



Regional Service Through Unity... Meeting our Region's Needs Today and Tomorrow



MEETING THE REGION'S THIRST FOR WATER BOIS D'ARC LAKE

Annual Public Works Round Up

May 21, 2019

R.J. Muraski, Assistant Deputy for Planning/CIP

North Texas Municipal Water District



OVERVIEW

- **History and Present Day of NTMWD**
- **Where We Get Our Water**
- **Why Bois d'Arc Lake is Needed**
- **Bois d'Arc Lake and Related Projects Construction**
- **Questions**





HISTORY OF NTMWD

10 Original Member Cities

Farmersville, Forney, Garland, McKinney, Mesquite, Plano, Princeton, Rockwall, Royse City, and Wylie

“We decided we were all in this together. We couldn’t do it separately.”

-
- 1951 – Created by Texas Legislature to Provide Water Service
 - 1956 – Began Providing Treated WATER to Member Cities
 - 1970s – Expanded to WASTEWATER Service
 - 1973 – Richardson added as Member City
 - 1980s – Expanded to SOLID WASTE Service
 - 1998 – Allen added as Member City
 - 2001 – Frisco added as Member City



REGIONAL PROVIDER: WATER, WASTEWATER, SOLID WASTE



BY THE NUMBERS

DID YOU KNOW?



Service area of 2,200 square miles in 10 counties

Serving 1.7 million people in one of the fastest-growing regions in the country



14
WATER PUMP STATIONS

WATER PUMP STATIONS

6
WATER TREATMENT PLANTS

WATER TREATMENT PLANTS
806+ MGD Capacity
(million gallons/day)

575+
MILES
WATER TRANSMISSION PIPELINES

WATER TRANSMISSION PIPELINES



250+
MILES
LARGE-DIAMETER WASTEWATER PIPELINES

LARGE-DIAMETER WASTEWATER PIPELINES

13
WASTEWATER TREATMENT PLANTS

WASTEWATER TREATMENT PLANTS

151+
MGD
WASTEWATER TREATMENT CAPACITY

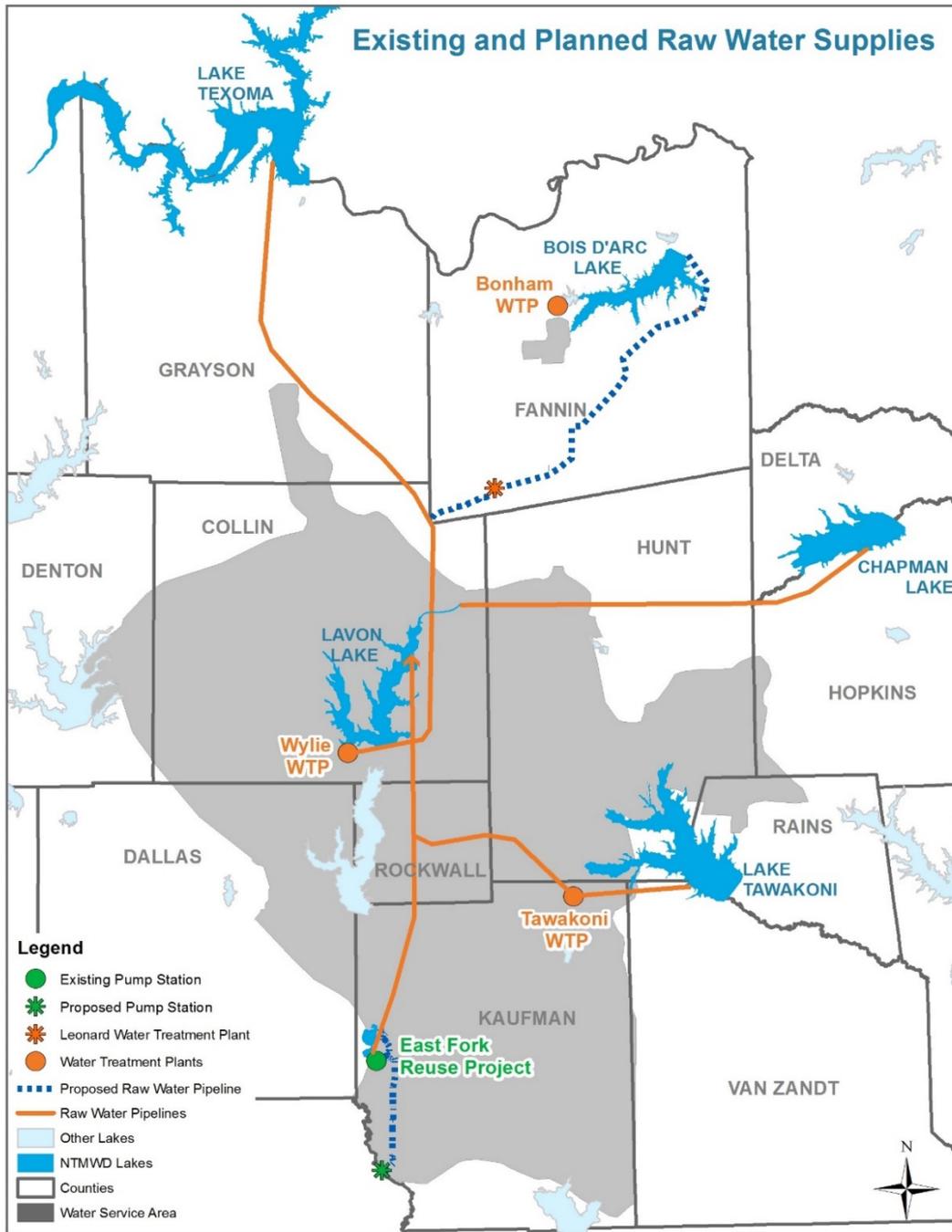
WASTEWATER TREATMENT CAPACITY
MGD (million gallons/day)



3 TRANSFER STATIONS
up to 3,295 tons of solid waste/day

985,000+
tons/year accepted at landfill





Existing:

- Lavon Lake
- Lake Texoma
- Lake Tawakoni
- Chapman Lake
- Reuse/Wetland

In Progress:

