



Permitting Lower Bois d'Arc Creek Reservoir

**Red River Authority of Texas
Texas Clean Rivers Program
Red River Basin Advisory Committee Meeting
March 24, 2015**

**Presented by:
Billy George, P.E.**





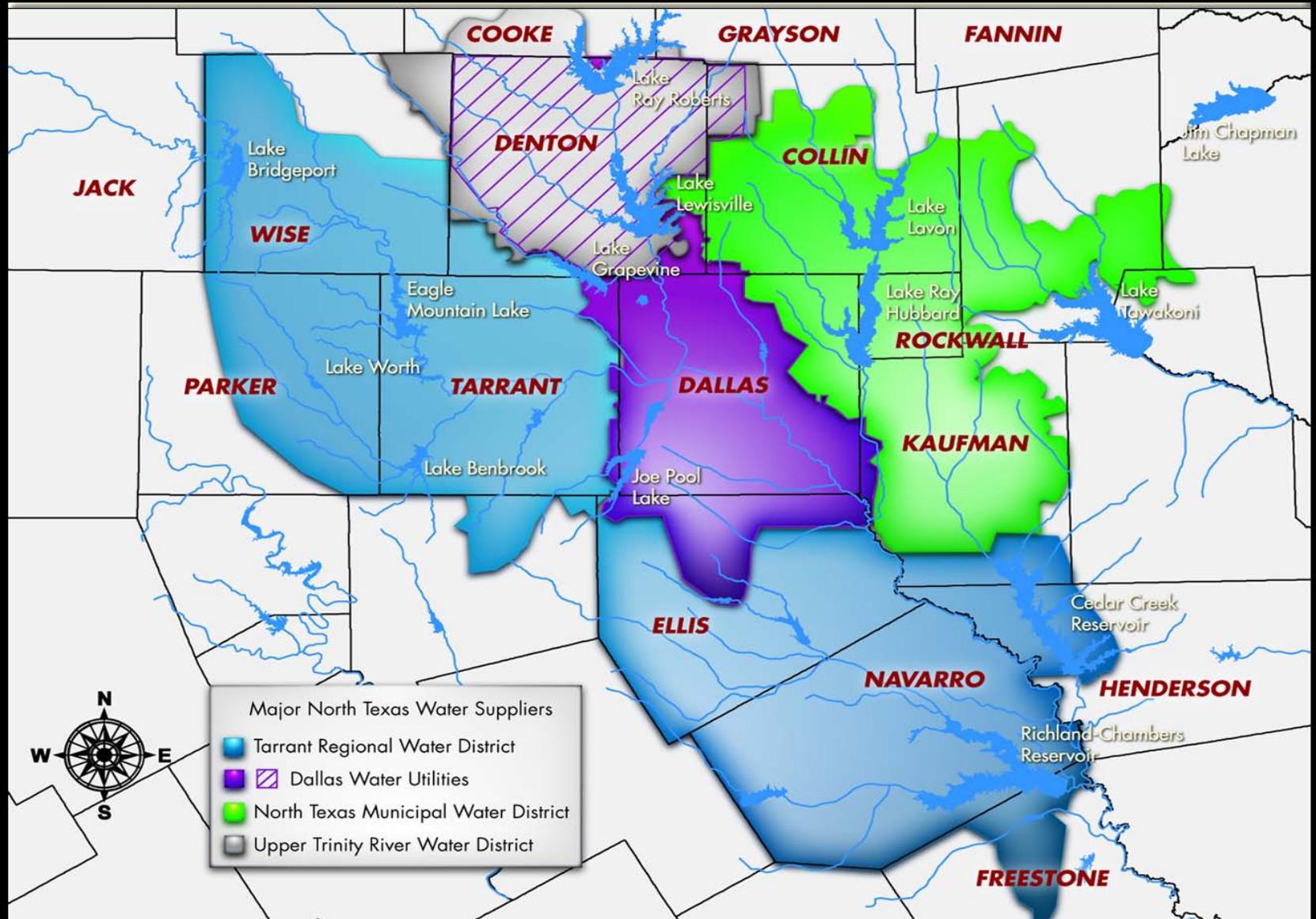
History of NTMWD

- 1951 - Created by Texas Legislature as a Special District to provide water service
- 1956 - Began providing treated water
- 1970's - Expanded to wastewater service
- 1980's - Expanded to solid waste service





