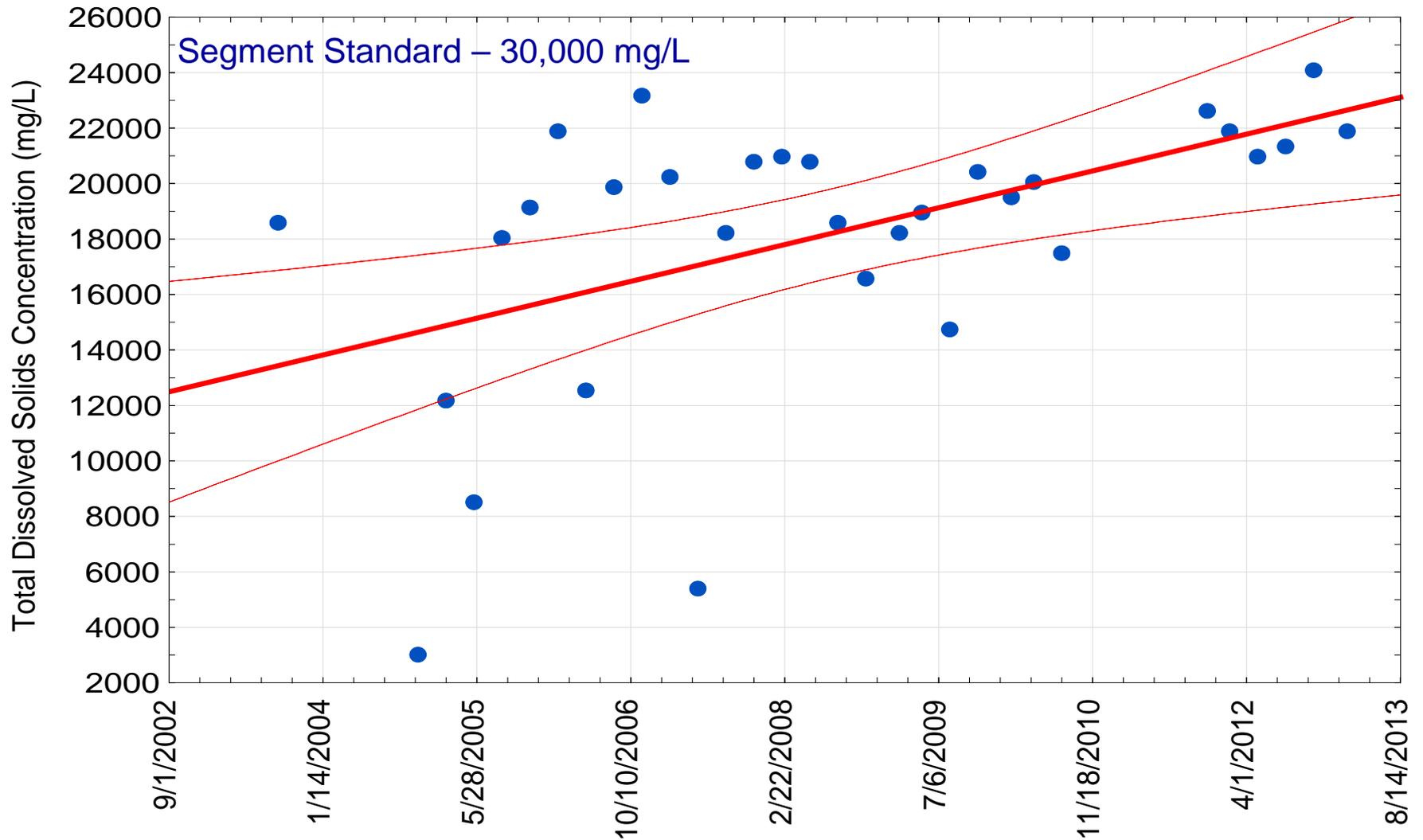
- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach III



Pease River at FM 104 – August 5, 2013



Upper Pease / North Fork Pease River
Segment 0220_01
Total Dissolved Solids (TDS)



Red River Basin – Reach III



- Red River Below Pease River (0205)
- Wildhorse Creek (0205A)
- Red River Above Pease River (0206)
- South Groesbeck Creek (0206B)
- Upper/North Fork Pease River (0220)
- Middle Fork Pease River (0221)
 - No impairments or concerns
- Pease River (0230)
- Paradise Creek (0230A)

Red River Basin – Reach III

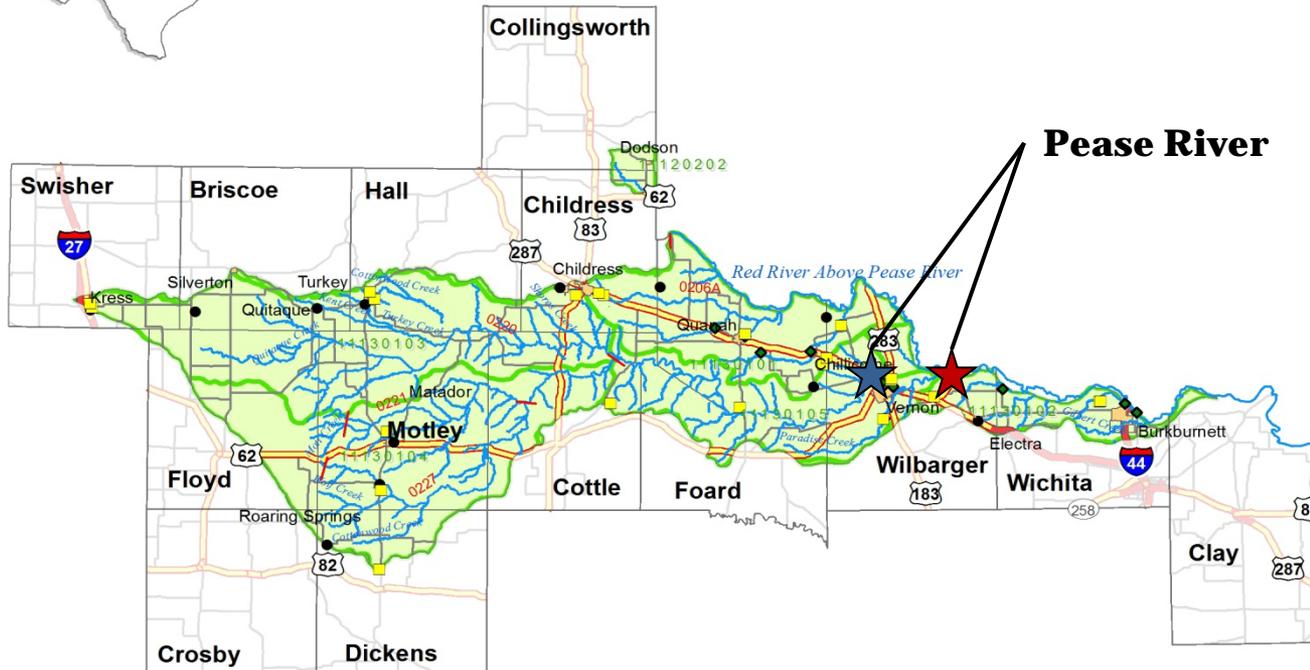


- Red River Below Pease River (0205)
- Wildhorse Creek (0205A)
- Red River Above Pease River (0206)
- South Groesbeck Creek (0206B)
- Upper/North Fork Pease River (0220)
- Middle Fork Pease River (0221)
- Pease River (0230)
 - No impairments or concerns
- Paradise Creek (0230A)



Red River Basin

Reach III



Pease River

Legend

- MSW / Landfill
- ◆ Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- ~ Hydrology
- ⊕ Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach III

