



**NORTH TEXAS MUNICIPAL
WATER DISTRICT**

Regional Service Through Unity

April 27, 2017

Mr. Luis Farias
Texas Water Development Board
Water Supply and Infrastructure-Regional Water Planning and Development
1700 N. Congress Avenue, 5th Floor
Austin, Texas 78711-3231

RE: NTMWD SWIFT Funding Application
SWIFT PIF Number 12203
SWIFT PIF Number 12218

Dear Mr. Farias:

Enclosed is the North Texas Municipal Water District (NTMWD) SWIFT Application for Lower Bois d'Arc Creek Reservoir and Treatment and Treated Water Distribution Improvements projects. Please note that the following three documents are planned to be executed after the District Board meets this afternoon:

1. Part B17: TWDB-0201A Resolution from the governing body
2. Part B18: TWDB-0201 Application Affidavit
3. Part B19: TWDB-201B Certificate of Secretary

Following execution of the document we will plan to email and mail a copy to you Friday.

We appreciate the opportunity to provide this application for financial assistance so that we may move forward in meeting our customer's needs. Please contact Erik Felthous, Finance Manager, at 469-626-4354 or via email efelthous@ntmwd.com at any time if you need further information.

Sincerely,

Judd Sanderson
Deputy Director (Finance & Personnel)

Enclosure

**APPLICATION FOR FINANCIAL ASSISTANCE
FOR WATER AND WASTEWATER INFRASTRUCTURE PROJECTS**

This application is comprehensive, covering all loan and grant assistance applications for water and wastewater infrastructure financing through the various Texas Water Development Board (TWDB) programs. The format of the application is intended to expedite the review process for both the applicant and TWDB staff. This application can be used by political subdivisions, including water supply corporations.

Please submit one double-sided original and one indexed, electronic copy, via electronic storage media such as CD or flash drive using MS Word, Excel and/or Adobe Acrobat.

Please submit your application to:

Texas Water Development Board
Water Supply and Infrastructure-Regional Water Planning and Development
P O Box 13231
1700 N. Congress Avenue, 5th Floor
Austin, Texas 78711-3231
(78701 for courier deliveries)

A complete application consists of all of the applicable information and forms requested in this document. When preparing this application please review the Application and all Guidance and Forms, listed at the end.

For more information, please contact your Regional Project Implementation Team at:

http://www.twdb.texas.gov/financial/programs/swift/regional_project_teams.asp

Thank you.

TWDB Use Only

Name of Applicant: _____

Date application received: _____

Date administratively complete: _____

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

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Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

Part A: General Information

1. The legal authority under which the applicant was created and operates.
 - a) TYPE A GENERAL-LAW MUNICIPALITY (Texas Local Gov't Code Sec. 5.001)
 - b) TYPE B GENERAL-LAW MUNICIPALITY (Texas Local Gov't Code Sec. 5.002)
 - c) TYPE C GENERAL-LAW MUNICIPALITY (Texas Local Gov't Code Sec. 5.003)
 - d) HOME-RULE MUNICIPALITY (Texas Local Gov't Code Sec. 5.004)
 - e) SPECIAL-LAW MUNICIPALITY (Texas Local Gov't Code Sec. 5.005)
 - f) NONPROFIT ORGANIZATION (Business Organization Code Chapter 22)
 - g) NONPROFIT WATER SUPPLY OR SEWER SERVICE CORP. (Texas Water Code Chapter 67)
 - h) ALL DISTRICTS (Texas Water Code Chapter 49)
 - i) OTHER (attach)

2. Applicant Name and Contact Information:

Name:	North Texas Municipal Water District
County:	Collin
Physical Address:	501 E. Brown Street, Wylie, TX 75098
Mailing Address:	PO Box 2408 Wylie, TX 75098
Phone:	972-442-5405
Fax:	972-442-5400
Website:	www.ntmwd.com

3. Brief description of the project

Lower Bois d'Arc Creek Reservoir is a multiphase project consisting of a new dam, reservoir, raw water pump station, raw water pipeline, terminal storage reservoir, and compensatory mitigation.

Treatment and Treated Water Distribution is a multiphase project consisting of a conventional water treatment plant, high service pump station, and treated water pipeline.

4. Applicant's Officers and Members:

<u>Name</u>	<u>Office Held</u>
Tom Kula	Executive Director/General Manager
Mike Rickman	Deputy Director (Operations & Maintenance)
Judd Sanderson	Deputy Director (Finance and Personnel)
Joe Stankiewicz	Deputy Director (Engineering & CIP)

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

5. Applicant's **primary contact person** for day-to-day project implementation.

Name:	Steve Long
Title:	Reservoir Project Manager
Address:	505 E. Brown Street, PO Box 2408, Wylie, TX 75098
Phone:	469-626-4713
Fax:	972-295-6440
Email:	slong@ntmwd.com

6. Applicant's Consultants (Attach copies of all draft and/or executed contracts for consultant services to be used by the Applicant in applying for financial assistance or constructing the proposed project.):

a) Applicant Engineer N/A

Firm Name:	Freese and Nichols, Inc.
Contact:	Jeff Payne
Address:	2711 N. Haskell, 33 rd Floor, Dallas, TX 75204
Phone:	972-624-9216
Fax:	214-217-2201
Email:	jp@freese.com

b) Bond Counsel N/A

Firm Name:	McCall, Parkhurst & Horton, L.L.P
Contact:	Alan Raynor
Address:	717 N. Harwood, 9 th Floor, Dallas, TX 75201-6514
Phone:	214-220-2800
Fax:	214-754-9250
Email:	araynor@mphlegal.com

c) Financial Advisor N/A

Firm Name:	First Southwest, a Division of Hilltop Securities, Inc.
Contact:	David Medanich
Address:	777 Main Street, Suite 1200, Ft. Worth, TX 76102-5351
Phone:	817-332-9710
Fax:	817-336-5572
Email:	David.medanich@hilltopsecurities.com

d) Certified Public Accountant (or other appropriate rep) N/A

Firm Name:	Weaver & Tidwell, L.L.P
Contact:	Shawn Parker
Address:	12221 Merit Drive, Suite 1400, Dallas, TX 75251-2280
Phone:	972-490-1970
Fax:	972-702-8321
Email:	Shawn.parker@weaverllp.com

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

e) Legal Counsel (if other than Bond Counsel) N/A

Firm Name:	Gay, McCall, Isaacks, & Roberts, P.C.
Contact:	Lewis Isaacks
Address:	777 East 15 th Street, Plano, TX 75074-5797
Phone:	972-424-8501
Fax:	972-424-5619
Email:	lisaacks@ntexas-attorneys.com

f) Any other consultant representing the Applicant before the Board N/A

Firm Name:	Lloyd Gosselink, Attorneys at Law
Contact:	Lauren Kalisek
Address:	816 Congress Ave, STE 1900, Austin, TX 78701
Phone:	512-322-5800
Fax:	512.472.0532
Email:	lkalisek@lglawfirm.com

7. List the counties within the Applicant's service area. Collin, Hunt, Rockwall, Dallas, Kaufman, Ellis, Rains, Fannin, Denton
8. Identify the Applicant's total service area population: Over 1.6M
9. Applicant is requesting funding from which programs? Check all that apply.