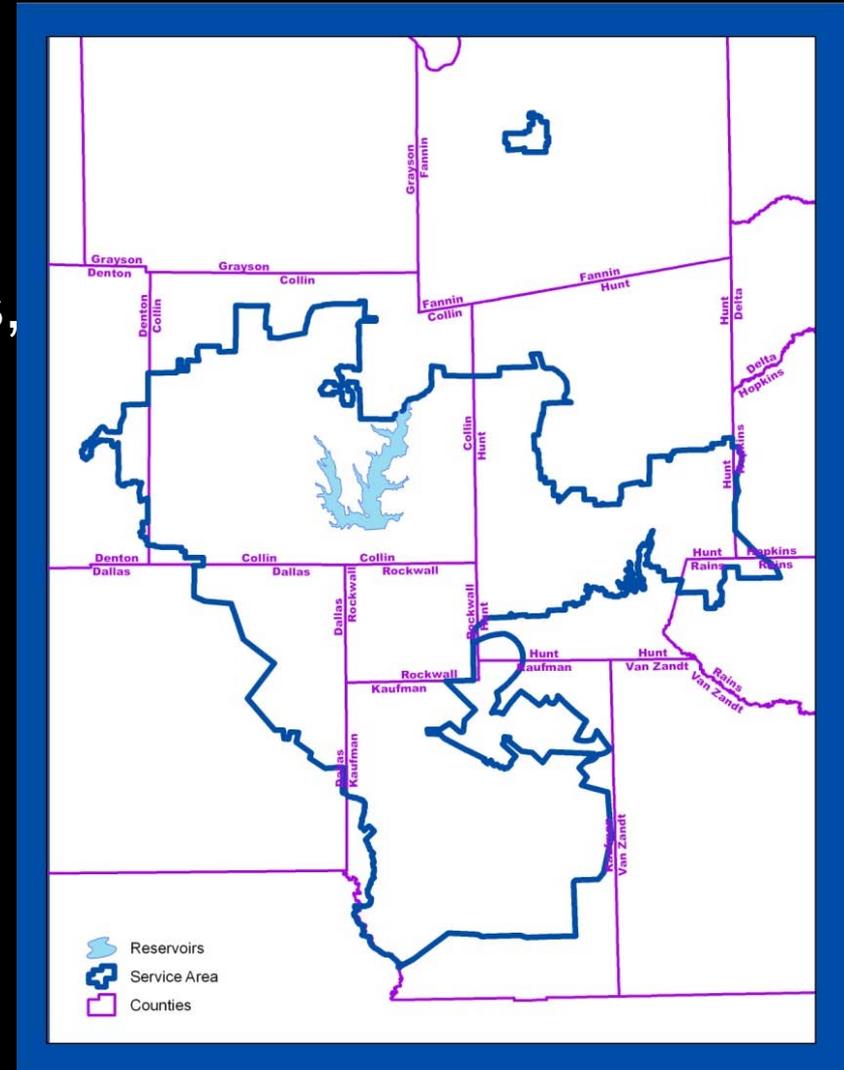
Major North Texas Water Providers





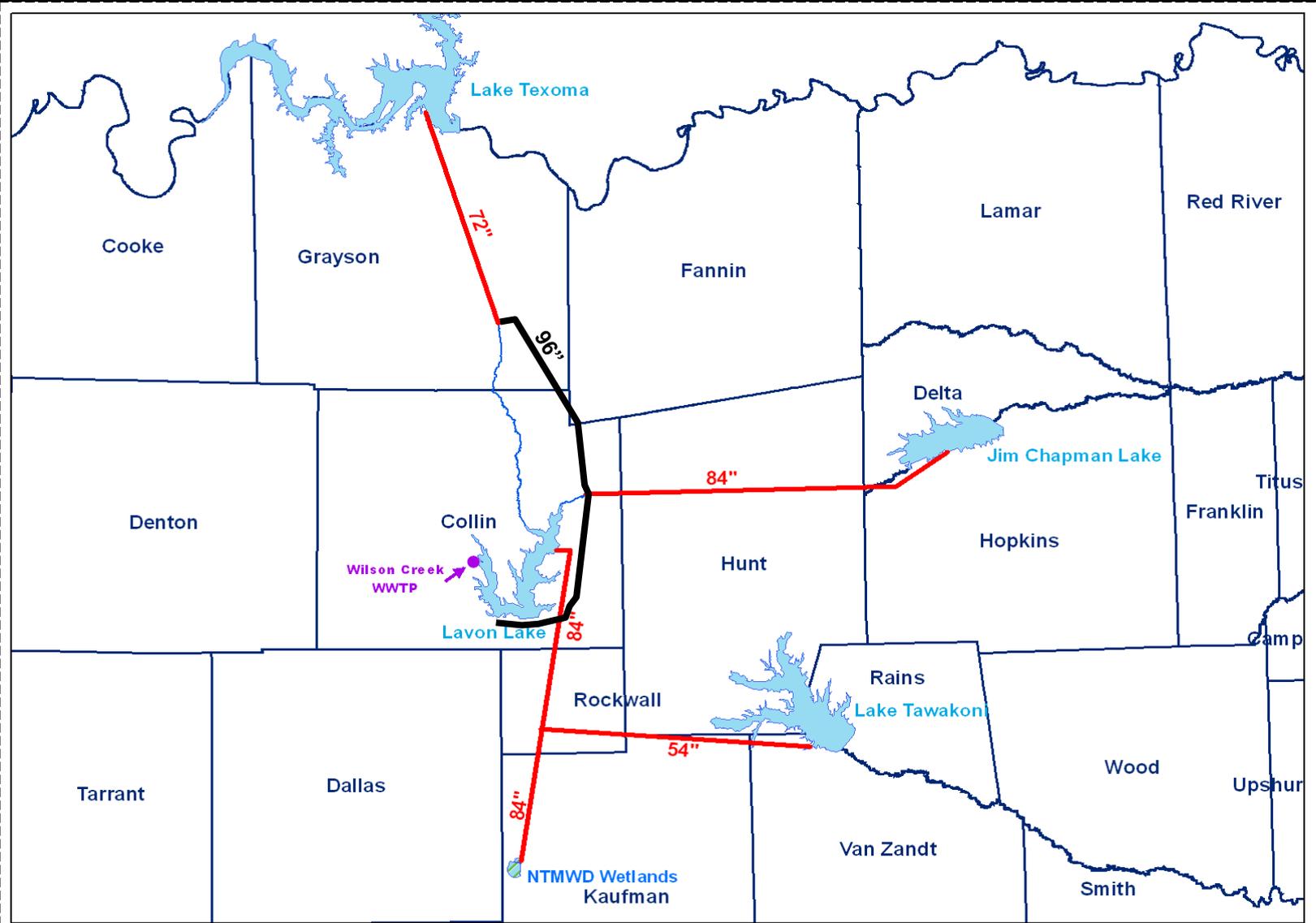
NTMWD Service Area

- 13 Member Cities
- 47 Customer Cities, Towns, MUDs, Special Utility Districts and Water Supply Corporations
- 1.6 Million People





NTMWD Raw Water Supply System





Lower Bois d'Arc Creek Reservoir Fannin County, TX

Area: 16,526 acres
Storage: 367,609 ac-ft
Supply: 120,600 ac-ft
(108 MGD)

Average Depth: 22 ft
Maximum Depth: 70 ft
Lake Elevation: 534 ft msl
Owner & Operator: NTMWD

(Not a USACE reservoir)





Leonard Water Treatment Plant

Site:

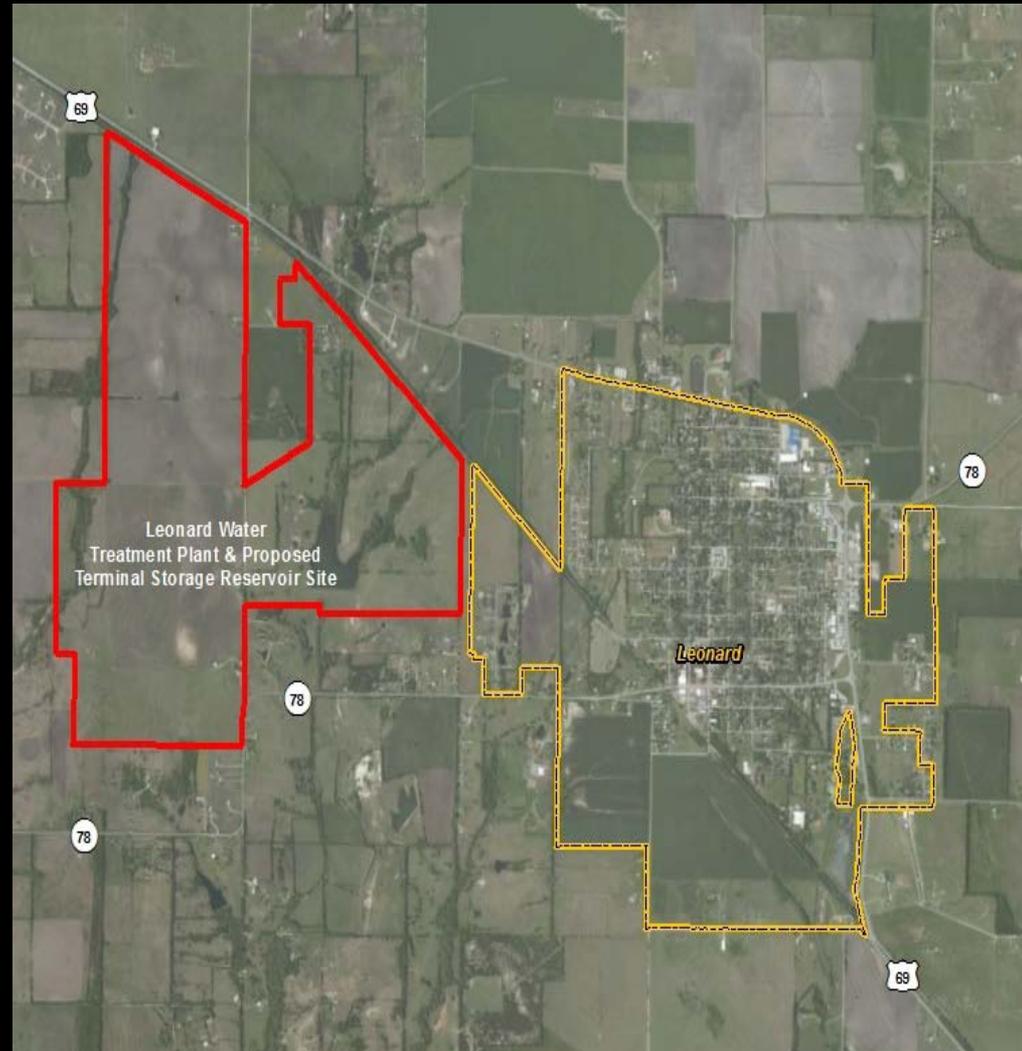
- Located west of Leonard
- Capacity: Phase I – 70 MGD;
Ultimate – 280 MGD
- Storage Reservoir – 420 MG

Scope accomplished to date:

- Property purchased
- Facilities master plan complete

Detailed Design

- Design - CH2MHill (2.5 years)
- Construction (2.5 years)





Current Cost Estimates

<u>Project Component</u>	<u>Cost Estimate</u>	<u>Expenditures</u>
• Reservoir	\$413 M	\$110 M
– Land		
– Dam		
– Intake		
– PS		
– Conflicts		
– Permitting		
– Mitigation		
• WTP (70 MGD) & Terminal Storage	\$249 M	\$.2 M
• 90-inch Raw Water Pipeline	\$185 M	\$4.4 M
• High Service PS & Pipeline	<u>\$145 M</u>	<u>\$0 M</u>
TOTAL	\$992 M	\$114.6 M





Three Purposes of the Reservoir

Vital New Source for Fannin County & NTMWD

- Supplement water supply for NTMWD Member Cities & Customers through 2040
- Provide water for Fannin County
- Provide recreational opportunities





Opportunities for Business Development & Commerce

- **\$145 M** in economic activity through new industrial & commercial activities
- **\$70 – 77 M** in annual spending by new, permanent & weekend residents
 - Supporting more than 500 new permanent jobs
- **\$16 - 22 M** in annual spending by non-local recreational visitors
- New housing, residents & recreational visitors will contribute:
 - **\$1.9 M** in county property tax revenues
 - **\$3.9 M** in school property tax revenues
 - **\$290,000** in municipal sales tax revenues
 - **\$175,000** in hotel occupancy tax revenues
- 3,200 new homes over a 30-year period

(2011 dollars)





Lower Bois d'Arc Creek Reservoir

Two Major Permits Required

- CWA Section 404
— USACE
- Water Rights
— TCEQ

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT (33 CFR 320)

OMIS APPROVAL NO. 0716-0033
Expires December 31, 2004

The Public Notice for this collection of information is estimated to average 30 hours per response, although the majority of applications should require 5 hours or less. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Justice, Washington Headquarters Service, Division of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0716-0033), Washington, DC 20503. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of these addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT
Authority: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research and Statistics Act, 33 USC 1915. Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Use: This information may be shared with the Department of Justice and other federal, state, and local government agencies. Submission of requested information is voluntary; however, if information is not provided the permit application cannot be processed nor can a permit be issued. Do not send original drawings or good reproducible copies which show the location and character of the proposed activity to be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

ITEMS 1 THRU 4 TO BE FILLED BY THE CORPUS

1. APPLICATION NO. 2. FIELD OFFICE CODE 3. DATE RECEIVED 4. DATE APPLICATION COMPLETED

ITEMS BELOW TO BE FILLED BY APPLICANT

5. APPLICANT'S NAME: North Texas Municipal Water District (NTMWD), c/o James Parks, Executive Director, 505 East Brown Street, P.O. Box 2400, Wylie, TX 75098

6. AUTHORIZED AGENT'S NAME AND TITLE (see agent's list on reverse): Michael Votaw, ARW, Environmental Scientist

7. APPLICANT'S ADDRESS: 505 East Brown Street, P.O. Box 2400, Wylie, TX 75098

8. AGENT'S ADDRESS: 4815 International Plaza, Suite 200, Fort Worth, Texas 76109-4895

9. APPLICANT'S PHONE NO. (AREA CODE & NUMBER): N/A

10. AGENT'S PHONE NO. (AREA CODE & NUMBER): N/A

11. STATEMENT OF AUTHORIZATION: I, Michael Votaw, hereby authorize _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information pertinent to my permit application.