Pease River at US 287 – November 12, 2013



Pease River at US 283 – November 12, 2013



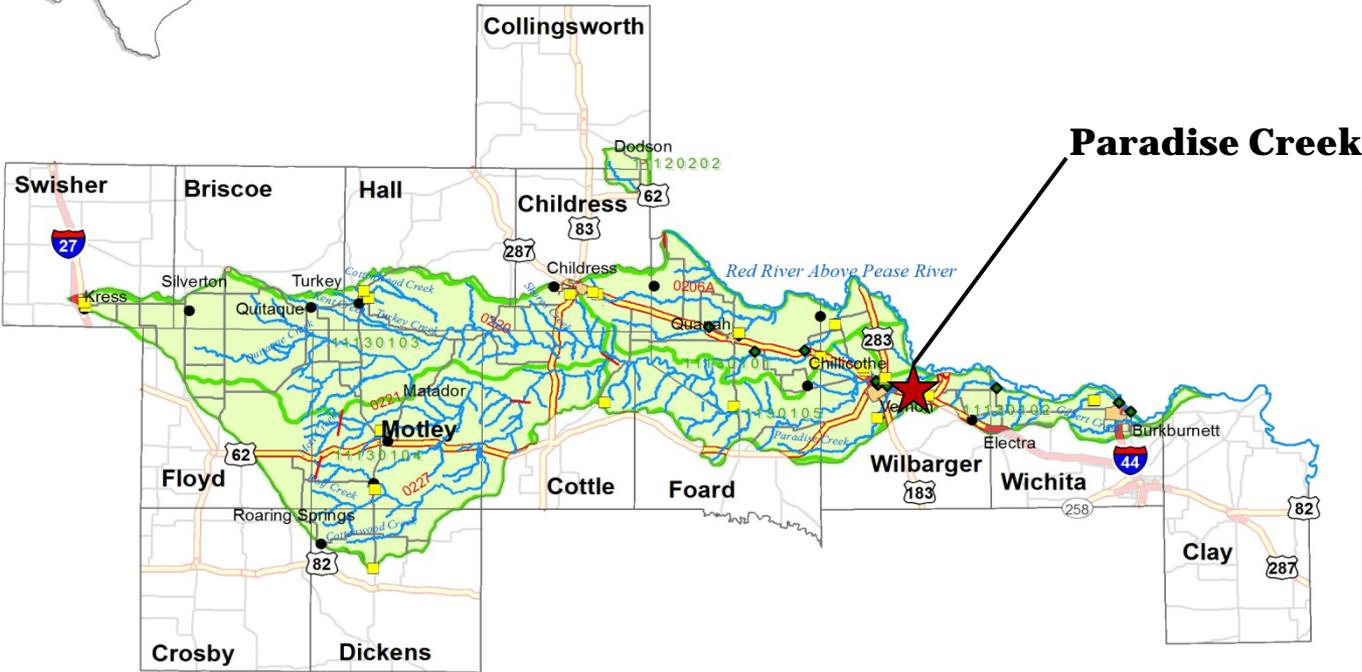
Red River Basin – Reach III



- Red River Below Pease River (0205)
- Wildhorse Creek (0205A)
- Red River Above Pease River (0206)
- South Groesbeck Creek (0206B)
- Upper/North Fork Pease River (0220)
- Middle Fork Pease River (0221)
- Pease River (0230)
- Paradise Creek (0230A)
 - Bacteria impairment
 - Chlorophyll-*a* concern
 - RUAA has been completed and submitted to TCEQ



Red River Basin Reach III



Paradise Creek

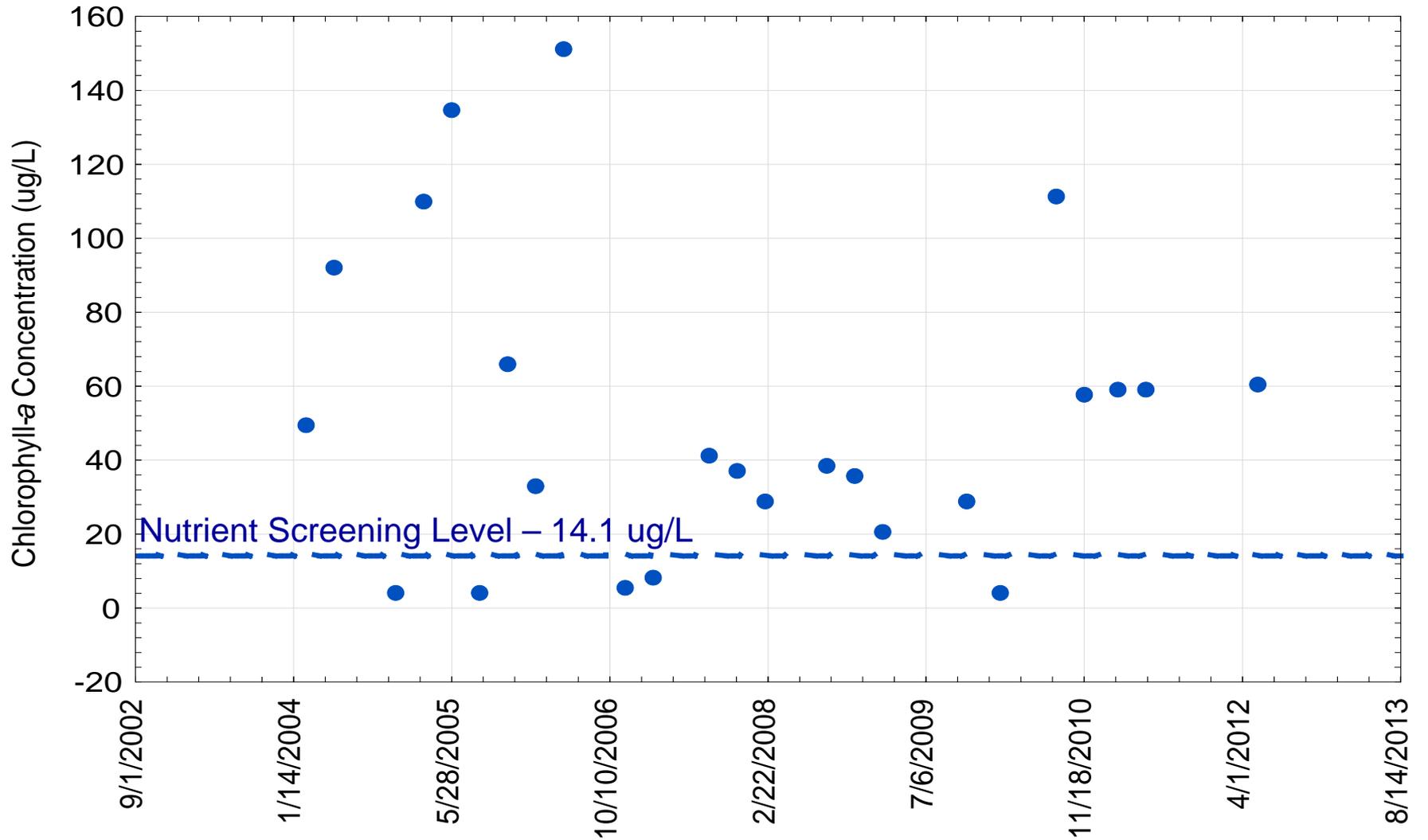
Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach III

Paradise Creek at US 287 – November 12, 2013



Paradise Creek
Segment 0230A_01
Chlorophyll - a



Red River Basin – Reach IV



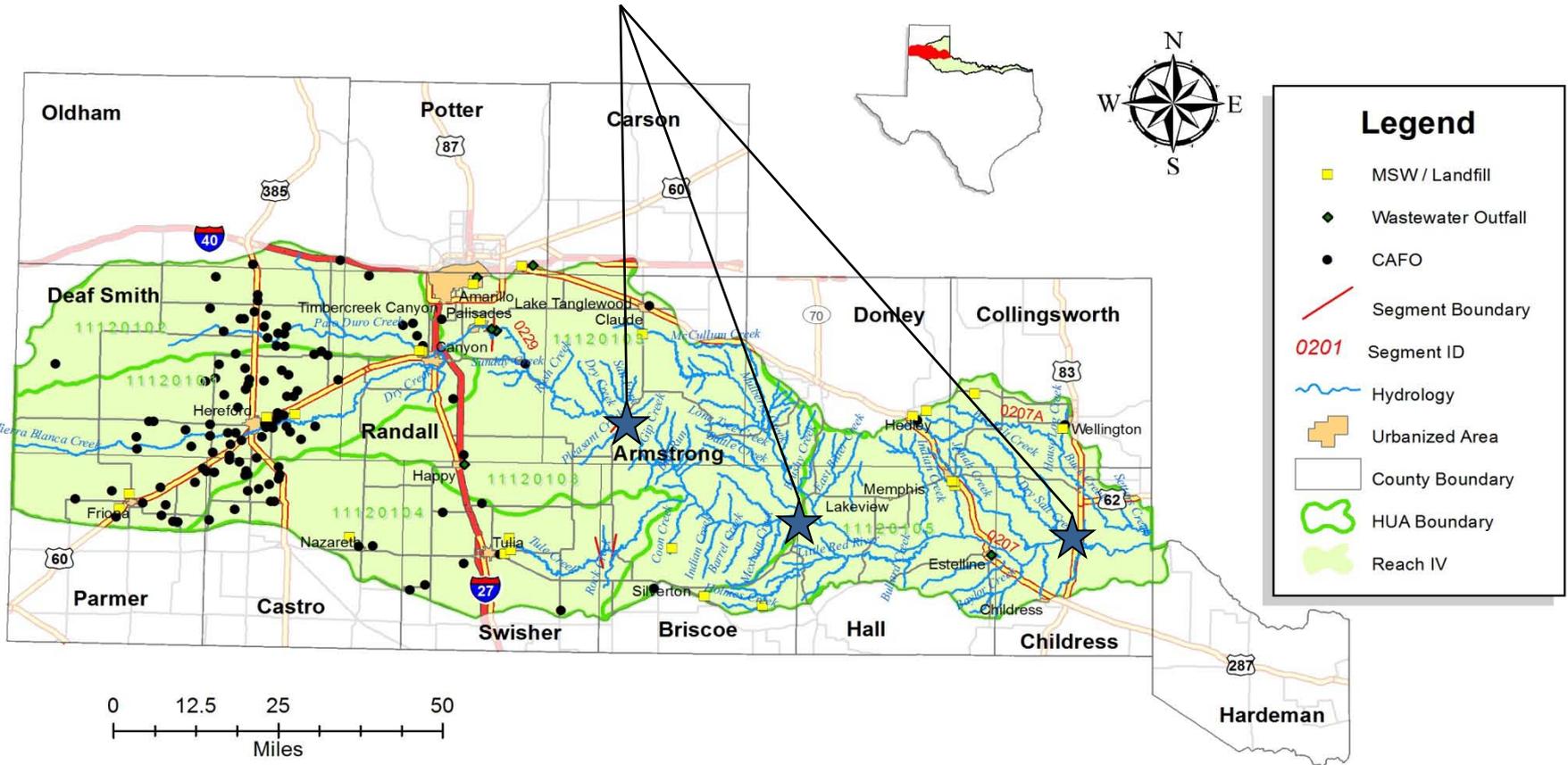
- Lower PDTF Red River (0207)
 - Bacteria impairment
 - Chlorophyll-*a* concern
 - RUAA is being conducted in this segment
- Buck Creek (0207A)
- Mackenzie Reservoir (0228)
- Upper PDTF Red River (0229)
- Lake Tanglewood (0229A)