- Bois d'Arc Lake



WATER SUPPLY PLANNING: FUTURE SOURCES

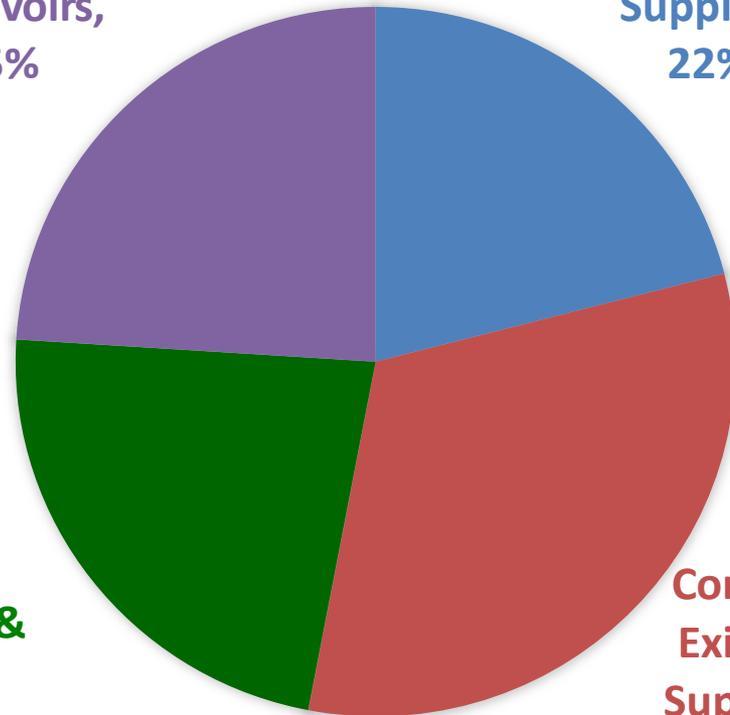
**Conservation and
Reuse = 21%**

**New Sources,
Reservoirs = 25%**

**Conservation &
Reuse, 21%**

**New
Reservoirs,
25%**

**Current
Supplies,
22%**



**Connect
Existing
Supplies,
32%**



ECONOMIC GROWTH

WATER SUPPLY INFRASTRUCTURE IS THE DRIVING FORCE OF COMMUNITY AND BUSINESS VITALITY

NTMWD Total Population Served: Historical and Projected

Year	1956	1961	1974	1994	2019	2040	2070
Population Served	32,000	60,000	200,000	800,000	1,700,000	2,500,000	3,700,000



Legacy West - Plano



The Star - Frisco

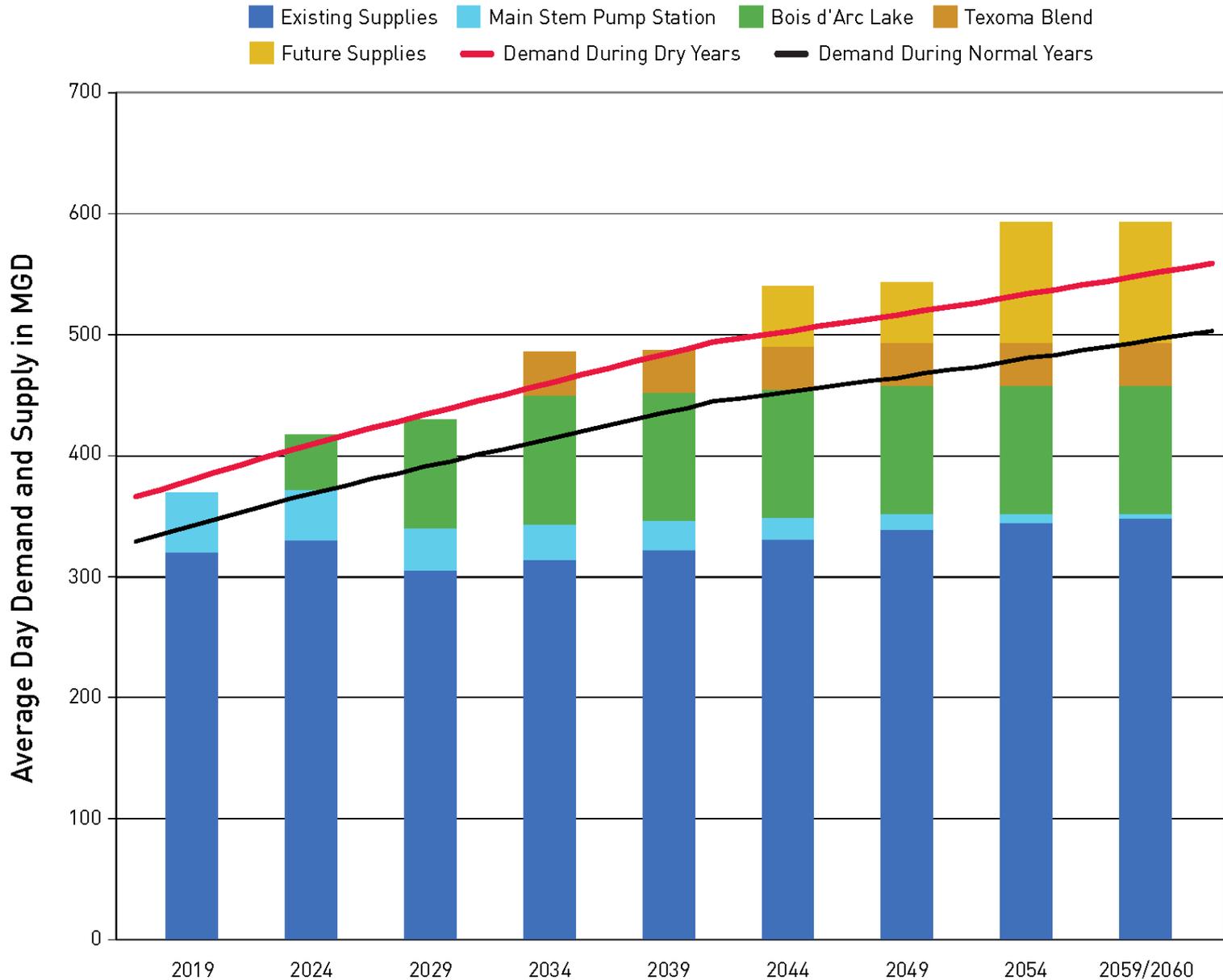


Watters Creek Convention Center – Allen



Craig Ranch - McKinney

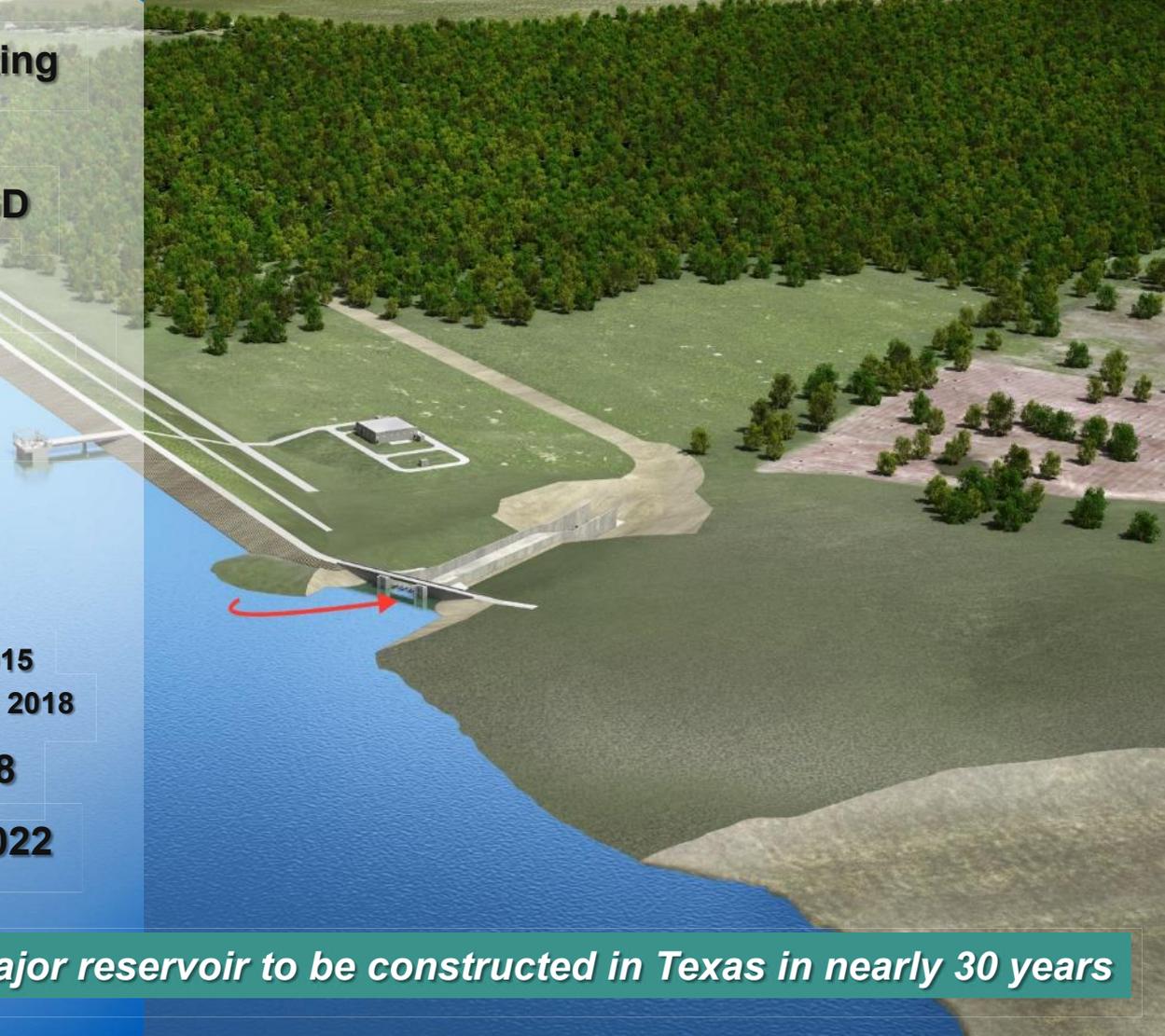
Meeting the Water Needs of North Texas 2019-2060