APPLICANT'S SIGNATURE: James M. Parks DATE: 30 May 2008

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE: Lower Bois d'Arc Creek Reservoir

13. NAME OF WATERBODY, IF KNOWN: Bois d'Arc Creek

14. PROJECT STREET ADDRESS OR LOCATION: N/A

15. LOCATION OF PROJECT: COUNTY: Farris STATE: Texas

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN: The Lower Bois d'Arc Creek Reservoir site is located southeast of the City of Busham, Farris County, Texas (Figure 1). The reservoir site is generally bounded by State Highway 82 to the south, FM 273 to the north, FM 100 to the east, and FM 808 to the west. The location of the proposed dam is approximately 11 miles northeast of Busham on Bois d'Arc Creek and Honey Grove Creek.

GENERAL LOCATION MAP
Lower Bois d'Arc Creek Reservoir
Proposed Lower Bois d'Arc Creek Reservoir

LEGEND

- Intermittent Stream
- Perennial Stream
- Channel / Intermittent Waterway
- Temporary Wetland
- Clear Water
- Shrub Wetland
- Wetland of Construction
- Lake





CWA Section 404 Permit

- Application submitted – June 2008
- EIS Determination – March 2009
 - EIS contractor selected – August 2009
 - Public & Agency Scoping Meetings – December 2009
- Draft EIS available Feb 20, 2015





EIS Scoping Meeting December 8, 2009



CWA Section 404 Permit Application

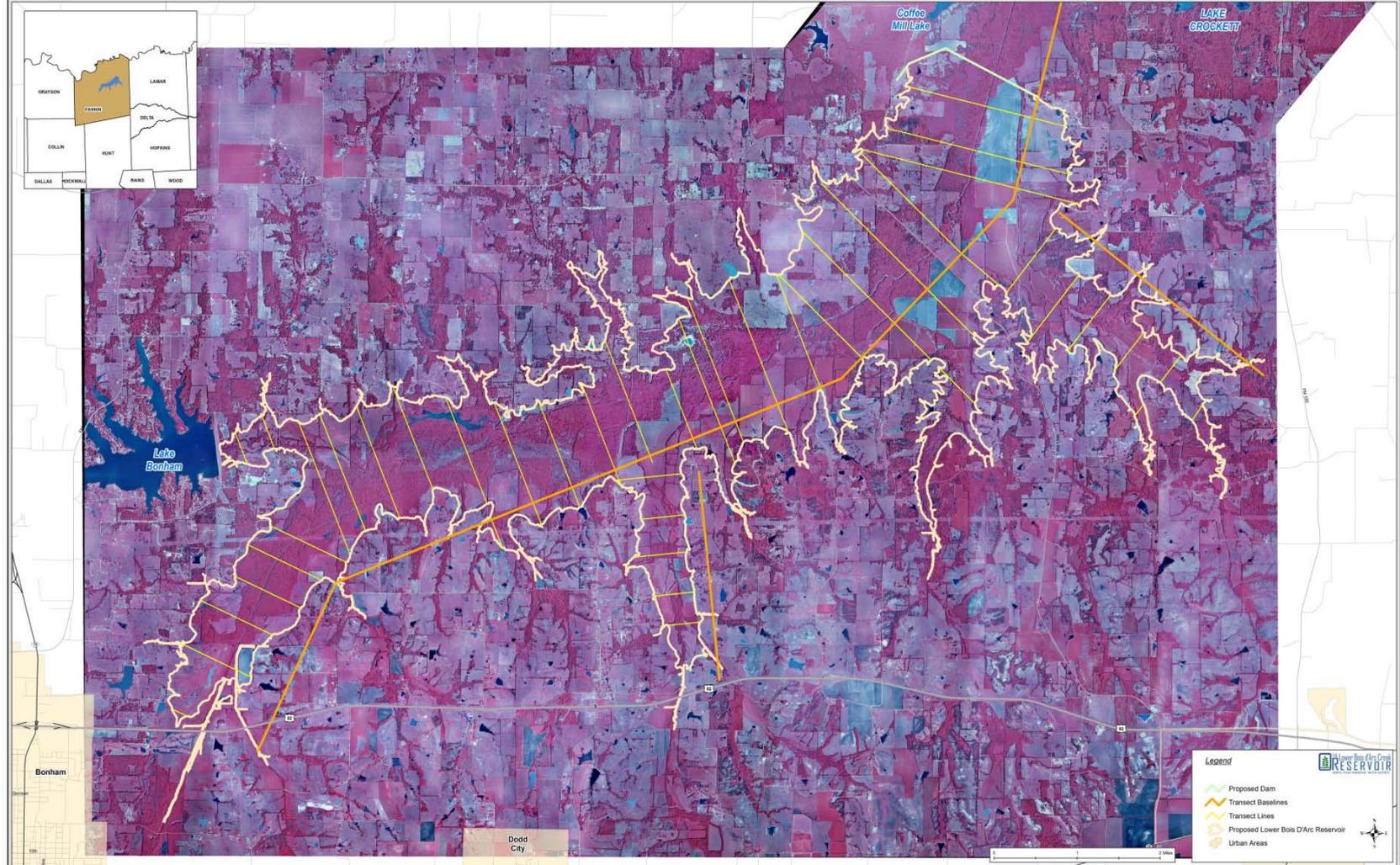
- Required by USACE

- Jurisdictional Determination Report
- Habitat Evaluation Procedures Study (HEP)
- Geomorphic Assessment of Stream
- Environmental Report
- Archeological Report
- Environmental Impact Statement Feb 2015(Draft)



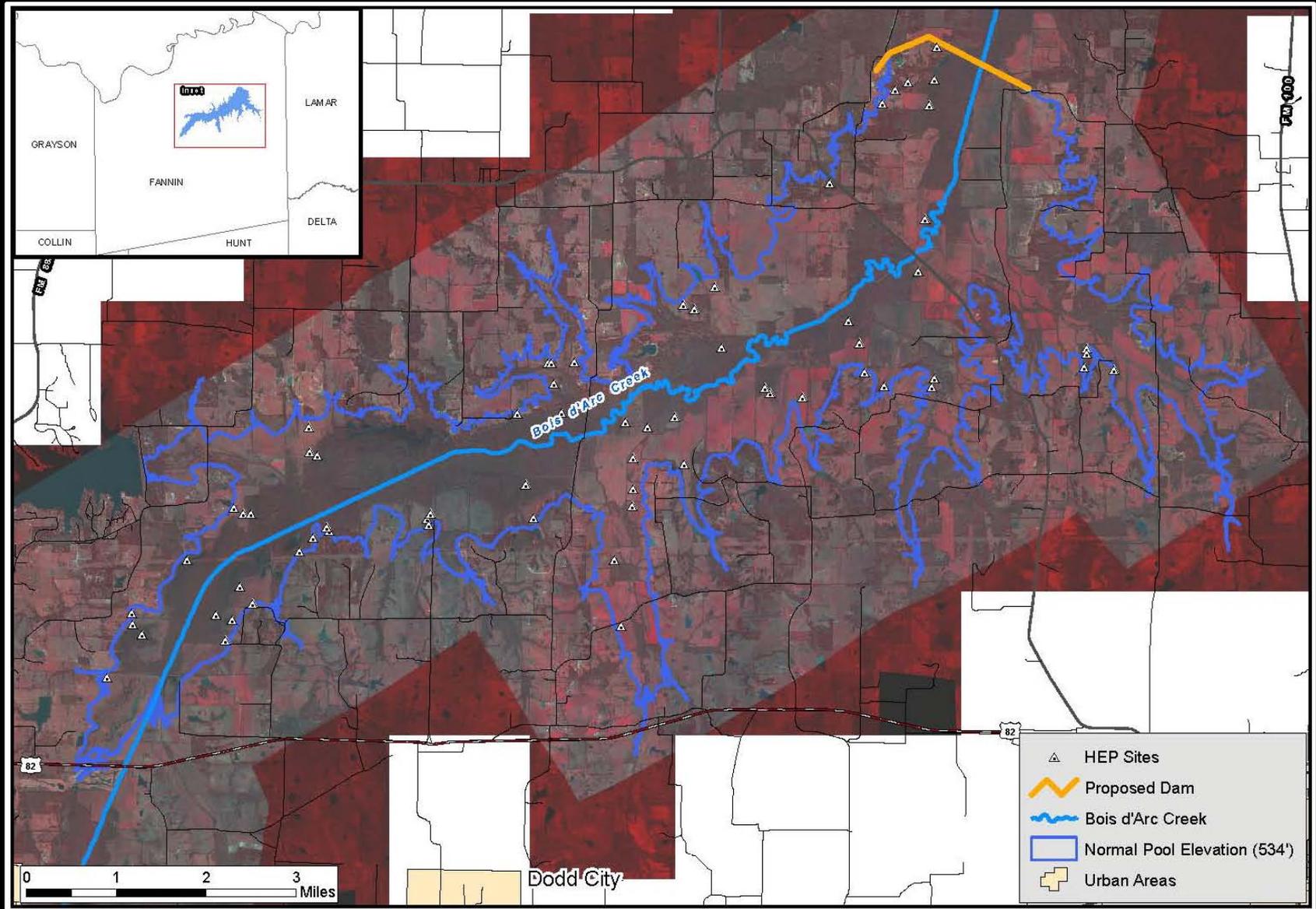
Jurisdictional Determination

Wetland Delineation Transects





Habitat Evaluation Procedures Study





Habitat Evaluation Procedures Study





Habitat Evaluation Procedures Study

Table 2. HEP Field Data Summary:
Habitat Variable Measurements at Upland Deciduous Forest Sites.