Red River Basin Reach IV



Lower PDTF Red River



Legend

- MSW / Landfill
- ◆ Wastewater Outfall
- CAFO
- Segment Boundary
- 0201 Segment ID
- ~ Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Reach IV

Lower PDTF Red River at SH 207 – October 15, 2013



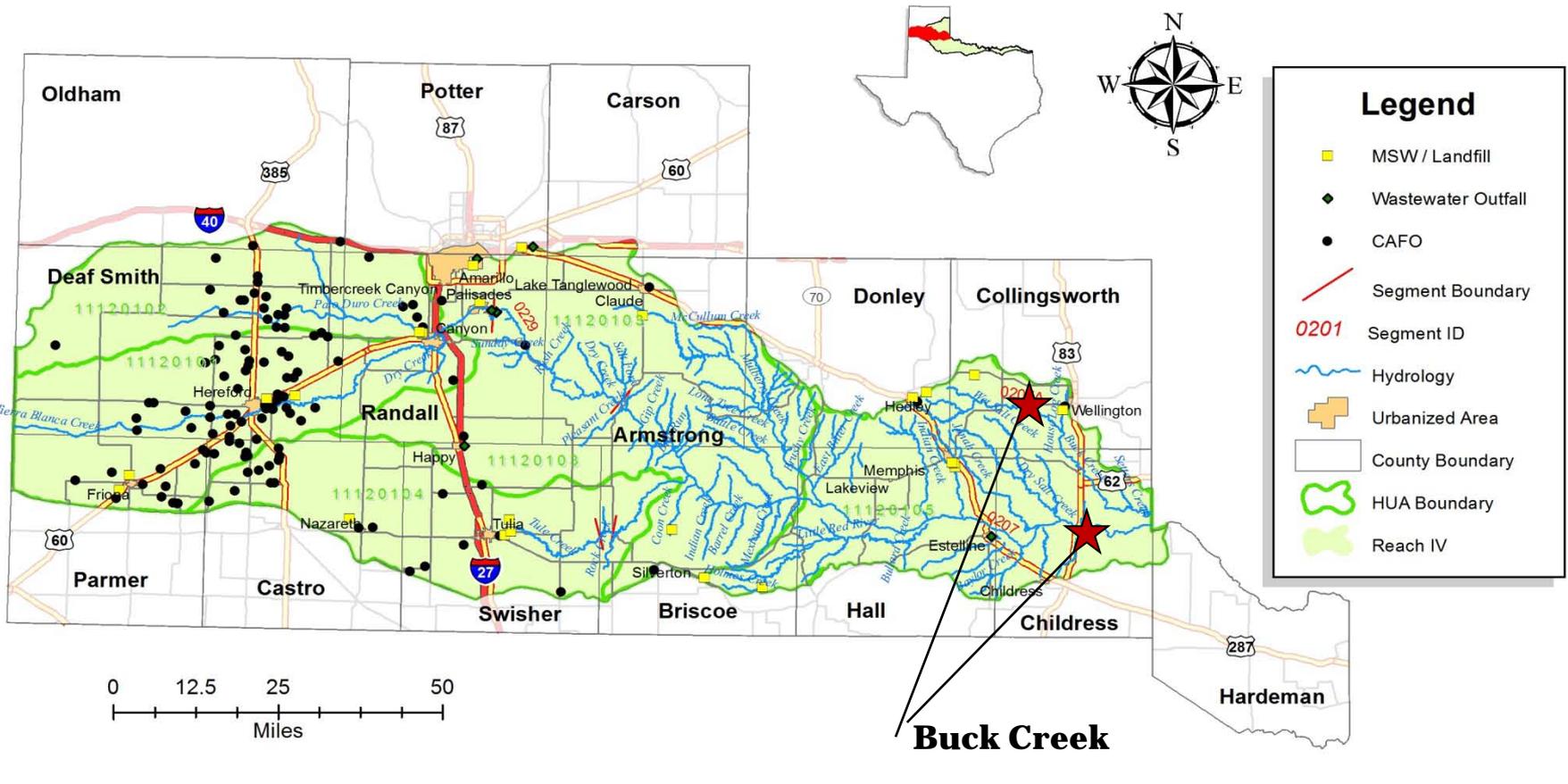
Red River Basin – Reach IV



- Lower PDTF Red River (0207)
- Buck Creek (0207A)
 - No impairments
 - Nitrate concern
- Mackenzie Reservoir (0228)
- Upper PDTF Red River (0229)
- Lake Tanglewood (0229A)



Red River Basin Reach IV



Buck Creek at Ranch Road 1547 – October 8, 2013



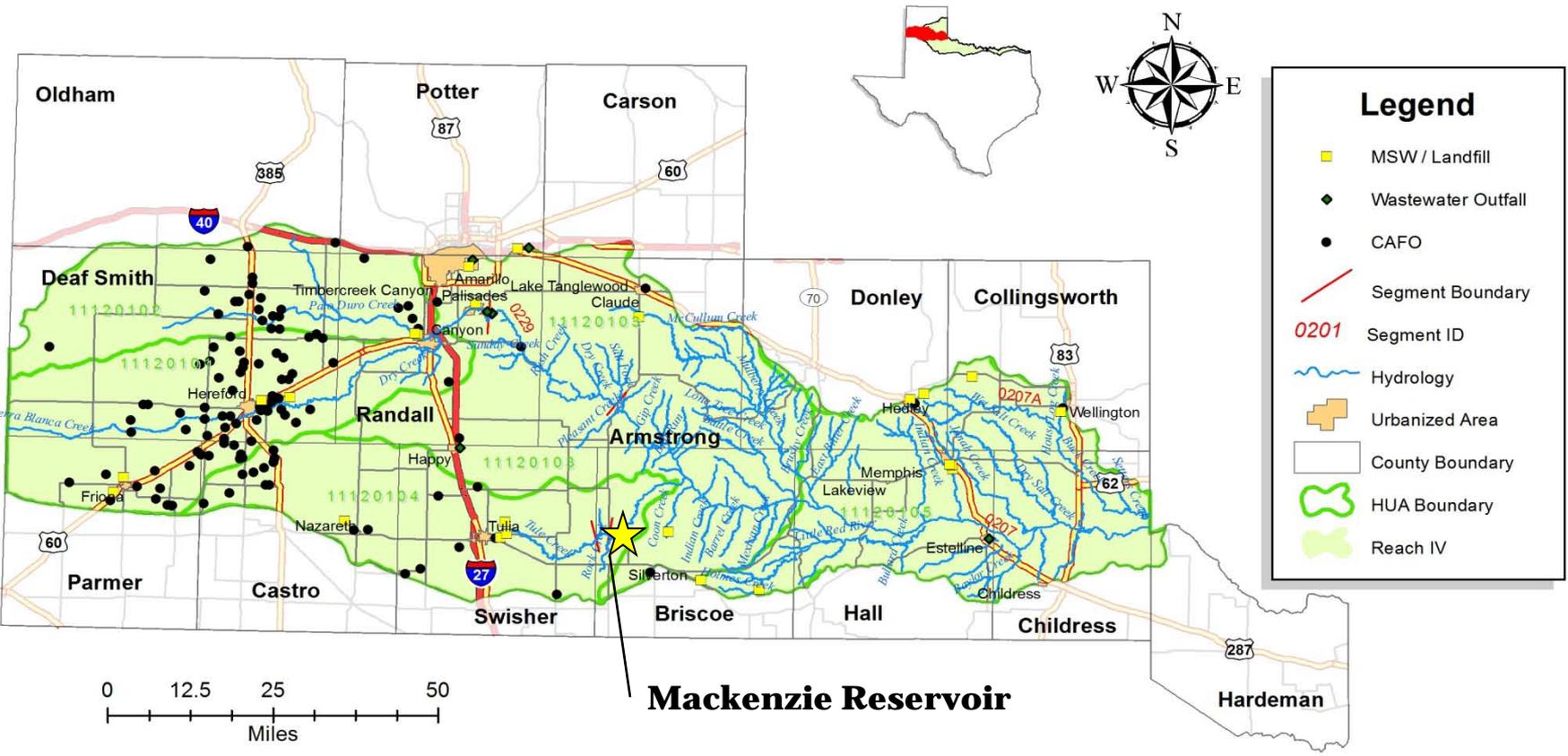
Red River Basin – Reach IV



- Lower PDTF Red River (0207)
- Buck Creek (0207A)
- Mackenzie Reservoir (0228)
 - **TDS** impairment
 - **No concerns**
- Upper PDTF Red River (0229)
- Lake Tanglewood (0229A)



