

North Central Texas Council of Governments

Watershed Protection Plans in North Central Texas: A Virtual Roundtable

November 30, 2020
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*Prepared in cooperation with the
Texas Commission on Environmental Quality and
U.S. Environmental Protection Agency*



What is a Watershed Protection Plan?

- Plan that prevents or manages nonpoint source water pollution - i.e. land runoff, drainage
- Developed through stakeholder groups
- Usually funded from TCEQ, TSSWCB, and U.S. EPA
- TCEQ's Nonpoint Source Viewer:

<https://tceq.maps.arcgis.com/apps/webappviewer/index.html?id=8a9549c92da0426e828b32deb7c7d4aa>

Source: TCEQ, <https://www.tceq.texas.gov/waterquality/nonpoint-source/mgmt-plan/watershed-pp.html>

What is a Watershed Characterization Study?

- First step in the development of a Watershed Protection Plan
- Collect and analyze water quality data

Source: TCEQ,
<https://www.tceq.texas.gov/waterquality/nonpoint-source/mgmt-plan/watershed-pp.html>

Watershed Protection Plans in NCTCOG Region

Legend

Category 4 Impaired Waters



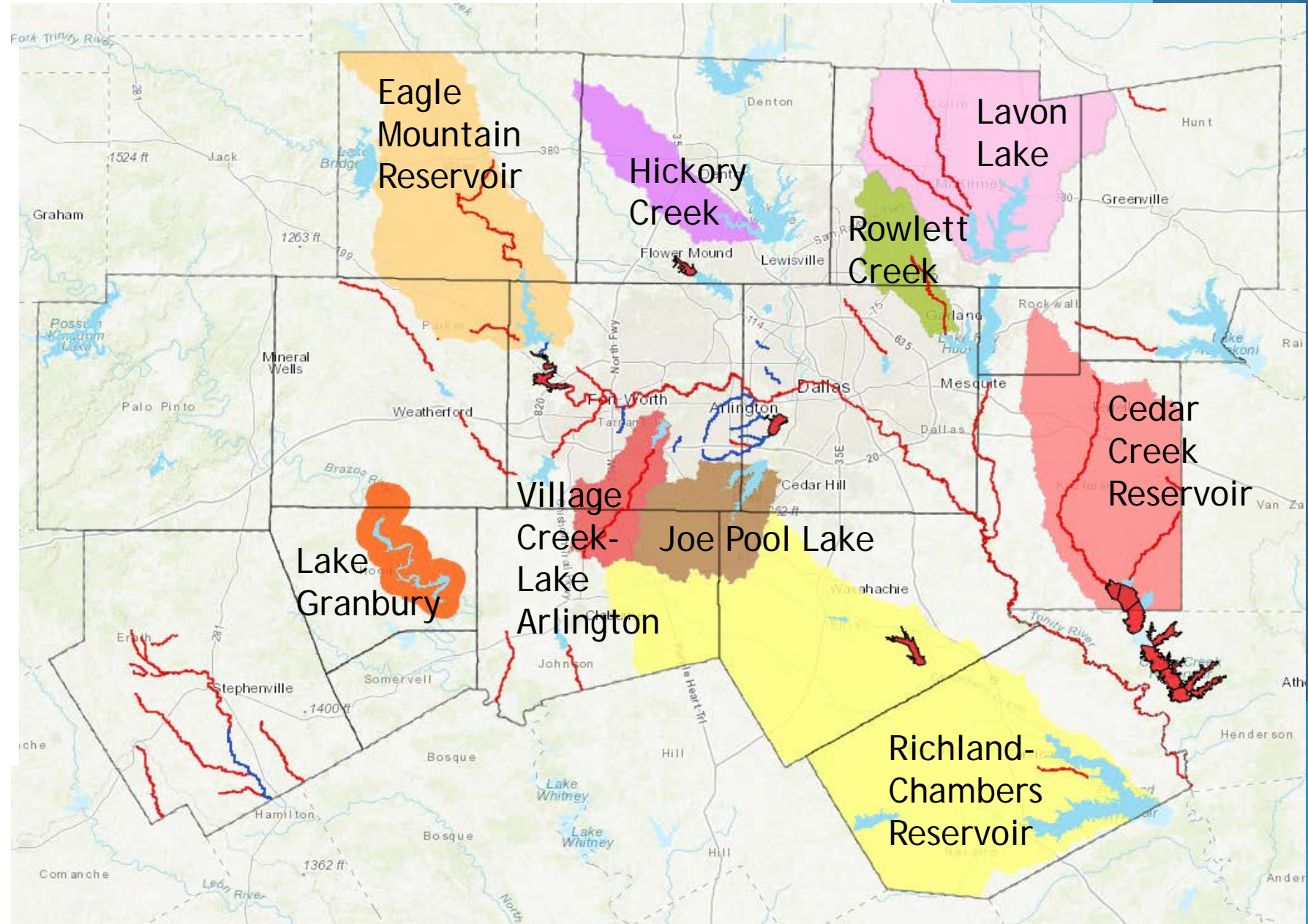
Category 5 Impaired Waters (TX 303 (d) List)



Category 5 Lakes (TX 303 (d) List)



NCTCOG Region



Source: 2018 Texas Integrated Report of Surface Water Quality, TCEQ, and TCEQ's Nonpoint Source Viewer: <https://www.tceq.texas.gov/gis/nonpoint-source-project-viewer>, and 2020 Update to the North Central Texas Water Quality Management Plan: <https://nctcoggis.maps.arcgis.com/apps/MapJournal/index.html?appid=f2bb81616f914e69871c8dce12af6b4c>

Tarrant Regional Water District

4 Major Reservoirs

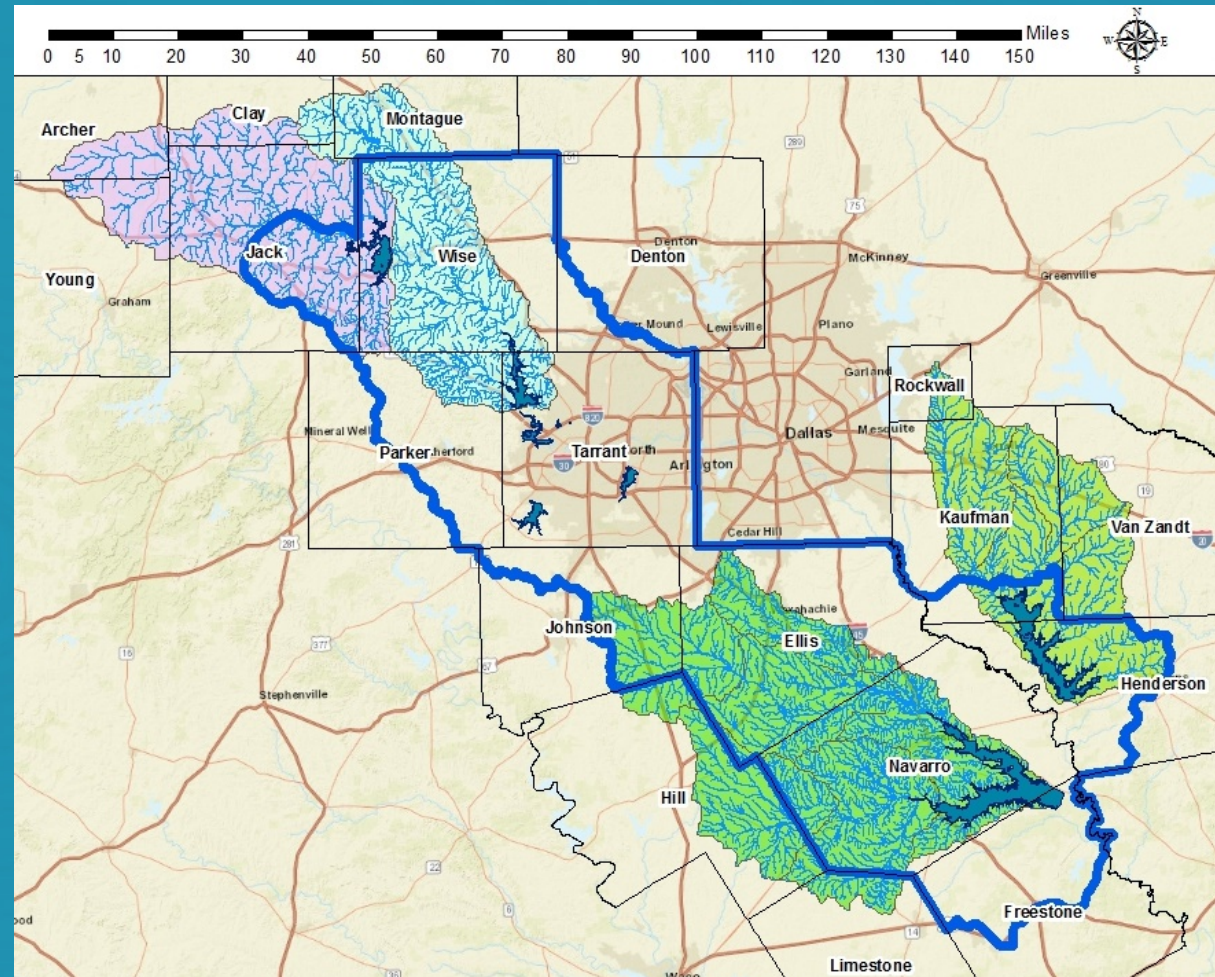
- > 97,000 surf. ac.
- > 760 mi. shoreline