	PROGRAM	AMOUNT REQUESTED
a) <input type="checkbox"/>	Drinking Water State Revolving Fund (DWSRF)	\$ _____
b) <input type="checkbox"/>	Clean Water State Revolving Fund (CWSRF)	\$ _____
c) <input type="checkbox"/>	Texas Water Development Fund (DFund)	\$ _____
d) <input type="checkbox"/>	State Participation	\$ _____
e) <input type="checkbox"/>	Rural Water Assistance Fund (RWAFF)	\$ _____
f) <input checked="" type="checkbox"/>	State Water Implementation Fund for Texas (SWIFT)	

Lower Bois d'Arc Creek Reservoir - \$713,072,510
 Treatment and Treated Water Distribution - \$404,331,800
 Total - **\$1,117,404,310**

See Attached FY 17 SWIFT Application Project Table

- | | | |
|-----------------------------|--|----------|
| g) <input type="checkbox"/> | Economically Distressed Areas Program (EDAP) | \$ _____ |
| h) <input type="checkbox"/> | If other please explain: _____ | \$ _____ |

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

10. Other Funding Sources: Provide a list of any other funding source(s) being utilized to complete the project, including Applicant's local contribution, if any, or commitments applied for and/or received from any other funding agency for this project or any aspect of this project. **Provide commitment letters if available. Additional funding sources must be included within the Project Budget (TWDB-1201).**

Funding Source	Type of Funds (Loan/Grant)	Amount (\$)	Date Applied for Funding	Anticipated or Funding Secured Date
SWIFT	Loan (LBCR)	\$713,072,510	4/28/2017	12/21/2017
SWIFT	Loan (Treatment and Treated Water Distribution)	\$404,331,800	4/28/2017	12/21/2017
SWIFT	Loan(Cost of Issuance)	\$59,575,690	4/28/2017	12/21/2017
Rev Bonds	Loan	\$154,644,050	Misc	Misc
Cap Imp	Cash	\$96,634,003	NA	NA
Total Funding from All Sources		\$1,428,258,053		

Comments: _____

11. Applicant is requesting funding for which phase(s)? Check all that apply.

- Planning
- Acquisition
- Design
- Construction

12. Is Applicant requesting funding to refinance existing debt?

- Yes If yes, attach a copy of the document securing the debt to be refinanced.
- Attached document**
- No

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

Part B: Legal Information

13. Cite the legal authority under which the Applicant can issue the proposed debt including the authority to make a proposed pledge of revenues. Chapter 62, Acts of the 52nd Legislature of the State of Texas, Regular Session, as amended

14. What type of pledge will be used to repay the proposed debt?

- Systems Revenue
- Taxes
- Combination of systems revenues and taxes
- Other (Contract Revenue, etc.)

15. Provide the full legal name of the security for the proposed debt issue(s). North Texas Municipal Water District Water System Revenue Bonds, Series 2017

16. Describe the pledge being offered and any existing rate covenants. Contract Revenues Payable by the Member Cities currently, Allen, Farmersville, Forney, Frisco, Garland, McKinney, Mesquite, Plano, Princeton, Richardson, Rockwall, Royse City and Wylie. Rate Covenant is 1.00 times debt service

17. Attach the resolution from the governing body requesting financial assistance.

TWDB-0201A (<http://www.twdb.texas.gov/financial/instructions/>)

Attached Draft Resolution

A copy of the signed Resolution will be overnighted to you on Friday for Monday delivery

18. Attach the Application Affidavit

TWDB-0201 (<http://www.twdb.texas.gov/financial/instructions/>)

Attached Draft Application Affidavit

The signed Affidavit will be overnighted to you on Friday for Monday delivery

19. Attach the Certificate of Secretary

TWDB-201B (<http://www.twdb.texas.gov/financial/instructions/>)

Attached Draft Certificate of Secretary

The signed Certificate of Secretary will be overnighted to you on Friday for Monday delivery.

20. Is the applicant a Water Supply Corporation (WSC)?

Yes If yes, attach each of the following:

- Articles of Incorporation**
- Certificate of Incorporation from the Texas Secretary of State evidencing that the current Articles of Incorporation are on file with the Secretary**
- By-laws and any amendments**
- Certificate of Status from the Texas Secretary of State (i.e. Certificate of Existence)**
- Certificate of Account Status from the Texas Comptroller of Public Accounts (certifies that the WSC is exempt from the franchise tax and that the WSC is in good standing).**

No

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

21. Is the applicant proposing to issue revenue bonds?
 Yes If yes, attach copies of the most recent resolution/ordinance(s) authorizing any outstanding parity debt. This is essential to insure outstanding bond covenants are consistent with covenants that might be required for TWDB financing.
 Attached resolution/ordinance(s)
 No
22. Does the applicant possess a Certificate of Convenience and Necessity (CCN)?
 Yes If yes, attach a copy of the CCN and service area map showing the areas the applicant is allowed to provide water or wastewater services.
 Attached CCN and service area map
 No If no, indicate the status of the CCN. _____
 N/A
23. Has the applicant been the subject of any enforcement action by the Texas Commission on Environmental Quality (TCEQ), the Environmental Protection Agency (EPA), or any other entity within the past three years?
 Yes If yes, attach a brief description of every enforcement action within the past three years and action(s) to address requirements.
 Attached
 No
24. Are any facilities to be constructed or the area to be served within the service are of a municipality or other public utility?
 Yes If yes, has the applicant obtained an affidavit stating that the utility does not object to the construction and operation of the services and facilities in its service area?
 If yes, attach a copy of the affidavit.
 Attached affidavit
 If no, provide an explanation as to why not. NTMWD and Bois d'Arc Municipal Water District have executed a Settlement Agreement. Agreement is Attached.
 No

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

25. If the assistance requested is more than \$500,000 a Water Conservation Plan (WCP) is required. The WCP cannot be more than **FIVE** years old and must have been adopted by the applicant. Has the applicant adopted a Board-approved WCP? (Check one and attach requested information, if any.)

- Yes Enter date of Applicant's WCP adoption: 2/27/14
- No If no, attach a copy of a draft Water Conservation Plan and Drought Contingency Plan prepared in accordance with the TWDB WCP Checklist (<http://www.twdb.state.tx.us/financial/instructions/doc/TWDB-1968.pdf>)
- Attached Draft WCP and Drought Contingency Plan**
- Attached Utility Profile TWDB-1965**
- <http://www.twdb.state.tx.us/financial/instructions/doc/TWDB-1965.pdf>
- N/A (Request is \$500,000 or less per Water Code §§ 15.106(c), 17.125(c), 17.277(c), and 17.857(c))

Note: If the applicant will utilize the project financed by the TWDB to furnish services to another entity that in turn will furnish services to the ultimate consumer, the requirements for the WCP may be met through contractual agreements between the applicant and the other entity providing for establishment of a water conservation plan. The provision requiring a WCP shall be included in the contract at the earliest of: the original execution, renewal or substantial amendment of that contract, or by other appropriate measures.

26. Does the applicant provide retail water services?

- Yes If yes, has the applicant already submitted to the TWDB the annual water use survey of groundwater and surface water for the last **THREE** years?
- Yes
- No If no, please download survey forms and attach a copy of the completed water use surveys to the application.
- <http://www.twdb.texas.gov/waterplanning/waterusesurvey/index.asp>
- Attached Water Use Survey**
- No

27. Is the applicant a retail public utility that provides potable water?

- Yes If yes, has the applicant already submitted the most recently required water loss audit to the TWDB?
- Yes
- No If no, and if applying for a water supply project, please complete the online TWDB Water Audit worksheet found at <http://www.twdb.texas.gov/conservation/resources/waterloss-resources.asp> and attach a copy to the application.
- Attached TWDB Water Audit worksheet**
- No

28. Does the Applicant provide wastewater services?

- Yes
- No

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

Part C: Financial Information

Regional or wholesale providers, complete questions 29-31.

Retail providers, complete questions 32-34.

29. List top **TEN** customers of the system by annual usage in gallons and percentage of total usage, including whether any are in bankruptcy.

Customer Name	Annual Usage (gal)	Percent of Usage	Bankruptcy (Y/N)
Plano	21,460,479,000	22%	N
McKinney	10,762,780,000	11%	N
Garland	10,642,929,000	11%	N
Frisco	10,225,090,000	11%	N
Richardson	8,545,084,000	9%	N
Mesquite	6,045,214,000	6%	N
Allen	5,511,594,000	6%	N
Rockwall	2,580,448,000	3%	N
Rowlett	2,616,367,000	3%	N
Wylie	1,877,558,000	2%	N

Comments: For 2016 Water Year (August 1 through July 31)

30. List the top TEN customers of the system by gross revenues and percent of total revenues, including whether any are in bankruptcy

Customer Name	Annual Revenue(\$)	Percent of Revenue	Bankruptcy (Y/N)
Plano	\$59,032,037	23%	N
Garland	\$30,160,876	12%	N
Richardson	\$24,219,789	10%	N
McKinney	\$23,496,122	9%	N
Frisco	\$22,950,293	9%	N
Mesquite	\$18,078,150	7%	N
Allen	\$13,560,825	5%	N
Rockwall	\$7,320,040	3%	N
Rowlett	\$7,233,346	3%	N
Wylie	\$4,006,713	2%	N

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

31. Provide a summary of the wholesale contracts with customers

Contract Type	Minimum annual amount	Usage fee per 1,000 gallons	Annual Operations and Maintenance	Annual Capital Costs	Annual Debt Service	Other
ATTACHED						

32. List top **TEN** customers of the water and/or wastewater system by annual revenue with corresponding usage and percentage of total use, including whether any are in bankruptcy.

a. **WATER**

Customer Name	Annual Usage (gal)	Percent of Total Water Revenue	Bankruptcy (Y/N)
Plano	21,460,479,000	23%	N
Garland	10,642,929,000	12%	N
Richardson	8,545,084,000	10%	N
McKinney	10,762,780,000	9%	N
Frisco	10,225,090,000	9%	N
Mesquite	6,045,214,000	7%	N
Allen	5,511,594,000	5%	N
Rockwall	2,580,448,000	3%	N
Rowlett	2,616,367,000	3%	N
Wylie	1,877,558,000	2%	N

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

b. **WASTEWATER**

Customer Name	Annual Usage (gal)	Percent of Total Wastewater Revenue	Bankruptcy (Y/N)
N/A			

33. Current Average Residential Usage and Rate Information

Service	Date of Last Rate Increase	Avg. Monthly Usage (gallons)	Avg. Monthly Bill (\$)	Avg. Monthly Increase Per Customer(\$)	Projected Monthly Increase Necessary (\$)
Water	N/A				
Wastewater					

34. Provide the number of customers for each of the past five years.

Year	Number of Customers
2016	46
2015	46
2014	46
2013	46
2012	45

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

All applicants complete questions 35-51 of the financial section, as applicable.

