Permitting Lower Bois d'Arc Creek Reservoir

NCTCOG
Water Resource Council
November 13, 2014

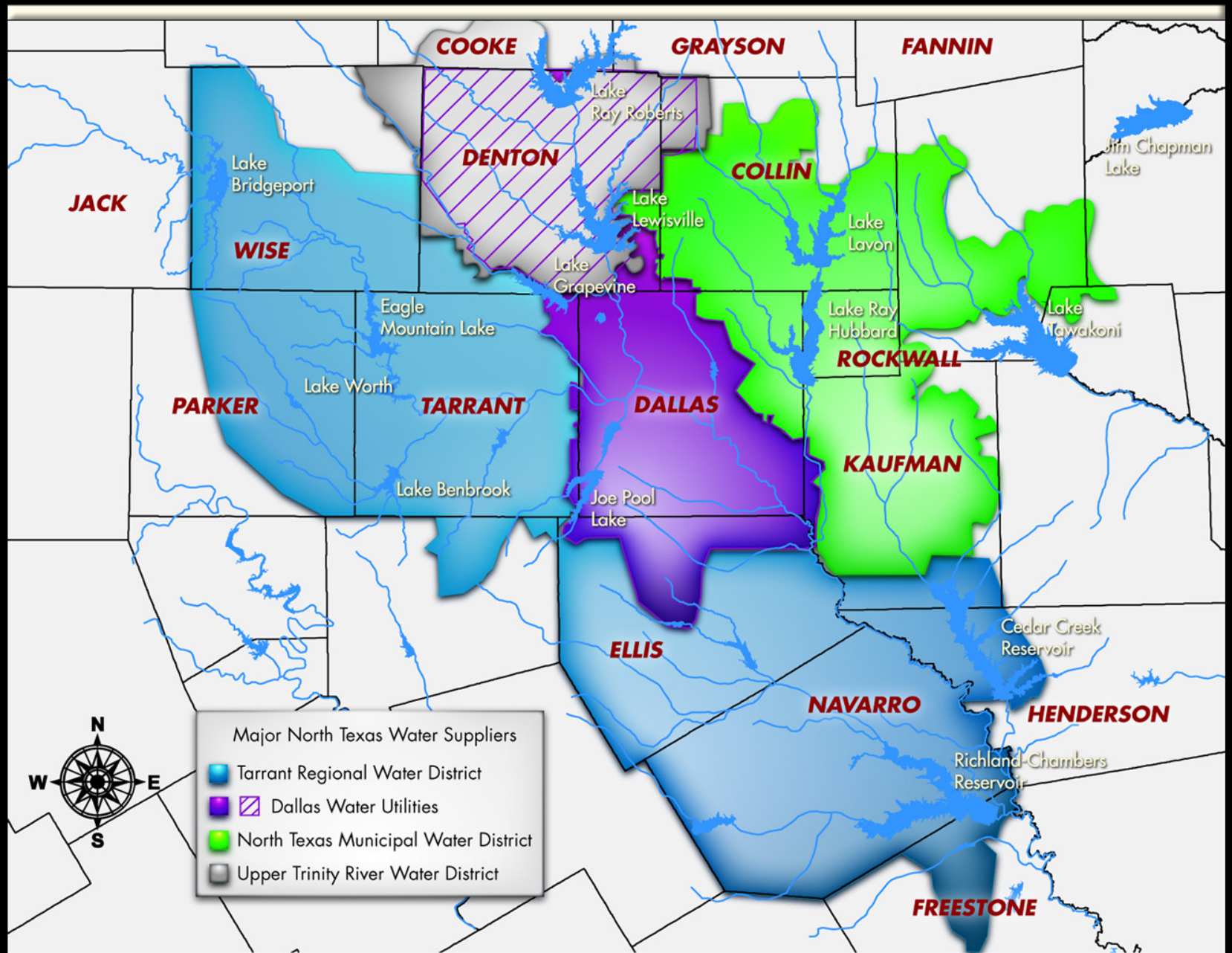
Presented by:

Robert McCarthy

History of NTMWD

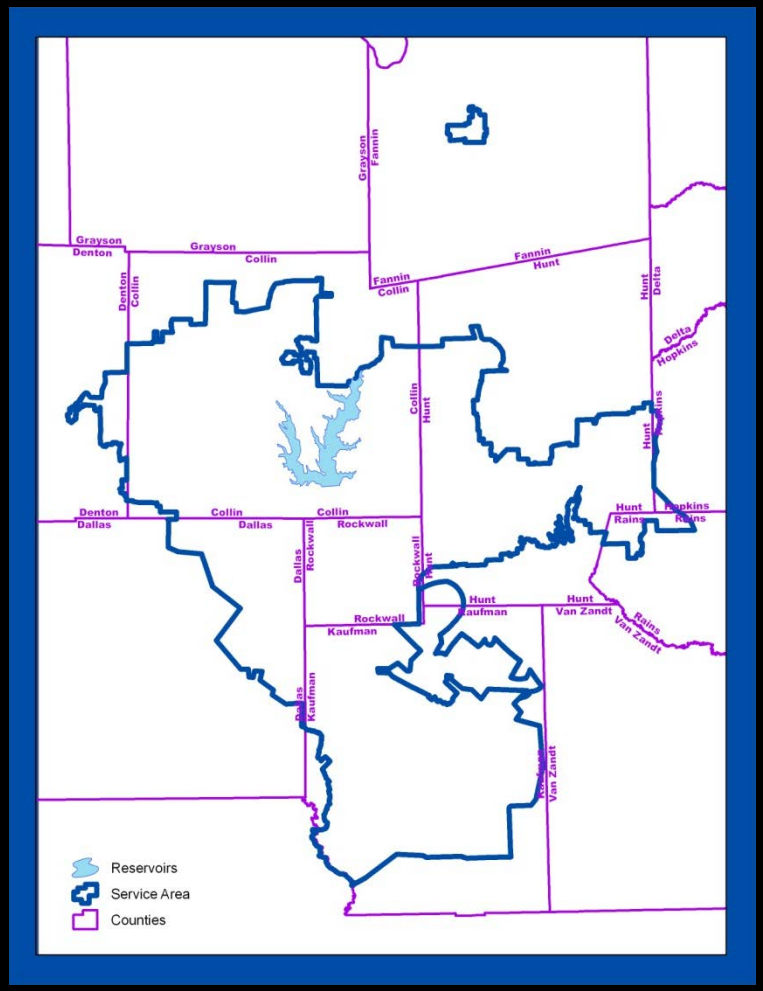
- 1951 - Created by Texas Legislature as a Special District to provide water service
- 1956 - Began providing treated water
- 1970s - Expanded to wastewater service
- 1980s - Expanded to solid waste service