BOIS D'ARC LAKE

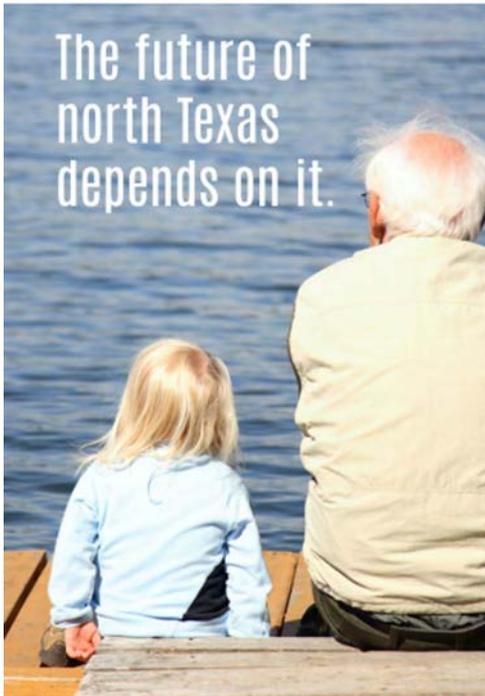
- Decade+ of planning, permitting
- Surface Area: 16,641 acres
- Supply: Firm Yield of 108 MGD
- Average/ Max Depth: 22/70 ft
- Lake Elevation: 534 ft mean sea level
- Owner & operator: NTMWD
- Cost Estimate: \$1.6B
- Permitting:
 - TX Water Rights – received June 2015
 - USACE Section 404 – received Feb. 2018
- Construction began May 2018
- Water delivery expected in 2022



First major reservoir to be constructed in Texas in nearly 30 years



PLANNING AND PERMITTING TIMELINE



December 2006

State Water Rights Permit Application

June 2008

USACE Section 404 Permit Application

February 2015

USACE Issues Draft Environmental Impact Statement

June 2015

State Water Rights Permit Received – Anticipating 404 Permit in Jan 2016

July 2015

USACE Requires HGM methodology for Mitigation – **Delay in expected 404 permit**

March 2017

USACE Issues Revised Draft Environmental Impact Statement

November 2017

USACE Issues Final Environmental Impact Statement

Feb 2018

USACE Section 404 Permit Received



BOIS D'ARC LAKE PROGRAM COMPONENTS

Major Components include several projects; projects were separated by type of work/infrastructure:



CMAR 1 – Dam and Reservoir Clearing/Terminal Storage Reservoir



Program Component 2 – Full Service Provider Mitigation Project



CMAR 3 – Leonard Water Treatment Plant and Pump Stations



CMAR 4 – Roads and Bridges



CMAR 5 – Raw Water and Treated Water pipelines

Bois d'Arc Lake: Key Components & Related Infrastructure

1. Dam and intake structure for reservoir
2. 35-mile raw water pipeline
3. \$50 million road projects
4. Mitigation area (over 17,000 acres)
5. New water treatment plant, pump station, terminal storage reservoir
6. 25-mile treated water pipeline





CMAR 1 – DAM & TERMINAL STORAGE RESERVOIR (TSR)

Goal:

By December 2020:

- Begin impounding water
- Complete terminal storage reservoir at Leonard WTP

Scope:

- Dam and Clearing
- Intake Tower
- 210 MG (420 MG ultimate) terminal storage reservoir
- Bonham Dam Improvements