Cover Type: Upland Deciduous Forest						
Species: Barred Owl, Carolina Chickadee, Downy Woodpecker, Eastern Turkey, Fox Squirrel						
Habitat Variable	Sample Site Number					
	1	2	3	4	5	20
% tree canopy closure	85	50	45	85	95	50
% tree canopy closure of hard mast producers >10" dbh*	0	0	35	10	70	50
% tree canopy closure of soft mast producing trees	60	50	10	90	20	5
% canopy closure deciduous trees in stand	85	25	45	85	80	50
% canopy closure of overstory trees	40	40	35	85	70	50
Average dbh of overstory trees (in)	15	12	18	8	15	16
Average height of overstory trees (ft)	30	35	35	35	60	60
# per acre of snags <10" dbh	200	3	90	10	10	1
# per acre of snags >6" dbh	40	3	0	2	0	1
% shrub crown cover	20	20	15	5	90	45
% herbaceous canopy cover	95	25	15	60	0	30
Average height of herbaceous canopy cover in summer (in)	18	12	12	14	0	6
# per acre of trees >20" dbh	0	0	30	0	0	0
Distance to grain (yd)	660	660	660	660	660	660
Basal Area: area of exposed woody stems if cut horizontally at 4.5 ft height (ft ² /ac)	120	140	60	80	5	160
Average dbh of hard mast producing trees that are >10" dbh (in)	0	0	18	0	40	16
# per hectare of hard mast producing trees >10" dbh	0	0	124	0	99	8
% of shrub crown cover comprised of soft mast producing shrubs	100	5	90	100	15	30
% of forest canopy comprised of evergreens	0	25	0	2	20	0

*dbh: diameter at breast height - the diameter of the stem/trunk measured at a distance of 4.5 feet above the ground.





Geomorphic Assessment Of Streams



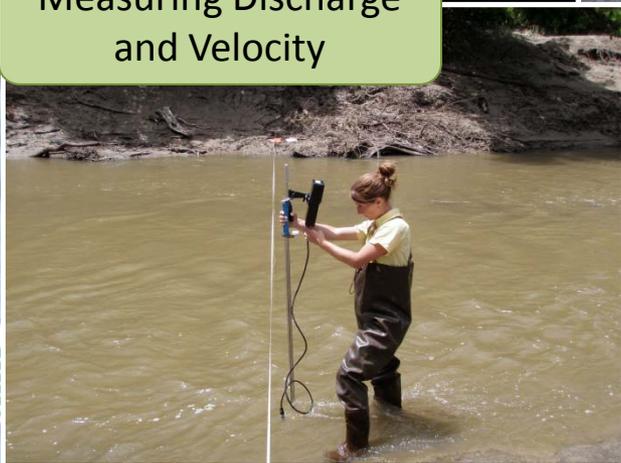
Mapping Geomorphic Units/Channel Processes



Monitoring Erosion



Soil Profiles
Depositional Environment



Measuring Discharge and Velocity



Measure cross sections

Environmental Report



Proposed Lower Bois d'Arc
Creek Reservoir
Fannin County, Texas

ENVIRONMENTAL REPORT

Supporting an Application
for a 404 Permit for
Lower Bois d'Arc Creek
Reservoir

VOLUME II

June 2008

Submitted to:
USACE, Tulsa District

Applicant:
North Texas Municipal
Water District

Prepared by:





Archaeological Report

AR Consultants, Inc. _____

Archaeological and Environmental Consulting
805 Business Parkway, Richardson, Texas 75081
Phone: (914) 338-0470
Fax: (914) 331-1519
E-mail: arcdg@aol.com

ARCHAEOLOGICAL SURVEY OF THE PROPOSED

LOWER BOIS D'ARC CREEK RESERVOIR

FANNIN COUNTY, TEXAS

Texas Antiquities Code Permit 5950

Cody S. Davis, MA
S. Alan Skinner, PhD
and
Molly A. Hall, MA

With Contributions from:
Deborah Anglin, MA, Stephanie Coffman, MS, Phillip L. Green, BA,
Kathryn Pocklington, BS, Nick Coleman, BA, and Rebecca Shelton, MA

Submitted to:

NORTH TEXAS MUNICIPAL WATER DISTRICT
505 E. Brown Street
Wylie, Texas 75098

Submitted by:

AR CONSULTANTS, INC.
805 Business Parkway
Richardson, TX 75081

Cultural Resources Report 2013-DRAFT
November 05, 2013

HISTORICAL BUILDINGS

ARCHAEOLOGY

NATURAL SCIENCES





CWA Section 404 Permit Recent Activities

- Pipeline Alignment, WTP Site Acquisition
- Archaeological Surveys
- Draft EIS
- EPA tour
- 30% Dam Design
- RFP for the Construction Manager at Risk (CMAR)
 - Incentives
- Mitigation Site Engineering





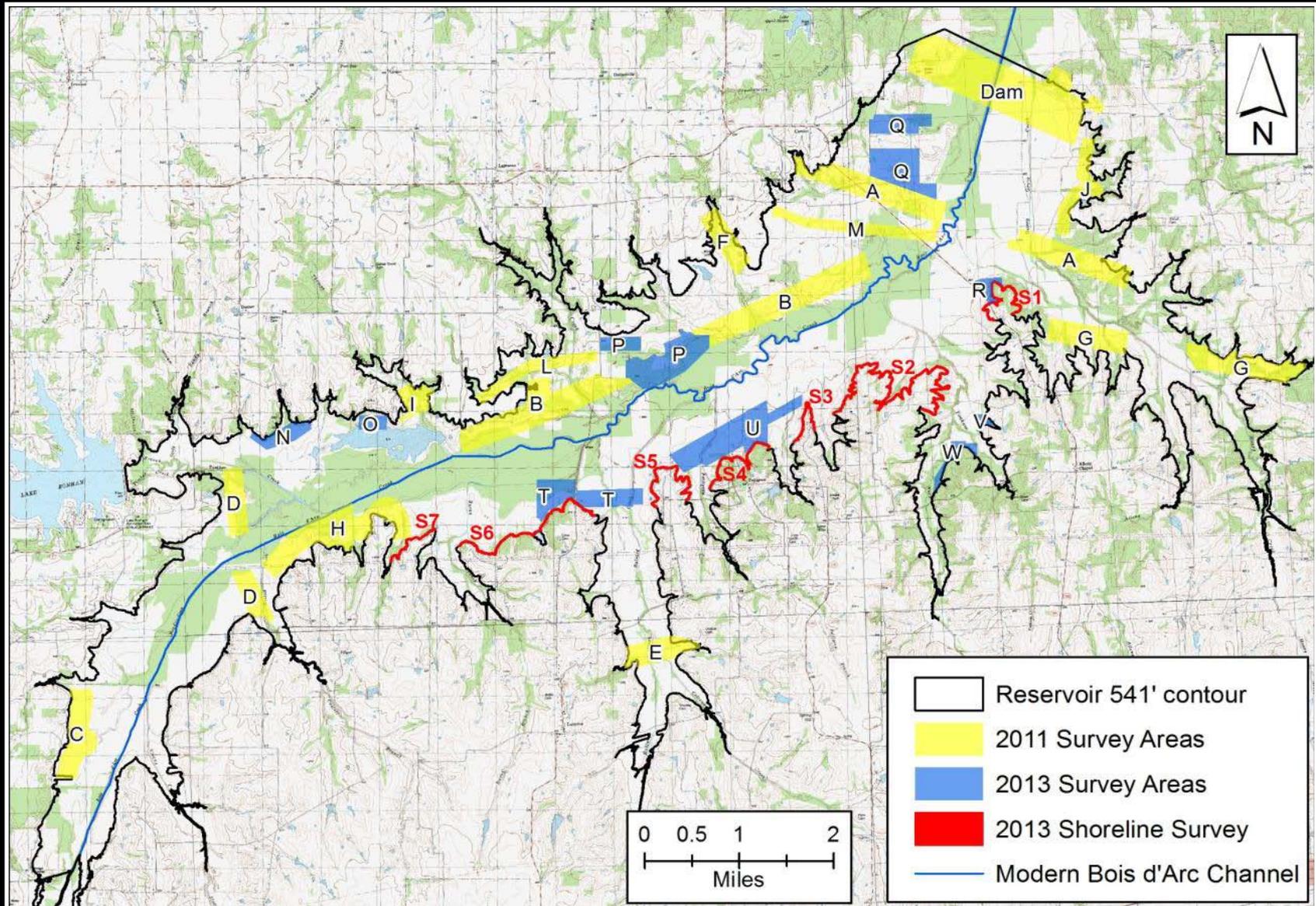
Archaeological Study

- Investigation
 - 22% of 22,590 acre reservoir site
 - Surveyed 4,500 acres
 - Walked 40 miles of creek channels - 500 acres
 - 5,423 shovel tests
 - 35 trenches
 - 4 stream bank profiles
- Findings
 - 38 historic structures - None recommended for NRHP
 - 61 sites - None recommended for NRHP
 - 28 prehistoric sites
 - 26 historic sites (includes Wilks Cemetery)
 - 4 prehistoric/historic sites
 - 13 sites recommended for further testing – 1 pending review