35. Disclose all issues that may affect the project or the applicant's ability to issue and/or repay debt (such as anticipated lawsuits, judgments, bankruptcies, major customer closings, etc.).
On December 14, 2016, District member cities Garland, Mesquite, Plano and Richardson (collectively the "PUC Petitioners") filed a petition at the Public Utility Commission (the "PUC") to appeal the charges imposed on the PUC Petitioners pursuant to the Regional Water Supply Facilities Amendatory Contract (the "Contract"). See PUC Petition, PUC Docket No. 46662. The District disputes the allegations contained in the PUC Petition and, on February 6, 2017, filed a Motion to Dismiss in response thereto. See PUC Response. All other member cities of the District have intervened in the PUC action. The PUC has not taken jurisdiction of the matter or issued any substantive ruling as of the date of this filing. All pleadings in the PUC action are available at the PUC's website, www.puc.texas.gov.

On March 1, 2017, in further defense of the PUC action and to seek prompt resolution of the issue, the District filed suit for expedited declaratory relief pursuant to Chapter 1205, Texas Government Code ("Chapter 1205"), seeking a declaration as to the validity of the Contract and the method of cost allocation contained therein. See Chapter 1205 Petition, *Ex Parte North Texas Municipal Water District*, Cause No. D-1-GN-17-000861, in the 98th District Court of Travis County, Texas, **Exhibit A**. Notice of this proceeding has been provided to all required parties, and the court has set hearings on dispositive motions for June 13, 2017 and June 20, 2017.

Also on March 1, 2017, the District filed a Petition for Declaratory Judgment, Application for Temporary Restraining Order, Temporary Injunction and Permanent Injunction against the PUC pursuant to section 2001.038 of the Texas Administrative Procedure Act (APA) seeking injunction or dismissal of the PUC action. See APA Petition, *North Texas Municipal Water District v. Public Utility Commission of Texas*, Cause No. D-1-GN-17-000877, in the 419th District Court of Travis County, Texas, **Exhibit B**. A hearing on the merits has been set by the court for May 31, 2017.

Exhibit A Attached
Exhibit B Attached

36. Has the applicant ever defaulted on any debt?
 Yes If yes, disclose all circumstances surrounding prior default(s). _____
 No

37. Does the applicant have taxing authority?
 Yes
 No

38. Provide the last five-years of data showing total taxable assessed valuation including net ad valorem taxes levied, corresponding tax rate (detailing debt service and general purposes), and tax collection rate.

Fiscal Year Ending	Net Taxable Assessed Value (\$)	Tax Rate	General Fund	Interest & Sinking Fund	Tax Levy \$	Percentage Current Collections	Percentage Total Collections
20							
20							
20							
20							
20							

Comments: N/A

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

39. Attach the last five-years of tax assessed values delineated by Classification (Residential, Commercial and Industrial). **If applicant does not have taxing authority, provide the assessed values of the county.**

- a) 2016 attached
- b) 2015 attached
- c) 2014 attached
- d) 2013 attached
- e) 2012 attached

40. Attach the direct and overlapping tax rate table:

- Attached tax rate table

41. Provide the current top **TEN** taxpayers showing percentage of ownership to total assessed valuation. State if any are in bankruptcy and explain anticipated prospective impacts in the Comments blank, below. If any of these have changed in the past three years, please provide information on the changes to the top ten.

Taxpayer Name	Assessed Value	Percent of Total	Bankruptcy (Y/N)
Oncor Electric Delivery	\$543,516,000	50%	N
BCS Office Investments One LP	\$362,453,000	33%	N
Stonebriar Mall LTD Partnership	\$287,982,000	26%	N
Bank of America NA (Corporate Offices)	\$252,609,000	23%	N
QORVO Texas LLC	\$190,075,000	17%	N
Bank of America NA (Branch Offices)	\$186,335,000	17%	N
JC Penny Co Inc	\$166,000,000	15%	N
AT&T Mobility LLC	\$161,911,000	15%	N
HP Enterprise Services LLC	\$151,351,000	14%	N
Village At Allen LP	\$147,302,000	14%	N

Comments: Per Collin County Texas 2016 Comprehensive Annual Financial Report for Fiscal Year Ended September 30,2016

42. Provide the maximum tax rate permitted by law per \$100 of property value. N/A

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

43. Does the applicant collect sales tax?

Yes Provide the sales tax collection history for the past five years.

Fiscal Year Ending	Total Collections
20	
20	
20	
20	
20	

No

44. Indicate the tax status of the proposed loan?

Tax-Exempt

Taxable

45. Proforma (**Select one of the four listed below**) Please be sure the proforma reflects the schedule requested, including multi-phased funding options.

a. System revenues are anticipated to be used to repay the proposed debt. Attach a proforma indicating the following information for each year the debt is outstanding:

- projected gross revenues
- operating and maintenance expenditures
- outstanding and proposed debt service requirements
- net revenues available for debt service and coverage of current and proposed debt paid from revenues

b. Taxes are anticipated to be used to repay the proposed debt. Attach a pro forma indicating the following information for each year the debt is outstanding:

- outstanding and proposed debt service requirements
- the tax rate necessary to repay current and proposed debt paid from taxes
- list the assumed collection rate and tax base used to prepare the schedule

c. Combination of system revenues and taxes to be used to repay the proposed debt. Attach a pro forma indicating the following information for each year the debt is outstanding:

- projected gross revenues, operating and maintenance expenditures, net revenues available for debt service
- outstanding and proposed debt service requirements
- the tax rate necessary to pay the current and proposed debt
- list the assumed collection rate and tax base used to prepare the schedule

d. Another type of pledge will be used to repay the proposed debt. Attach a pro forma with information for each year the debt is outstanding, which includes projected revenues, annual expenditures, outstanding debt requirements, and revenues available for debt service.

Attached

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

46. Attach a **FIVE** year comparative system operating statement (not condensed) including audited prior years and an unaudited year-to-date statement. Unaudited year-to-date statement must reflect the financial status for a period not exceeding the latest six months.

Attached Operating Statement.

47. Attach **ONE** copy of an annual audit of financial statements, including the management letter, for the preceding fiscal year prepared by a certified public accountant or firm of accountants and, if the last annual audit was more than 6 months ago, then, provide interim financial information.

Attached Annual Audit

Attached Management Letter

If applicable, attached interim financial information

48. Does the applicant have any outstanding debt? (Check all that apply)

Yes, General obligation debt

Yes, Revenue debt

Yes, Authorized but unissued debt

No

49. Attach a listing of total outstanding debt and identify the debt holder. Segregate by type (General Obligation or Revenue) and present a consolidated schedule for each, showing total annual requirements. Note any authorized but unissued debt.

a. General Obligation Debt:

Yes

Attached schedule. The schedule should also identify the debt holder.

No

b. Revenue:

Yes

Attached schedule. The schedule should also identify the debt holder.

No

c. Authorized by Unissued Debt:

Yes

Attached schedule. The schedule should also identify the debt holder.

No

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

50. List the ten largest employers of the Applicant's service area:

Name	Number of Employees
HP Enterprise Svc LLC	10,000
JP Morgan Chase & CO	6,000
Bank of America Home Loans	4,646
Liberty Mutual Insurance	4,000
Toyota	4,000
JC Penny Corporate	3,800
Capital One	3,683
University of Texas at Dallas	3,500
Blue Cross and Blue Shield of Texas	3,100
Medical Center of Plano	3,000

Comments (example, any anticipated changes to the tax base, employers etc.) Per Collin County Texas 2016 Comprehensive Annual Financial Report for Fiscal Year Ended September 30,2016.