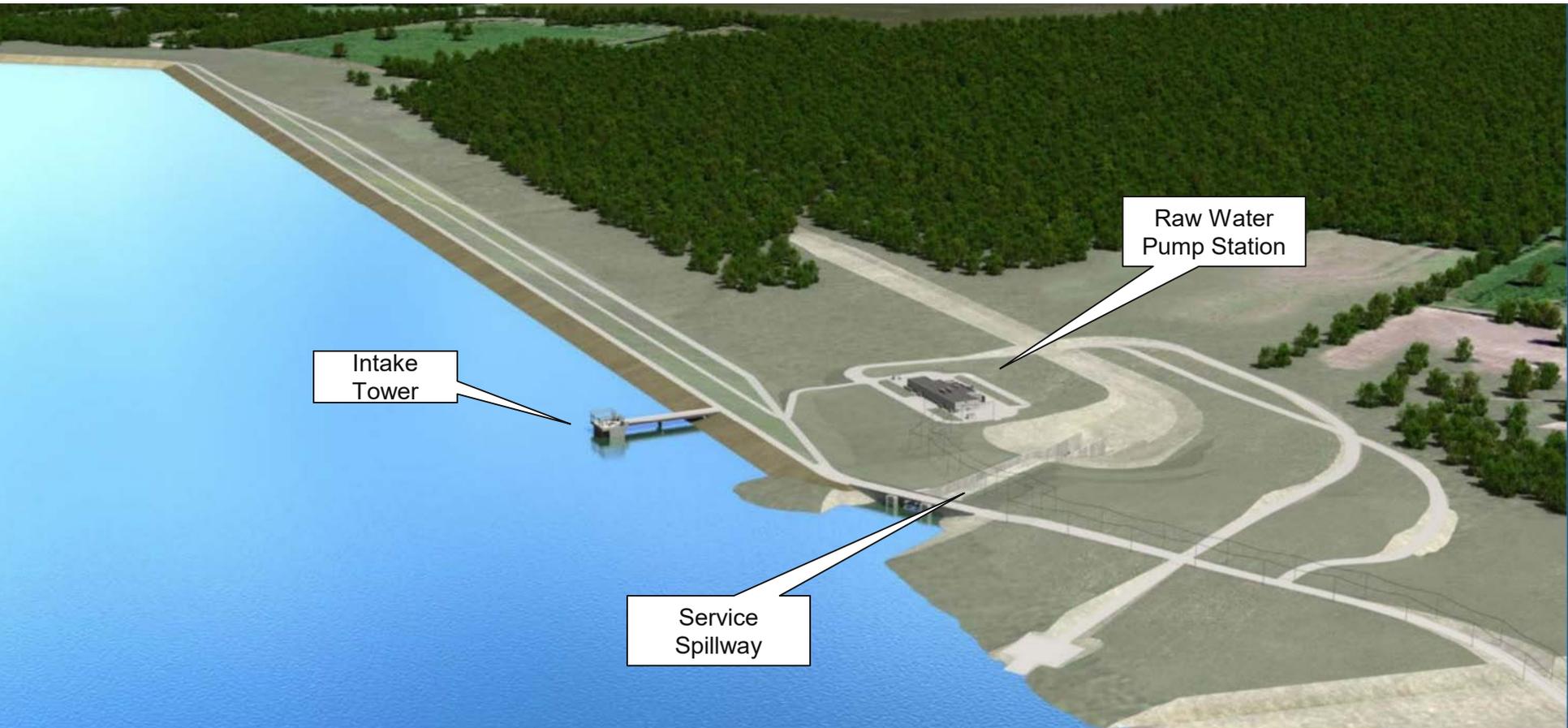




NORTH
TEXAS
MUNICIPAL
WATER
DISTRICT



CMAR 1 PROGRESS PHOTOS



Intake
Tower

Service
Spillway

Raw Water
Pump Station



CMAR 1 LOOKING WEST

2-mile long, 90-ft tall dam, Clearing of Dam footprint 100%





NORTH
TEXAS
MUNICIPAL
WATER
DISTRICT



CMAR 1 SERVICE SPILLWAY/CHUTE/STILLING BASIN/RWPS



Raw Water
Pump Station

Service
Spillway



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TEXAS
MUNICIPAL
WATER
DISTRICT



CMAR 1 RAW WATER INTAKE PIPES LOOKING NORTH TO RWPS



Intake Tower
110'

Raw Water
Pump Station



BOIS D'ARC LAKE DAM AND RESERVOIR

Raw Water Intake Structure



Pouring walls for the Intake Structure



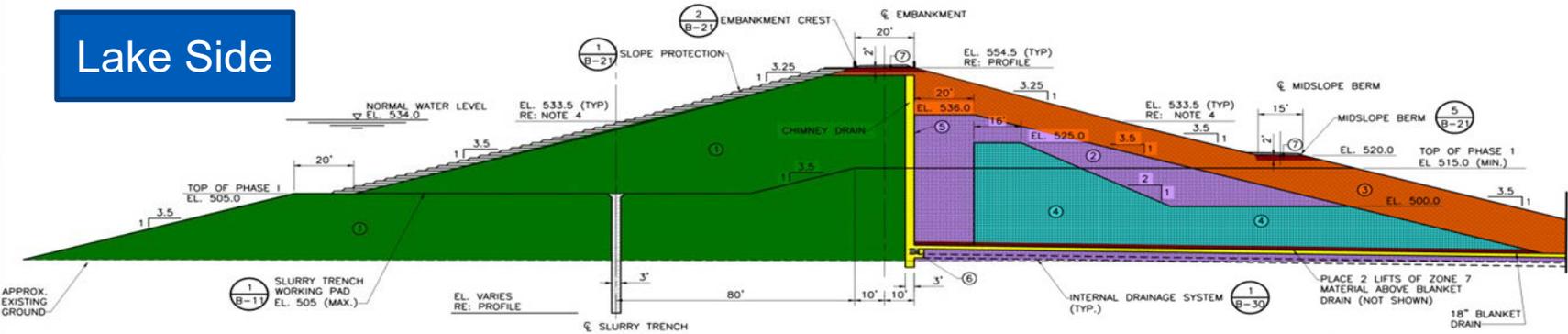
Intake Structure looking toward the
Raw Water Pump Station



CMAR 1 EMBANKMENT CROSSSECTION

- = Zone 1 Material (Fat Clay, Impervious Core)
- = Zone 2 Material (Leaner Clay, Cohesive Random)
- = Zone 3 Material (Sandy Clay, Low Plasticity Random)
- = Zone 4 Material (Mixed Clay, Random Fill)
- = Zone 5 Material (Sand, Sand Filter)
- = Zone 6 Material (Gravel, Gravel Drain)
- = Zone 7 Material (Sandy Clay, Cohesionless Random)

Lake Side



TYPICAL EMBANKMENT SECTION
 STA. 54+00 TO STA. 107+60
 1"=20' (EXCEPT FROM STA. 105+35 TO STA. 105+65)

Drawn by: M. H. ...
 Title: Reservoir Embankment Profile

FREESE & MICHALS

10000 North Loop West, Suite 2000, Houston, Texas 77058-1000
 Tel: 281-732-7477 Fax: 281-732-7477
 Web: www.freezemichals.com

NORTH TEXAS MUNICIPAL WATER DISTRICT
LOWER BOIS D'ARC CREEK RESERVOIR
 B - EMBANKMENT
TYPICAL SECTIONS AND DETAILS
 STA. 54+00 TO STA. 112+48

NO. 12605	REV. 01	DATE	BY	CHKD.	APP'D.
12605	01	DEC 2017
ISSUED FOR CONSTRUCTION					
VERIFY SCALE. Box is one inch on ground. This sheet is not valid if not on a 1"=20' scale. If this sheet is not on a 1"=20' scale, it is void.					

SHEET
B-20
 OF 20



PROGRAM COMPONENT 2 – AQUATIC AND TERRESTRIAL MITIGATION

Goal:

Replace trees, wetlands, streams, and wildlife habitat inundated by the reservoir

Scope:

- Conversion of Riverby Ranch to a mitigation area
- Turn-key approach – Full Service Provider (FSP)
- Current mitigation plan added;
 - Wetlands Reserve Property (WRP) to Riverby area – additional tree planting
 - Upstream Mitigation Area – tree planting in flood plain of Bois d' Arc Creek



ENVIRONMENTAL IMPROVEMENTS

- **Environmental mitigation on more than 17,000 acres in two locations**
 - Largest permittee-responsible ecological mitigation project in nation
 - Over 8,500 acres of wetland restoration and enhancement
 - Planting approx. 5 million trees
 - Restoring or enhancing over 3,200 acres of native grasslands; 2,600 acres of forests
 - Improving over 70 miles of local streams





BOIS D'ARC LAKE

Mitigation



Crews planting trees
Approx. 1.67 million planted



Shumard Oak, Water Oak, Willow Oak,
Pecan, Sugarberry, American Elm



BOIS D'ARC LAKE

Mitigation



Crews planting buttonbush



Stream restoration work



CMAR 3 – WATER TREATMENT PLANT & PUMP STATIONS

Goal:

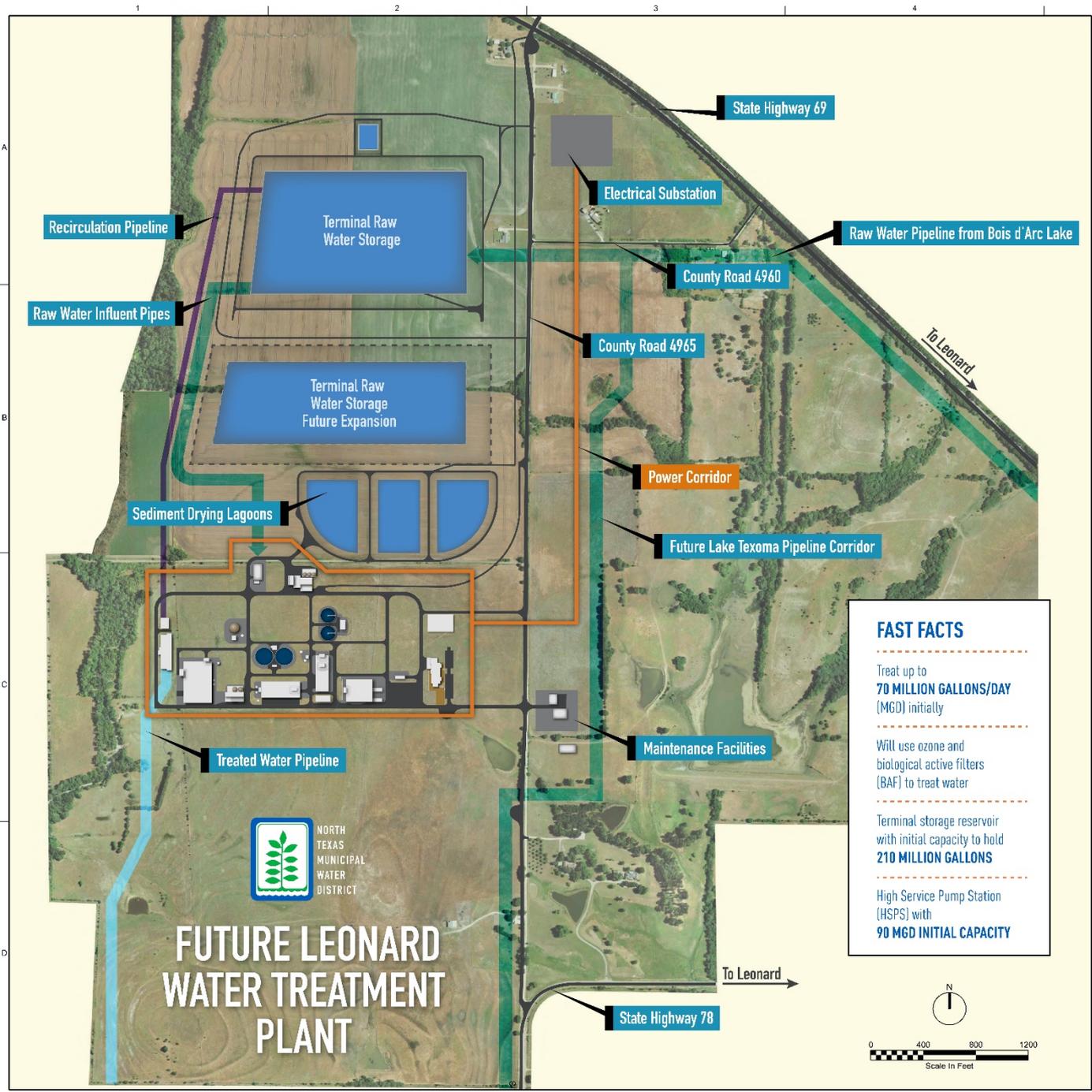
Complete and operational by First Quarter of 2022

Scope:

- Raw Water Pump Station (RWPS) at the dam (90 MGD – 236 MGD ultimate)
- 70 MGD Leonard Water Treatment Plant (LWTP) (280 MGD ultimate)
- High Service Pump Station (HSPS) at WTP site (90 MGD – 330 MGD ultimate)

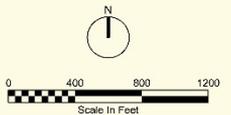


NORTH TEXAS MUNICIPAL WATER DISTRICT



FAST FACTS

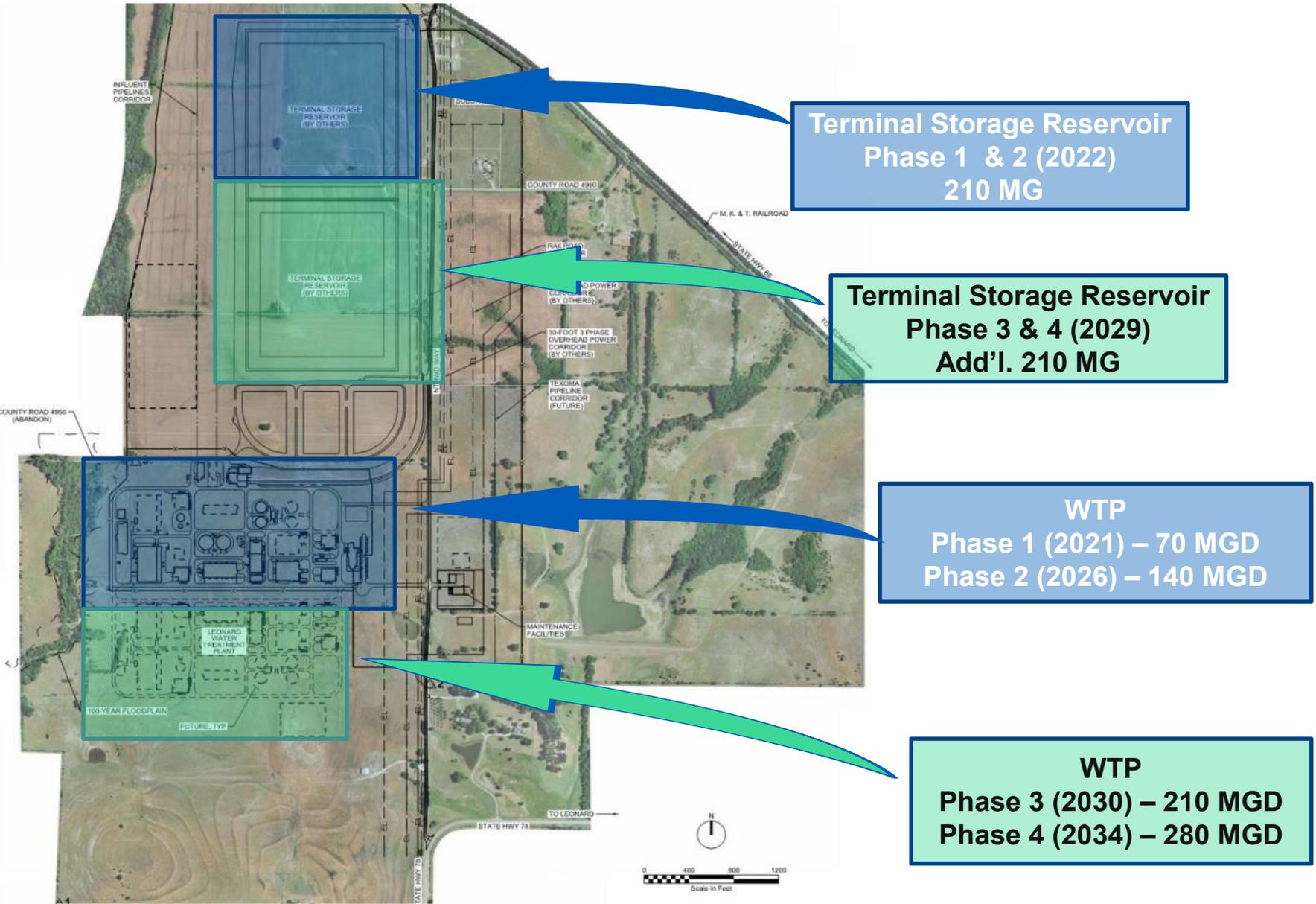
- Treat up to **70 MILLION GALLONS/DAY (MGD)** initially
- Will use ozone and biological active filters (BAF) to treat water
- Terminal storage reservoir with initial capacity to hold **210 MILLION GALLONS**
- High Service Pump Station (HSPS) with **90 MGD INITIAL CAPACITY**