Watersheds

- > 5,000 mi²
- > 5,500 stream mi.
- Parts of 17 counties

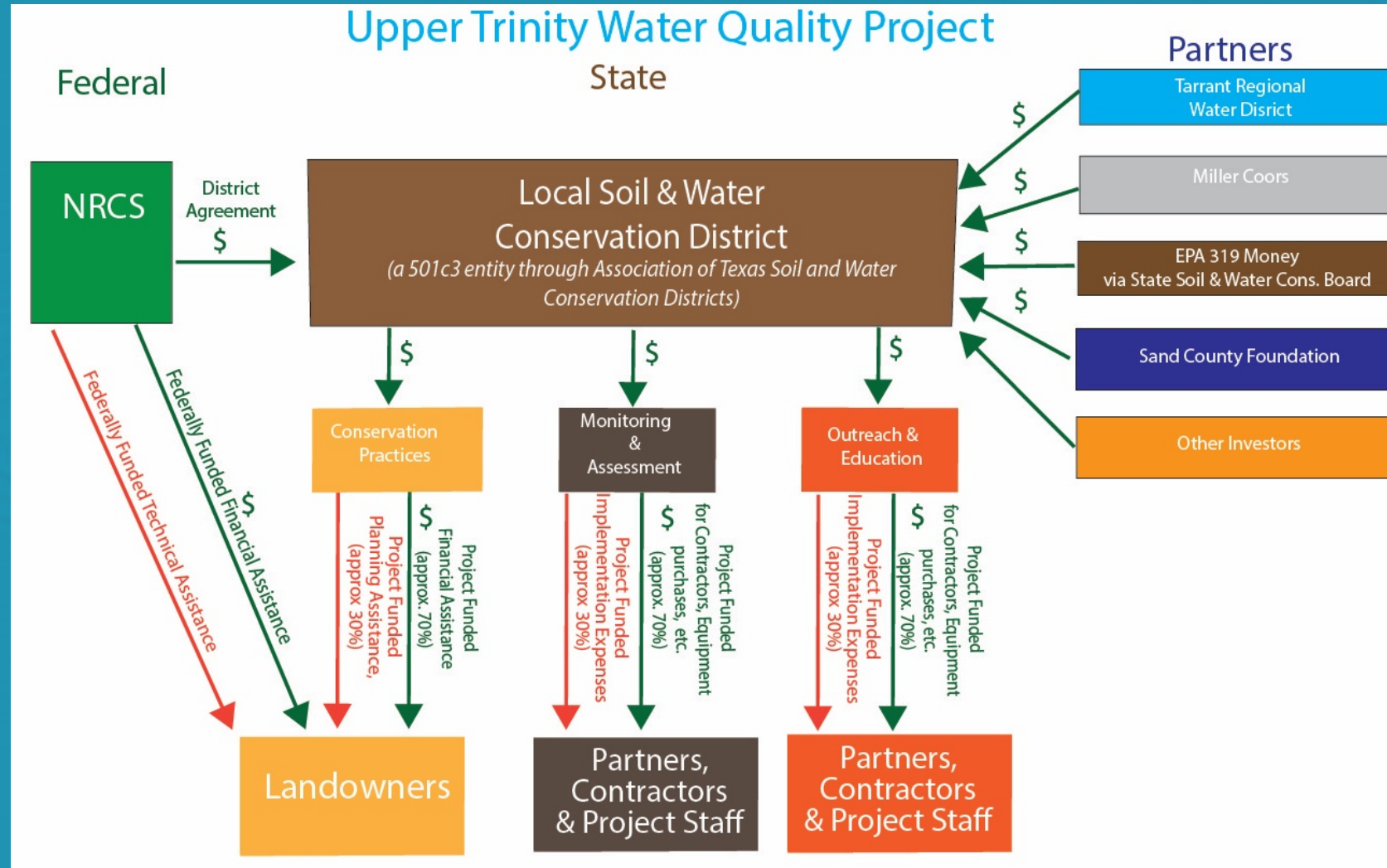
Service Area

- > 2.2 million people
- > 30 wholesale customers



TRWD Watershed Program Mission:

To protect TRWD water supplies through responsible watershed planning and land stewardship.



Technical vs Financial Assistance

Conservation Practices that address water quality (2012-2015)

Eagle Mountain

Planning	210,262 ac
Funding	41,737 ac

Total in Conservation 251,999 ac

TOTAL FUNDS
\$2,000,000

Cost of Conservation
\$7.94 per acre

Richland/Chambers

Planning	101,605 ac
Funding	74,195 ac

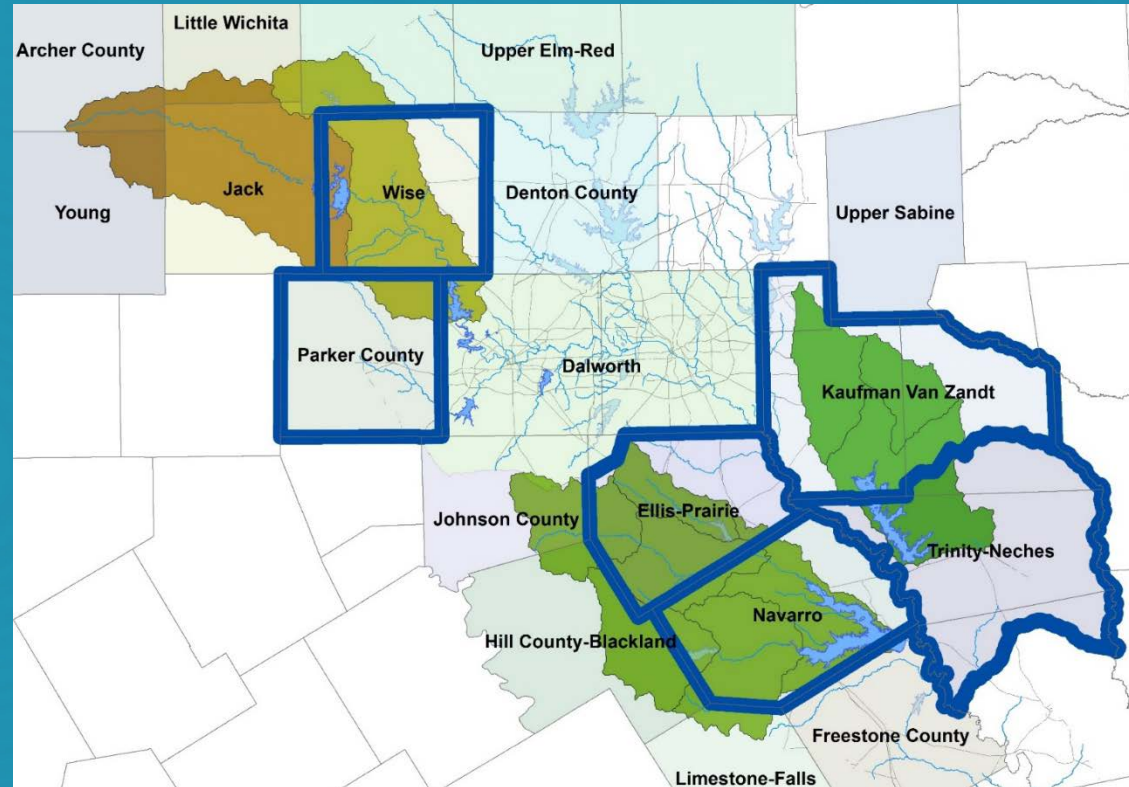
Total in Conservation 175,800 ac

TOTAL FUNDS
\$7,800,000

Cost of Conservation
\$44.37 per acre

2020 WPP Status Update

- ▶ Richland-Chambers
 - ▶ Draft WPP complete
 - ▶ Target EPA acceptance: 2022
- ▶ Eagle Mountain
 - ▶ Write 9-Elements WPP in Summer 2021
 - ▶ Target EPA acceptance: 2024
- ▶ Cedar Creek
 - ▶ Target EPA acceptance: 2026