51. Provide any current bond ratings with date received.

	Standard & Poor's	Date Received	Moody's	Date Received	Fitch	Date Received
G.O.						
Revenue	AAA	4/16/16	Aa2	10/27/16	NA	NA

52. Is the project intended to allow the applicant to provide or receive water or sewer services to or from another entity?

- Yes. If yes, the applicant must attach, at a minimum, the proposed agreement, contract, or other documentation establishing the service relationship, with the final and binding agreements provided prior to loan closing.
- Attached**
- No.

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

Part D: Project Information

53. Description of Project Need (for example, is the project needed to address a current compliance issue, avoid potential compliance issues, extend service, expand capacity, etc.):

Please Reference the Draft Environmental Impact Statement (DEIS) issued by the U.S. Army Corps of Engineers and dated March 2017. The "Purpose Need" section on Page ES-2 of the Executive Summary discusses the need for the LBCR project. The LBCR project detailed in the DEIS terminates at the proposed Leonard Water Treatment Plant (LWTP). In addition to this description, the NTMWD has a separate Capital Improvements Program (CIP) pipeline that will allow the new water supply to enter the existing NTMWD distribution system. This 84" pipeline from Leonard to McKinney is being executed under the overall NTMWD LBCR Program.

54. Description of Project, including a bulleted list of project elements/components, and alternatives considered (including existing facilities):

- **Please see Section 1.1 of the DEIS for a description of the LBCR Project. This section begins on Page 1-1 of the DEIS.**
- **The 84" Pipeline from the LWTP to Hwy 5 Pump Station (McKinney No. 4) extends from the proposed LWTP site to the NTMWD's 84-inch North McKinney Phase 3 Pipeline located just east of State Highway 5 in north McKinney, Texas. The NTMWD will be acquiring sufficient easement for the proposed pipeline to install a future parallel 84-inch pipeline as the capacity of the LWTP is increased.**
- **It is important to document how the NTMWD has organized the LBCR Program. There is an overall program management function that is staffed by NTMWD personnel as well as outsourced program management consultants. The design and execution of the projects has been organized under five Construction Managers at Risk (CMARs). On the file titled "FY 17 SWIFT Application Project Table" there is references to six categories the NTMWD projects fall within. These are; (1) Program, (2) CMAR 1, (3) CMAR 2, (4) CMAR 3, (5) CMAR 4, and (6) CMAR 5. A description of each of these categories is below;**
 - **Program – These are items specifically related to permitting, archeological, or program management functions.**
 - **CMAR 1 – These are the design and construction projects as well as property acquisition related to the Dam, Terminal Storage Reservoir, and Reservoir Clearing.**
 - **CMAR 2- These are the design and construction projects as well as property acquisition related to the mitigation.**
 - **CMAR 3 - These are the design and construction projects as well as property acquisition related to the water treatment plant, raw water pump station, and high service pump station.**
 - **CMAR 4 - These are the design and construction projects as well as property acquisition related to the road improvements and boat ramps.**
 - **CMAR 5 - These are the design and construction projects as well as property acquisition related to the pipelines.**
- **Due to the multi-project nature of the LBCR Program and the fact that many of the components are in various stages of planning and design, there is not a single engineering feasibility document that can be provided. The file titled "FY 17 SWIFT Application Project Table" summarizes by project the supporting documentation file that the NTMWD is submitting in support of the SWIFT application.**

A complete preliminary engineering feasibility data must include:

- a. A description and purpose of the project, including existing facilities.
 - Note: CWSRF and DWSRF must address issues scored in Intended Use Plan submittal

Attached

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

- b. **If project is for Construction only, then attach** the appropriate Engineering Feasibility Report:
 - a) **Water** (TWDB-0555 at <http://www.twdb.texas.gov/financial/instructions/doc/TWDB-0555.pdf>)
 Attached
 - b) **Wastewater** (TWDB-0556 at <http://www.twdb.texas.gov/financial/instructions/doc/TWDB-0556.pdf>)
 Attached
- c. DWSRF applicants must complete a Projected Draw Schedule (TWDB-1202 at <http://www.twdb.texas.gov/financial/instructions/doc/TWDB-1202.xls>)

55. Water Made Available (For projects requesting a construction component):

a.

1 Lower Bois d'Arc Creek Reservoir

- o New supply 120,665 (acre-feet/year) 713,072,510 (\$) capital cost
- o The **increase** in the total annual volume of water supply that will be made available to the recipient(s) by the proposed project.
- o Water Plan project examples: new groundwater wells, reservoir development, pipelines to sources.

2 Treatment and Treated Water Distribution

- o New supply 120,665 (acre-feet/year) 404,331,800 (\$) capital cost
- o The **increase** in the total annual volume of water supply that will be made available to the recipient(s) by the proposed project.
- o Water Plan project examples: new groundwater wells, reservoir development, pipelines to sources.

b. *New Conservation savings* _____ (acre-feet/year) _____ (\$) capital cost

- o Annual volume of anticipated water savings resulting from implementation of the proposed conservation project including water loss) and other conservation activities,
- o Water Plan project examples: municipal conservation, advanced Water Conservation, on-farm conservation, brush control, irrigation conservation.

c. *New Reuse supply* _____ (acre-feet/year) _____ (\$) capital cost

- o Increase in the annual volume of (direct or indirect) reuse water supply that will be made available to the recipient(s) by the proposed project.
- o Water Plan project examples: direct reuse, non-potable reuse, recycled water programs.

d. *Maintenance of Current Supply* _____ (acre-feet/year) _____ (\$) capital cost

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

- Volume of recipients' current supplies that will be maintained by implementing the proposed project
- Water Plan project examples: None. Not a water plan project. (Examples of these type projects: treatment rehabilitation, system storage facilities, system upgrades).

56. Project Location:

Please see the submitted file titled "LBCR Project Location Map.PDF" for an overall project location map.

Attach a map of the service area and drawings as necessary to locate and describe the project. The map should show the project footprint and major project components.

Attached

57. Attach the Census tract numbers in which the applicant's service area is within. The Census tracts within your area may be found at:

<http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>

Please follow these steps:

- Select Advanced Search.
- Select the Geographies button located below Topics (left side of page).
- On the top of the window select the Name tab.
- In the text box, type "All Census Tracts within___" (Fill in the blank with the name of a County Subdivision or a Place.) Select "Go".
- If your town is a County Subdivision, select the geography labeled "All Census Tracts (or parts) within City, County, State" from the Geography Results. If your town is a place select the geography labeled "All Census Tracts (or parts) full-or-partially within City, State" from the Geography Results.
- Close the Geographies Search window.
- Use the Topics on the left side of the page to further refine your search or to select a table(s) from your search results.

Attached Census tracts

58. Project Schedule:

- a) Requested loan closing date.
December 21, 2017
- b) Estimated date to submit environmental planning documents.
Actual submittal date: March 23, 2017
- c) Estimated date to submit engineering planning documents.
Engineering planning documents for the dam, reservoir clearing, raw water pump station, mitigation (Riverby Ranch), FM 897, Fannin County Roads, raw water pipeline, treated water pipeline, terminal storage reservoir, Leonard WTP, FM 897 Extension, Fannin County Roads **are submitted** with this application. Engineering planning documents for the Leonard High Service Pump Station will be submitted in July 2017.
- d) Estimated date for completion of design.
Design of the dam and FM 897 are complete. The design for all other components will be complete by September 2019.

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

- e) Estimated Construction start date for first contract.
April 2018
- f) Estimated Construction end date for last contract.
March 15, 2022

59. **Attach** a copy of current and future populations and projected water use or wastewater flows. Include entities to be served.