Major North Texas Water Providers

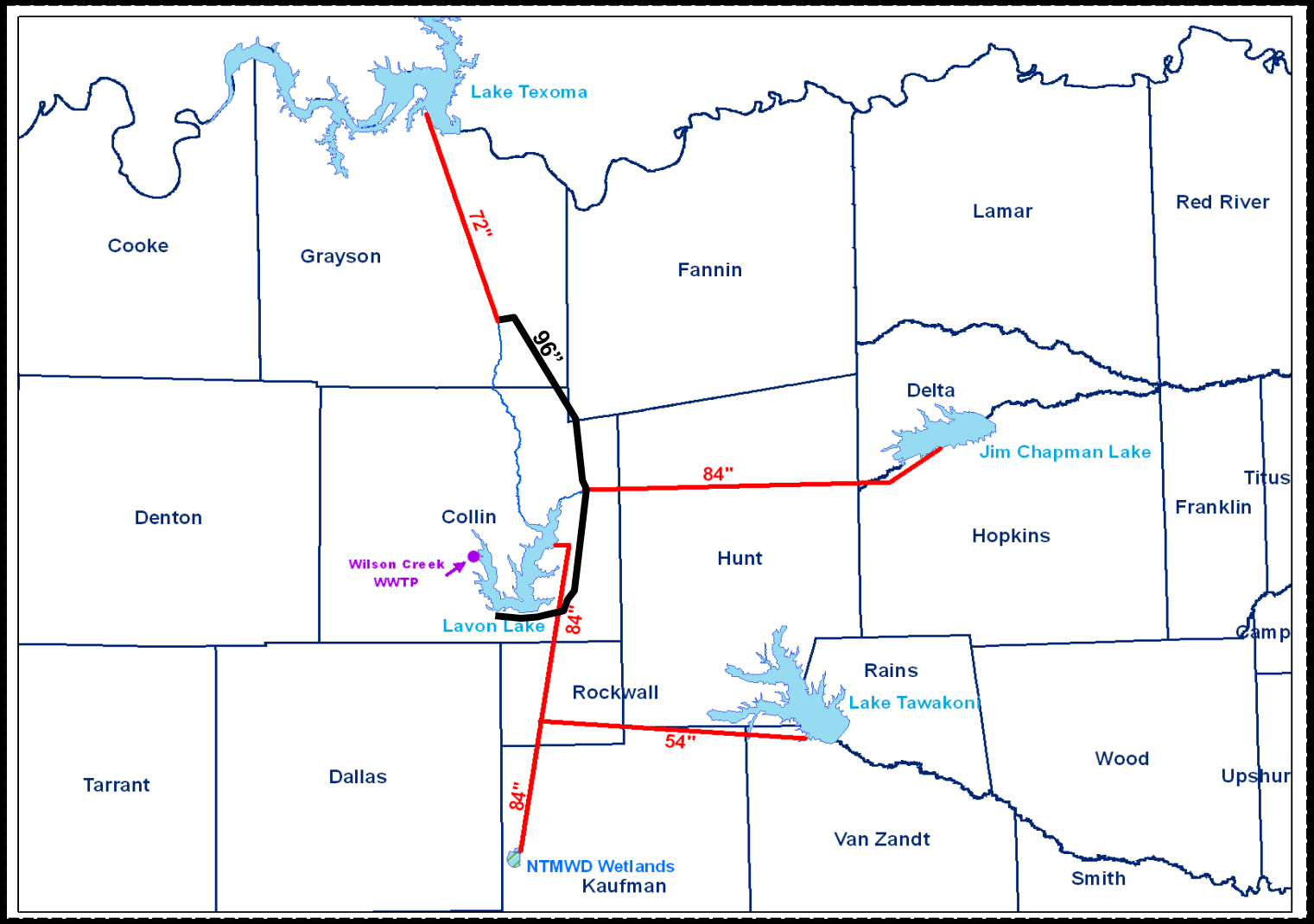


NTMWD Service Area

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



NTMWD Raw Water Supply System

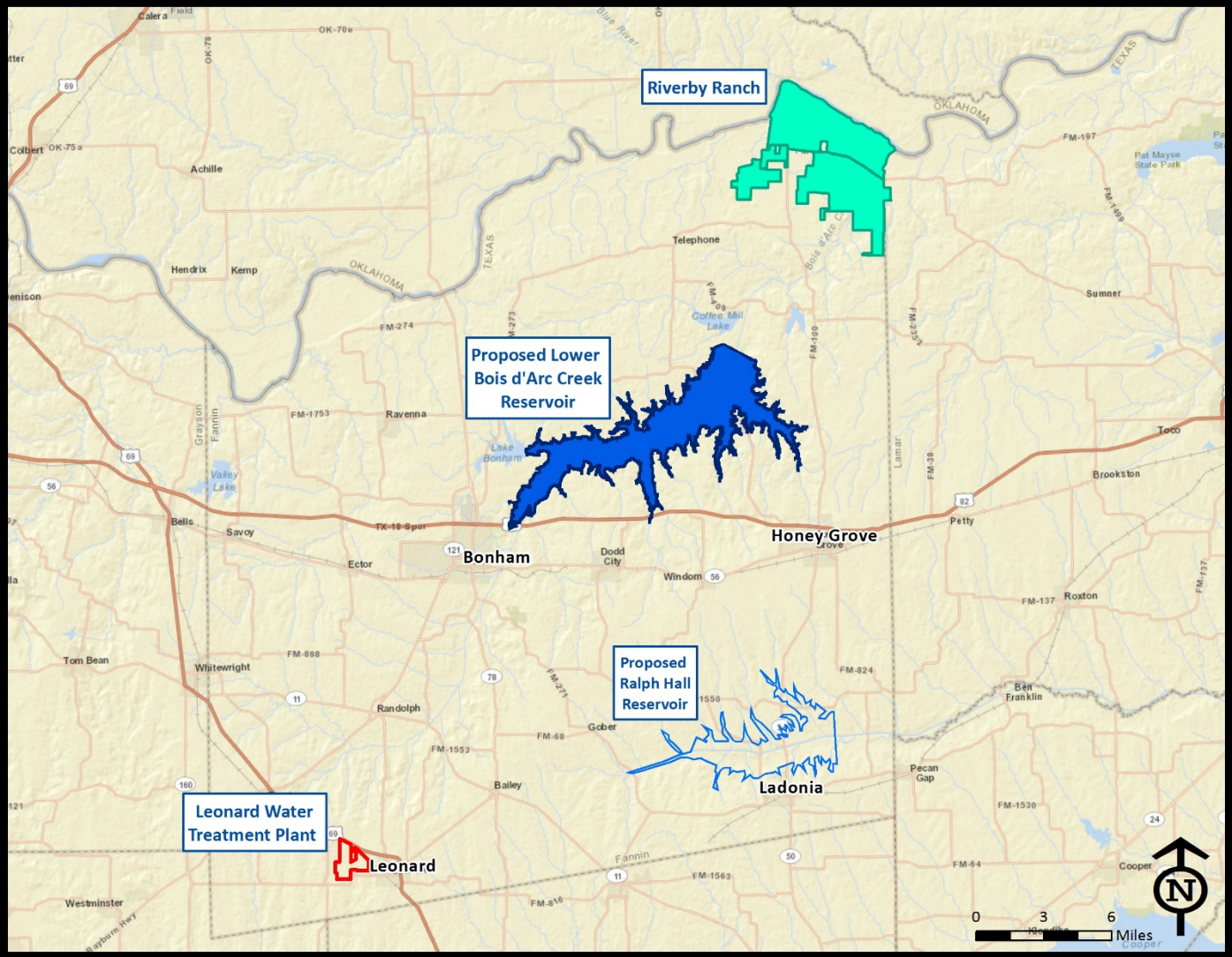


Lower Bois d'Arc Creek Reservoir
Fannin County, TX

Area:	16,526 acres
Storage:	367,609 ac-ft
Supply:	113 MGD
Average Depth:	22 ft
Maximum Depth:	70 ft
Lake Elevation:	534 ft msl
Owner & operator:	NTMWD

(Not a USACE reservoir)

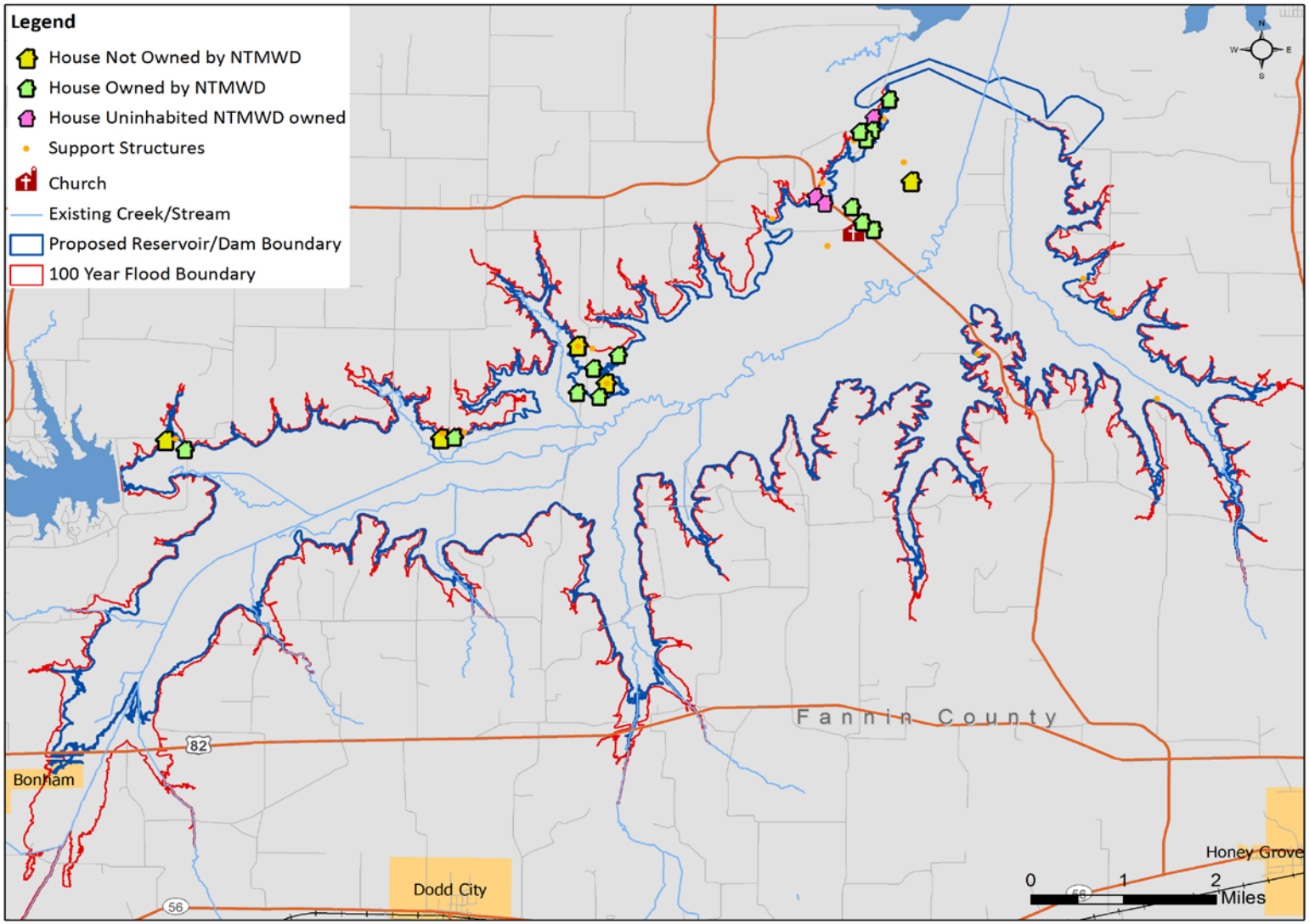
Lower Bois d'Arc Creek Reservoir Project



Current Cost Estimates

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

Lower Bois d'Arc Creek Reservoir
Houses inside 100 year flood boundary



Three Purposes of the Reservoir

Vital New Source for Fannin County & NTMWD

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

Benefits To Economic Growth

During Construction:

- Dam and infrastructure will increase local economic activity in Fannin County between $509 M & $563 M during construction

Following Construction:

- Ongoing operation & maintenance of new infrastructure will support approximately 24 full-time equivalent jobs & spur approximately $2 M in new economic activity per year

(2011 dollars)