Red River Basin Reach IV



Red River Basin – Reach IV

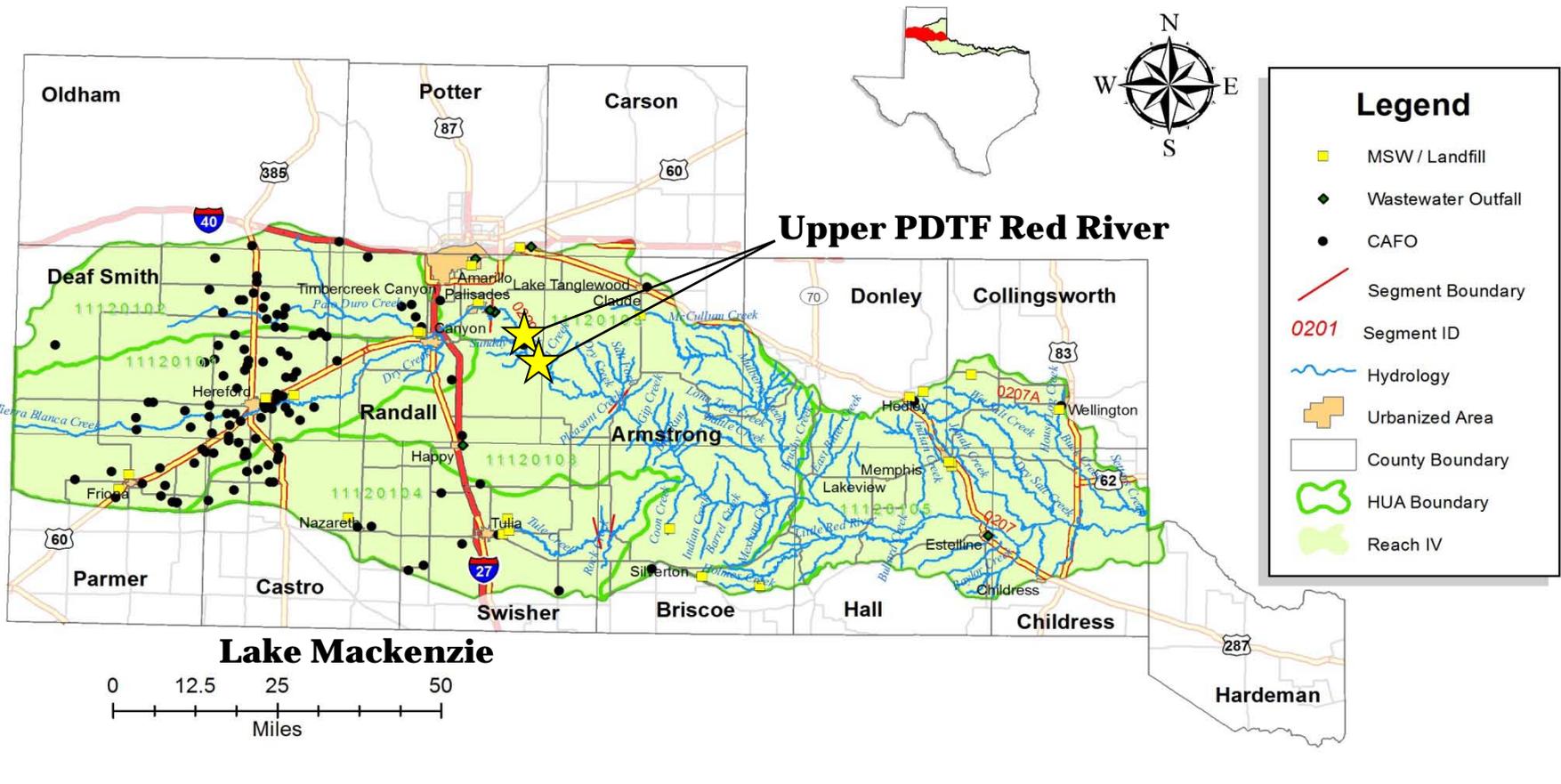


- Lower PDTF Red River (0207)
- Buck Creek (0207A)
- Mackenzie Reservoir (0228)
- Upper PDTF Red River (0229)
 - pH impairment
 - Chlorophyll-*a*, **bacteria**, **depressed DO**, nitrate, and total phosphorus concerns
- Lake Tanglewood (0229A)