Lower Bois d’Arc Creek Reservoir

Attached

Treatment and Treated Water Distribution

Attached

60. Attach the most current itemized project cost estimate (include all costs and funding sources). Utilize the budget format provided (TWDB-1201 at <http://www.twdb.texas.gov/financial/instructions/>). If applying for pre-construction costs only (i.e., P, A, D) then itemize only the relevant portions in the attached budget template

Lower Bois d’Arc Creek Reservoir

Attached

Treatment and Treated Water Distribution

Attached

61. Attach the appropriate Project Information Form:

Wastewater: Attached a completed Wastewater Project Information Form WRD-253a <http://www.twdb.texas.gov/financial/instructions/index.asp>

Water: Attached a completed Water Project Information Form

Lower Bois d’Arc Creek Reservoir

WRD-253d <http://www.twdb.texas.gov/financial/instructions/index.asp>

Water: Attached a completed Water Project Information Form

Treatment and Treated Water Distribution

WRD-253d <http://www.twdb.texas.gov/financial/instructions/index.asp>

62. If the project is for Construction only, wastewater projects that involve the construction of a new plant or the expansion of an existing plant and/or associated facilities, attach evidence that an application for a new Texas Pollution Discharge Elimination System Permit or amendment to an existing permit related to the proposed project has been filed with the Texas Commission on Environmental Quality (TCEQ). Final permit authorization must be obtained from the TCEQ before funds can be released for construction activities.

Attached

No. Provide explanation: N/A

63. If this project will result in: (a) an increase by the applicant in the use of groundwater, (b) drilling a new water well, or (c) an increase by the applicant in use of surface water, then the applicant must demonstrate that it has acquired – by contract, ownership or lease – the necessary property rights, groundwater permits, and/or surface water rights sufficient for the project before funds can be released for construction.

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

a) Does the applicant currently own all the property rights, groundwater permits and surface water rights needed for this project?

- Yes If yes, please attach the completed, appropriate form.
1. WRD 208A (<http://www.twdb.texas.gov/financial/instructions/index.asp>) (Surface Water)
 - Attached**
 2. WRD 208B (<http://www.twdb.texas.gov/financial/instructions/index.asp>) (Groundwater)
 - Attached**
- No
- N/A

b) If all property rights, groundwater permits, and surface water rights, needed for this project have not yet been acquired, identify the rights and/or permits that will need to be acquired and provide the anticipated date by which the applicant expects to have acquired such rights and/or permits.

Type of Permit Water Right	Entity from which the permit or right must be acquired	Acquired by lease or full ownership	Expected acquisition date	Permit / Water Right ID No.
N/A				

c) List any major permits not identified elsewhere that are necessary for completion of project. Also, list any more necessary minor permits that may involve particular difficulty due to the nature of the proposed project.

Permit	Issuing Entity	Permit Acquired (Y/N)
404	USACE	N

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

64. Has the applicant obtained all necessary land and easements for the project?

Yes. If yes, attach the site certificate (ED-101 at <http://www.twdb.texas.gov/financial/instructions/index.asp>)
 Attached

No. If no, **fill out the table below** and describe the land or easements that will need to be acquired, provide the anticipated date by which the applicant expects to have the land or easements, and indicate if funding from TWDB is to be used for the acquisition.

Description of Land or Easement Permit	Entity from which the permit or right must be acquired	Acquired by lease or full ownership	Expected acquisition date	To Be Funded by TWDB (Yes/No)
See Attached				

Comments: See attached "Property to be Purchased reservoir", "Property to be Purchased Raw Water PL", "Treated Water Pipeline Property – Description", "Treated Water Pipeline Property – Table 1", & "Treated Water Pipeline Property – Table 2"

65. Has a Categorical Exclusion (CE), Determination of No Effect (DNE), Finding of No Significant Impact (FONSI), Record of Decision (ROD), or any other environmental determination been issued for this project?

Yes
 Attach a copy of the finding.
 No

66. Is the project potentially eligible for a Categorical Exclusion (CE)/ Determination of No Effect (DNE) because it involves only minor rehabilitation or the functional replacement of existing equipment?

Yes
 No

67. Are there potentially adverse environmental or social impacts that may require mitigation or extensive regulatory agency or public coordination (e.g. known impacts to properties eligible for listing on the National Register of Historic Places; potentially significant public controversy; need for an individual permit from the U.S. Army Corps of Engineers)?

Yes
 If yes, attach additional information
See Attached Draft EIS in Part D Questions 53 & 54
 No

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

Part E: State Water Implementation Fund for Texas (SWIFT) Applicants Only:

68. Identify the type of SWIFT funding (If more than one funding option is being requested indicate the amount of funding for each):

- Deferred \$
 - Low Interest Loan
- Lower Bois d'Arc Creek Reservoir – \$713,072,510
Treatment and Treated Water Distribution - \$404,331,800
Total - **\$1,117,404,310**
- Board Participation \$

69. For multi-year funding request or phased commitments, provide a schedule reflecting the closing dates for each loan requested.

Attached

70. **Notice to SWIFT Applicants:** Texas Water Code Sec. 15.435(h) requires all recipients of financial assistance from the SWIFT to acknowledge any applicable legal obligations in federal law, related to contracting with disadvantaged business enterprises, and state law, related to contracting with historically underutilized businesses. Checking the boxes below serves as this acknowledgement.

As an applicant for financial assistance from SWIFT, I acknowledge that this project must comply with any applicable legal obligations in federal law related to contracting with disadvantaged business enterprises.

As an applicant for financial assistance from SWIFT, I acknowledge that this project must comply with applicable legal obligations in state law (Texas Government Code Chapter 2161 and Texas Administrative Code Chapter 20, Subchapter B) related to contracting with historically underutilized businesses.

71. Provide drafts of the following documents:

- a. Proposed Bond Ordinance
- Attached**
- b. Private Placement Memorandum
- Attached**

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

Part F: Economically Distressed Programs (EDAP) Applicants Only:

In accordance with TWDB Rules (31 TAC Chapter 363), an application for EDAP will **not** be considered until the County has adopted and is enforcing the Model Subdivision Rules (MSRs) Texas Water Code § 16.343. If the proposed project is within a municipality or its extraterritorial jurisdiction (ETJ), or if the applicant is a municipality, the municipality must also have adopted and be enforcing MSRs.

72. Describe procedures for collecting monthly customer bills (include procedures for collection of delinquent accounts)

73. Is financing being requested for a **wastewater** project?
 Yes If yes, does the applicant have the required resolution/ordinance establishing a mandatory hookup policy?
 Yes. If yes, attach a copy of the resolution/ordinance.
 Attached
 No. If no, explain _____
 No
74. Required documentation for the project area for Preliminary EDAP Eligibility (31 TAC Chapter 363)
 Attached documentation of inadequacy of water and/or wastewater services.
 Attached documentation regarding the financial resources of the residential users in the EDAP area. Census data or documentation regarding median household income should be provided.
 Attached documentation demonstrating existence of a residence in the project area prior to **June 1, 2005**. This could include tax records of residence, dated aerial maps, or, other documentation demonstrating existence of a residence.
75. Has the Department of State Health Services issued a determination stating a public health nuisance exists in the project area?
 Yes If yes, attach a copy of the determination.
 Attached
 No If no determination exists, attach documentation demonstrating a public health nuisance exists in the project area. (*Photographs may be submitted, but they **must** be labeled with location and date when taken. If the soil types are mentioned in the project area as an issue, include soil profile maps*) This documentation will be used by TWDB staff to request a determination from the Department of State Health Services
 Attached
76. Is this project providing new service?
 Yes If yes, attach plats of the affected subdivisions.
 Attached
 No
77. Attach an EDAP Facility Engineering Plan/Scope of Services report that complies with the requirements of WRD-023A. <http://www.twdb.texas.gov/financial/instructions/index.asp>
 Attached

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

Part G: CWSRF/DWSRF Applicants Only

Only applicants applying for funding from the CWSRF and DWSRF Programs must complete this section.

Pursuant to Federal Funding Accountability and Transparency Act (FFATA) the applicant is required to obtain a DUNS number that will represent a universal identifier for all federal funding assistance. DUNS numbers can be obtained from Dun and Bradstreet at <http://fedgov.dnb.com/webform/>

78. Applicant's Data Universal Number System (DUNS) Number:
DUNS _____

Pursuant to Federal Funding Accountability and Transparency Act (FFATA) the applicant is required to register with System for Award Management (SAM) and maintain current registration at all times during which the Board loan agreement is active or under consideration by the Board. Register at: <https://sam.gov>.

79. The applicant has registered and will maintain current SAM registration at all times during which a federal subaward is active or under consideration by the Board.
 Yes
 No

80. Federal Awards information:

1. Did applicant receive over 80% of their revenue from Federal Awards last year?

Yes
 No

2. Did applicant receive over \$25 million in Federal Awards last year?

Yes
 No

3. Public does not have access to executive compensation information via SEC or IRS reports?

Yes
 No

81. If applicant checked **YES** to **ALL** three boxes in 3 above, applicant is required to disclose the name and compensation of the five most highly compensated officers.