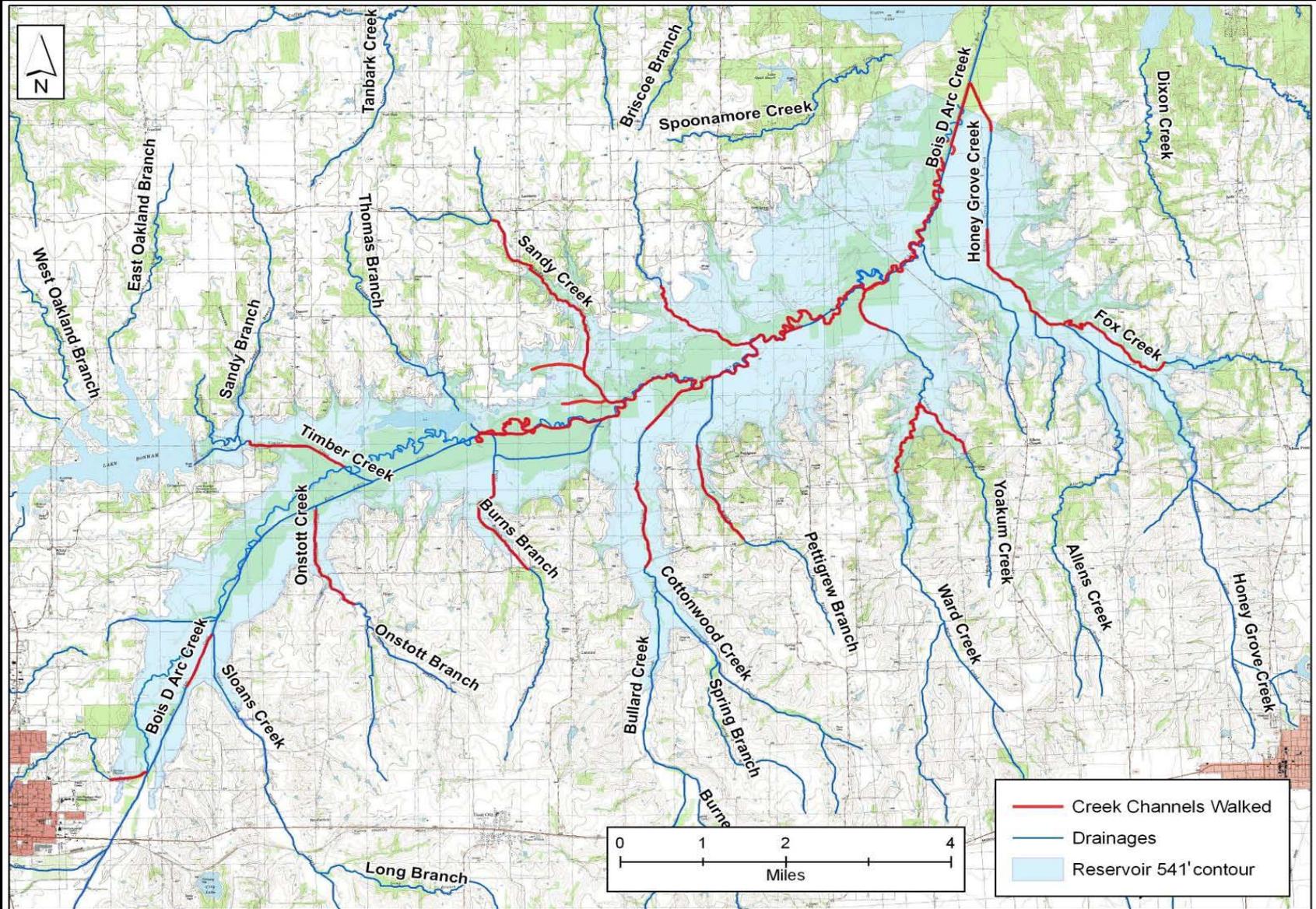


Archaeological Study





Archaeological Study





Archaeological Study Shovel Tests





Archaeological Study Trenching





Archaeological Study Stream Bank Profile





Archaeological Study Prehistoric Artifacts



Archaeological Study Historic Site





Archaeological Study Historic Cemeteries



North arrow pointing up.

SCALE: 1"=50'

BAR SCALE

LEGEND

- HEADSTONE
- ▲ FOOTSTONE

HEI HAYTER ENGINEERING INCORPORATED
445 S.E. LOOP 286 P.O. BOX 500
FANNIN, TEXAS 75024
www.HayterEngineeringInc.com
TBPE FIRM NO. F 000315

WILKS CEMETERY
FANNIN COUNTY, TEXAS
OCTOBER 2011



Mitigation Plan





Riverby Ranch





Baseline Terrestrial Habitat Units at Riverby Ranch*

Cover Type	Average HSI Values	Area (acres)	Habitat Units (HUs)
Upland Deciduous Forest	0.58	78	46
Grassland / Old Field	0.41	5,413	2,220
Riparian Woodland / Bottomland Hardwood	0.38	840	319
Shrubland	N/A	41	N/A
Cropland	0.44	3,858	1,697
TOTAL		10,230	4,282

**Does not include any of the Wetland Reserve Program habitat (approximately 2,700 acres) within the ranch that will remain enrolled in perpetuity.*





Baseline Stream Conditions at Riverby Ranch

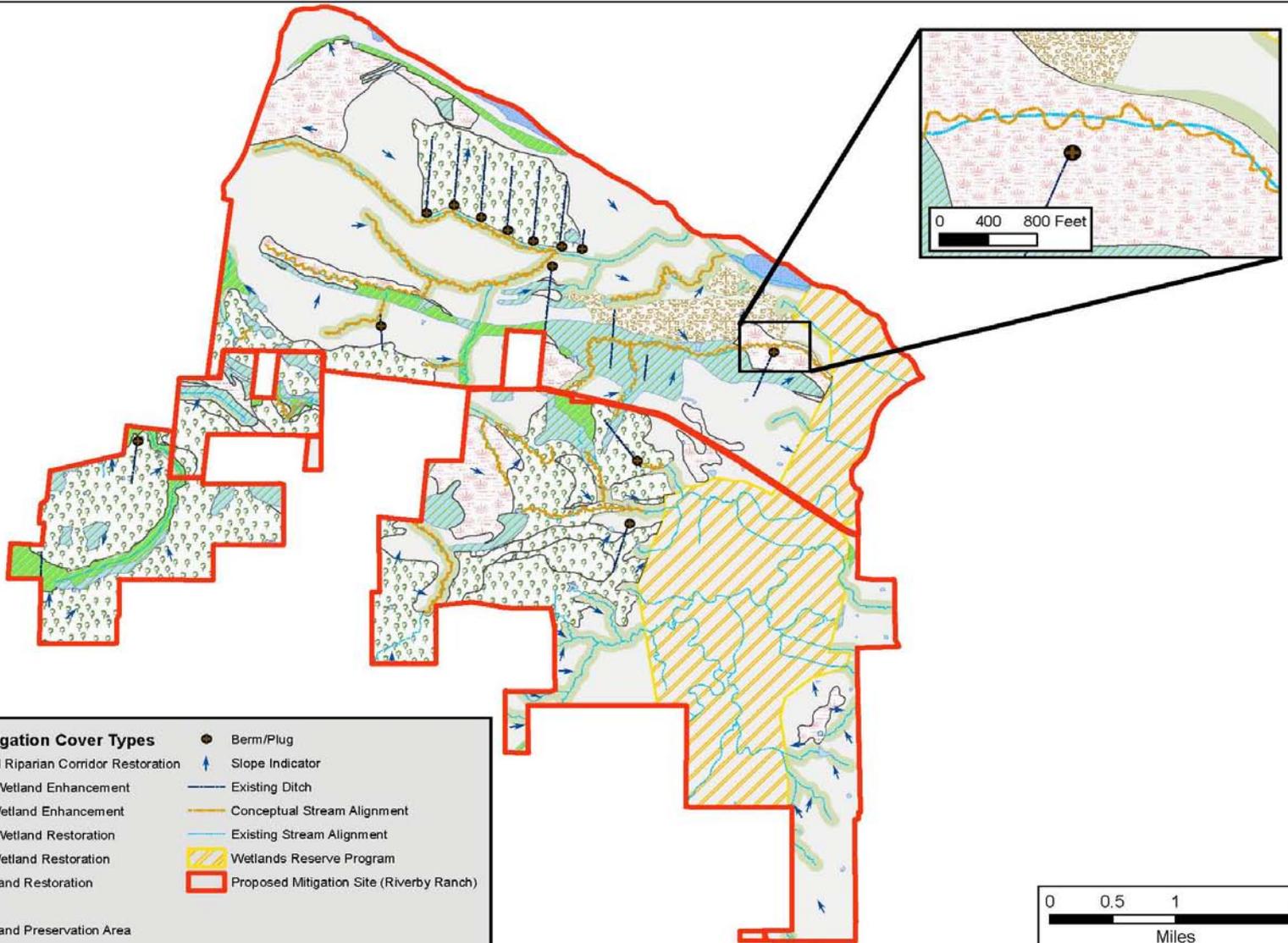
Typical cattle impacts to streams at the proposed mitigation site.