FUTURE LEONARD WATER TREATMENT PLANT



Leonard Water Treatment Plant – Site Map





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DISTRICT



BOIS D'ARC LAKE RELATED PROJECT

Leonard Water Treatment Plant



Looking north at plant site



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MUNICIPAL
WATER
DISTRICT



BOIS D'ARC LAKE RELATED PROJECT

Leonard Water Treatment Plant



Looking northeast at plant site



BOIS D'ARC LAKE RELATED PROJECT

Leonard Water Treatment Plant



Working on reinforcing steel for pipe encasement for Chlorine Contact Basin



Clearwell excavation



CMAR 4 – ROADS IMPROVEMENTS & BOAT RAMPS

Goal:

Before impoundment, complete the following

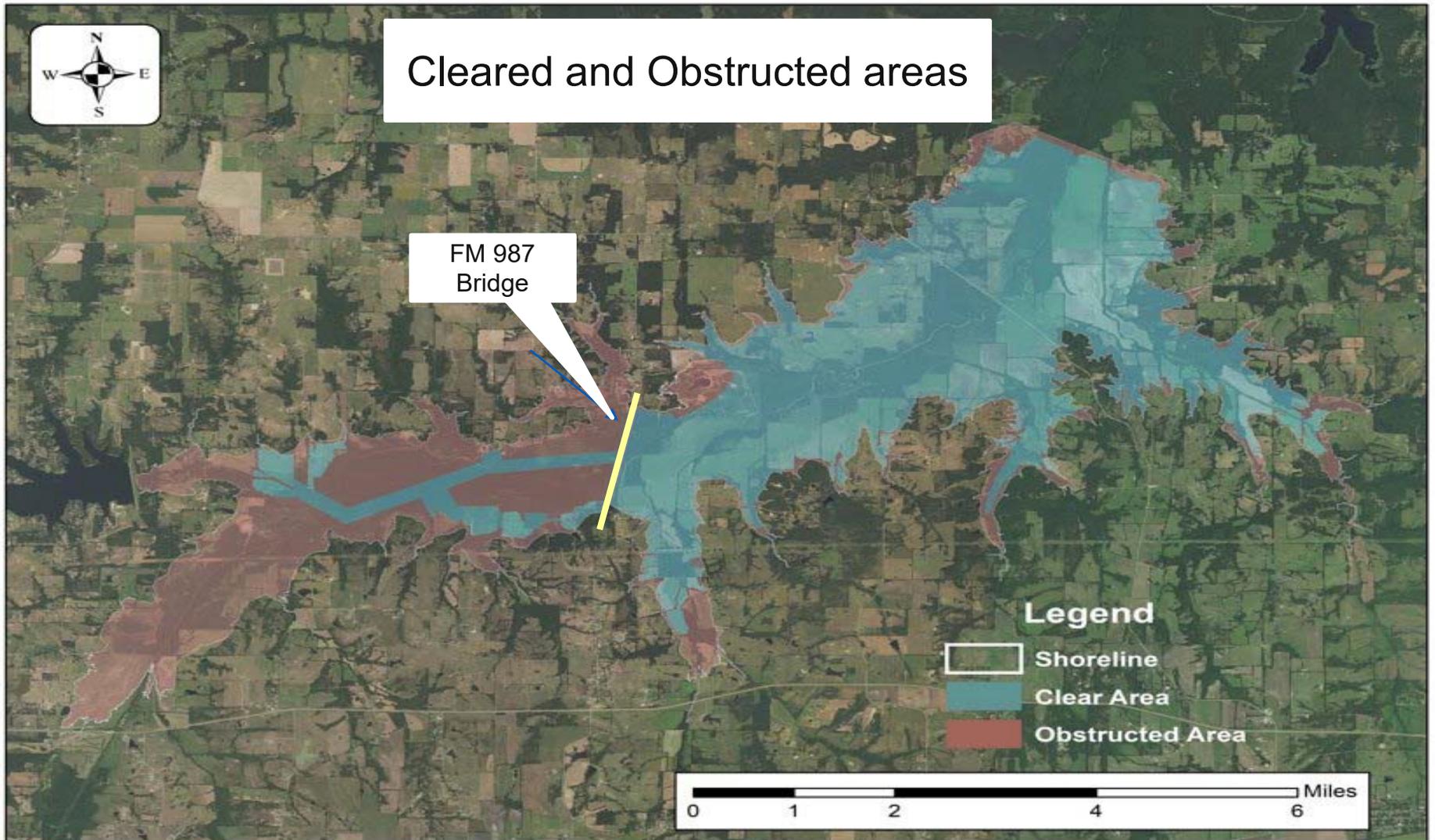
- FM 897 Improvements
- Fannin County Road improvements
- Boat ramps

Scope:

- FM 897
 - 5.1 miles of new 2-lane FM roadway
 - 1.5 miles of new 2-lane bridge
 - ROW generally 120' wide; varies to 275' in some locations
- County roads
 - Improvements at 9 locations
 - Bridge, culvert, and roadway embankment (3.8 miles)
 - Bridge/culvert demolition at 5 additional locations



BOIS D'ARC LAKE





CMAR 4 PROGRESS PHOTOS

- FM 897 south abutment looking north to Bois d'Arc Creek
- Cleared reservoir on the right





FM 897 BRIDGE

Pouring Columns and Bent Caps
August 2018



First Set of Beams Placed
September 2018



1.3 mile long bridge

240 concrete columns when complete

Each beam=115 ft long, weighs 101,000 lbs



CMAR 5 – RAW AND TREATED WATER PIPELINES

Goal:

Complete by early 2021

Scope:

Approximately 35 miles of 90-in raw water pipeline (RWPL) and ~25 miles of 84-in treated water pipeline (TWPL)

Status

- Design separated in five segments (A to E) of ~ 12-13 mi each
 - RWPL – 3 segments 100% Design completed. Procurement started on materials
 - TWPL – 2 segments @ 60% Design completed
- Coordination between CMAR and 5 design teams:
Design standards, standard details, system surge and hydraulic analysis, survey/property documents, corrosion protection design, and fiber optic design