Officer's Name	Officer's Compensation (\$)

82. Complete form WRD 213 (<http://www.twdb.texas.gov/financial/instructions/index.asp>) - Certification Regarding Lobbying

Attached Yes
 No
 N/A

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

83. If applying for CWSRF Equivalency or DWSRF, **attach** the Certification Regarding Debarment, Suspension and Other Responsibility. SRF-404
(<http://www.twdb.texas.gov/financial/instructions/doc/SRF-404.pdf>)

Attached Yes
 No
 N/A

84. If applying for CWSRF Equivalency or DWSRF, **attach** the Assurances – Construction Programs. EPA-424D (<http://www.twdb.texas.gov/financial/doc/EPA-424D.pdf>)

Attached Yes
 No
 N/A

85. The applicant must comply with the Davis-Bacon Act regarding prevailing wage rates. The applicant acknowledges that they are aware of, and will abide by, the Davis-Bacon Act requirements.

Yes
 No

Further information on the Davis-Bacon requirement is available through the TWDB Guidance document, DB-0156 (<http://www.twdb.texas.gov/financial/instructions/index.asp>)

All project costs funded by the TWDB through CWSRF Equivalency or DWSRF must comply with the federal Disadvantaged Business Enterprise (DBE) program rules and requirements. The federal DBE program requires a good faith effort to contract with DBE's for all procurements including: professional and non-professional consulting services, equipment, supplies and construction to be funded by federal equivalency dollars. Guidance and forms are found at:

TWDB-0210 (<http://www.twdb.texas.gov/financial/instructions/doc/TWDB-0210.pdf>)

86. **At a minimum, you must complete and attach** the Applicant Affirmative Steps Certification and Goals. This form is required to obtain a financial assistance commitment.

TWDB-0215 (<http://www.twdb.texas.gov/financial/instructions/doc/TWDB-0215.pdf>)

Attached Yes
 No

87. If you have already solicited contractors, complete and attach the Affirmative Steps Solicitation Report. This form is required prior to loan closing and release of any funds; therefore, if this question is not applicable at this time, select N/A.

TWDB-216 (<http://www.twdb.texas.gov/financial/instructions/doc/TWDB-0216.pdf>)

Attached Yes
 No
 N/A

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

88. If you have awarded contracts to contractors, complete and attach the Loan/Grant Participation Summary. This form must be submitted for review prior to loan closing and release of funds. This form is required prior to loan closing and release of any funds; therefore, if this question is not applicable at this time, select N/A.

TWDB-0373 (<http://www.twdb.texas.gov/financial/doc/TWDB-0373.pdf>)

Attached Yes
 No
 N/A

89. All Contractors that have been awarded will need to complete and attach the Prime Contractor Affirmative Steps Certification and Goals This form is required prior to loan closing and release of any funds; therefore, if this question is not applicable at this time, select N/A.

TWDB-217 (<http://www.twdb.texas.gov/financial/instructions/doc/TWDB-0217.pdf>)

Attached Yes
 No
 N/A

90. **All CWSRF applicants** must be a Designated Management Agency (DMA) for wastewater collection and treatment. Please complete and attach DMA resolutions. WRD-210 (<http://www.twdb.texas.gov/financial/doc/WRD-210.pdf>) is an example of this type of resolution.

 Attached
 N/A

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

Part H: Documentation of "Green" Projects and Project Components

CWSRF and DWSRF Applicants Only

All SRF applicants must complete this section if green benefits are all or part of the project (**more than an incidental benefit**). Project is defined as the entire project or a stand-alone component of the project. This section is required so that the TWDB may determine whether the project qualifies as "green" pursuant to Environmental Protection Agency (EPA) Guidance.

A project (or project component) is "green" if the primary purpose qualifies under EPA Guidance as one of the following:

- a. Green Infrastructure,
- b. Water Efficiency-related,
- c. Energy Efficiency-related, or
- d. Environmentally Innovative.

You must use the Green Project Reserve guidance to complete this section. Current guidance may be found at: **Green Project Reserve: Guidance for determining project eligibility**
TWDB-0161 (<http://www.twdb.texas.gov/financial/instructions/doc/TWDB-0161.pdf>)

91. Does your project or a component of your project qualify as Green, per EPA guidance?
- Yes
 No

If Yes, Please complete the remainder of Section G.

92. Type of Green Project
- Water Efficiency Energy Efficiency Green Infrastructure Environmentally Innovative

93. The correct worksheets must be completed.
Green Project Reserve: CWSRF Green Project Worksheets
TWDB-0162 (<http://www.twdb.texas.gov/financial/instructions/doc/TWDB-0162.pdf>)
- Attached** Yes
 No
 N/A

- Green Project Reserve: DWSRF Green Project Worksheets**
TWDB-0163 (<http://www.twdb.texas.gov/financial/instructions/doc/TWDB-0163.pdf>)
- Attached** Yes
 No
 N/A

TWDB will make the final determination whether your project (or project component) meets federal criteria as "green". You may be required to submit a **business case, utilizing the Green guidance**

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

Part I: Summary of attachments to application

Following is a list of the documents that may be necessary in order to process this application. While not all of the listed information below may be required for all projects, an applicant should review the application carefully because incomplete applications will not be processed until all of this information has been provided. In addition, please make sure your entity system name appears on every attachment. **Label each attachment with the number of the pertinent application section (i.e. "Part B5").**

Check list for your convenience

Part A

- No. 6
- No. 12

General Information

Draft or executed consulting contracts (engineering, financial advisor, bond counsel)
Existing security document for refinancing

Part B

- No. 17
- No. 18
- No. 19
- No. 20

Legal

Resolution (TWDB-0201A)
Application Affidavit (TWDB-0201)
Certificate of Secretary (TWDB-201B)
Water Supply Corporations

- Articles of Incorporation
- Certificate of incorporation from the Texas Secretary of State
- By-laws and any amendments
- Certificate of status from the Texas Secretary of State
- Certificate of account status from Texas Comptroller

- No. 21
- No. 22
- No. 23
- No. 24
- No. 25
- No. 26

Resolution/ordinance authorizing the issuance of parity debt
Certificate of Convenience & Necessity
Enforcement Actions
Affidavit of No Objection
Two copies of the Water Conservation Plan (TWDB-1968 and TWDB-1965)
Water use surveys

- No. 27

Water Loss Audit
<http://www.twdb.texas.gov/waterplanning/waterusesurvey/index.asp>
<http://www.twdb.texas.gov/conservation/resources/waterloss-resources.asp>

Part C

- No. 39
- No. 40
- No. 45
- No. 46
- No. 47
- No. 49
- No. 52

Financial

Assessed Values by Classifications
Direct and Overlapping Tax Table
Proforma for each year of debt outstanding
Five year comparative system operating statement.
Annual audit and management letter
Outstanding debt schedule
Service provider contracts

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

Part D

Project Information

- No. 54a Preliminary Engineering Feasibility Data (PEFD)
- No. 54b Engineering Feasibility Report
 - Water (TWDB-0555)
 - Wastewater (TWDB-0556)
- No. 54c Project Draw Schedule (TWDB-1202)
- No. 56 Project Map
- No. 57 Census Tract(s)
- No. 59 Current and future populations and projected water use or wastewater flows
- No. 60 Project Cost Estimate Budget (TWDB-1201)
- No. 61 Wastewater Project Information Form (WRD-253a)
Water Project Information Form (WRD-253d)
- No. 62 Texas Pollution Discharge Elimination System Permit
- No. 63 If applicant has property rights and permits
 - a. WRD-208A (Surface Water)
 - b. WRD-208B (Groundwater)
- No. 63c Additional Permits
- No. 64 Site certificate, evidencing land ownership for the project. (ED-101)
- No. 65 Categorical Exclusion (CE), Finding of No Significant Impact (FONSI), Record of Decision or any other supporting document
- No. 67 Social or environmental issues

Part E

State Water Implementation Fund for Texas

- No. 69 Multi-year/phased commitment schedule
- No. 71a Draft Bond Ordinance
- No. 71b Private Placement Memorandum

Part F

Economically Distressed Areas Program

- No. 73 Resolution/ordinance establishing a mandatory hookup policy
- No. 74 EDAP applicants
 - Inadequacy documentation
 - Financial resources documentation
 - Existence of residences prior to 06/01/2005
- No. 75 Public health nuisance
- No. 76 Plats
- No. 77 EDAP Planning Phase – Facility Engineering Plan/Scope of Services (WRD-023A)