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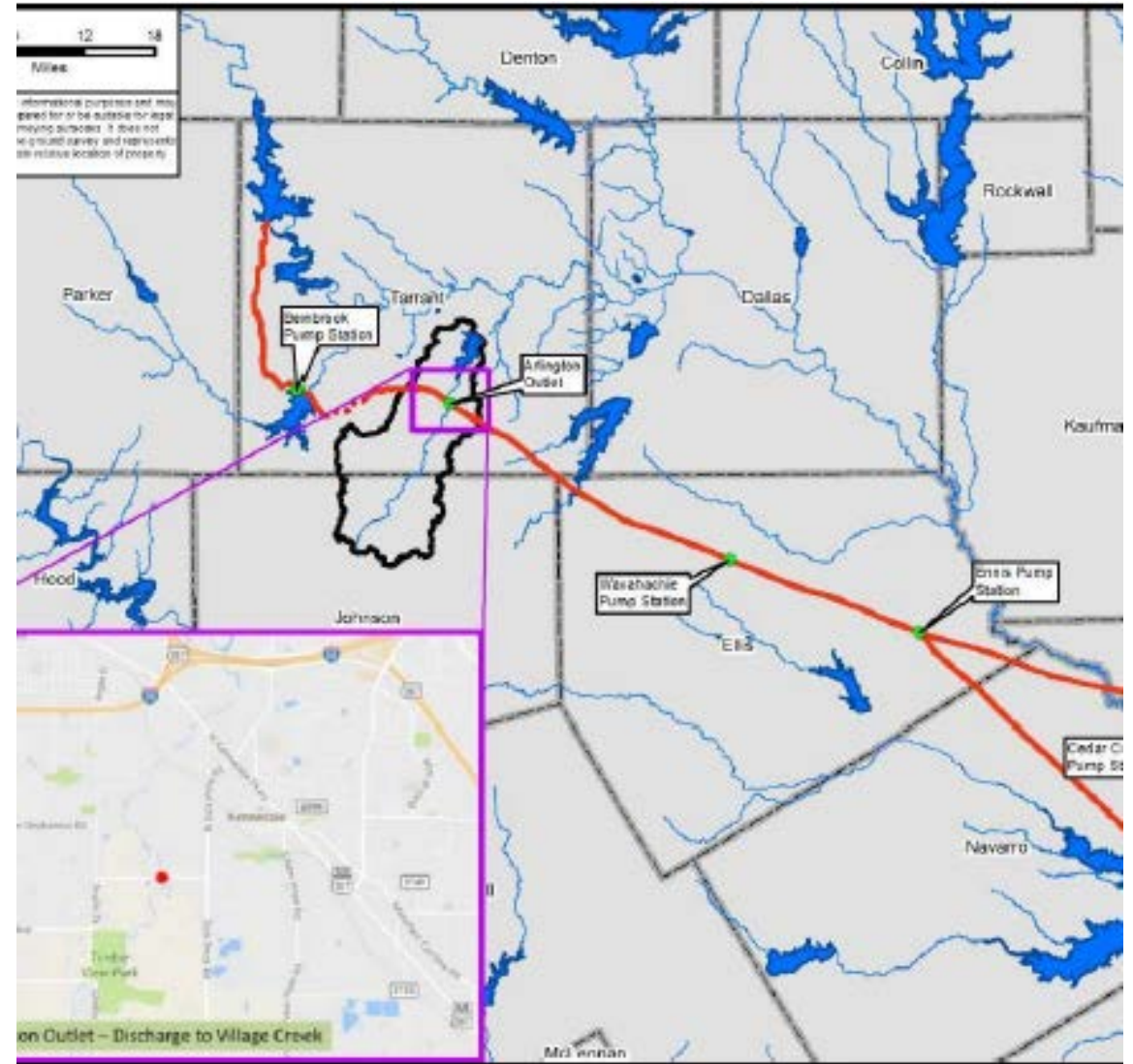


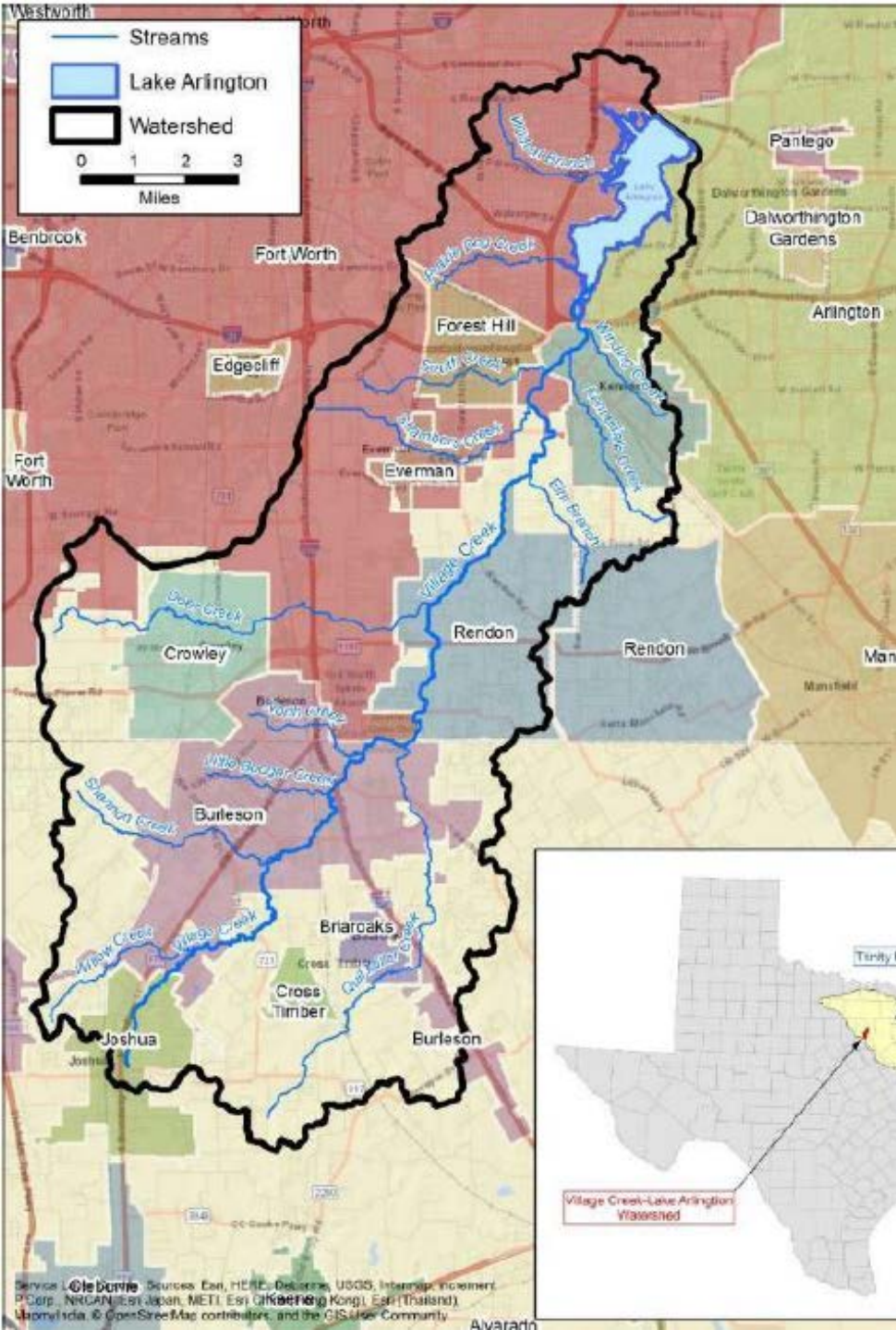
Village Creek
Lake Arlington

WATERSHED
PROTECTION

Lake Arlington Intricacies

- Urban Water Body
- Tarrant Regional Water District (TRWD) owns the water
 - City of Arlington, Trinity River Authority, and Exelon Power purchase water from TRWD
- City of Arlington owns the land/bowl under the lake





Watershed Protection Plan

- Watershed Protection Plan(WPP) desired as a holistic approach to address current and future water quality
- WPP Funded – 319 Grant with City of Arlington matching funds and TRA in kind contributions
- Trinity River Authority(TRA) – completed necessary elements and developed WPP
- EPA accepted WPP in 2019