Cleared and degraded riparian corridors along streams at the proposed mitigation site.

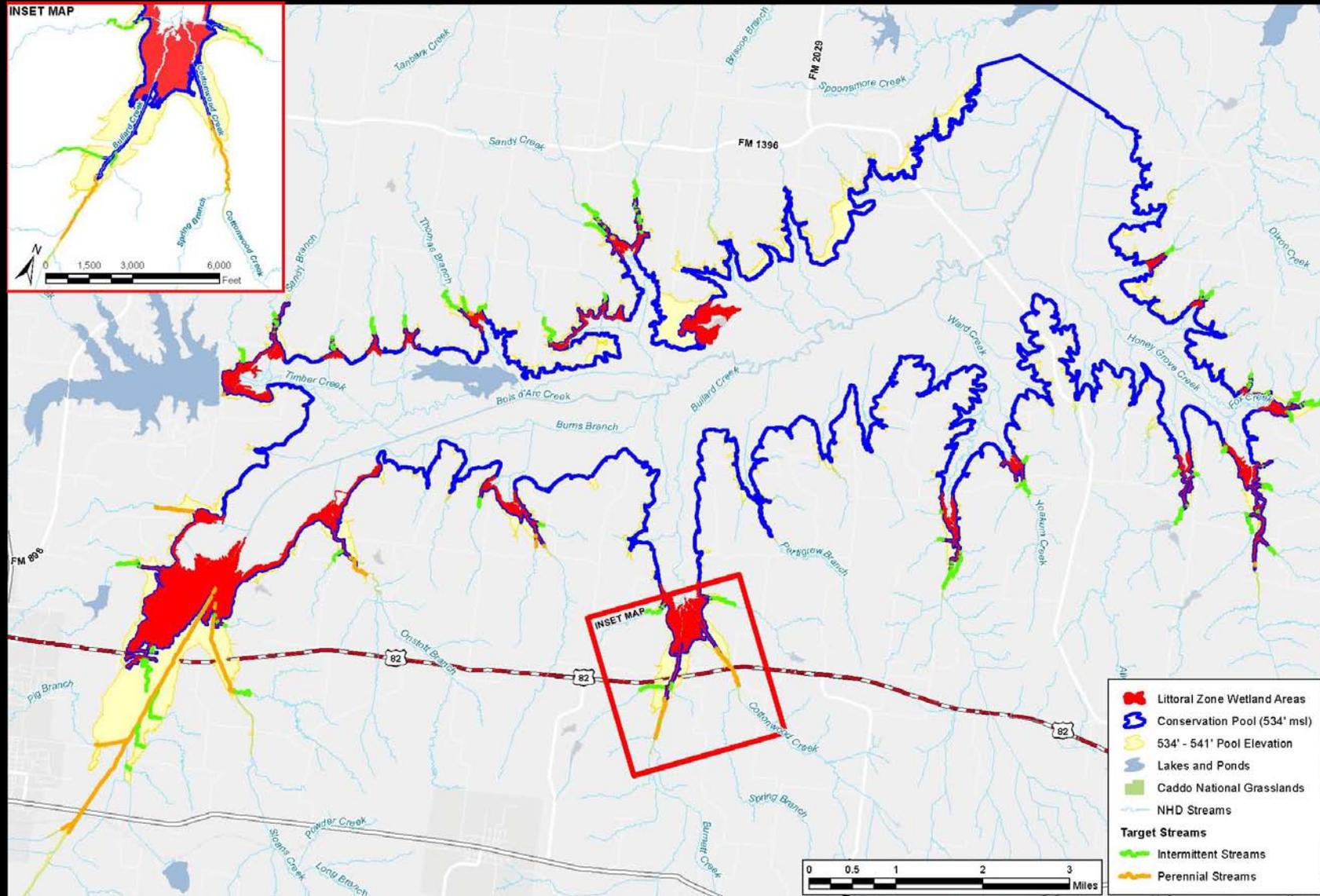


Proposed Future Cover Types at Riverby Ranch





On-Site Streams and Fringe Wetlands Mitigation





Proposed Mitigation for Impacts to Terrestrial Habitat

Terrestrial Resource Type	Amount Impacted*	Amount of Mitigation	Net Gain (+) / Net Loss (-)
Upland Deciduous Forest (HU)	(-) 1,046	(+) 665	(-) 381
Riparian Woodland / Bottomland Hardwood (HU)	(-) 433	(+) 855	(+) 422
Grassland / Old Field (HU)	(-) 2,886	(+) 2,393	(-) 493
Shrubland (acre)	(-) 64	(+) 41	(-) 23

**Total impacts from Reservoir, Raw Water Line, Terminal Storage Reservoir and Leonard Water Treatment Plant*





Boring at Dam Site





TCEQ Water Rights Application

- Submitted - December 2006
- Administratively Complete - June 2007
- Interbasin Transfer Meetings - September 2007
- Supplemental Application
 - 401 Application (TCEQ must certify state water quality standards will be met for any CWA Section 404 Permits) – October 2008





TCEQ Water Rights Permit Recent Activities

- Received draft permit from TCEQ – September 5, 2014
- Hired Conservation Experts and Enhanced Conservation Plan
- Settlement Agreements
 - National Wildlife Federation
 - Sierra Club
 - Texas Parks & Wildlife
 - Bois d’Arc MUD
 - Landowners
- Water Supply briefing to local, State, and Federal elected officials November 6, 2014
- Updated Fannin County land prices
- SOAH Jurisdictional Hearing held November 10, 2014
- Meetings with protestants now on-going
- **Contested Case Hearing set for July 6-15, 2015**





Environmental Flow Releases

Season	Months	Subsistence	Base	Pulse
Fall-Winter	November - February	1 cfs*	3 cfs	2 per season Trigger: 150 cfs Volume: 1,000 ac-ft Duration: 7 days
Spring	March - June	1 cfs*	10 cfs	2 per season Trigger: 500 cfs Volume: 3,540 ac-ft Duration: 10 days
Summer	July - October	1 cfs*	3 cfs	1 per season Trigger: 100 cfs Volume: 500 ac-ft Duration: 5 days

cfs = cubic feet per second

ac-ft = acre-feet

**A subsistence period freshet requirement with a trigger level of 20 cfs, a volume of 69 ac-ft, and a duration of 3 days, to occur no more than every 60 days, also applies.*