Part G

CWSRF/DWSRF Applicants Only

- No. 82 Lobbying Activities (WRD-213)
- No. 83 Certification Regarding Debarment, Suspension and Other Responsibility Requirements. (SRF-404)
- No. 84 Assurances – Construction Programs (EPA-424D)
Disadvantaged Business Requirements Guidance (TWDB-0210)
- No. 86 Affirmative Steps Certification and Goals (TWDB-0215)
- No. 87 Affirmative Steps Solicitation Report (TWDB-216)
- No. 88 Loan/ Grant Participation Summary (TWDB-0373)
- No. 89 Prime Contractor Affirmative Steps Certification and Goals (TWDB-217)
- No. 90 Designated Management Agency (WRD-210)

Part H

Green Projects

- No. 93 Guidance (TWDB-0161)
CWSRF Green Project Worksheets (TWDB-0162)
DWSRF Green Project Worksheets (TWDB-0163)

Please label each attachment with the number of the pertinent application section (i.e. "Part D5")

Part J: Guidance and Forms

Part A

General Information

CWSRF – 31 TAC 375

DWSRF – 31 TAC 371

EDAP and SWIFT - 31 TAC 363

For more information visit, <http://www.twdb.texas.gov/about/rules/index.asp>.

Part D

Project Information

[State Programs - 31 TAC 363](#)

[Drinking Water State Revolving Fund - 31 TAC 371](#)

[Clean Water State Revolving Fund / Equivalency - 31 TAC 375](#)

[Clean Water State Revolving Fund / Non-Equivalency - 31 TAC 375](#)

Guidelines for Environmental Assessment, Clean Water Non-Equivalency (ED-001A)

Clean Water EID Instructions (SRF-099)

Guidelines for Environmental Assessment, State Participation, DFund, RWF and WIF,
(ED-001B)

Guidelines for Environmental Assessment, EDAP (ED-001C)

Drinking Water EID Instructions (DW-001)

Part H

Green Projects and Project Components

Green Project Reserve: Guidance for determining project eligibility
(TWDB-0161)

North Texas Municipal Water District
FY 17 SWIFT Multi-Year Funding Commitment
Lower Bois d'Arc Creek Reservoir & Treatment and Treated Water
Distribution

Part A

Supporting Documentation and Attachments

AGREEMENT FOR ENGINEERING SERVICES

STATE OF TEXAS

COUNTY OF COLLIN

This Agreement made, entered into and executed this the 17th day of December, 2015 by and, between the NORTH TEXAS MUNICIPAL WATER DISTRICT of Wylie, Texas, hereinafter called the "District" acting herein by and through its officers, duly authorized to so act and FREESE AND NICHOLS, INC., hereinafter called the "Engineer" acting herein, by and through its representative, duly authorized to so act for and in behalf of said Engineer.

WITNESSETH that whereas the District intends to contract for design services associated with the Lower Bois D' Arc Program Management Services (Calendar Year 2016), NTMWD Project No. 374 Lower Bois d'Arc Creek Reservoir (LBCR) Program Management, such improvements hereinafter called the "Project."

NOW, THEREFORE, the District and the Engineer in consideration of the mutual covenants and agreements herein contained do mutually agree as follows:

SECTION I

EMPLOYMENT OF ENGINEER

The District agrees to employ the Engineer, and the Engineer agrees to perform professional engineering services in connection with the Project as stated in the sections to follow and for having rendered such services, the District agrees to pay to the Engineer compensation as stated in the sections to follow.

SECTION II

PERIOD OF SERVICE

This agreement shall become effective upon execution by the District and the Engineer and shall remain in force for the period, which may reasonably be required for the design, award of contract, and construction of the Project, including extra services and any required extensions approved by the District.

SECTION III

BASIC SERVICES

The Engineer shall render professional services necessary for the development of the project. The Scope of Services covered by Basic Services for the Project shall be as indicated in Attachment A.

SECTION IV

SPECIAL SERVICES

Special Services to be performed by the Engineer, if authorized by the District, are indicated in Attachment A.

SECTION V

ADDITIONAL SERVICES

Additional services to be performed by the Engineer, if authorized by the District, which are not included in the above described basic and special services, are described as follows:

1. Field layouts or the furnishing of construction line and grade surveys;
2. Investigations involving detailed consideration of operation, maintenance and overhead expenses, and the preparation of rate schedules, earnings and expense statements, feasibility studies, appraisals, evaluations, assessment schedules, and material audits or inventories required for certification of force account construction performed by the District;
3. Preparing of applications and supporting documents for governmental grants, loans, or planning advances and providing data for detailed applications;
4. Providing shop, mill, field or laboratory inspection of materials and equipment;
5. Preparation of any required Operation and Maintenance Manuals or conducting operator training and preparation of Environmental Impact Assessments or Statements;
6. Appearance before regulatory agencies or courts as an expert witness in any litigation with third parties or condemnation proceedings arising from the development or construction of the Project including the preparation of engineering data and reports for assistance to the District.
7. Furnishing the services of a full-time Resident Project Representative to act as the District's onsite representative during the construction phase, if requested by the District under terms and conditions described in Section IX of this agreement.

SECTION VI

COORDINATION WITH THE DISTRICT

The Engineer shall hold periodic conferences with the District or its representatives in order to obtain full benefit of the District's experience and knowledge of existing needs and facilities so that the Project as designed will be consistent with the District's current policies and construction standards. To implement this coordination, the District will make available to the Engineer for use in designing and constructing the Project existing plans, maps, field notes, statistics, computations and other data in its possession relative to existing facilities and to the Project. The Engineer shall coordinate with the Owner in obtaining plans for existing facilities.

SECTION VII

WRITTEN AUTHORIZATION

All engineering services and work to be performed by the Engineer under this agreement shall be authorized by the District in writing. Prior to each phase of the basic services as outlined in Section III of this agreement, the Engineer will submit a proposed work order for District approval. The work order shall set forth in reasonable detail the scope of the Project and the engineering services to be provided, including estimated cost of the construction work, approximate total amount of

engineering fees for additional services, if required, and approximate date of completion of the services authorized.

The written work order for each phase of the basic services shall be acknowledged and accepted by both the District and the Engineer.

It is specifically understood and agreed that the Engineer shall not be authorized or undertake any work pursuant to this Agreement which such work would require the payment of any charge, expense or reimbursement without having first had and obtained a work order or specific written authorization from the District.

SECTION VIII COMPENSATION

For and in consideration of the services to be rendered by the Engineer, the District shall pay the fees hereinafter set forth.

A. COMPENSATION TERMS:

1. "Construction Cost" is defined as the total cost to the District for the execution of the work on the construction project, excluding the fees or other costs for engineering and legal services and the cost of land, right-of-way, and administrative expenses, but including the direct cost to the District of all current construction contracts, items of construction including labor, materials and equipment, required for the completed work (including extras) and the total value at site of Project of all labor, materials and equipment purchased or furnished directly by the District for the Project.
2. "Salary Cost" is defined as the cost of salary of engineers, draftsmen, stenographers, surveyors, clerks, and laborers for time directly chargeable to the Project, plus Social Security contributions, unemployment, excise and payroll taxes, employment compensation insurance, retirement benefits, medical and insurance benefits, sick leave, vacation and holiday pay applicable thereto.
3. "Sub-Contract Expense" is defined as that expense for any assignment incurred by the Engineer in employment of others in outside firms for services in the nature of foundation borings, testing, and similar services that are not included in the Basic Services.
4. "Direct Non-Labor Expense" is defined as that expense for any assignment incurred by the Engineer for supplies, transportation and equipment, travel, communications, subsistence and lodging away from home and similar incidentals in connection with that assignment.

B. BASIC SERVICES:

The Engineer shall be compensated for the work described as Basic Services (Section III). Work to be performed by the Engineer as part of Basic Services is described in "Scope of Services, Attachment A". The Basic Services Compensation will not exceed **\$4,625,000** without prior written authorization from the District, and shall be as follows:

Partial payments to the Engineer will be made on the basis of monthly statements rendered to and approved by the Executive Director of the District; however, under no circumstances shall any monthly statement for services exceed the value of work performed at the time a statement is rendered. The Engineer shall be entitled to a cumulative amount not to exceed eighty-five percent (85%) of the maximum fee upon completion and submissions of the plans, specifications and bid proposals to the District and completion of the bidding assistance task. The remaining fifteen percent (15%) of the basic charge shall be paid in installments during the construction phase of the project in proportion to the contractors compensation for work completed. In no case shall any payments exceed the value of the work actually completed at the time a statement is rendered.