Opportunities for Business Development & Commerce

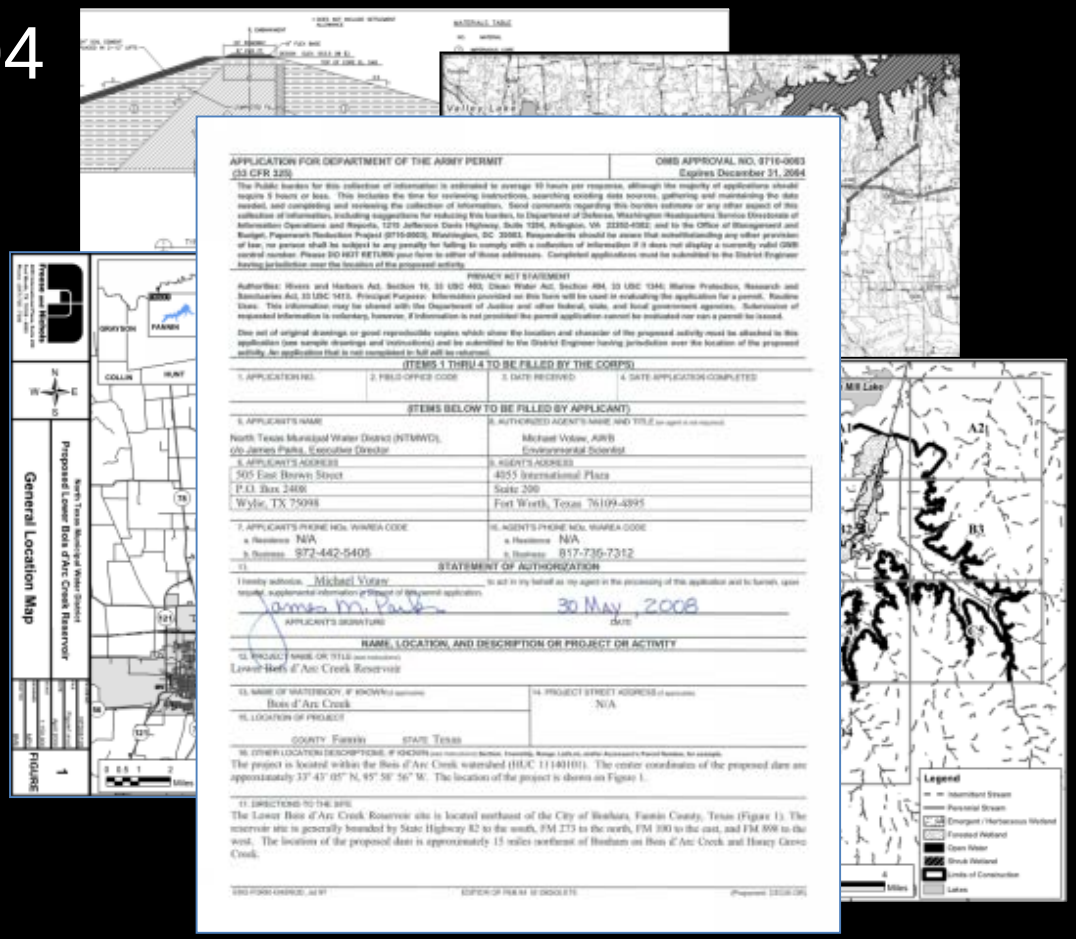
- $145 M in economic activity through new industrial & commercial activities
- $70 – 77 M in annual spending by new, permanent & weekend residents
  - Supporting more than 500 new permanent jobs
- $16 - 22 M in annual spending by non-local recreational visitors
- New housing, residents & recreational 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



CWA Section 404 Permit

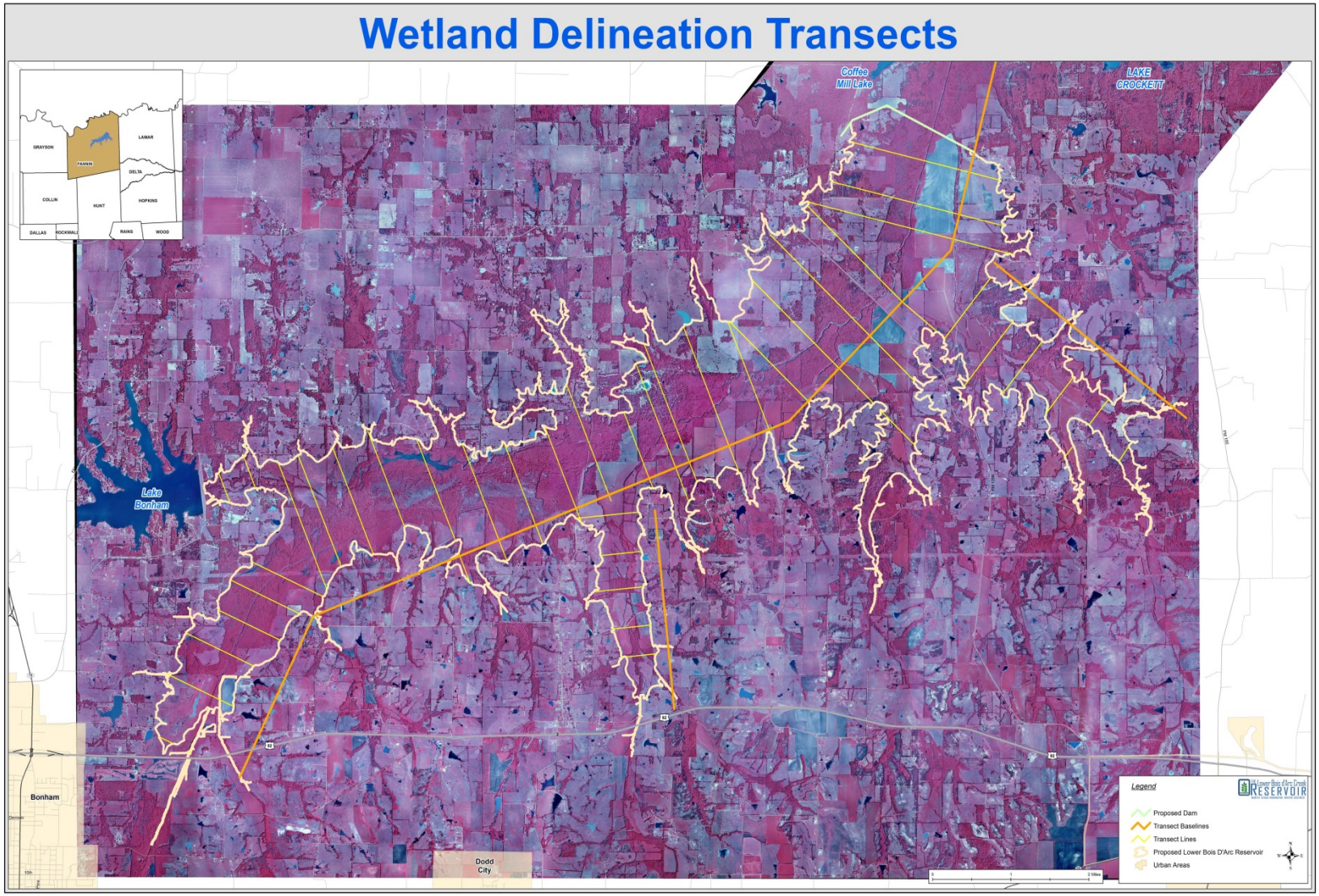
- Application submitted – June 2008
- EIS Determination – March 2009
  - EIS contractor selected – August 2009
  - Public & Agency Scoping Meetings – December 2009
- Draft EIS expected to be published in early 2015

EIS Scoping Meeting
December 8, 2009

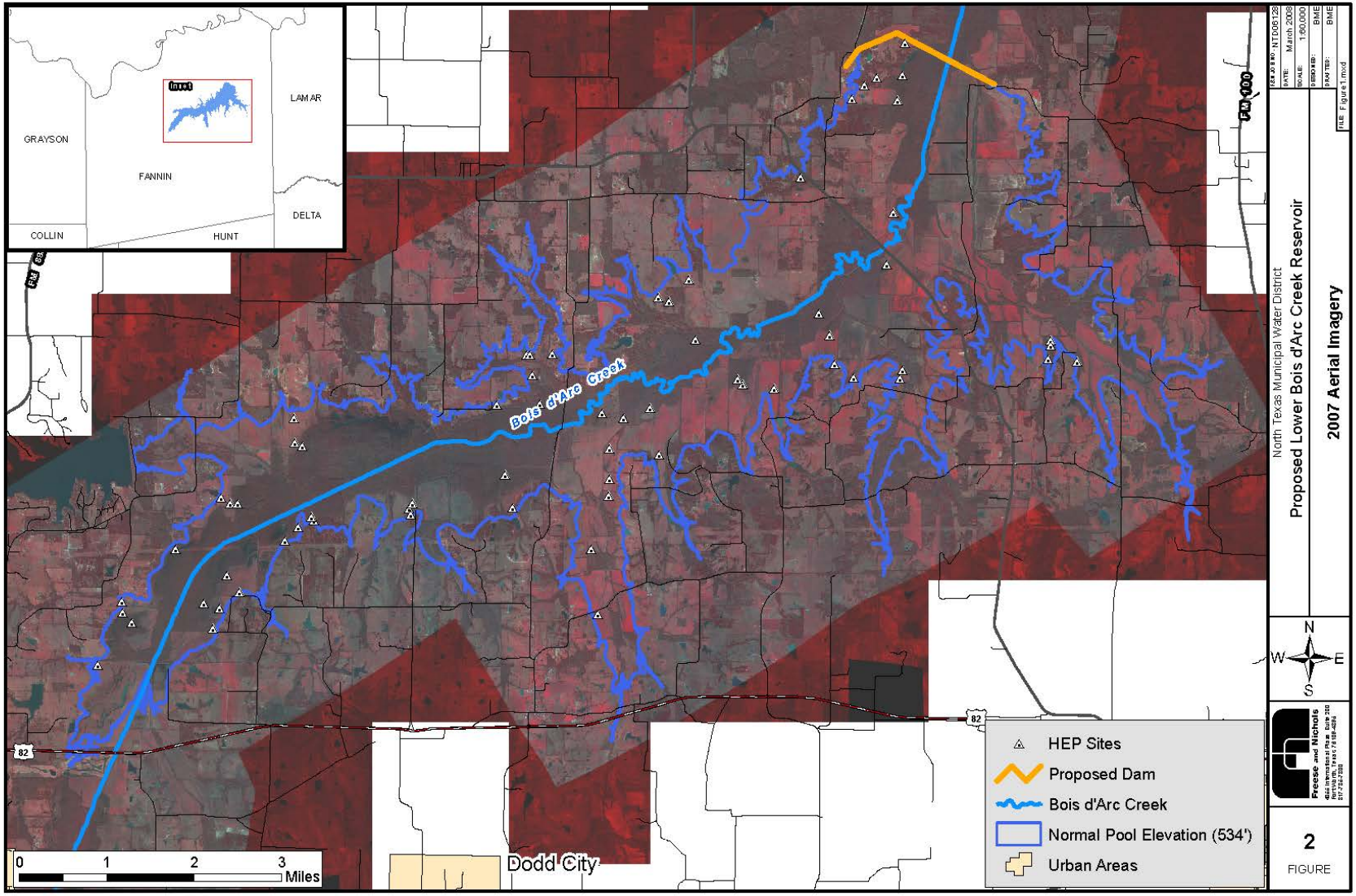
CWA Section 404 Permit Application

- Required by USACE
  - Jurisdictional Determination Report ☑
  - Habitat Evaluation Procedures Study (HEP) ☑
  - Geomorphic Assessment of Stream ☑
  - Environmental Report ☑
  - Archeological Report ☑
  - Environmental Impact Statement early 2015(Draft)

Jurisdictional Determination



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.