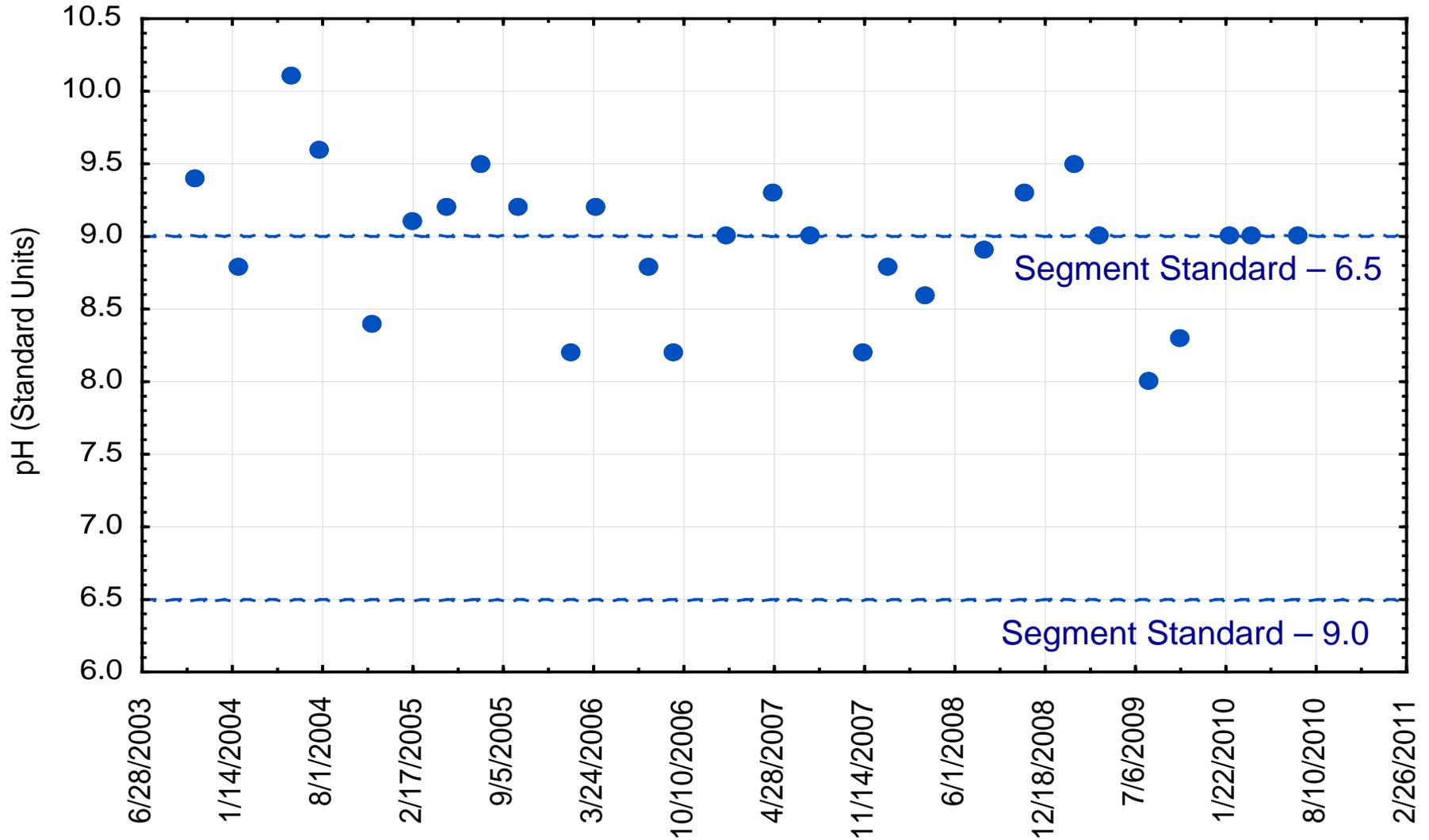


Red River Basin

Reach IV



Upper Prairie Dog Town Fork of the Red River
Segment 0229_02
pH



Red River Basin – Reach IV



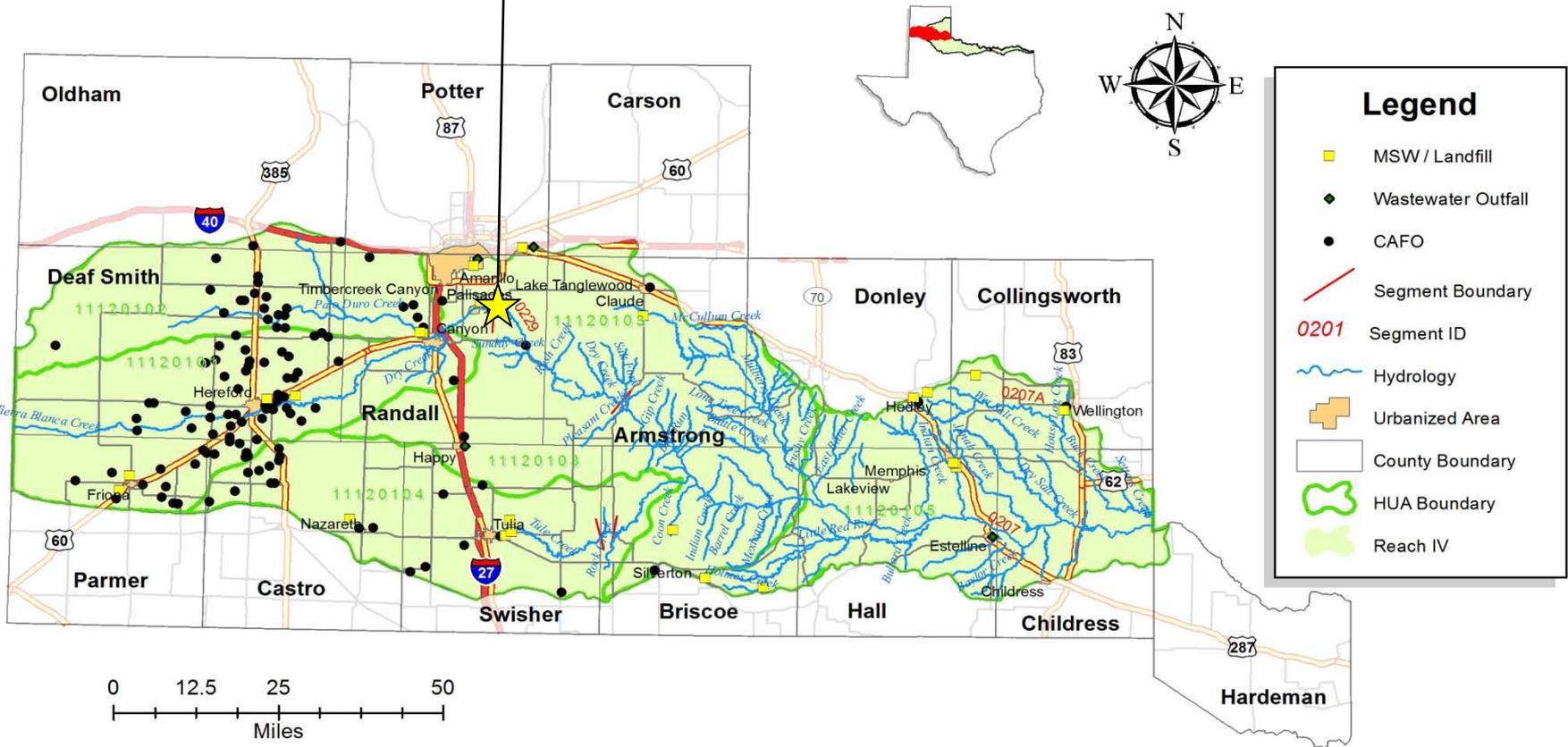
- Lower PDTF Red River (0207)
- Buck Creek (0207A)
- Mackenzie Reservoir (0228)
- Upper PDTF Red River (0229)
- Lake Tanglewood (0229A)
 - No impairments
 - Ammonia, chlorophyll-*a*, depressed DO, nitrate, and total phosphorus concerns



Red River Basin Reach IV



Lake Tanglewood



Red River Basin – Reach V

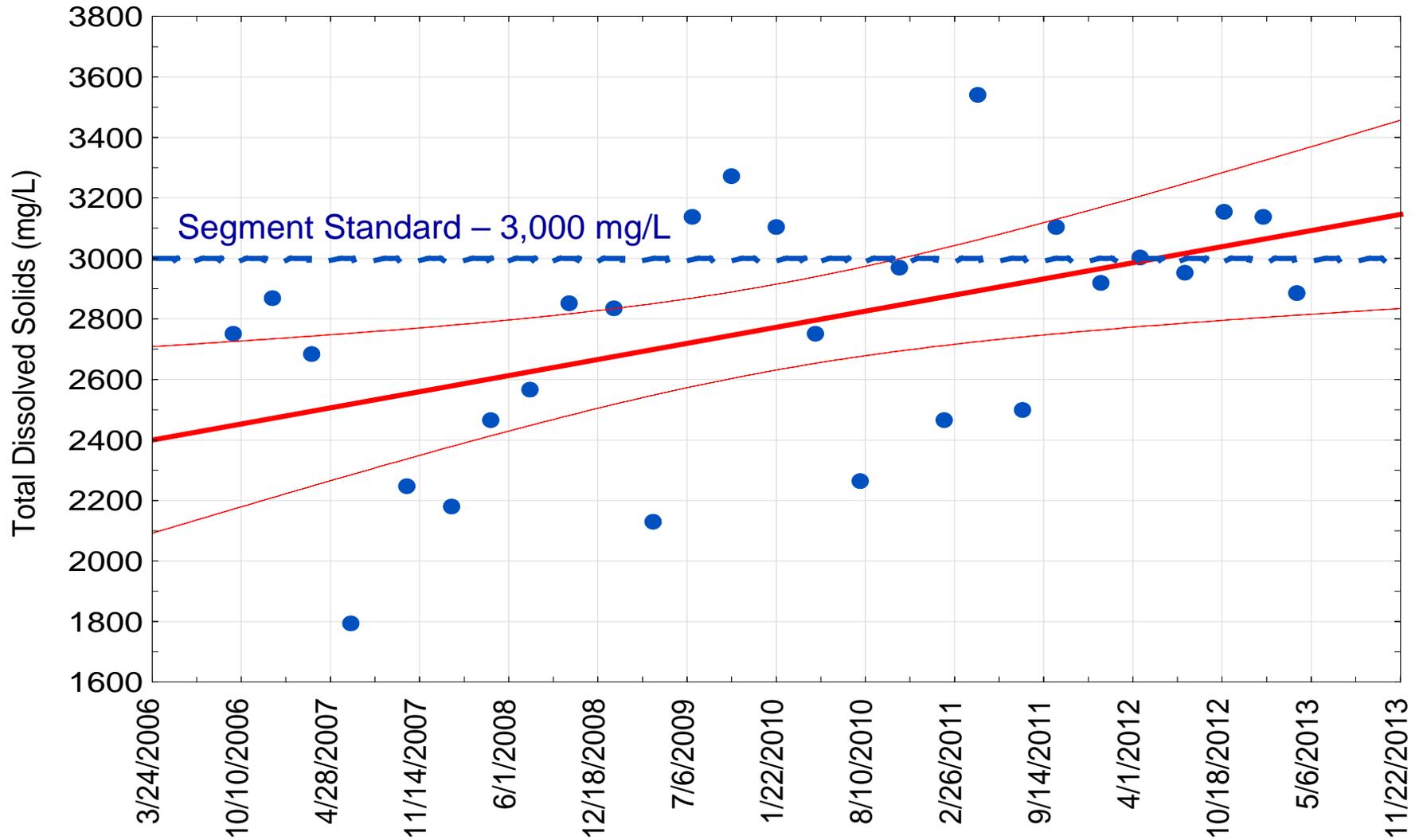


- Salt Fork of the Red River (0222)
 - **Bacteria impairment**
 - **Nitrate concern**
- Lelia Lake Creek (0222A)
- Greenbelt Lake (0223)
- North Fork Red River (0224)
- McClellan Creek (0224A)
- Sweetwater Creek (0299A)

Salt Fork of the Red River at US 83 – October 7, 2013



Salt Fork of the Red River
Segment 0222_01
Total Dissolved Solids (TDS)