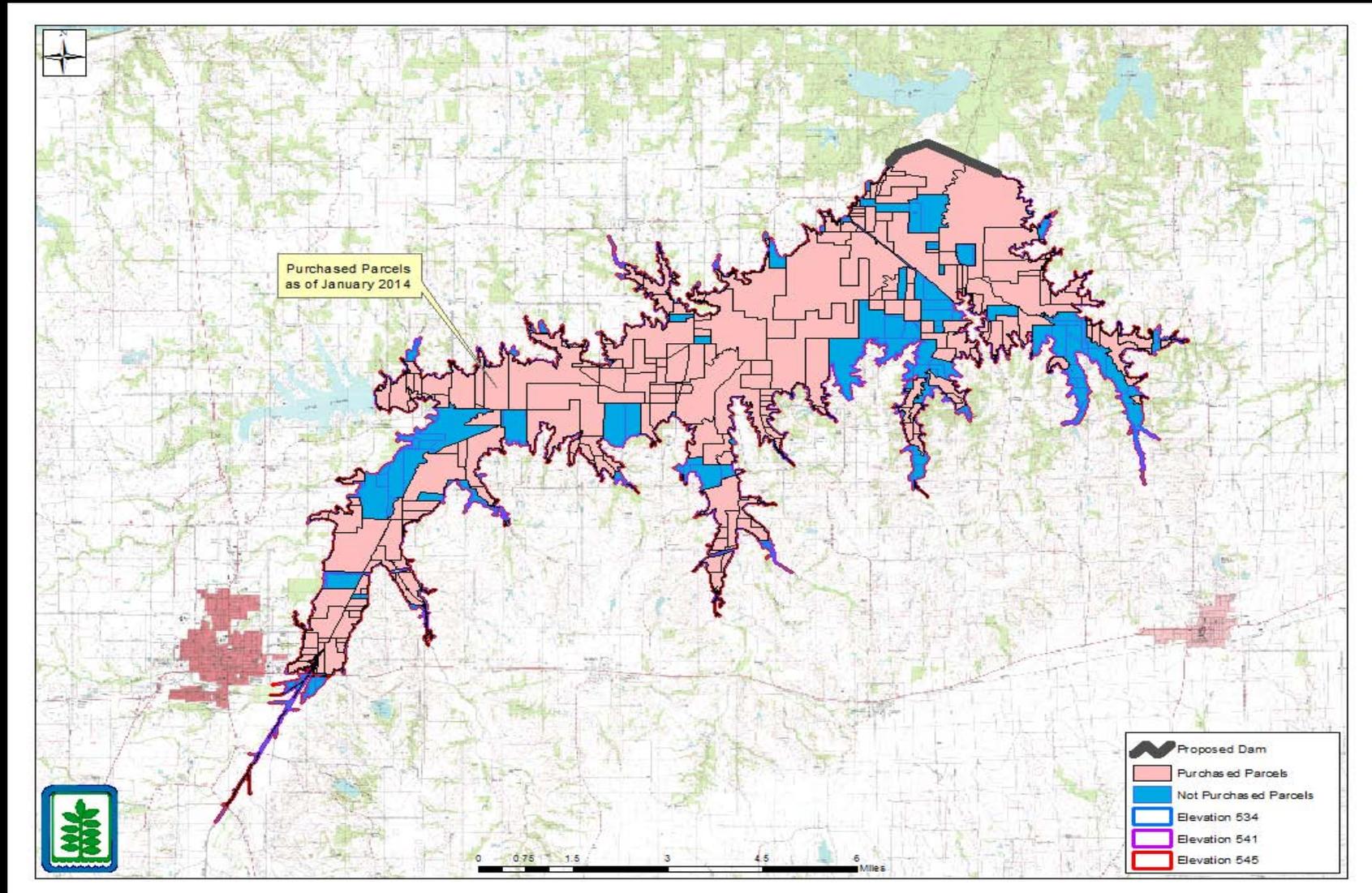
Property Acquisition

- NTMWD Board initially approved - November 2007
- Reservoir site property needed - 22,590 acres
- Acquisitions to date - 18,850 acres (83%)
- Riverby Ranch mitigation area - 14,959 acres
- Leonard WTP site - 841 acres
- **Reaching out to remaining landowners**





Lower Bois d'Arc Creek Reservoir Purchased Parcels





Senate Bill 525 - 82nd Legislature

- Grants Fannin County zoning authority over “the area within 5,000 feet of where the shoreline of the Lower Bois d’Arc Creek Reservoir would be if the reservoir were filled to its storage capacity”
- Effective upon passage of SB 525 (April 29, 2011)





Local Government Code

Section 231.133

- (a) The commissioners court of a county in which an area subject to this subchapter is located may regulate in that area:
- (1) the height, number of stories, & size of buildings & other structures;
 - (2) the percentage of a lot that may be occupied;
 - (3) the size of yards, courts, & other open spaces;
 - (4) population density;
 - (5) the location & use of buildings, other structures, & land for business, industrial, residential, or other purposes;
 - (6) the placement of water & sewage facilities, parks, & other public requirements





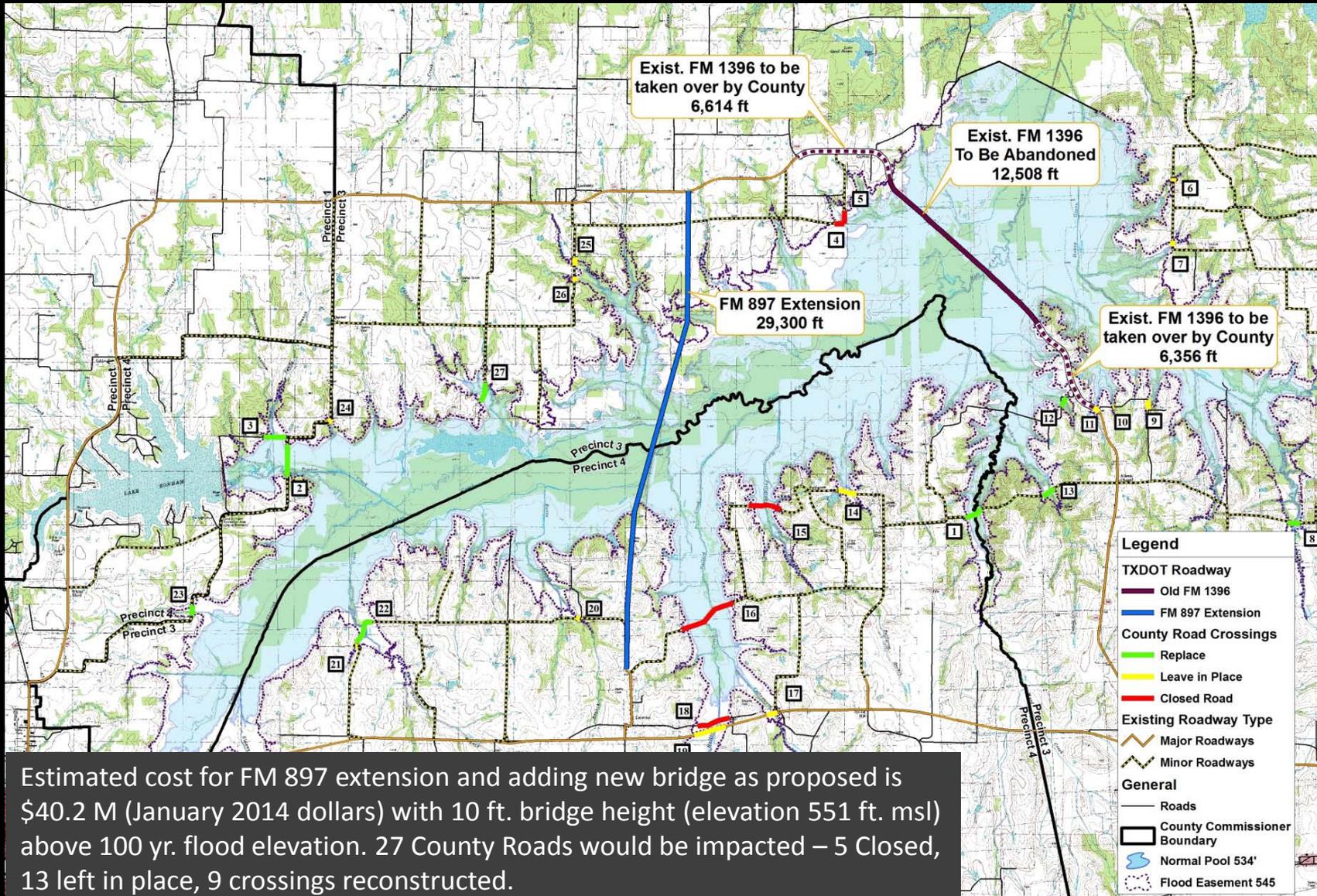
Other Issues

- Roads (Hwy. 1396 & County Road crossings)
- Reservoir clearing plan
- Utilities
 - Power lines
 - Telephone lines
 - Natural gas lines
 - Bois d'Arc MUD pipelines
- Lake Bonham
 - Dam protection
 - Emergency spillway enhancement





Highway 1396 Relocation



Estimated cost for FM 897 extension and adding new bridge as proposed is \$40.2 M (January 2014 dollars) with 10 ft. bridge height (elevation 551 ft. msl) above 100 yr. flood elevation. 27 County Roads would be impacted – 5 Closed, 13 left in place, 9 crossings reconstructed.