BOIS D'ARC LAKE DAM AND RESERVOIR

Raw Water Pipe



90-inch pipe



Pipe near the dam site



BOIS D'ARC LAKE DAM AND RESERVOIR

Raw Water Pipe

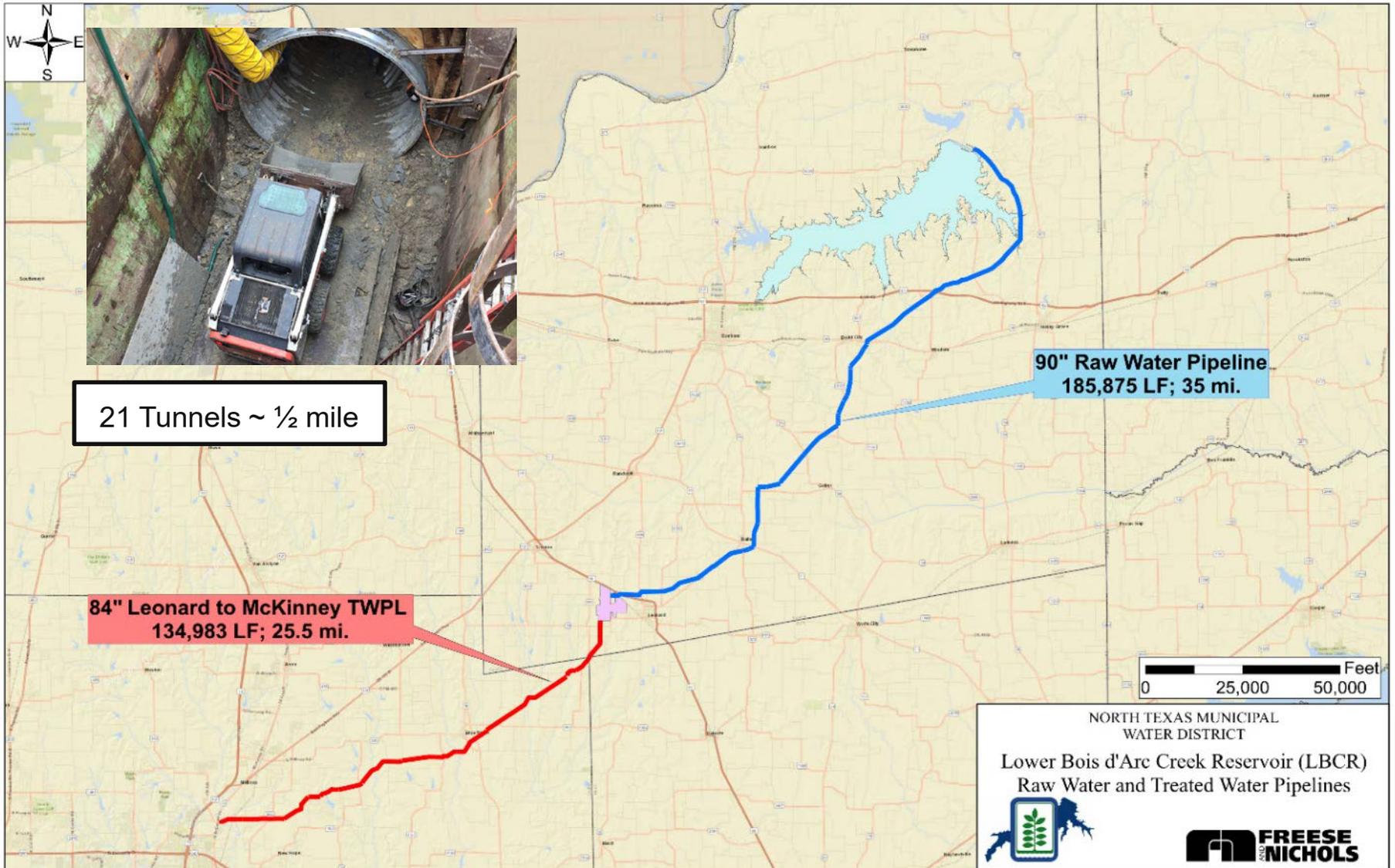


Pipe installation at the dam site



21 tunnels and crossings
need to be done

Raw water and Treated water pipelines – Site Map





PARTNERING WITH FANNIN COUNTY

Goal: Involve and Assist our County Partner

LBCR Zoning Initiative

- Protect water quality adjacent to the reservoir



Local Business & Contractor Outreach

- NTMWD hosted programs on 7/20 & 8/29 in Fannin County
- Approximately 180 businesses attended
- Focused on educating local businesses:

50 contractors in Fannin Co
and surrounding area hired.
~ \$50M





PARTNERING WITH FANNIN COUNTY

Goal: Involve and Assist our County Partner

TPWD Fish Habitat Enhancement

- Construct brush piles
- TPWD provides nursery stock (ShareLunker Program)

Fannin County Road & Bridges

- Upgrade bridges to minimum TXDOT standards
- Reestablish roadway network



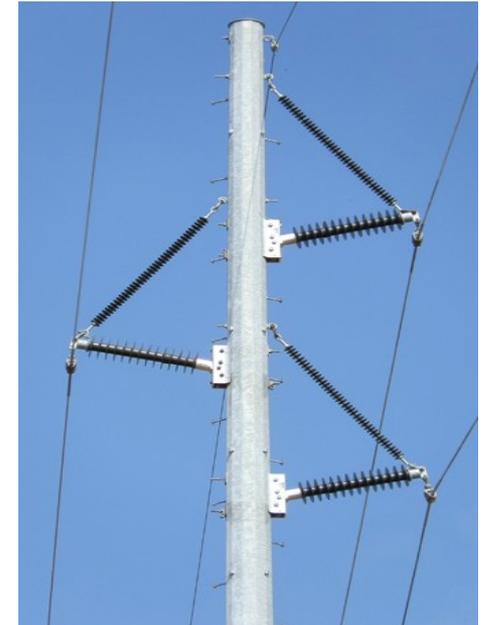


PARTNERING WITH FANNIN COUNTY

Goal: Involve and Assist our County Partner

Fannin County Electric Supply

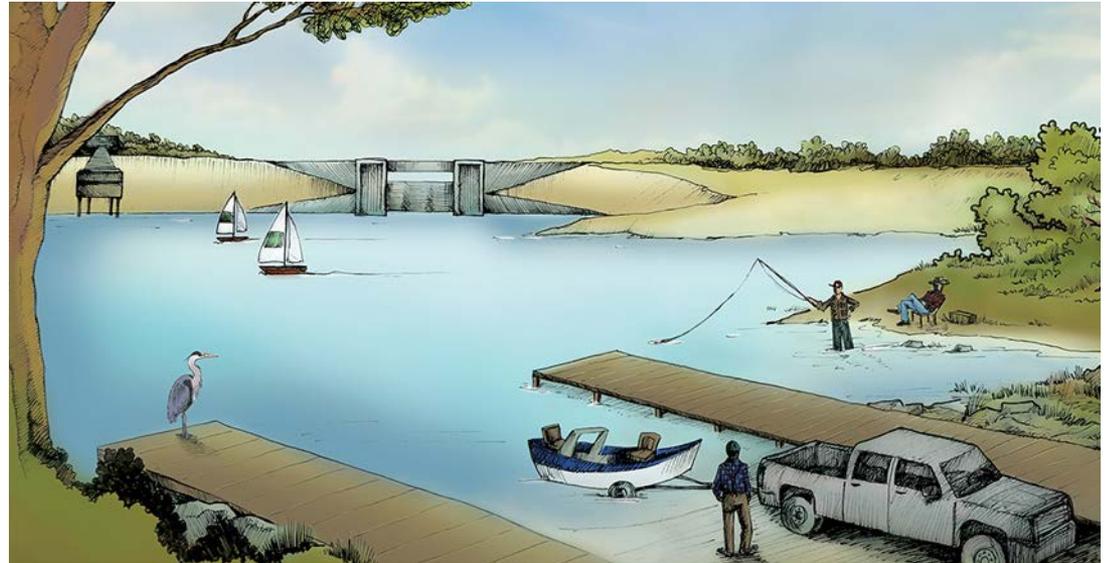
- Close coordination to maintain power network
- Improve high voltage transmission power service
- Two Electrical substations