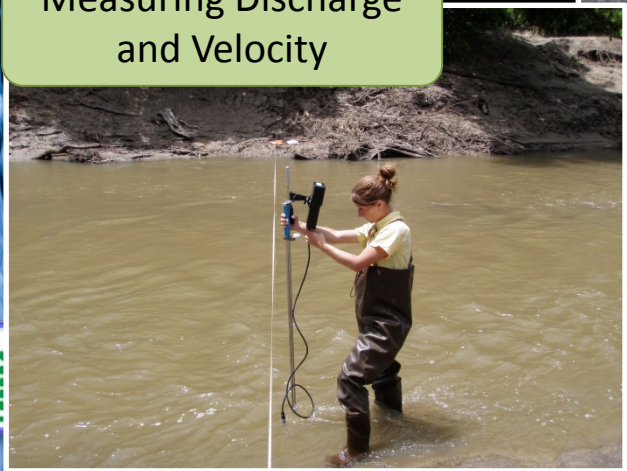
Geomorphic Assessment Of Streams

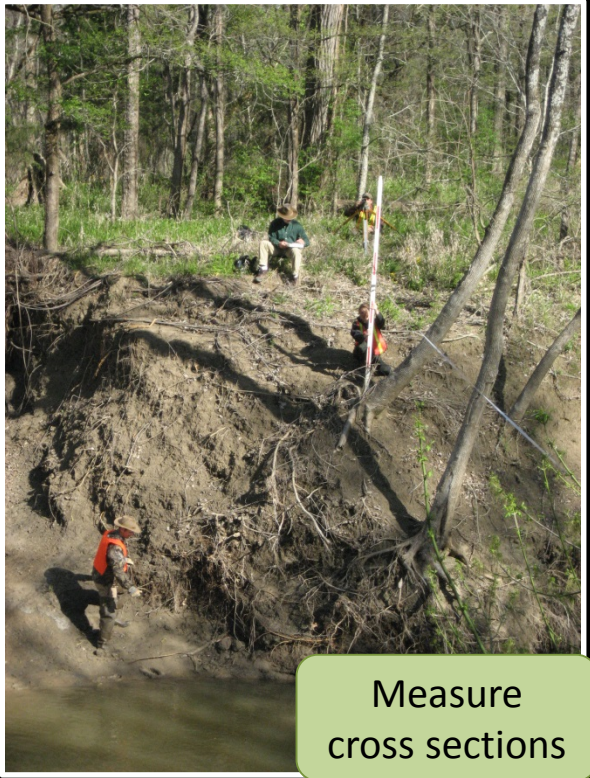
Mapping Geomorphic Units/Channel Processes

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:
Freese and Nichols

Archaeological Report

AR Consultants, Inc.

Archaeological and Environmental Consulting
805 Business Parkway, Richardson, Texas 75081
Phone: (214) 368-0478
Fax: (214) 221-1519
E-mail: arcdig@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

- Completed Final Pipeline Alignment, Intake Pump Station Location, and Terminal Storage Analysis Study
- Met with THC and USACE and Completed Archaeological Study of reservoir site, pipeline route and Leonard WTP site. Began Archaeological Study of Mitigation Site
- Completed Final Draft Proposed Mitigation Plan
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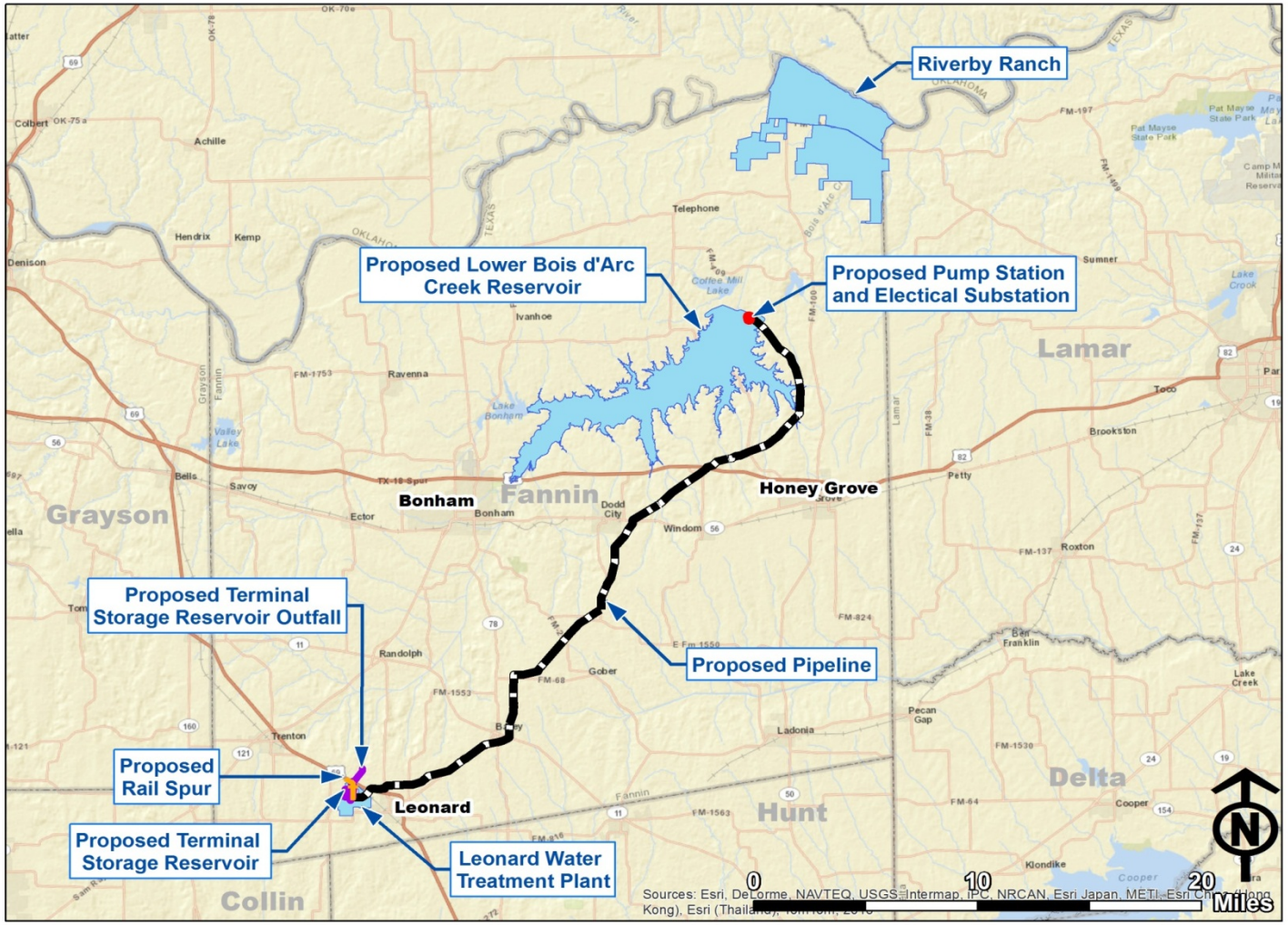
Final Pipeline Alignment, Intake Pump Station, and Terminal Storage Location



Leonard Water Treatment Plant

Site:

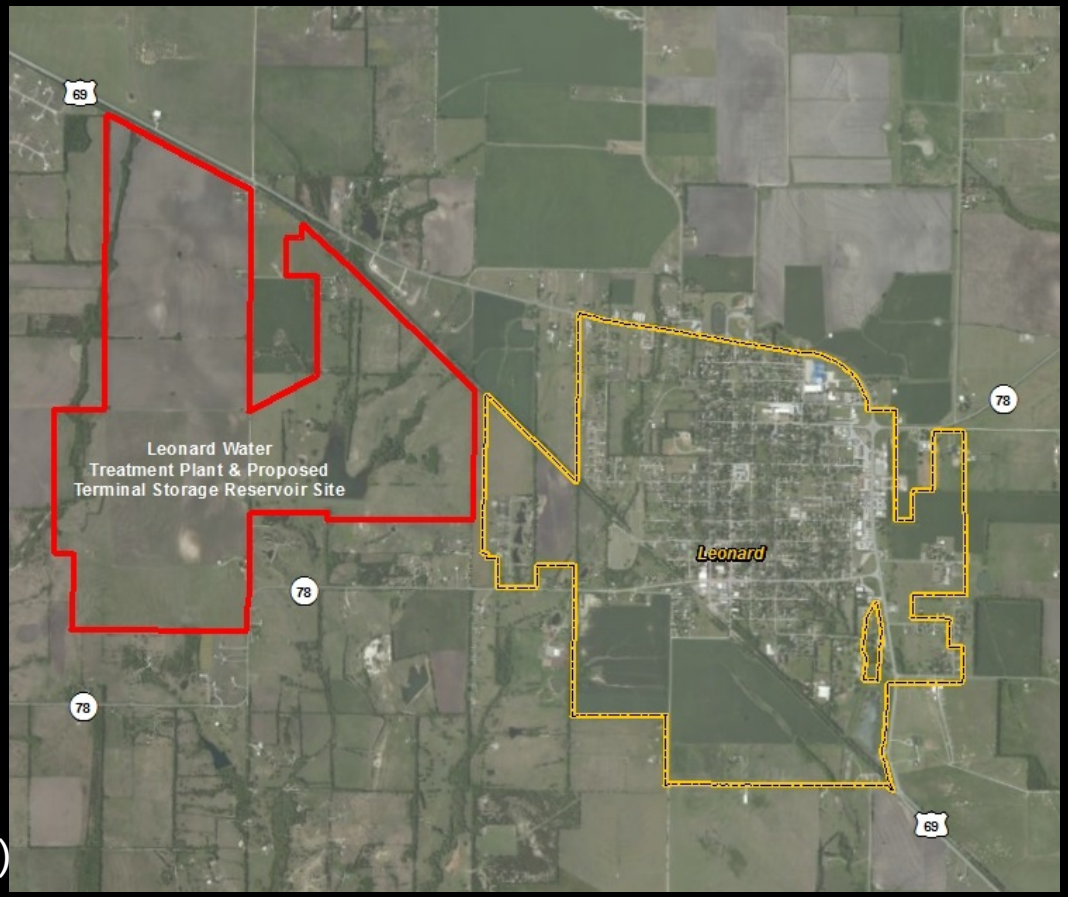
- Located west of Leonard
- Capacity: Phase I – 70 MGD; Ultimate – 280 MGD
- Storage Reservoir – 420 MG