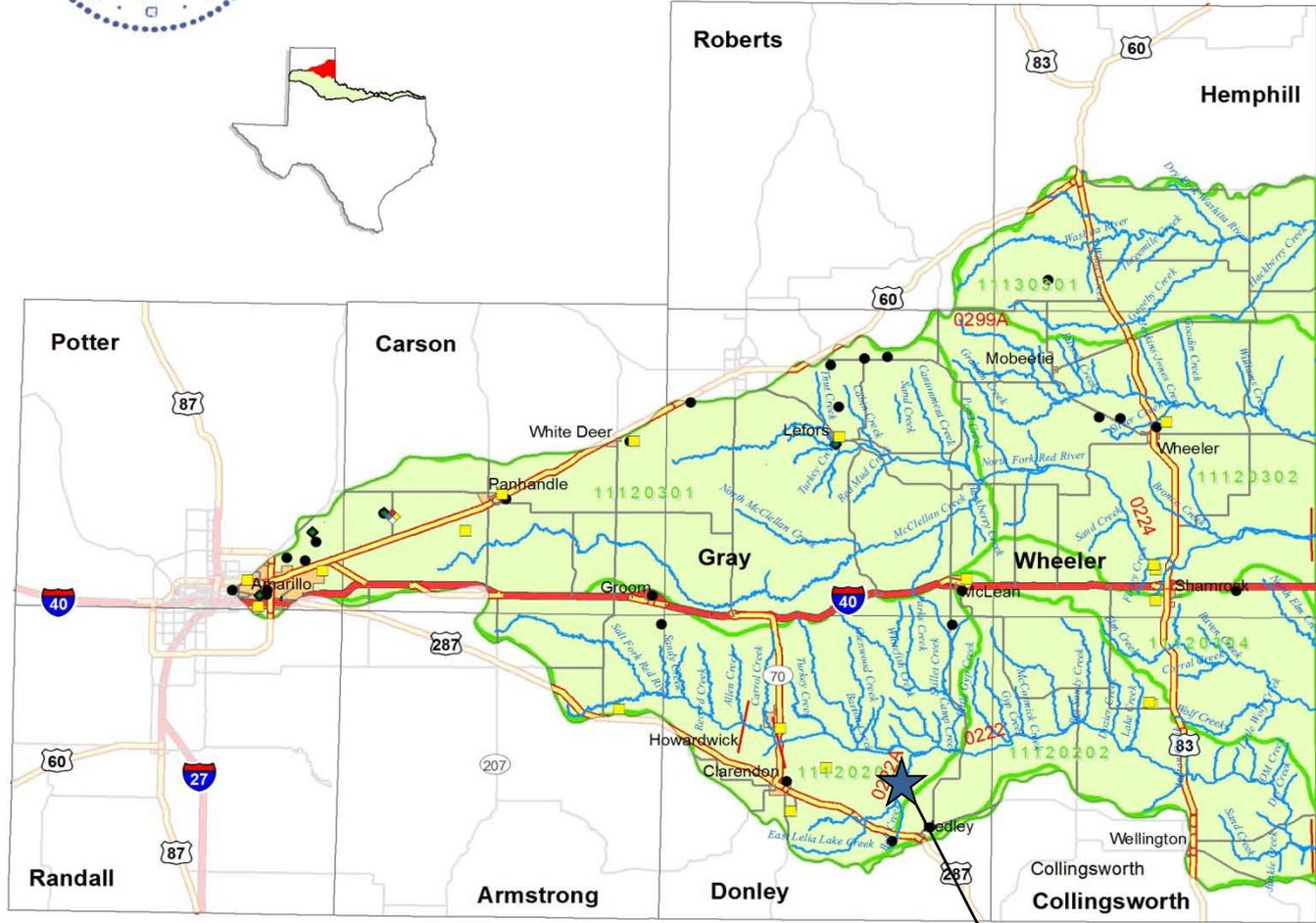
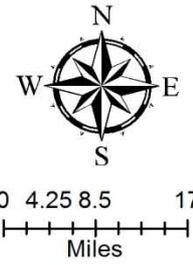
Red River Basin – Reach V



- Salt Fork of the Red River (0222)
- Lelia Lake Creek (0222A)
 - No impairments or concerns
- Greenbelt Lake (0223)
- North Fork Red River (0224)
- McClellan Creek (0224A)
- Sweetwater Creek (0299A)



Red River Basin Reach V



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach V

Lelia Lake Creek

Red River Basin – Reach V

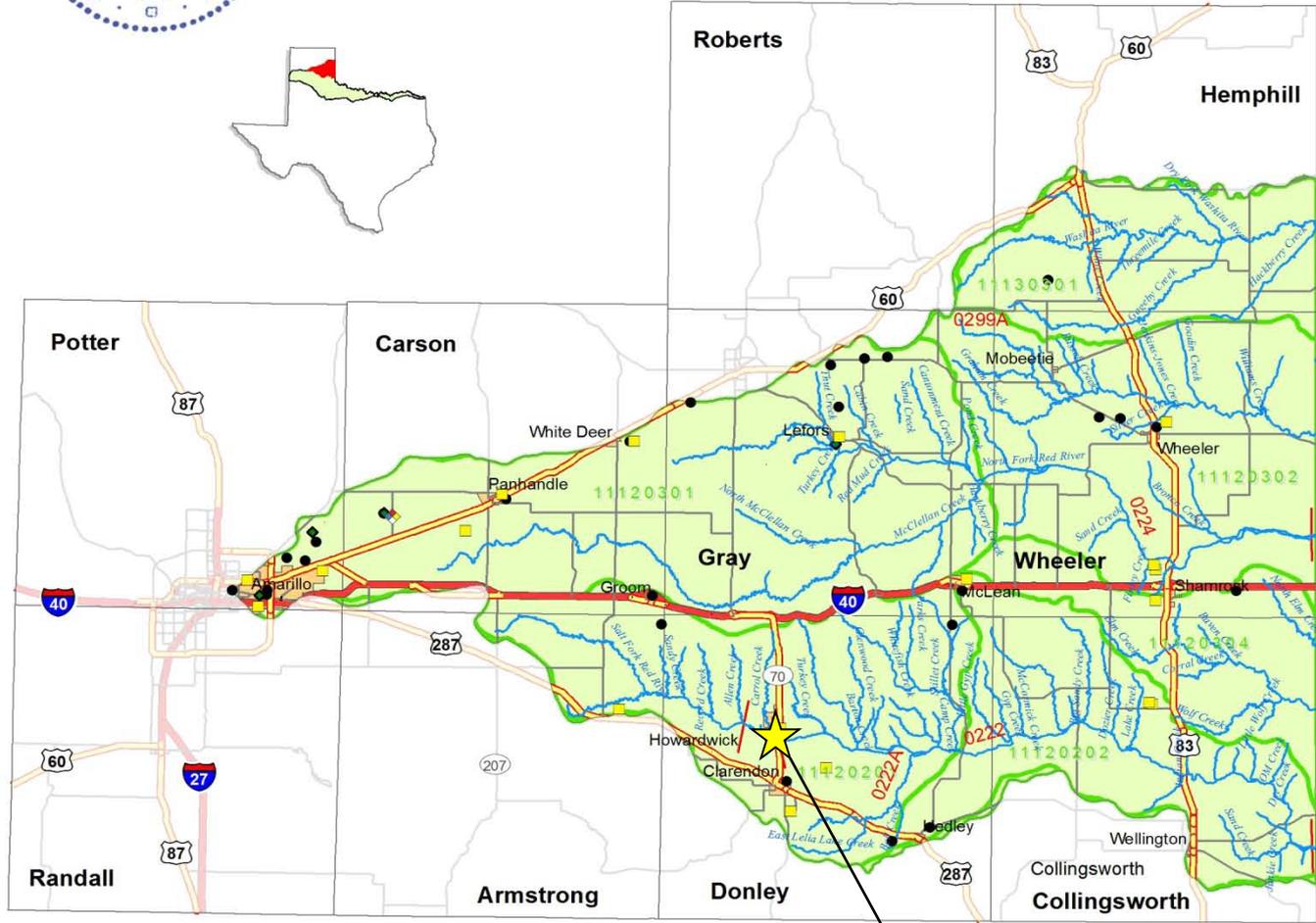
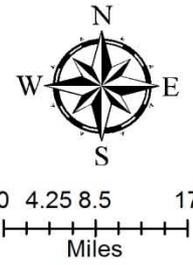


- Salt Fork of the Red River (0222)
- Lelia Lake Creek (0222A)
- Greenbelt Lake (0223)
 - No impairments or concerns
- North Fork Red River (0224)
- McClellan Creek (0224A)
- Sweetwater Creek (0299A)