Management Measure	Responsible Party	Unit Cost	Units Implemented (by year)										Total Cost	Funding Source
			1	2	3	4	5	6	7	8	9	10		
Illegal Dumping and Litter Accumulation														
Illegal dumping surveys	Cities, counties, HOAs, NAs	\$5,800	1	1	1	1	1	1	1	1	1	1	\$58,000	F6,S7,S8,N1,N3
Rural home hazardous waste pickup/dropoff days	Counties, CDPs	\$5,000	2	2	2	2	2	2	2	2	2	2	\$100,000	F6,S7,N1,N3
VCLA cleanup events	Homeowners	\$3,500	1	1	1	1	1	1	1	1	1	1	\$35,000	F6,S7,N1,N3
Education & outreach		N/A	Assistance/input as needed										N/A	Unknown
Lawn Residue and Waste														
Illicit discharge surveys	Cities, counties	N/A	As needed										N/A	F6,S2,S7,S8,N1,N3
Permeable paver driveways, rain barrels	Residents, businesses, cities, counties	\$5,500	1	1	1	1	1	1	1	1	1	1	\$55,000	F6,S5,S7,N1,N2,N3
Low-water use plantings in greenspaces	Cities, counties, HOAs, NAs	N/A	Assistance/input as needed										N/A	F6,S5,S7,N1,N2,N3
Lawn waste management ordinances/bylaws	Cities, counties, HOAs, NAs	N/A	As early as feasible										N/A	L, F3
"Water Wise" lawn care training	Residents, landscapers	\$3,500		1			1			1			\$10,500	F8,N1,N3
Education & outreach - bill inserts	Cities, counties, regional entities	\$17,000		1	1	1	1	1	1	1	1	1	\$153,000	F8,N1,N3
Education & outreach - general		\$17,000	Assistance/input as needed										\$17,000	F8,N1,N3
SSOs														
Support for wastewater treatment network for SSO locations	Wastewater infrastructure operators	N/A	As needed										N/A	L, F3
Stormwater infrastructure assessments	Cities	\$800	1	1	2	2	2	2	2	1	1	1	\$12,000	F6,S2,S7,S8,N1,N3
Permeable pavers for parking lots	Lot owners/operators	\$37,500		1		1		1		1			\$150,000	F6,S5,S7,N1,N2,N3
Education & outreach	Residents	N/A	Assistance/input as needed										N/A	N/A

Watershed Protection Plan Updates

- Measures considered for implementation – Trail project on Fort Worth side, Clean Slate – waterway clean-up
- Challenges presented with outside jurisdiction implementation.
- COVID budget setbacks

• City of Arlington ongoing initiatives

Joe Pool Lake Watershed Protection Plan (Phases I & II)

November 2020



Trinity River Authority of Texas
Enriching the Trinity basin as a resource for Texans

Funding Source

Funding provided by the Texas Commission on Environmental Quality through a Clean Water Act Section 319(h) grant from the U.S. Environmental Protection Agency, with local match funding from the TRA and the cities of Cedar Hill, Grand Prairie, Mansfield and Midlothian.



2014 Texas Integrated Report

SegID: 0838C Walnut Creek

From the confluence with Joe Pool Lake up to the headwaters at Spring Street in Burleson.

Parameter(s)

Category

Year Segment First Listed

bacteria

5b

2006

0838C_01

From the confluence with Joe Pool Lake up to the headwaters at Spring Street in Burleson.

- Criteria exceeded 126 MPN/100mL at 195.6 MPN/100mL

SEG ID: 0838 Joe Pool Lake

From Joe Pool Dam in Dallas County up to the normal pool elevation of 522 feet (impounds Mountain Creek)

Parameter(s)

Level of Concern

nitrate

CS

0838_02

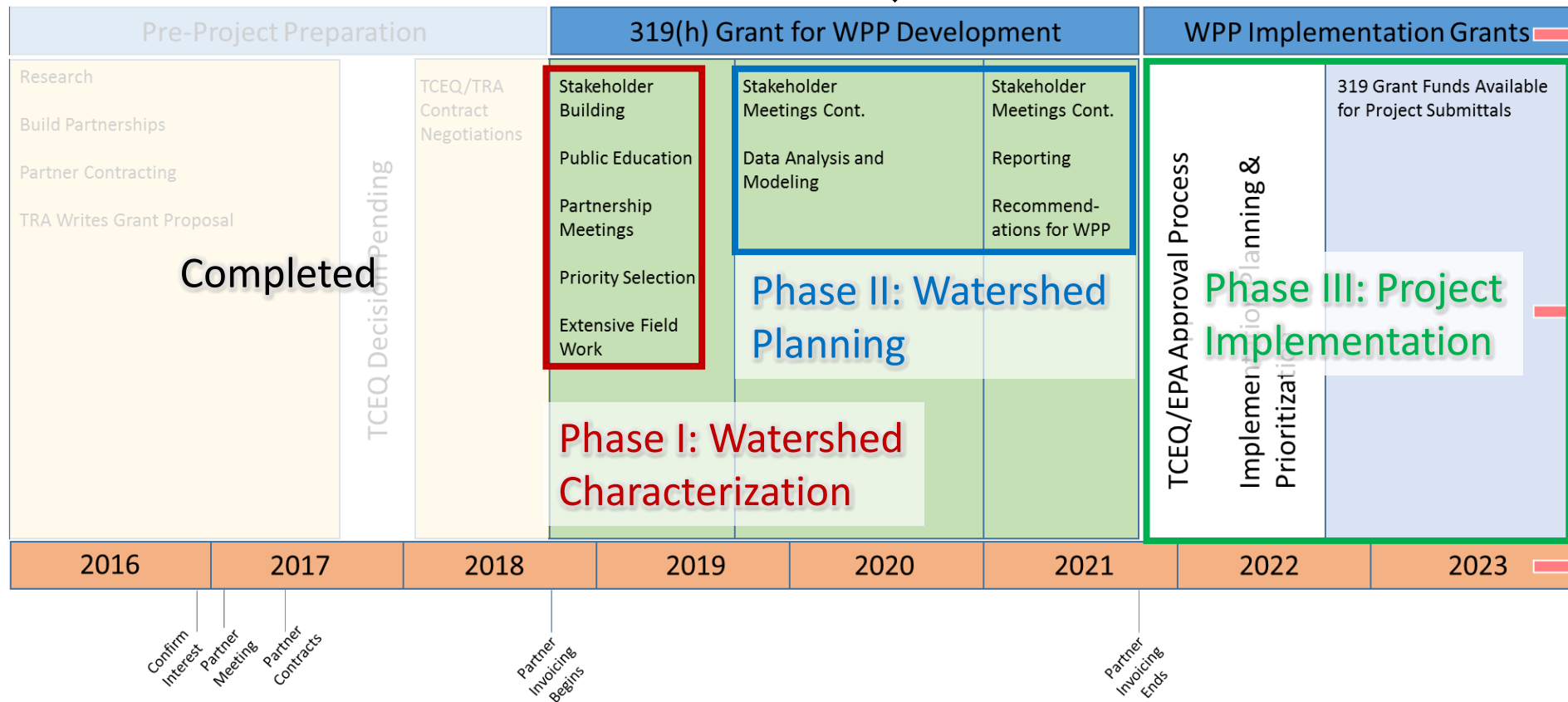
Mountain Creek arm

- Screening level 0.37 mg/L; exceeded at 0.74 mg/L



Joe Pool Lake WPP Timeline

We are here



Completed or In-Progress

- Phase I – Watershed Characterization
 - [Analysis of Historical Data](#)
 - Data Collection
- Phase II – Development of Watershed Protection Plan
 - Stakeholder development
 - Modeling
 - WPP



Where do we go from here?

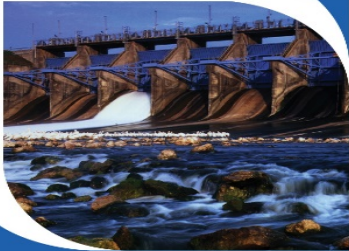
- Next Group Meeting
 - Tentative for mid-February 2021
- First Steering Committee Meeting
 - Tentative for Late February or Early March 2021
- Load Calculations, Modeling & BMP evaluation
 - Baseline data retrieval underway
 - Analysis completed by mid-2021



Questions?