Scope accomplished to date:

- Property purchased
- Facilities master plan underway

Schedule:

- Detail Engineering (2.5 years)
- Construction (2.5 years)



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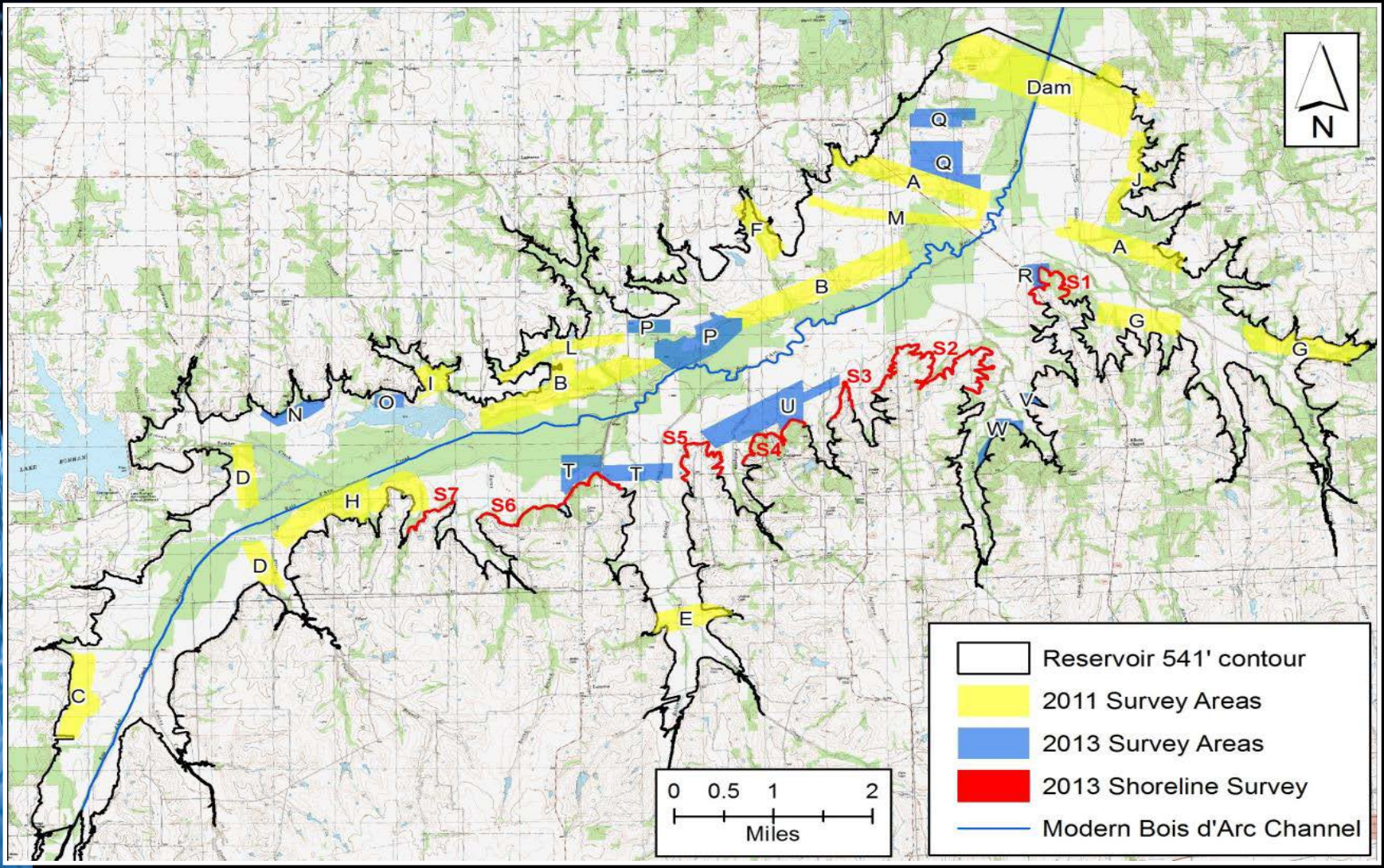
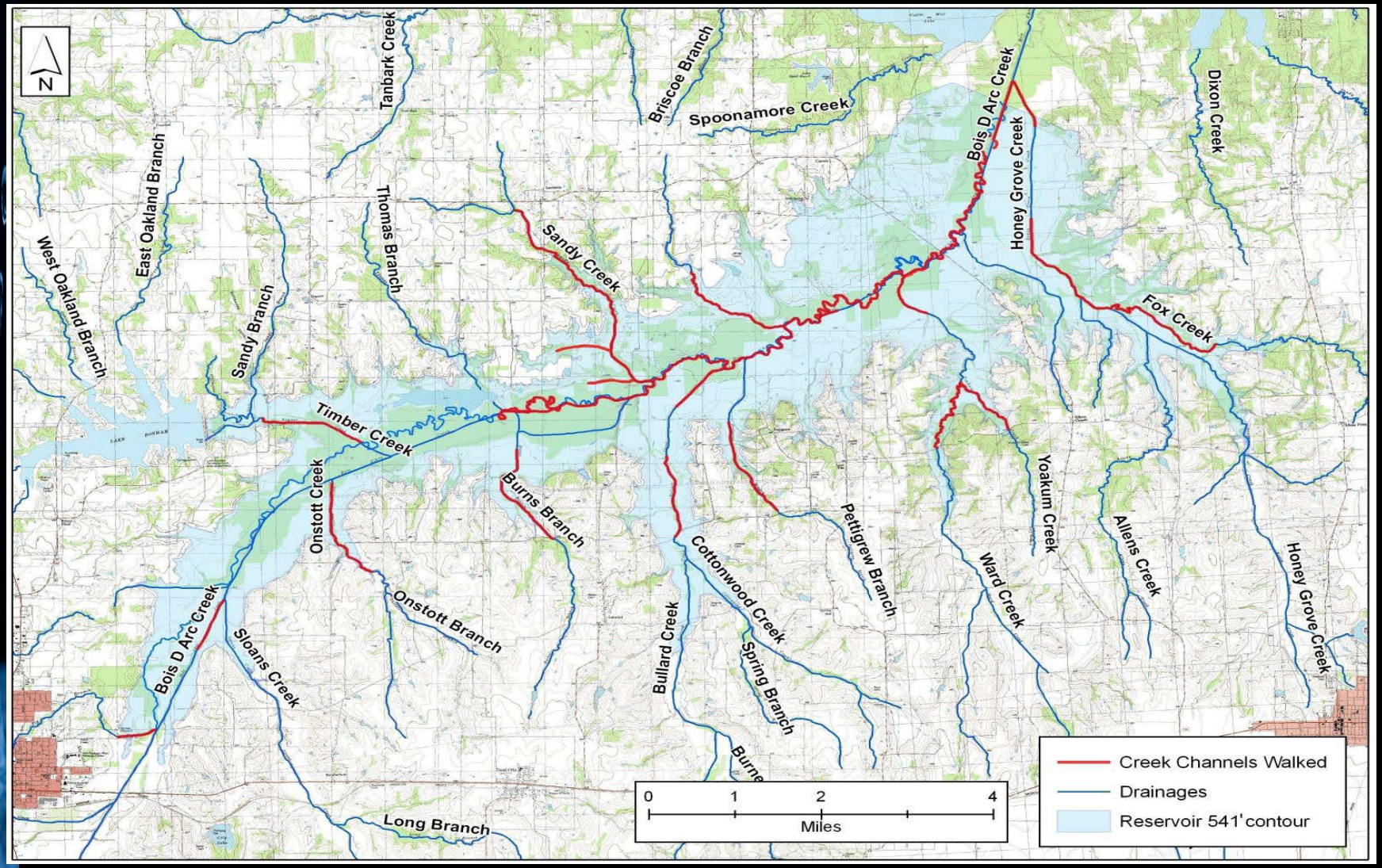
Archaeological Study

- 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
    - 31 prehistoric sites
    - 26 historic sites (includes Wilks Cemetery)
    - 4 prehistoric/historic sites
    - 9 sites recommended for further testing