Red River Basin

Reach V



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach V

Greenbelt Lake

Red River Basin – Reach V

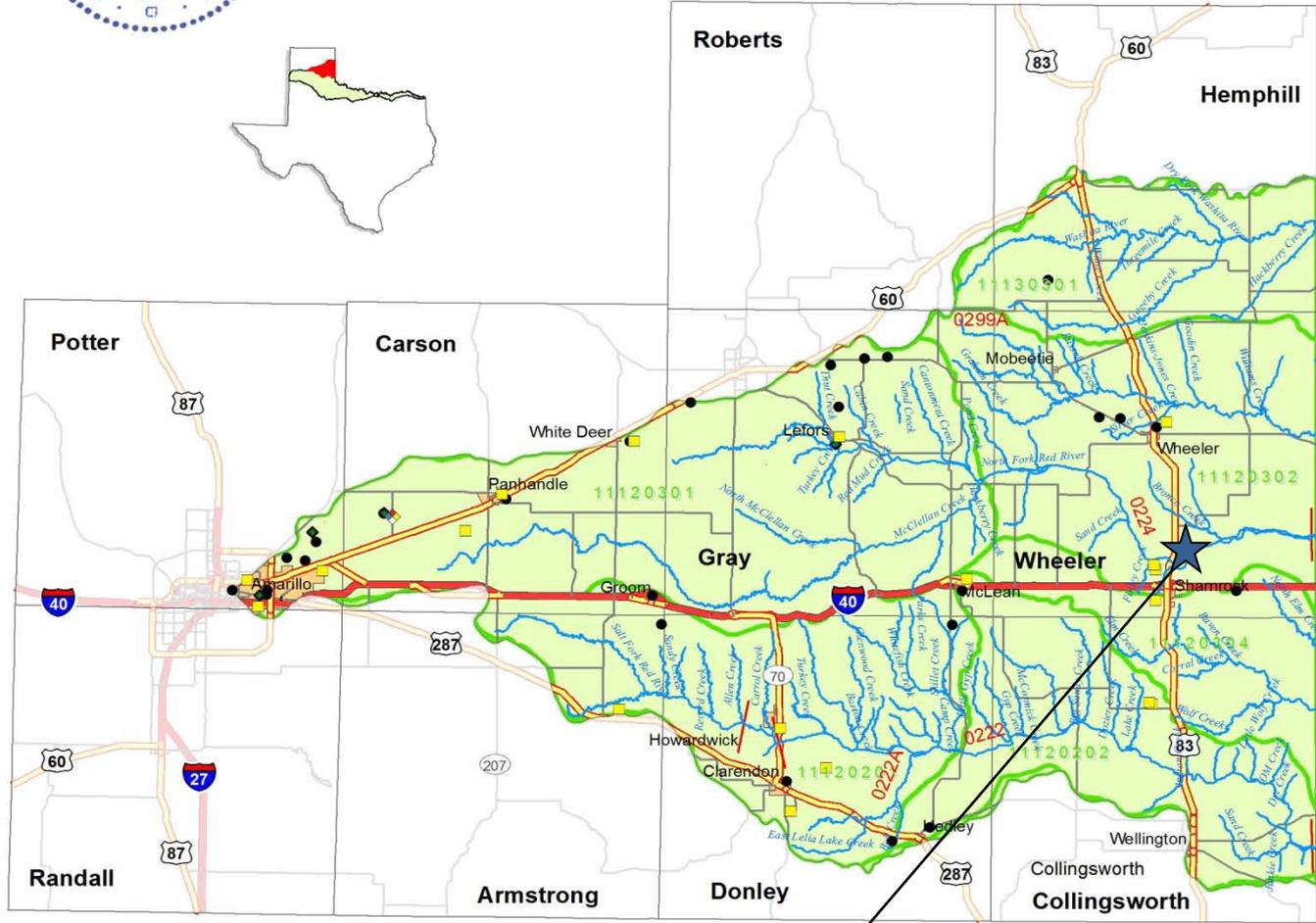
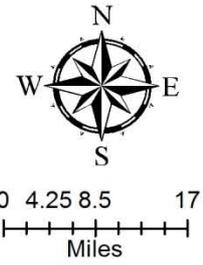


- Salt Fork of the Red River (0222)
- Lelia Lake Creek (0222A)
- Greenbelt Lake (0223)
- North Fork Red River (0224)
 - No impairments or concerns
- McClellan Creek (0224A)
- Sweetwater Creek (0299A)



Red River Basin

Reach V



Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach V

North Fork Red River

Red Reach V

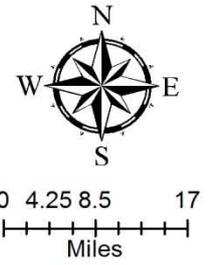


- Salt Fork of the Red River (0222)
- Lelia Lake Creek (0222A)
- Greenbelt Lake (0223)
- North Fork Red River (0224)
- McClellan Creek (0224A)
 - Bacteria impairment
 - No concerns
- Sweetwater Creek (0299A)