<http://www.trinityra.org/joepoollakewpp>

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**BIOLOGICAL & AGRICULTURAL
ENGINEERING**
TEXAS A & M UNIVERSITY

Rowlett Creek Watershed Characterization Project

Fouad H. Jaber, PhD, PE

Associate Professor and Extension Specialist
Biological and Agricultural Engineering
AgriLife Extension

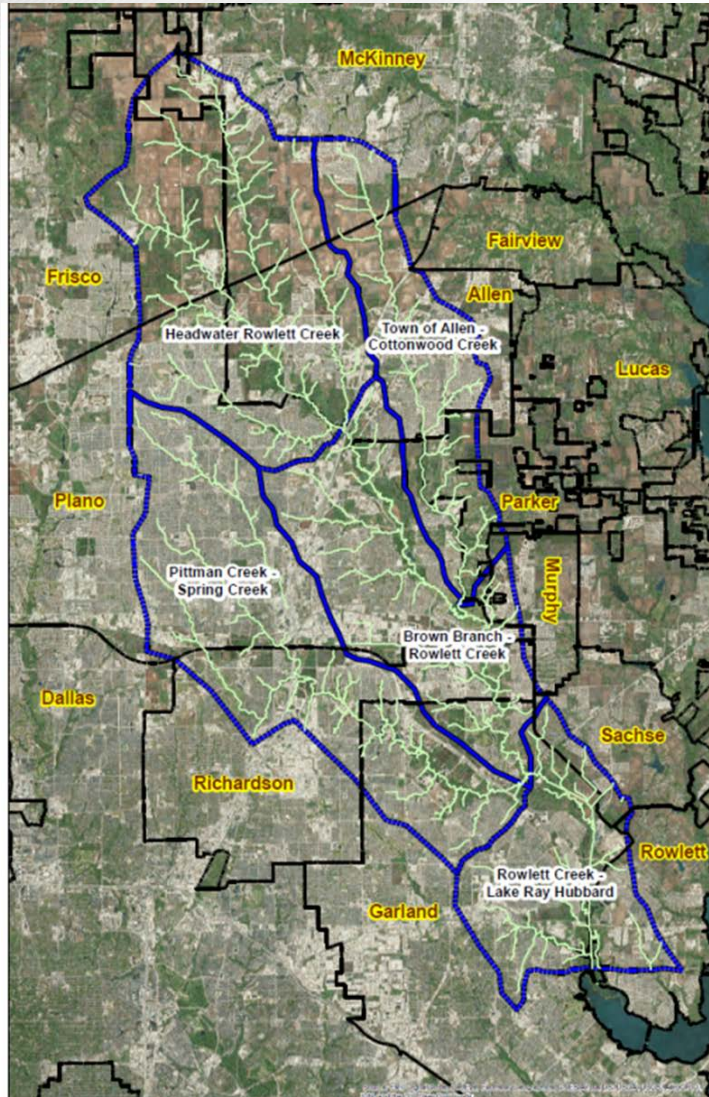
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TEXAS A&M
AGRILIFE
RESEARCH | EXTENSION

Rowlett Creek Watershed



- Highly urbanized
- Flows through Plano, Garland, McKinney, Frisco, Allen, and Murphy
- Discharges into Lake Ray Hubbard – Water supply reservoir for Dallas Water Utilities
- On 303d list for bacteria
- Concern for nitrate

Watershed Characterization Project

- Funded through a 319 grant from TCEQ/EPA
- Collaboration between Texas A&M AgriLife, City of Plano, Southern Methodist University, and North Texas Municipal Water District
- Includes monitoring and modeling parts
- Considered Phase I in development of a Watershed Protection Plan
- Stakeholder group being developed planning a kickoff meeting in January 2021
- Phase I to be completed in Early 2022

What Has Been Done

- Developed Monitoring QAPP
- Selected monitoring sites
- Installed water quality sampling equipment
- On-going water quality data collection
- Gathered existing historic flow and water quality data
- Started working on stakeholder list

Upcoming steps

- Continuing monitoring data collection
- Finishing modeling QAPP
- Modeling Rowlett creek
- Developing LDC and determining needed reductions
- Simulating best management practices to reduce water quality impairments