Archaeological Study



Archaeological Study



Archaeological Study
Shovel Tests

Archaeological Study Trenching

Archaeological Study
Stream Bank Profile

Archaeological Study
Prehistoric Artifacts

Archaeological Study
Historic Artifacts

Archaeological Study
Historic Site

Archaeological Study
Historic Site

Archaeological Study
Historic Cemeteries

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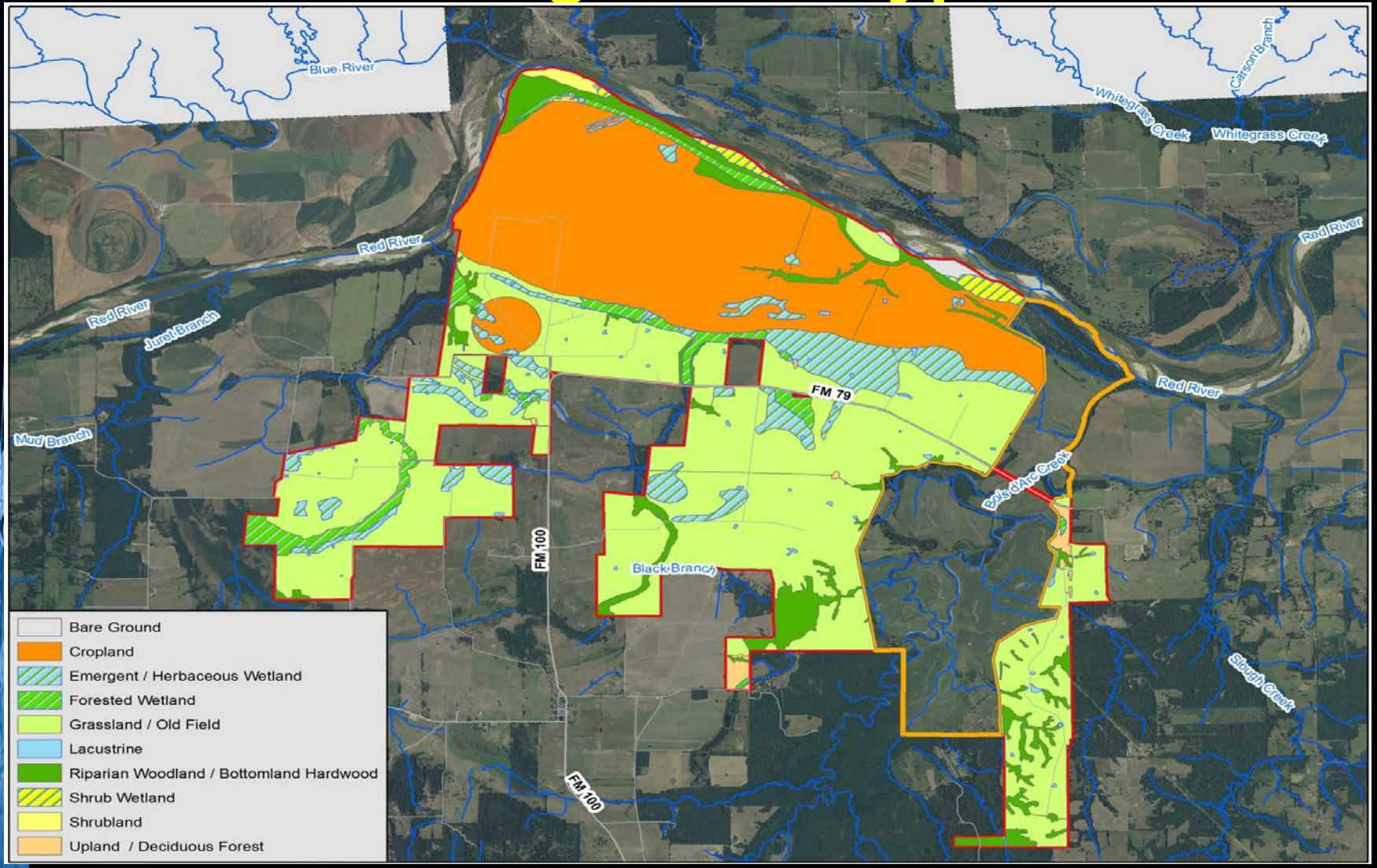
Riverby Ranch

Riverby Ranch
Existing Cover Types



Baseline Habitat Units at Riverby Ranch

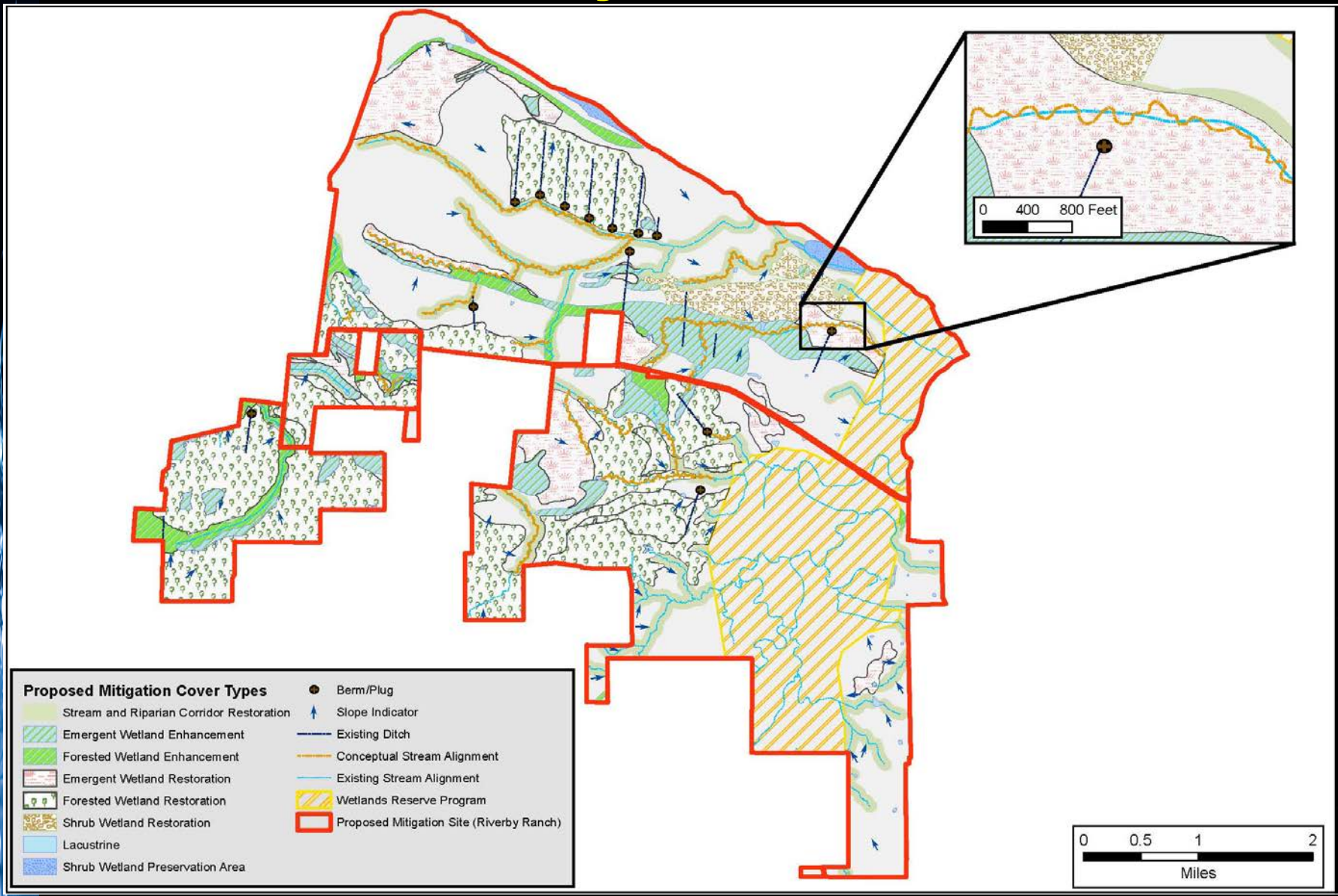
Cover Type	Average HSI Values	Area (acres)	Habitat Units (HUs)
Upland Deciduous Forest	0.58	78	45
Riparian Woodland / Bottomland Hardwood	0.38	840	317
Forested Wetland	0.38	452	171
Emergent / Herbaceous Wetland	0.24	1,377	337
Grassland / Old Field	0.41	5,413	2,234
Cropland	0.44	3,858	1,690
Shrubland	N/A	41	N/A
Shrub Wetland	N/A	98	N/A
Bare Ground	N/A	36	N/A
Lacustrine (Open Waters)	N/A	34	N/A
TOTAL:		**12,228**	**4,794**

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

Mitigation Measures Utilized to Achieve Ecological Uplift

- Establishing conservation easements in perpetuity
- Removing cattle and stopping existing farming practices
- Earthwork/Stream Restoration
  - Restoring stream meanders and riparian corridors
  - Restoring stream and wetland hydrology
- Revegetation - Planting of native trees, shrubs, and herbaceous species
- Controlling invasive/non-native species
- Once implemented, these measures all provide for improvements (i.e., ecological uplift) to fish and wildlife habitat, which was estimated using the USFWS's Habitat Evaluation Procedures (HEP)

Proposed Future Cover Types at Riverby Ranch



Proposed Mitigation for Impacts to Waters of the U.S.