Reservoir Clearing

Major Scope Items:

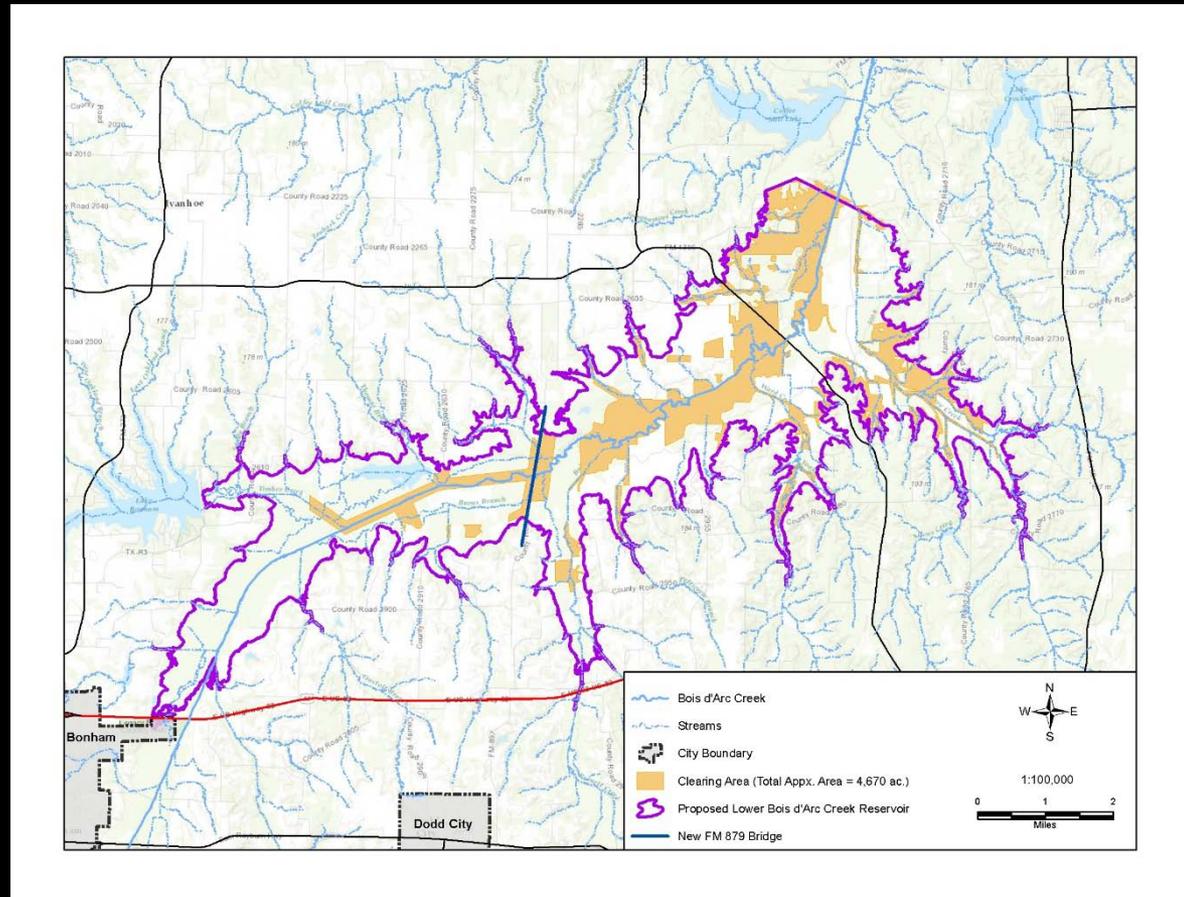
- Clear 3200 acres of timber
 - Enhance creation of fish habitat
 - Improve human access to shore locations
 - Reduce hazards to boating safety and fishing from large floating debris
- To be undertaken during 2 years preceding impoundment

Scope accomplished to date:

- Initial layout for permitting

Schedule:

- Engineering (1 year)
- Construction (2 years)





CWA Section 404 Permit USACE Projected Timeline

- Draft Environmental Impact Statement (EIS) Issued – February 20
- Draft EIS Public Review Period Ends – April 21
- USACE Preparation of Administrative Final EIS and circulation to cooperating agencies – Mid-August
- Cooperating agencies comments due to USEPA – Mid-September
- USACE complete Administrative Final EIS and send to Division for review – Late September
- USACE receive Division comments – Mid-October





CWA Section 404 Permit USACE Projected Timeline

- USACE incorporate Division comments into Final EIS and send to HQ and EPA - Late October
- Final EIS published in Federal Register – Mid-November
- USACE Issue Record of Decision (ROD) and 404 Permit – Mid-December 2015 to January 2016
- Deadline for Appeal of 404 Permit – 30 days after ROD
- **NTMWD is working with USACE to compress timeline**





TCEQ Water Rights Projected Timeline – Settlement

- Negotiate Settlements with Protestants – January 1 – April 1, 2015
- Settlement Agreements Executed – April 15, 2015
- Remand of Application to TCEQ – May 1, 2015
- Action by TCEQ to Issue Permit – June 1, 2015
- Deadline for Filing Motion to Overturn – June 23, 2015





TCEQ Water Rights Projected Timeline – Possible

- Contested Case Hearing – July 6-15, 2015
- Written Closing Arguments/Replies – August 31, 2015
- Preliminary Final Decision Issued – October 30, 2015
- Exceptions/Replies – November 30, 2015
- TCEQ Consideration of Preliminary Final Decision –
January 13, 2016
- TCEQ Order Issued – January 27, 2016
- Deadline for Filing Motion for Rehearing – February 19, 2016

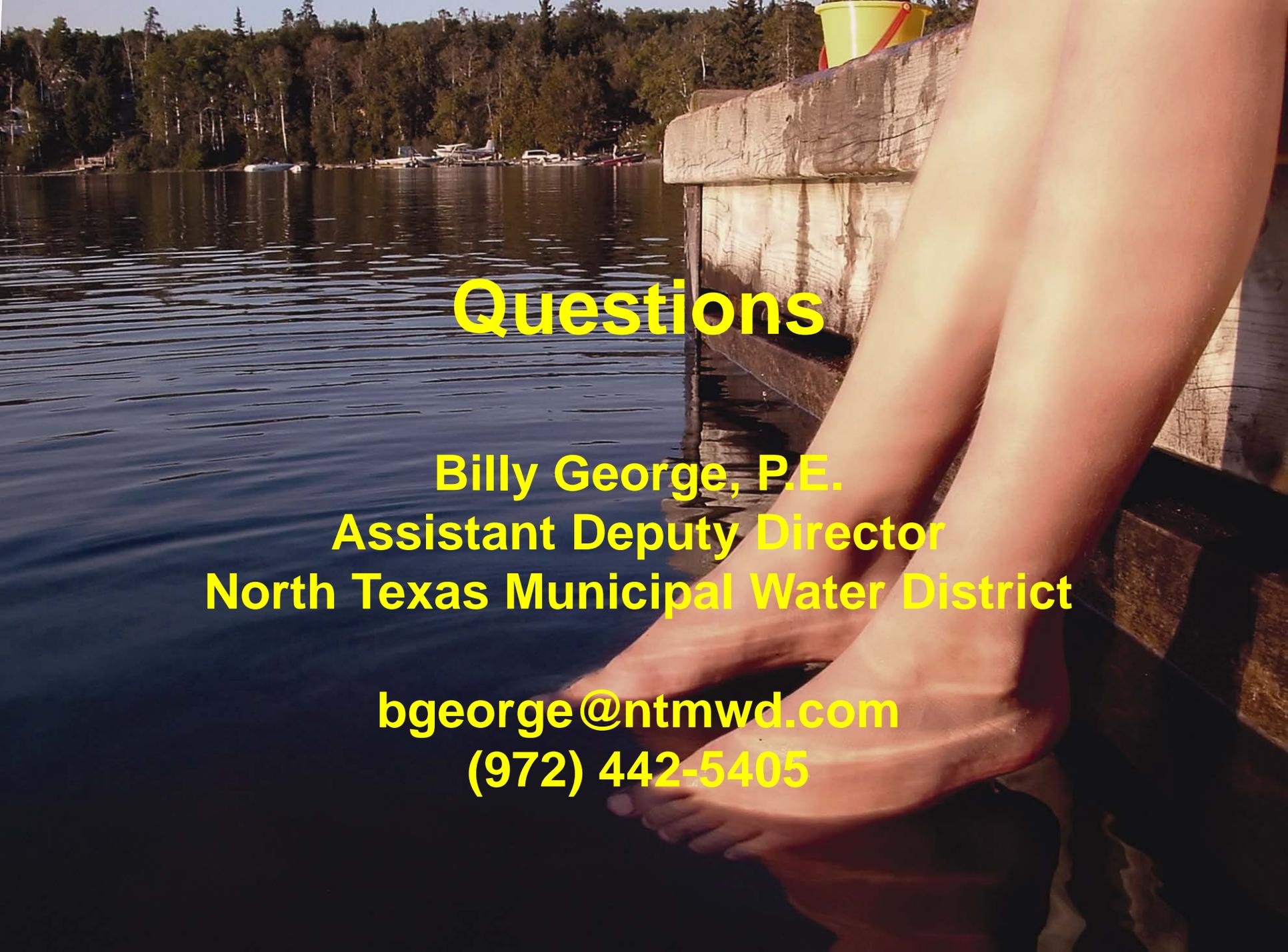




LBCR Overall Timeline

Activity	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Environmental Studies & Permitting		■	■	■	■	■	■	■	■	■	■						
Land & Easement Acquisition				■	■	■	■	■	■	■	■						
Dam & Reservoir Design										■	■						
Pipeline, Pump Station & WTP Design										■	■	■	■				
Dam & Reservoir Construction												■	■	■			
WTP & Pipeline Construction														■	■	■	
Reservoir Impoundment															■	■	■
Delivering Water																	





Questions

**Billy George, P.E.
Assistant Deputy Director
North Texas Municipal Water District**

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(972) 442-5405**