Fouad H. Jaber, PhD

Associate Professor and Extension Specialist

Biological and Agricultural Engineering

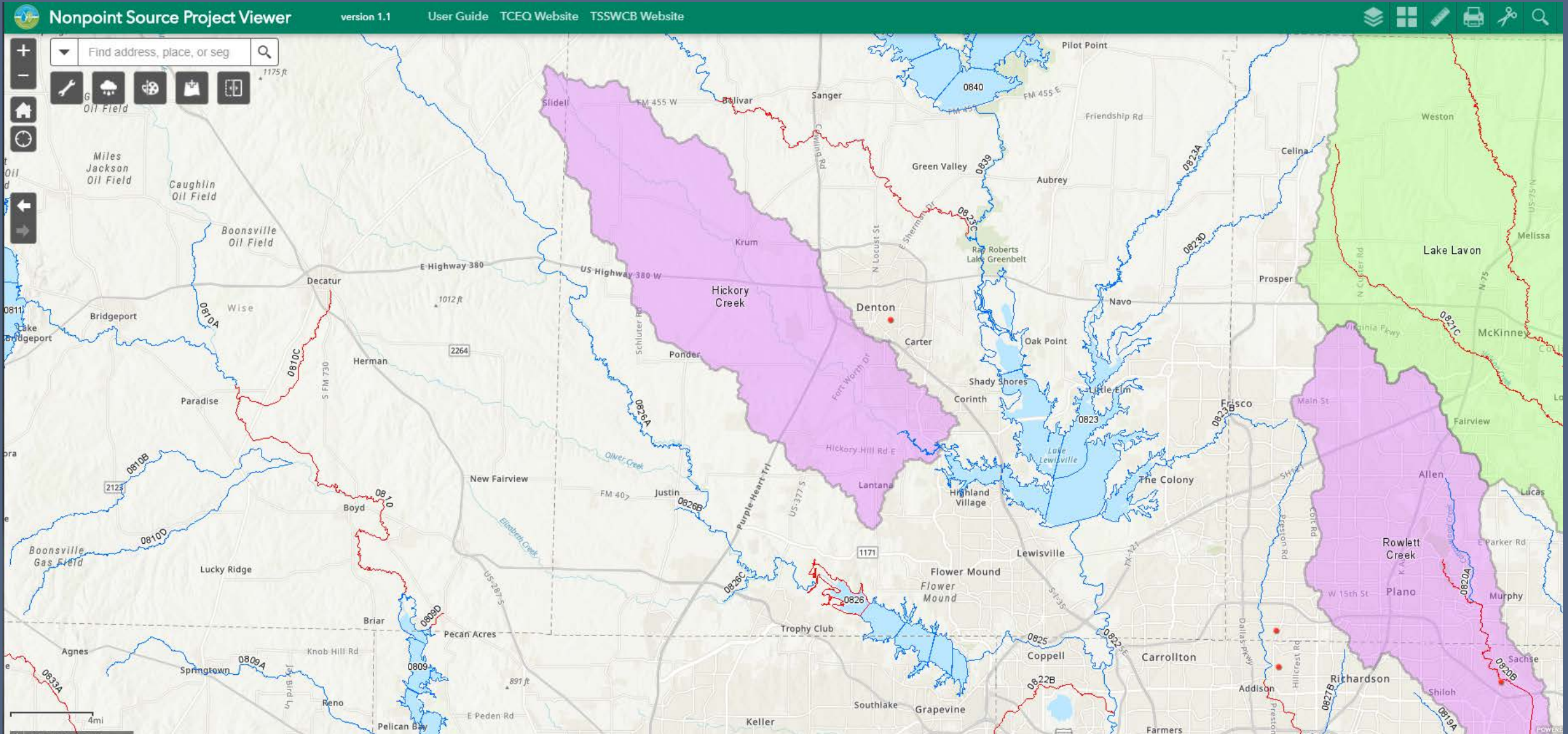
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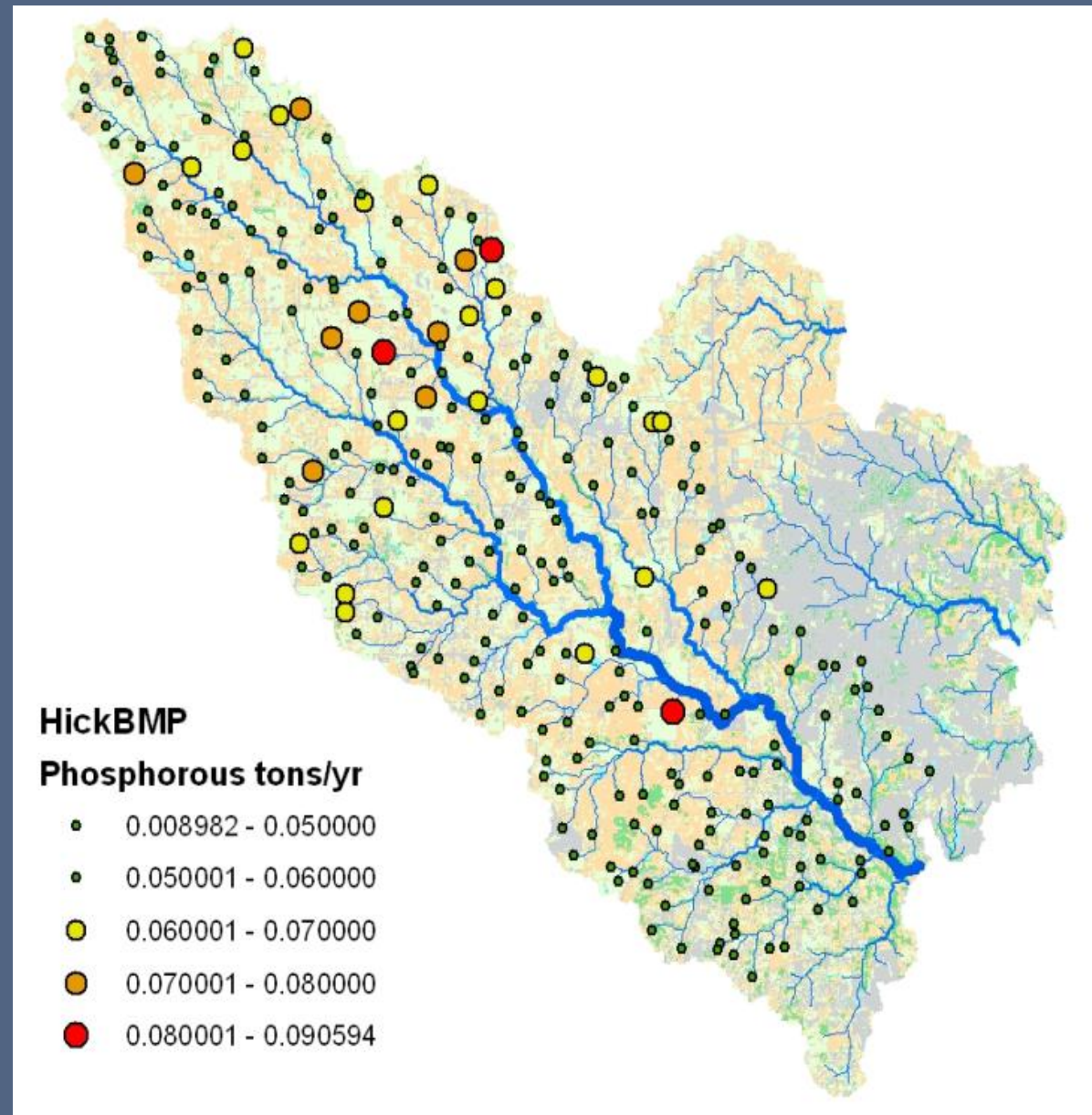
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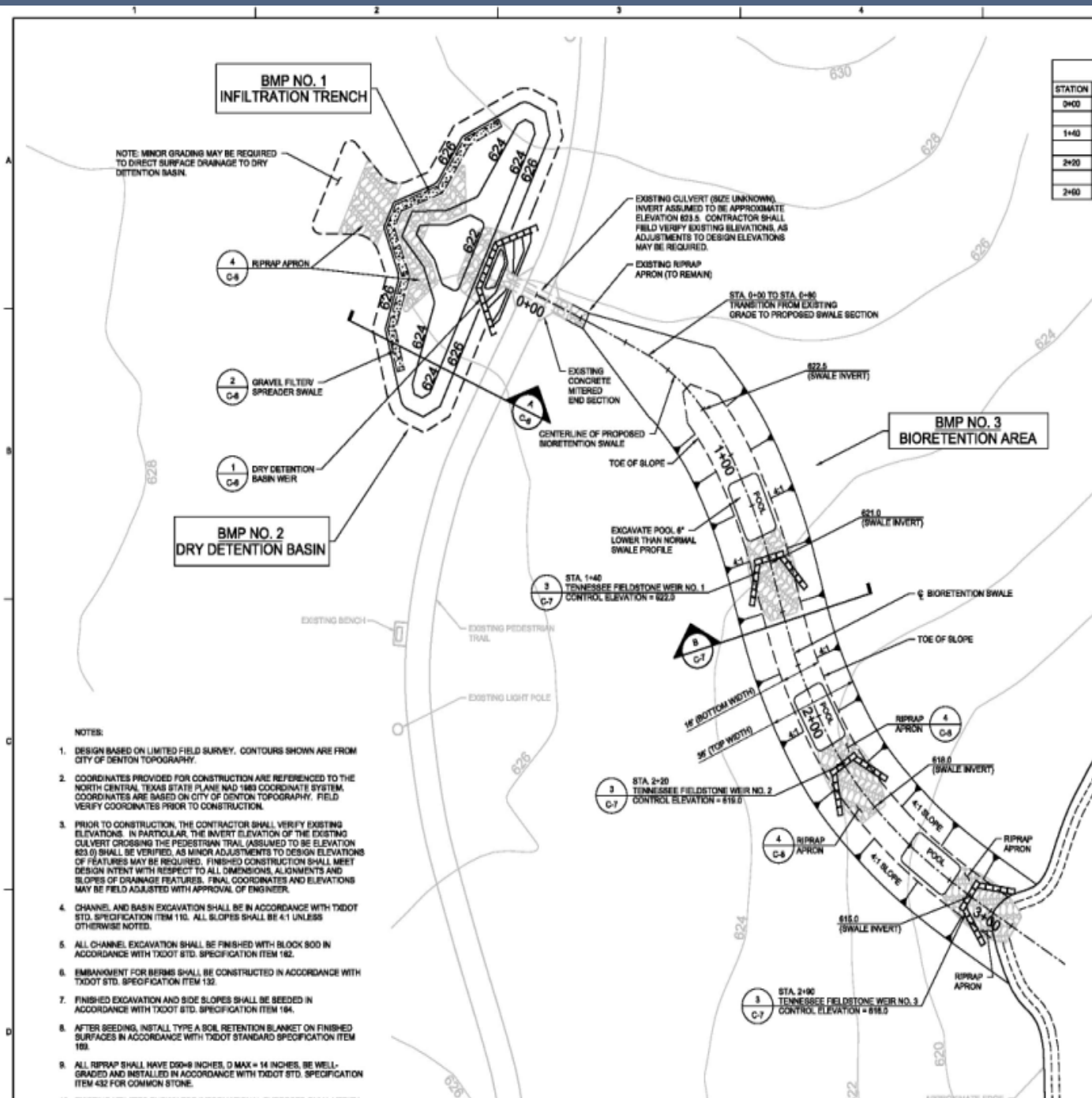
Hickory Creek Watershed Protection Plan



Phosphorus Nitrogen Sediment

Land Use	Annual Loads per Unit Area from each Land Use (pounds/acre/yr)		
	Sediment	Phosphorus	Nitrogen
Urban	161.49	1.34	3.66
Agriculture	123.12	1.96	3.75
Rangeland	55.32	0.27	1.87
Forest	21.41	0.09	0.71





**BMP NO. 1
INFILTRATION TRENCH**

NOTE: MINOR GRADING MAY BE REQUIRED TO DIRECT SURFACE DRAINAGE TO DRY DETENTION BASIN.