Type of Water of the U.S.	Amount Impacted*		Amount of Mitigation		Net Gain (+) / Net Loss (-)	
	Acres	HUs	Acres	HUs	Acres	HUs
Emergent Wetland	(-)1,223	(-)514	(+)3,879	(+)1,276.2	(+)2,656	(+)762.2
Forested Wetland	(-)4,602	(-)1,150.5	(+)3,952	(+)2,266.1	(-)650	(+)1,115.6
Shrub Wetland	(-)49	(-)23	(+)423	(+)224.3	(+)374	(+)201.3
Open Waters	(-)87	N/A	(+)15,273[1]	N/A	(+)15,186	N/A
Streams (linear ft.)	(-)651,024		(+)486,375		(-)164,649	

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

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**
Shrubland (acre)	(-) 64	(+) 41	**(-) 23**
Grassland / Old Field (HU)	(-) 2,886	(+) 2,393	**(-) 493**

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

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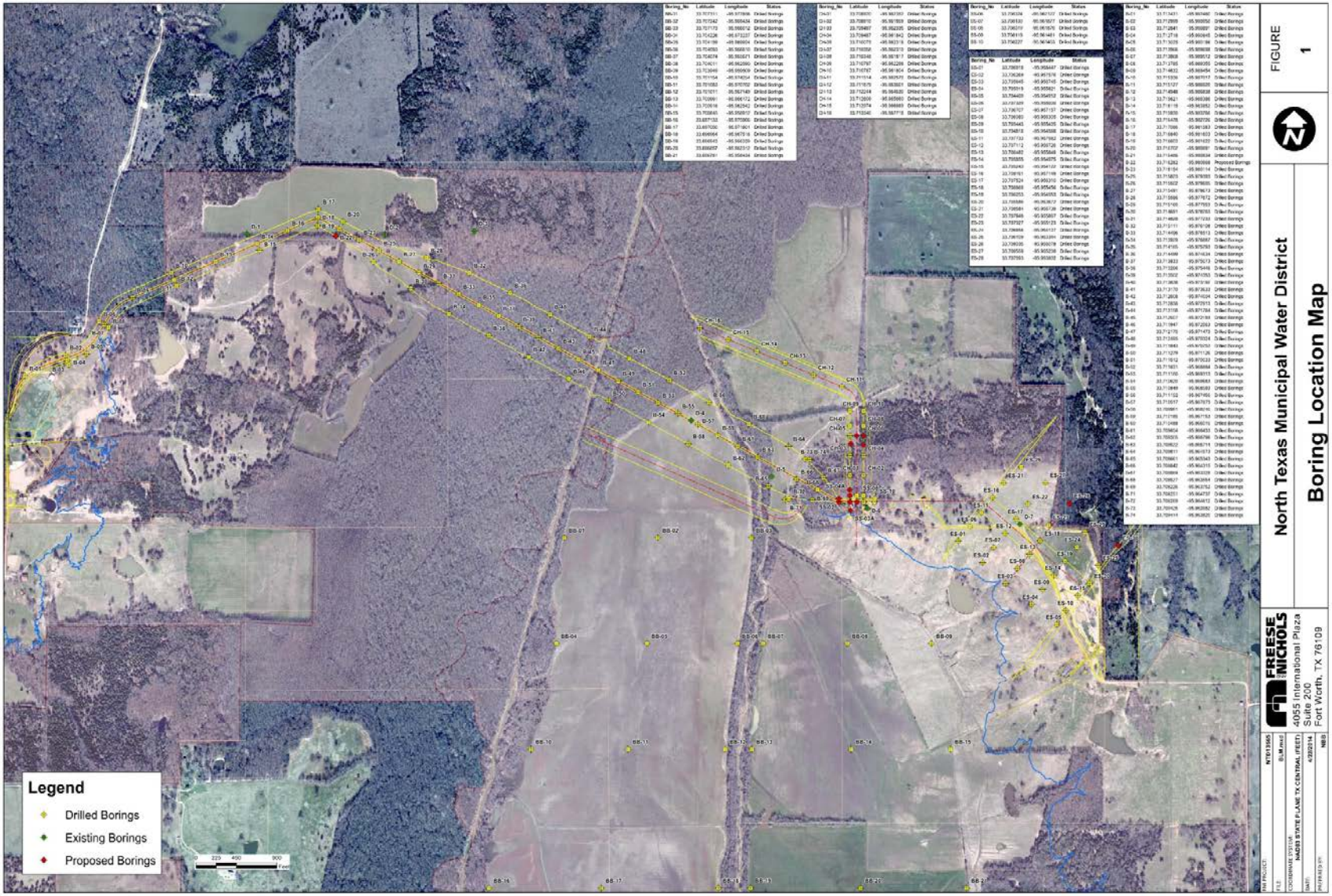
Boring Locations at Dam Site



Boring at Dam Site

Core Sample from Boring

Core Sample from Boring B-66
Rock Core from 55’ - 60’

Planned Activities
CWA Section 404 Permit

- Continued discussions:
  - USFS
  - Parks and Wildlife
  - TxDot
  - Fannin County
  - USACE
  - EPA Tour of Project Site scheduled for November 25, 2014
  - Draft EIS expected early 2015

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

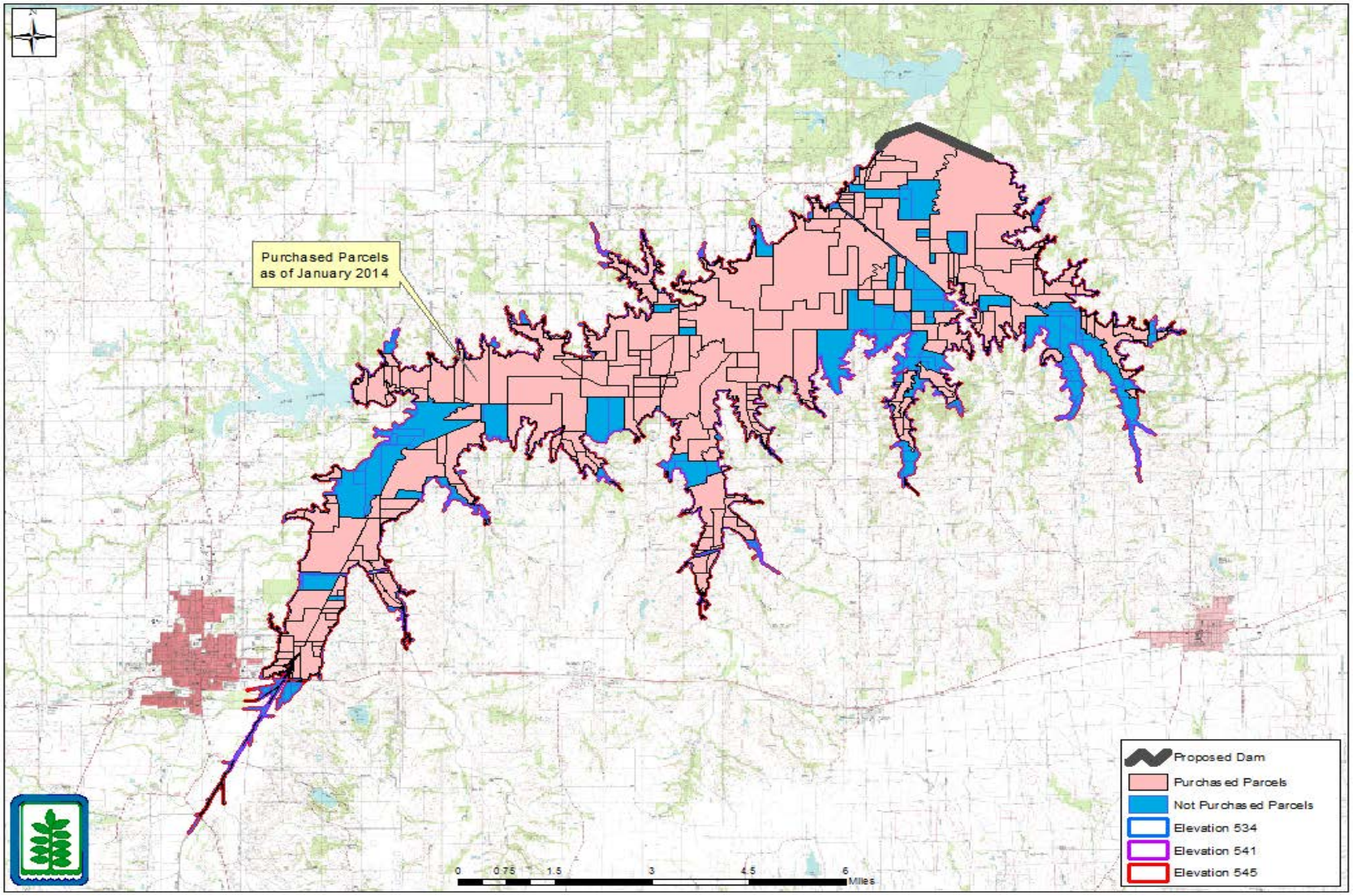
2014 Activities – TCEQ Water Rights Permit

- Hired Conservation Experts and Enhanced Conservation Plan
- Met with protestants
  - National Wildlife Federation
  - Sierra Club
  - Texas Parks and Wildlife
  - Bois d'Arc MUD
  - Landowners
- SOAH Jurisdictional Hearing November 10, 2014
- Contested Case Hearing April 20-29, 2015

Property Acquisition

- NTMWD Board initially approved - Nov. 2007
- Reservoir site property needed - 22,590 acres
- Acquisitions to date - 18,560 acres (82%)
- Riverby Ranch mitigation area - 14,959 acres
- North (Leonard) WTP site - 841 acres

Lower Bois d'Arc Creek Reservoir Purchased Parcels



Impact on Local Taxing Authorities

- Taxes paid to Fannin County by NTMWD
  - Tax Years 2008 - 2010 - $272,043.77
  - Tax Year 2011 - $171,436.66
  - Tax Year 2012 - $166,884.20
  - Tax Year 2013 - $174,046.25

- Taxes paid to Lamar County by NTMWD
  - Tax Year 2010 - $145.20
  - Tax Year 2011 - $2,047.52
  - Tax Year 2012 - $2,037.04
  - Tax Year 2013 - $2,222.77

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;