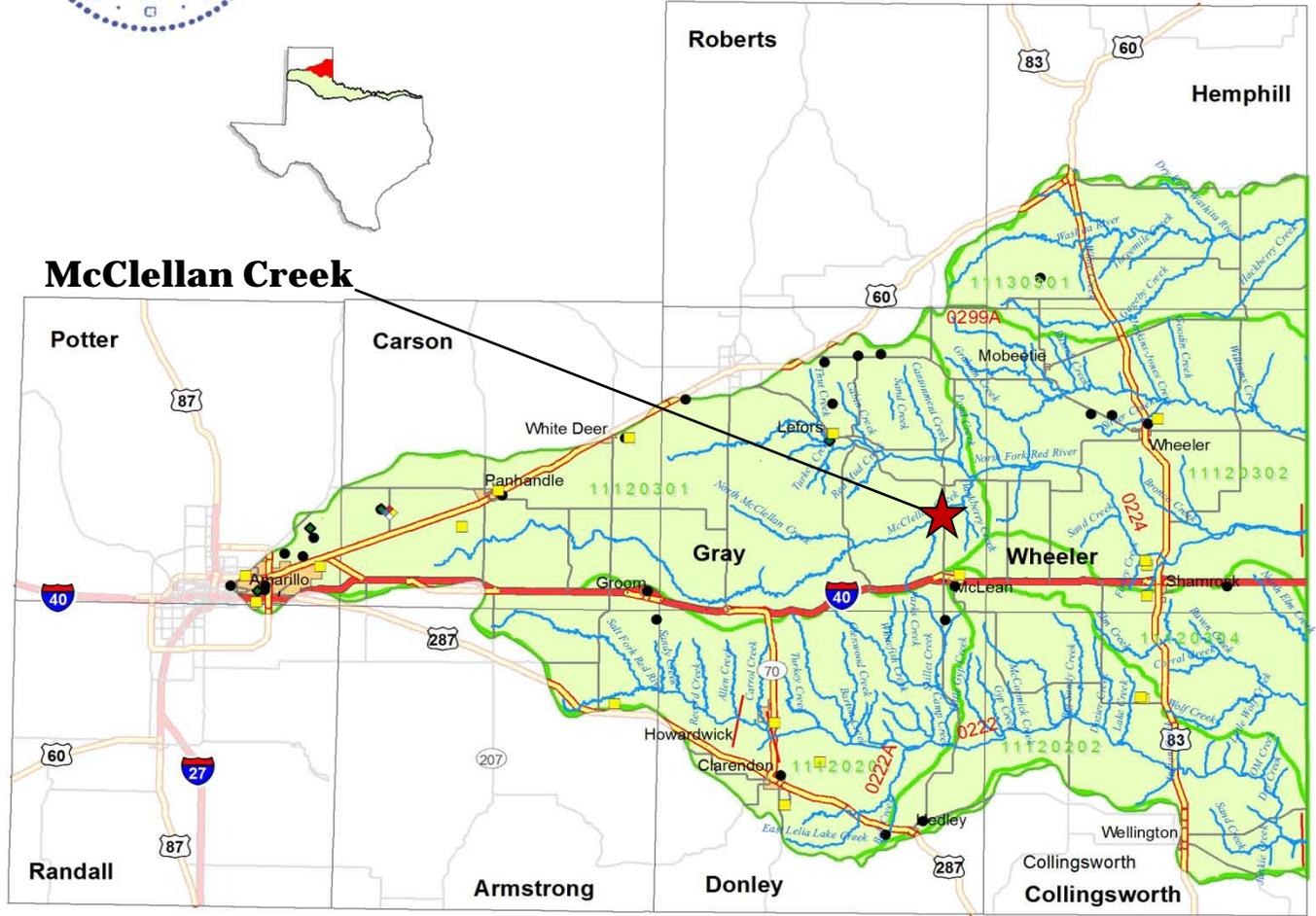


Red River Basin

Reach V



McClellan Creek



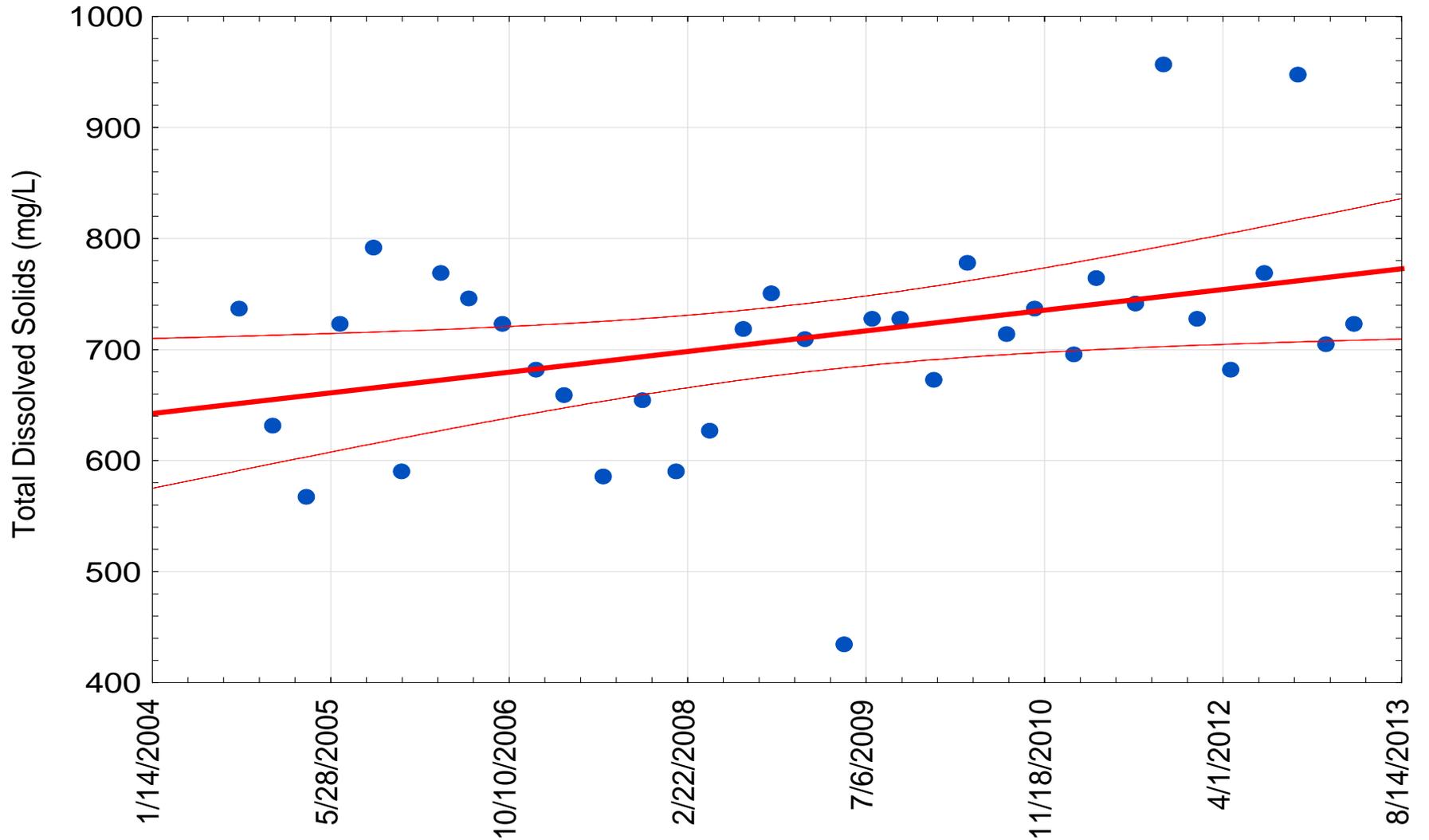
Legend

- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach V

McClellan Creek at SH 273 – April 10, 2014



McClellan Creek
Segment 0224A_01
Total Dissolved Solids (TDS)



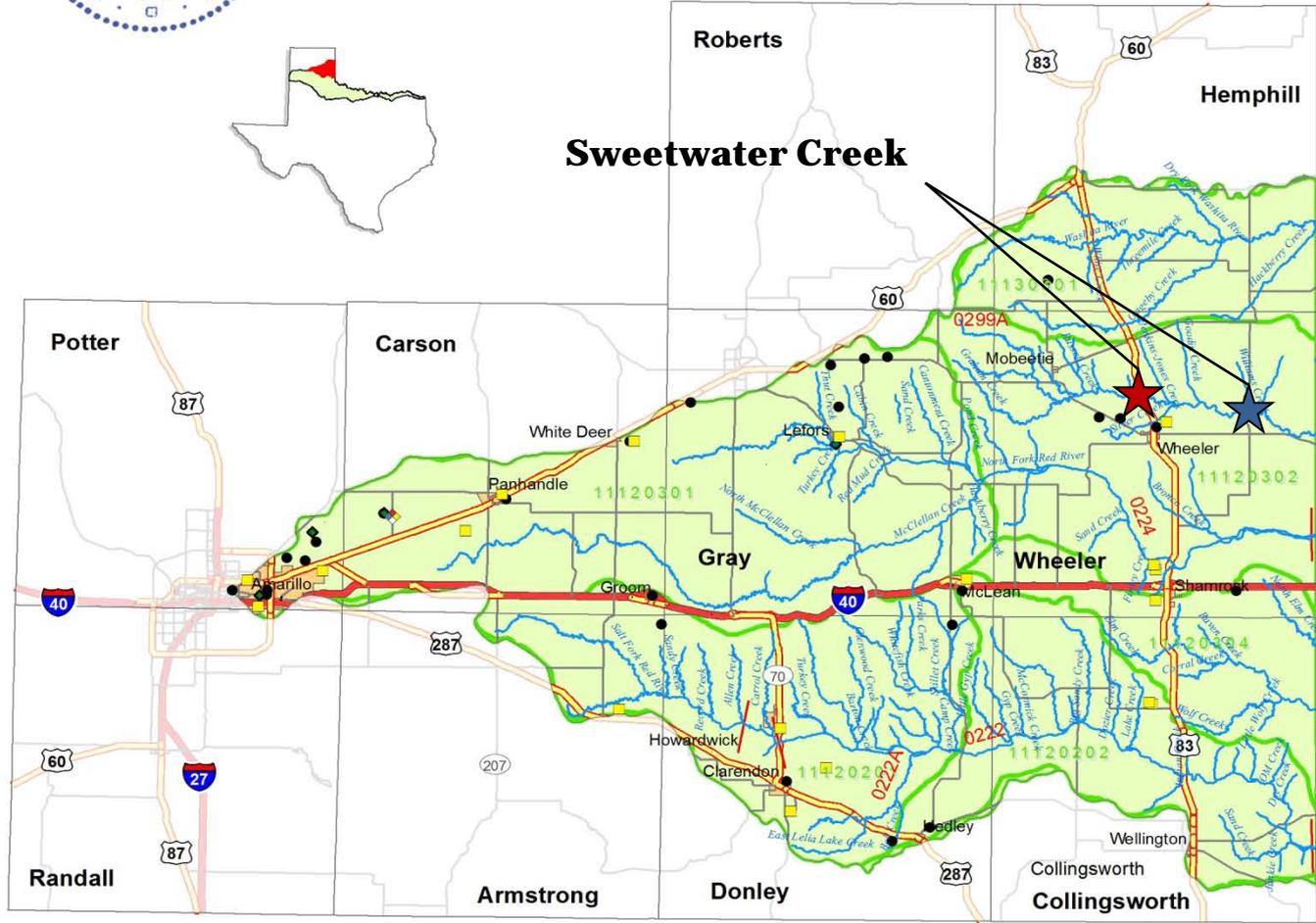
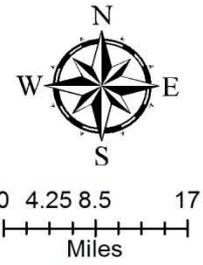
Red River Basin – Reach V



- Salt Fork of the Red River (0222)
- Lelia Lake Creek (0222A)
- Greenbelt Lake (0223)
- North Fork Red River (0224)
- McClellan Creek (0224A)
- Sweetwater Creek (0299A)
 - No impairments – Bacteria delisted in *Draft 2014 IR*
 - No concerns
 - RUAA has been completed and submitted to TCEQ



Red River Basin Reach V



Legend

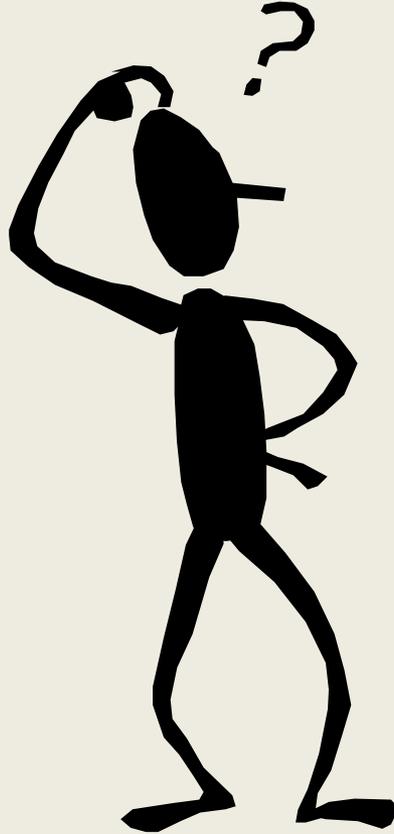
- MSW / Landfill
- Wastewater Outfall
- CAFO
- Superfund Site
- Segment Boundary
- 0201 Segment ID
- Hydrology
- Urbanized Area
- County Boundary
- HUA Boundary
- Red Reach V

FY-2016 Goals



- Continue to support the development of a cost effective method to track bacteria sources, like that utilized in the Buck Creek Project as bacteria accounts for approximately **18.2%** of all impairments in the Canadian River Basin, and **52.2%** in the Red River Basin.
- Continue to increase the number of Clean Rivers Program monitoring partners, increasing the amount of water quality data, thus aiding future assessments.
- Continue to educate the general public on the conservation and protection of this precious natural resource.

Questions



RED RIVER AUTHORITY OF TEXAS



Clean Rivers
Program
Partner Since
1991



NELAP
Accredited
Laboratory
Since 2006

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Phone Number: (940) 723-8697 • Fax Number: (940) 723-8531

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