4 RIPRAP APRON
C-4

2 GRAVEL FILTER/ SPREADER SWALE
C-4

1 DRY DETENTION BASIN WEIR
C-4

**BMP NO. 2
DRY DETENTION BASIN**

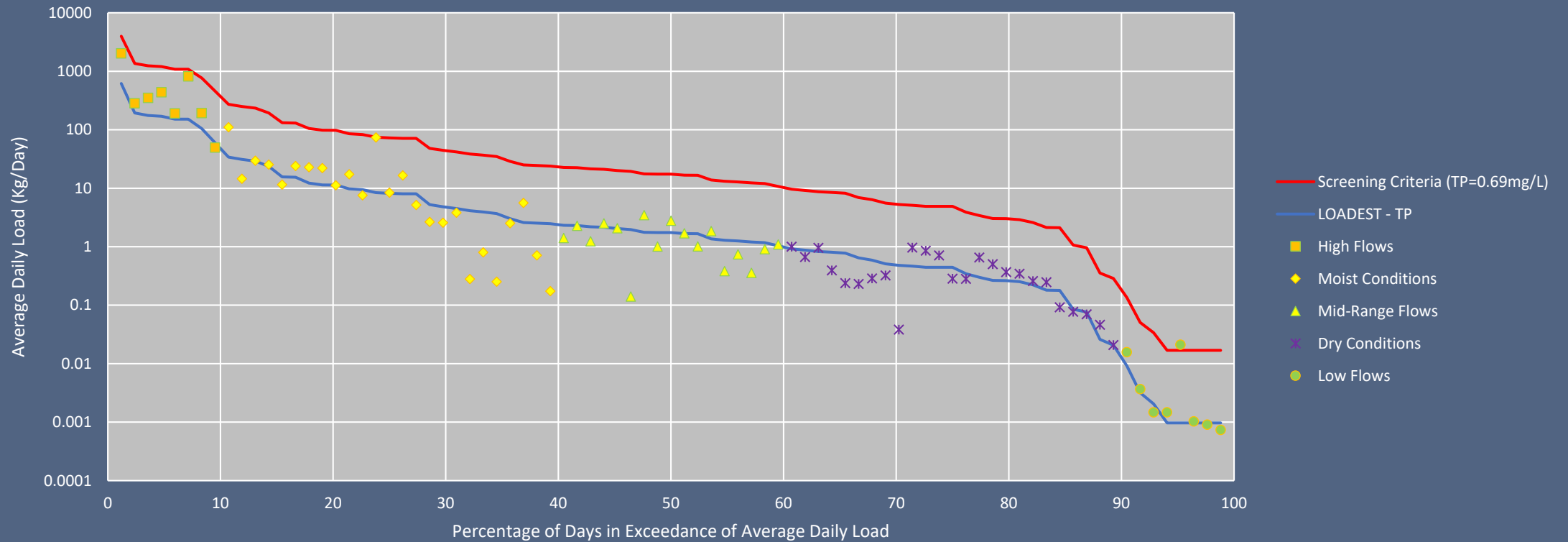
**BMP NO. 3
BIORETENTION AREA**

- NOTES:
- DESIGN BASED ON LIMITED FIELD SURVEY. CONTOURS SHOWN ARE FROM CITY OF DENTON TOPOGRAPHY.
 - COORDINATES PROVIDED FOR CONSTRUCTION ARE REFERENCED TO THE NORTH CENTRAL TEXAS STATE PLANE NAD 1983 COORDINATE SYSTEM. COORDINATES ARE BASED ON CITY OF DENTON TOPOGRAPHY. FIELD VERIFY COORDINATES PRIOR TO CONSTRUCTION.
 - PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY EXISTING ELEVATIONS. IN PARTICULAR, THE INVERT ELEVATION OF THE EXISTING CULVERT CROSSING THE PEDESTRIAN TRAIL (ASSUMED TO BE ELEVATION 823.0) SHALL BE VERIFIED, AS MINOR ADJUSTMENTS TO DESIGN ELEVATIONS OF FEATURES MAY BE REQUIRED. FINISHED CONSTRUCTION SHALL MEET DESIGN INTENT WITH RESPECT TO ALL DIMENSIONS, ALIGNMENTS AND SLOPES OF DRAINAGE FEATURES. FINAL COORDINATES AND ELEVATIONS MAY BE FIELD ADJUSTED WITH APPROVAL OF ENGINEER.
 - CHANNEL AND BASIN EXCAVATION SHALL BE IN ACCORDANCE WITH TxDOT STD. SPECIFICATION ITEM 110. ALL SLOPES SHALL BE 4:1 UNLESS OTHERWISE NOTED.
 - ALL CHANNEL EXCAVATION SHALL BE FINISHED WITH BLOCK 800 IN ACCORDANCE WITH TxDOT STD. SPECIFICATION ITEM 162.
 - EMBANKMENT FOR BERMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH TxDOT STD. SPECIFICATION ITEM 152.
 - FINISHED EXCAVATION AND SIDE SLOPES SHALL BE SEEDED IN ACCORDANCE WITH TxDOT STD. SPECIFICATION ITEM 194.
 - AFTER SEEDED, INSTALL TYPE A SOIL RETENTION BLANKET ON FINISHED SURFACES IN ACCORDANCE WITH TxDOT STANDARD SPECIFICATION ITEM 169.
 - ALL RIPRAP SHALL HAVE D₅₀ = 9 INCHES, D_{MAX} = 14 INCHES, BE WELL-GRADED AND INSTALLED IN ACCORDANCE WITH TxDOT STD. SPECIFICATION ITEM 432 FOR COMMON STONE.



Load Duration Curve

Load Duration Curve - Total Phosphorus (TP)
Hickory Creek at Country Club (n=83)



JoEtta Dailey, Watershed Protection Manager

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STORMWATER QUALITY PROJECT

This system cleans stormwater as it flows into Hickory Creek. Through a combination of methods, it causes water to slow down and infiltrate into the soil. This allows natural systems such as plants and soil-based microorganisms to remove or break down pollutants including nutrients, sediments, bacteria and heavy metals.



Learn more at www.dentonwatersheds.com

This project is supported by the Clean Water Act Section 319 Grant administered through the Texas Commission on Environmental Quality and by project partners, Upper Trinity Regional Water District and the North Texas Municipal Water District.