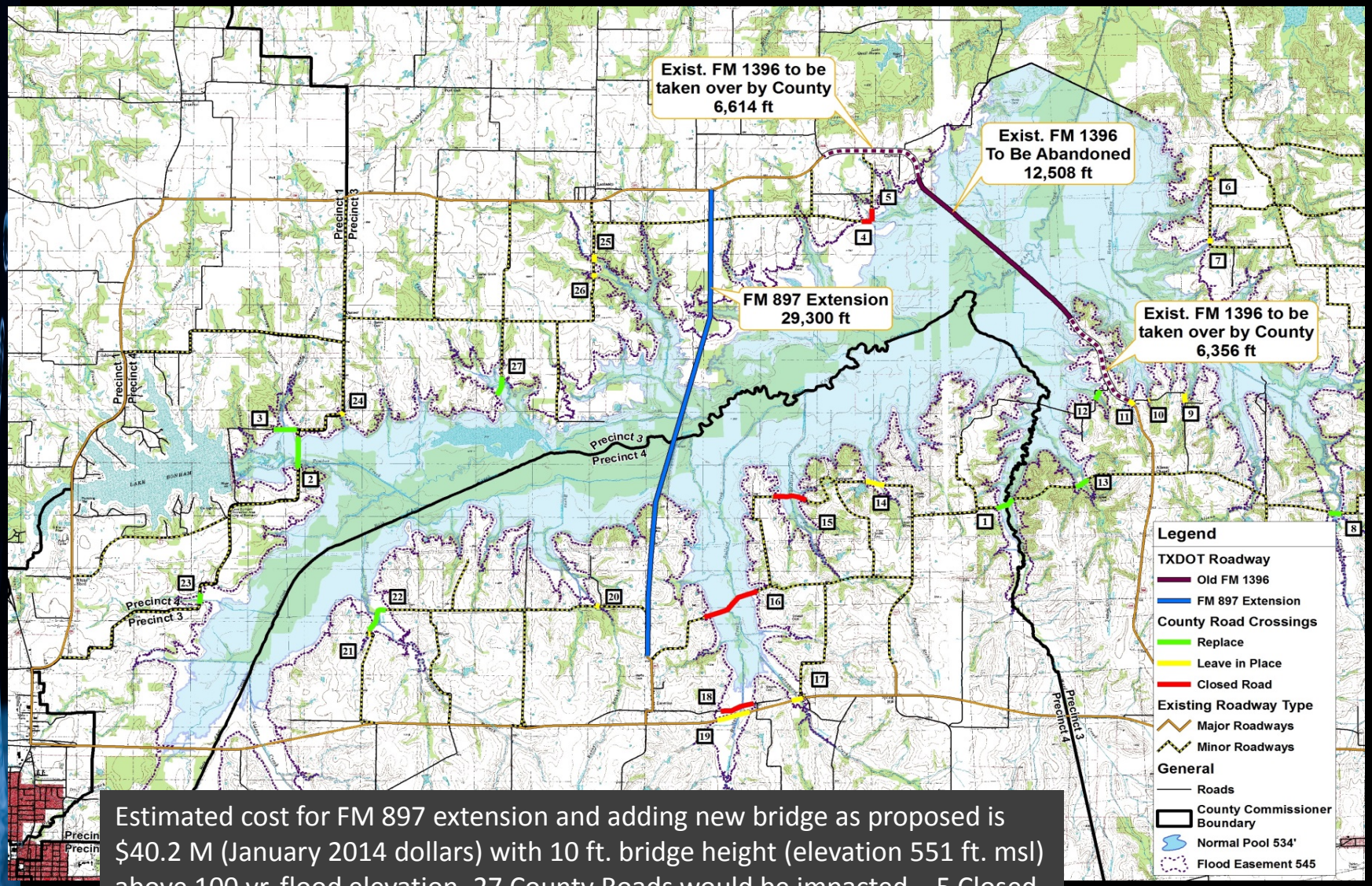
(5) the location & use of buildings, other structures, & land for business, industrial, residential, or other purposes;

(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:

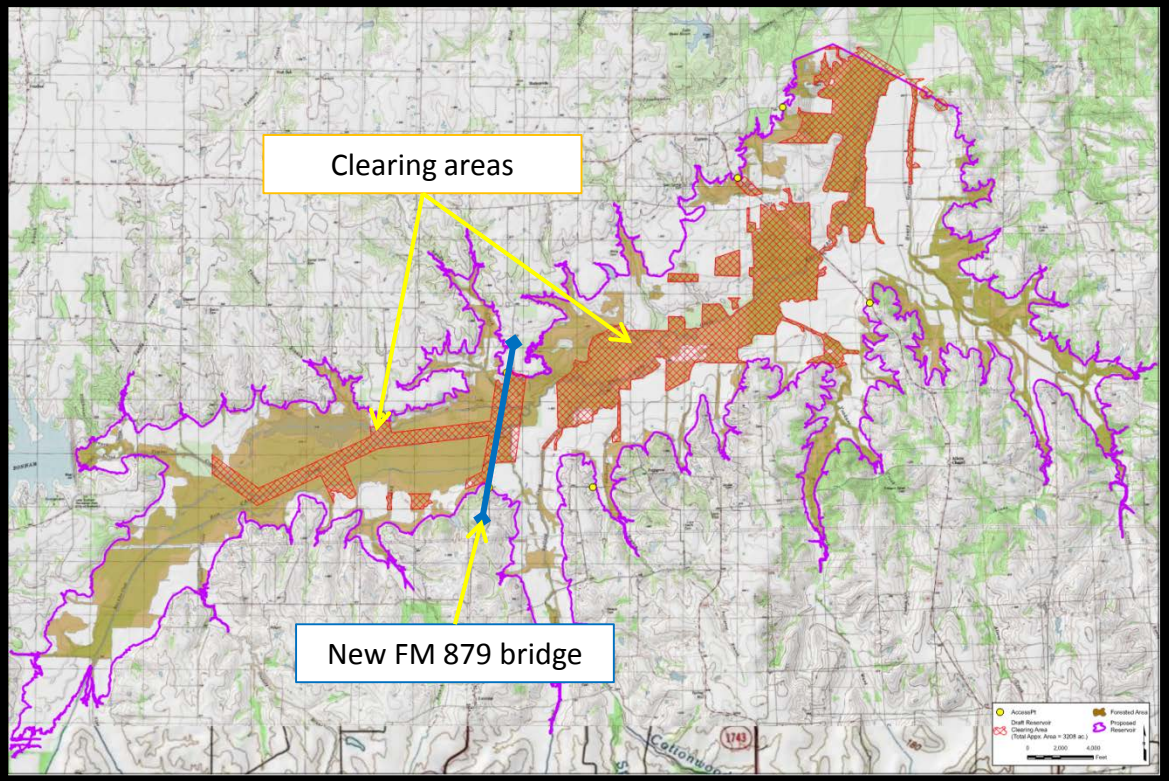
- Clear 3200 acres of timber
  - Enhance creation of fish habitat
  - Improve human access to shore locations
  - Reduce hazards to boating safety and fishing from large floating debris
- To be undertaken during 2 years preceding impoundment

Scope accomplished to date:

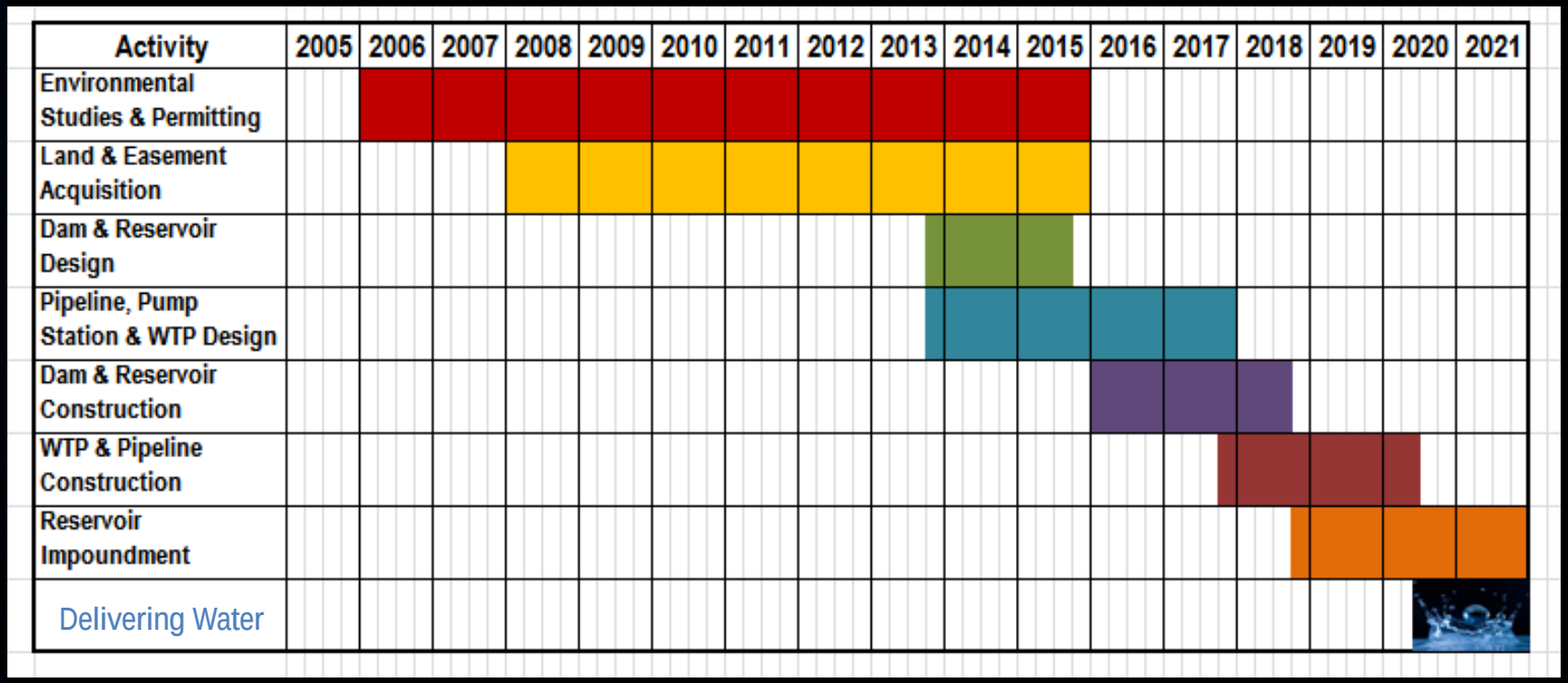
- Initial layout for permitting

Schedule:

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



LBCR Overall Timeline



Questions