BOIS D'ARC LAKE BENEFITS

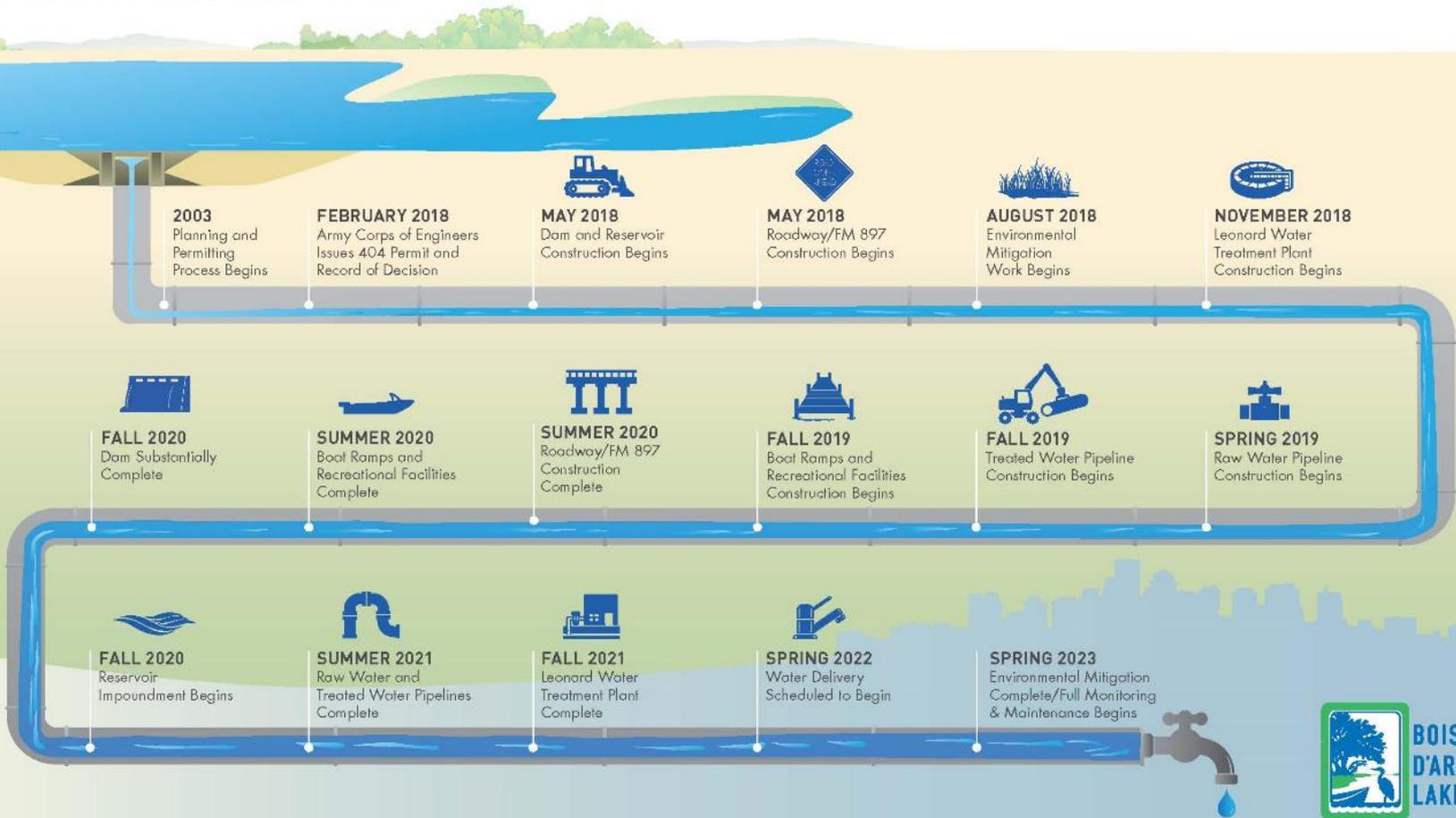
- **Supply water to the District's members/customers including Bonham**
 - Possibility to serve other Fannin County communities
- **Major recreation amenity**
 - 3 Public Boat Ramps
 - TPWD Establishing Fisheries
- **Supports economic growth**
 - \$509 million economic activity in Fannin Co. during construction
 - \$166 million annually economic activity after completion





TIMELINE

TIMELINE FOR PROJECTS





BOIS D'ARC PUBLIC RELATIONS DEDICATED WEB SITE

Bois d'Arc Lake Project

PROJECT OVERVIEW

The Bois d'Arc Lake project in Fannin County will be a critical new source of water for residents and businesses in all the north Texas communities served by the District.

The project is needed to meet the growing water demands of the region including Fannin County. The new source of water is part of a comprehensive long-range strategy NTMWD has developed to meet the region's needs for several decades. The approach includes a continued commitment to water conservation and reuse, using and leveraging existing water supplies and sources, and building new sources of supplies.

Learn more about the Bois d'Arc Lake program business opportunities.

This will be the first new reservoir constructed in Texas in nearly three decades. NTMWD began permitting required for the project in 2003. The [final permit was approved](#) by the U.S. Army Corps of Engineers on Feb. 2, 2018, and ground was broken May 25 of the same year with anticipated water delivery in 2022."

The project will pipe water from the new lake 35 miles to a new water treatment plant to be constructed in Leonard.

Major components:

1. Reservoir dam and intake
2. Raw water pipeline
3. Roadway improvements and bridge
4. Environmental mitigation area

Other projects:

1. Water treatment plant (initial capacity of 70 MGD – million gallons per day)
2. 25-mile treated water pipeline

RELATED LINKS

[Bois d'Arc Lake Fact Sheet](#)

[Bois d'Arc Lake Project Cost](#)

[Our Water System](#)

[Planning for the Future](#)

[Projects](#)

[Bois d'Arc Lake Business Opportunities](#)

[Final Environmental Impact Statement](#)

[Fannin County Comprehensive Plan for Bois d'Arc Lake, Part I \(Split to Reduce Load Time\)](#)

[Fannin County Comprehensive Plan for Bois d'Arc Lake, Part II \(Split to Reduce Load Time\)](#)

[Fannin County Bois d'Arc Lake Zoning Regulations](#)

[Fannin County Amended Bois d'Arc Lake Future Land Use Plan](#)

[Fannin County Bois d'Arc Lake Zoning Map](#)



SCHEDULE



BOIS D'ARC LAKE

WEATHER RISKS ARE REAL!





QUESTIONS? FOLLOW US @NTMWD



Newsletter Signup

News Stream Project Pipeline



www.BoisdArcLake.org