NORTH
TEXAS
MUNICIPAL
WATER
DISTRICT



LAVON LAKE WATERSHED PROTECTION PLAN

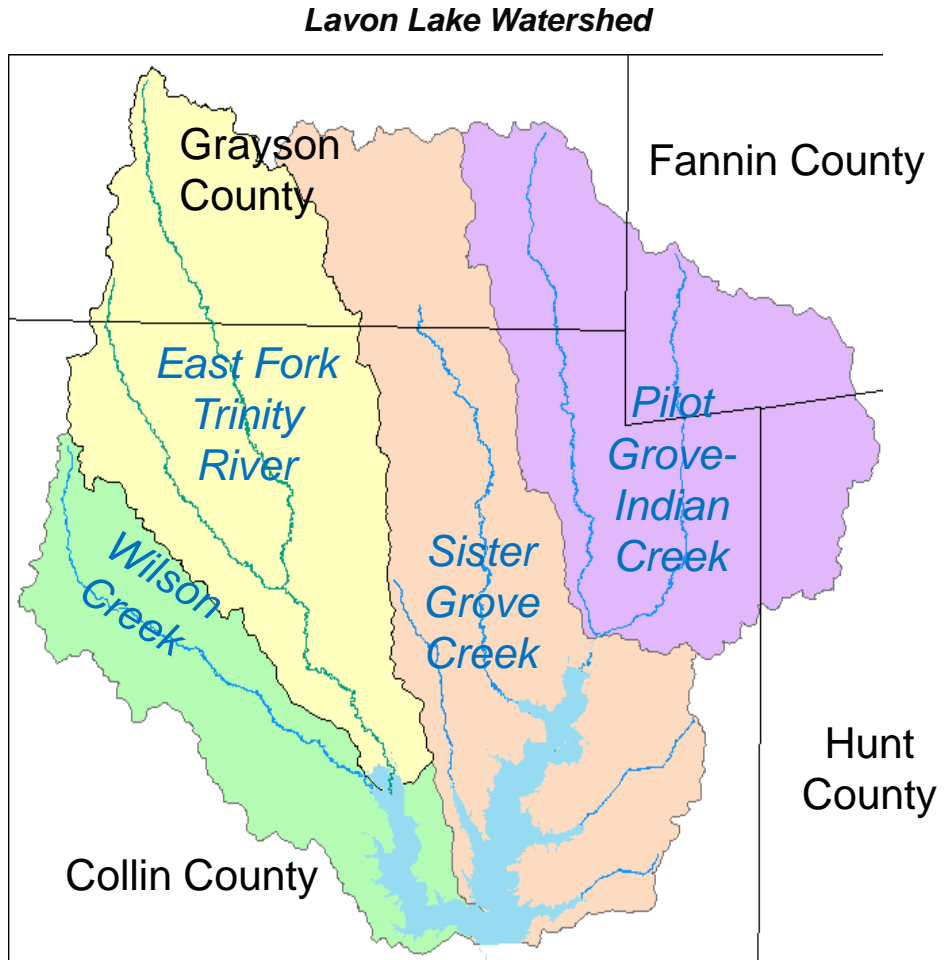
David Cowan

November 30, 2020

NCTCOG Virtual Roundtable



CLICK TO LAVON LAKE WATERSHED PROTECTION PLAN



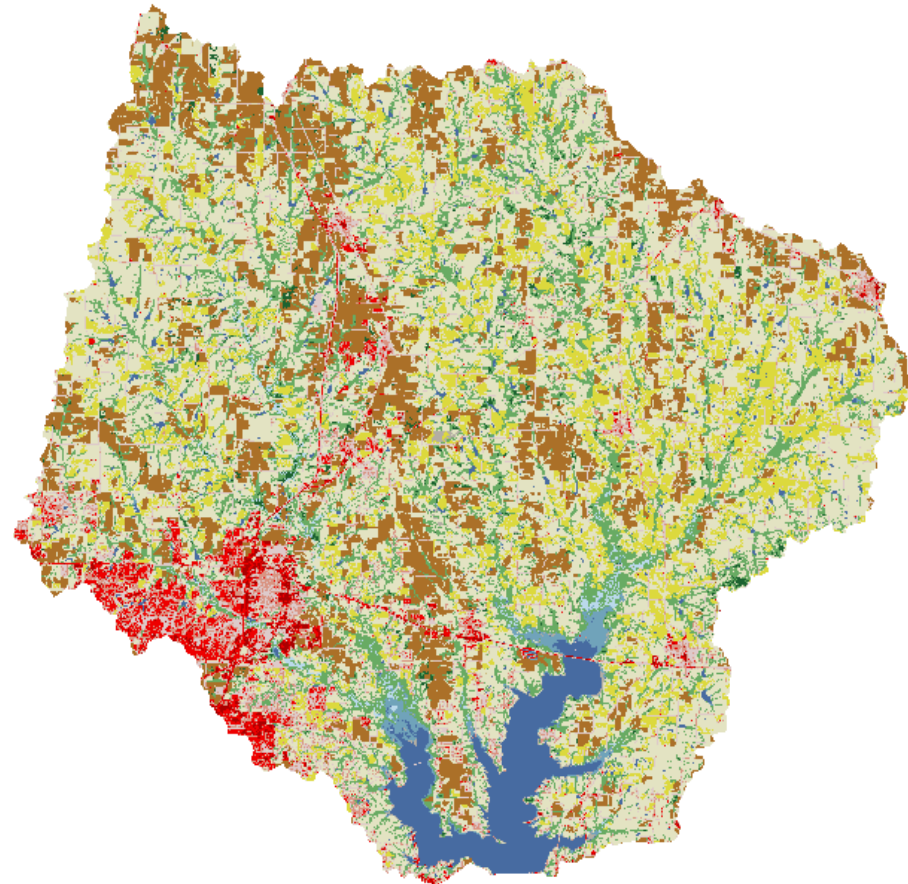


CLICK TO LAVON LAKE WATERSHED PROTECTION PLAN

- Water**
- Developed Open**
- Developed Low**
- Developed Med.**
- Developed High**
- Barren Land**
- Deciduous Forest**
- Evergreen Forest**
- Mixed Forest**
- Grassland/Herb.**
- Shrub/Scrub**
- Hay/Pasture**
- Cropland**
- Woody Wetlands**
- Emergent Wetlands**



Lavon Lake Watershed





CLICK TO LAVON LAKE WATERSHED PROTECTION PLAN

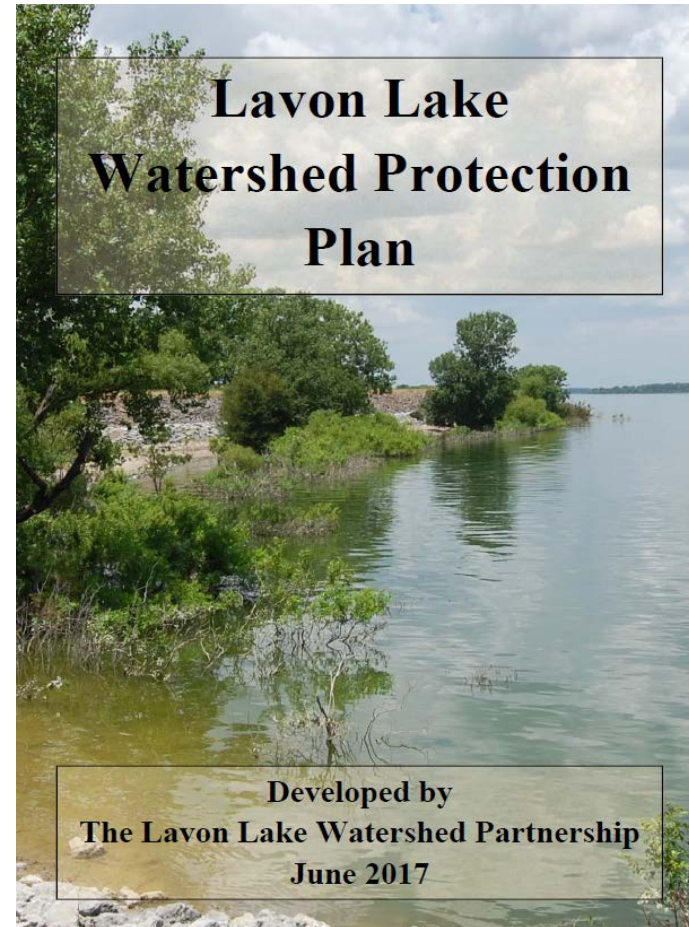
Watershed Protection Plan

(Accepted by EPA December, 2017)

Established a 10-year implementation horizon to:

- Reduce bacteria
- Reduce sediment and nutrient loads
- Help keep toxic/hazardous substances out of the water

Created grant funding opportunities for management measures identified in the plan





CLICK TO VIEW LAVON LAKE WATERSHED PROTECTION PLAN

Funding for Lavon Lake Watershed Implementation

- NRCS (2018 Farm Bill) ~ \$1M from NRCS in priority funding for conservation measures
- TSSWCB (CWA 319h) - SWCD Watershed Technician
- TSSWCB (CWA 319h) - water monitoring and outreach
- TCEQ (CWA 319h) - green stormwater infrastructure installations



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FOR IMMEDIATE RELEASE

Media Contact:

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Public Relations Officer

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Lavon Lake watershed to receive federal protection funds

One of only two in the state selected as priority watersheds to receive funding

WYLIE, TX – August 3, 2020: The North Texas Municipal Water District (NTMWD) has been notified the Lavon Lake watershed has been selected as one of two priority watersheds in Texas by the Natural Resources Conservation Service (NRCS) for watershed protection funding. The Lampasas River watershed in Central Texas is the other priority watershed selected. **The designation will result in about \$2.28M in watershed protection projects in the Lavon Lake and Lampasas River watersheds geared towards reducing erosion and nutrients such as nitrogen and phosphorus commonly found in fertilizer.**

Watersheds are areas of land that water flows across, through or under before ultimately draining into creeks, streams, rivers, lakes or oceans. The Lavon Lake watershed is comprised of 492,095 acres of land in parts of Collin, Fannin, Grayson, and Hunt Counties that capture and direct rainfall into creeks, streams and rivers that flow into Lavon Lake.

“The primary focus of the Lavon Lake watershed protection plan is to prevent contaminants from entering Lavon Lake from surrounding cities, farms and ranchlands,” said David Cowan, NTMWD Watershed Manager. “This funding will help us with our mission of protecting water quality in this critical water source for North Texans,” Cowan added.

The funding is part of the Agriculture Improvement Act of 2018 (Farm Bill) which includes specific protections for source water and drinking water supplies. **The Farm Bill is administered through NRCS to help farmers and ranchers implement conservation measures on their land to improve water quality. It provides a direct benefit to agriculture producers and water utilities. The Lavon Lake watershed was selected as a priority project because it is a key drinking water source for nearly 2 million North Texans.**



CLICK TO LAVON LAKE WATERSHED PROTECTION PLAN

Rural NPS Strategies

- Develop water quality management plans through the SWCD and NRCS
- Monitor water quality at 14 sites to determine effectiveness of implementation measures
- Provide support for the Lavon Lake Watershed Partnership
- Education and Outreach
 - Stream Hydrology Trailer
 - Signage & NPS Video
 - AgriLife Workshops

Urban NPS Strategies

- Design and construct LID installations in high profile locations in the watershed
- Develop and host stormwater workshops and roundtables for cities
- Develop an urban stormwater guidance document for local cities



CLICK TO LAVON LAKE WATERSHED PROTECTION PLAN

Lessons Learned

- Be adaptable to the COVID-19 new norm
- Communicate often and to everyone



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Thank you for attending!

November 30, 2020
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www.nctcog.org/WaterResources