It is specifically understood and agreed that the Engineer shall not be authorized to undertake any work pursuant to this Agreement, which would require additional payments by the District of any charge, expense or reimbursement above the maximum fee without having first obtained written authorization from the District.

C. SPECIAL SERVICES:

For the special services described in Attachment A and authorized by the District, the Engineer shall be compensated as follows:

No Special Services

D. ADDITIONAL SERVICES:

If additional services are required and approved by the District, the Engineer shall be compensated as follows:

1. Where the services of individuals are supplied by the Engineer, as authorized by the District, payment for these services will be based on salary costs times a multiplier of 2.25.
2. Services for direct non-labor expenses and subcontract expense provided by the Engineer shall be reimbursed at actual cost times a multiplier of 1.10.
3. Compensation for the services of a Resident Project Representative during the construction phase, if requested by the District, shall be under the terms and conditions described in Section IX of this Agreement.

E. PARTIAL PAYMENT:

Partial payments to the Engineer may be made from time to time if the circumstances warrant it. In this event, payment will be made on the basis of statements rendered and approved by the Executive Director of the District, but in no event shall any statement exceed the value of work performed.

F. NON-CONSTRUCTION PAYMENT:

If construction bids are received and a contract is not awarded or if construction bids are not received, payment to the Engineer shall be based on time and charges expended by the Engineer at that time in accordance with Basic Charges above, or a maximum of eighty-five percent (85%) of the Basic Charge agreed by the District and the Engineer. In either case (as described above) the Engineer will receive payment within six (6) months after the District has approved and received the final plans, specifications and contract documents.

SECTION IX

RESIDENT PROJECT REPRESENTATIVE

If the District elects to have the Engineer furnish the services of a Resident Project Representative to act as the District's on-site representative during the construction phase, the Engineer will furnish these services at salary cost times a multiplier of 2.25; direct non-labor expenses shall be reimbursed at actual cost times a multiplier of 1.10. If a Resident Project Representative is required by the District, the services provided by the Engineer shall be as described in an attachment to the District's written request and authorization entitled, "*Duties, Responsibilities and Limitations of Authority of Resident Project Representative*".

SECTION X

REVISION TO PLANS AND SPECIFICATIONS

The Engineer will make, without expense to the District, such amendments to the draft plans and specifications as may be required to meet the needs of the District; but if after a definite plan has been approved by the District, a decision is subsequently made by the District which requires additional work by the Engineer, the Engineer shall be compensated for such extra services and expenses as Additional Services as described in Section VIII above. If revisions in the report are required by reason of the Engineer's error or omission, then such revisions will be made by the Engineer without additional compensation.

SECTION XI

OWNERSHIP OF DOCUMENTS

Original documents, plans, designs, and survey notes developed in connection with services performed hereunder belong to and remain the property of the District in consideration of which it is mutually agreed that the District will use them solely in connection with the Project, save with the express consent of the Engineer. The Engineer may retain reproducible copies of such documents.

SECTION XII

TERMINATION

Either party to this agreement may terminate the agreement by giving to the other party thirty (30) days notice in writing. Upon delivery of such notice by the District to the Engineer, the Engineer shall immediately, unless the notice directs otherwise, discontinue all services in connection with the performance of this agreement and should proceed to cancel promptly all existing orders and contracts insofar as such orders or contracts are chargeable to this agreement. As soon as practicable after receipt of Notice of Termination, the Engineer shall

submit a statement showing in detail the services performed under this agreement to the date of termination. The District shall then pay the Engineer promptly that portion of the Basic Services called for under this Agreement, less such payments on account of the charges as have been previously made. Copies of all complete or partially completed designs, plans, and specifications prepared under this agreement shall be delivered to the District when and if this agreement is terminated.

SECTION XIII

SECTION CAPTIONS

Each Section of this Agreement has been supplied; with a caption to serve only as a guide to the contents. The caption does not control the meaning of any section or in any way determine its interpretation or application.

SECTION XIV

SUCCESSORS AND ASSIGNS

This Agreement shall be binding upon the parties hereto, and the successors, assigns and personal representatives of the parties in respect to all covenants of the Agreement. This Agreement shall not be assignable in whole or in part by the Engineers without the written consent of the District. Nothing herein shall be construed as creating any personal liability on the part of any Officer, Director, or agent of the District.

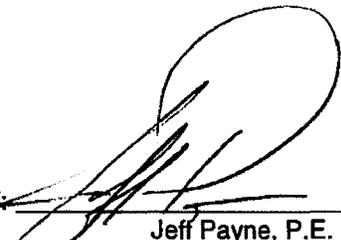
IN WITNESS HEREOF, the North Texas Municipal Water District has caused the present to be executed in several counterparts by its Executive Director and Freese and Nichols, Inc. by and through its representative.

NORTH TEXAS MUNICIPAL WATER DISTRICT

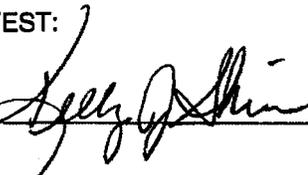
BY: 
Thomas Kula
Executive Director

ATTEST:

BY: 
Stephen Dilligan

BY: 
Jeff Payne, P.E.
Vice President

ATTEST:

BY: 
Kelly G. Smith

Attachment A
Scope of Services
Lower Bois D' Arc Program Management Services (Calendar Year 2016)

The scope of this project is to continue to provide Program Management (PrgM) services to the NTMWD for the Lower Bois d' Arc Creek Reservoir program. This program consists of the following major components; Dam, Raw Water Transmission System, Leonard Water Treatment Plant, and Treated Water Delivery System. This scope of services is for January, 2016 through December, 2016. It is anticipated that the following LBCR engineering, alternate delivery, and construction activities will begin or continue in CY 2016;

Dam Design – Freese & Nichols, Inc.	Raw Water Pump Station Design - Freese & Nichols, Inc.
Mitigation Design – Freese & Nichols, Inc.	FM 897 Design – Bridgefarmer and Assoc.
Leonard WTP Design – CH2M, Inc.	Reservoir Clearing Package Development
County Road Design – TBD	Raw Water Pipeline Final Design – 3 Detailed Design Firms - Freese and Nichols, Inc., and TBD
Early out work packages as authorized	High Service Pump Station Design – Freese and Nichols, Inc.
Treated Water Pipeline Final Design – Freese and Nichols, Inc. Perform Alignment Selection and 2 Detailed Design Firms TBD	CMAR 1 (Dam) – Archer Western, Inc.
CMAR 2 (Mitigation) – Archer Western, Inc.	CMAR 3 (WTP and PS's) - TBD
CMAR 4 (Roads) - TBD	CMAR 5 (Pipelines) - TBD

Specifically, FNI will provide the following functions as part of this scope of services.

1. Program Manager, Assistant Program Manager, and Project Controls – These functions will provide overall program management and monitoring services. The estimated labor effort for this scope of services is based on a Program Manager providing an average of 12 hours per week for 52 weeks, an Assistant Program Manager providing average of 24 hours per week for 52 weeks, General technical oversight and Program QC for an average of eight (8) hours per month for 12 months, a scheduler providing up to 16 hours per month for 12 months, a GIS Technician for up to 24 hours per month for 12 months, an EIT providing up to general project controls support for 40 hours per month for 12 months, and a Construction Manager at Risk (CMAR) Process Manager for an average of 20 hours per month for 12 months. The general functions of these positions are listed below;
 - a. Overall responsibility of establishing and operating program management team.
 - b. Develop/maintain program management plan.
 - c. Assist in various NTMWD reporting functions to include staff, executive-level, and Board updates.
 - d. Develop/maintain a program controls system, web-based collaboration/document control site, master program schedule, and master program budget.
 - e. Assistance with various public-involvement and stakeholder activities.
 - f. Management of program resources to ensure LBCR program is executed on schedule and within budget.

- g. Management of cost, schedule, and quality performance.
 - h. Attendance at management, design team, and other related meetings (approximately 1 per month).
 - i. Communication with NTWMD LBCR Manager and other staff.
 - j. Advise and coordinate with NTMWD staff on the development and execution of processes to procure and manage the five CMAR's associated with the LBCR Program.
 - k. Assist in developing design consultant strategy.
2. Hydraulic Modeling (Operations) – Freese and Nichols will provide the services of a hydraulic modeling team to assist the detailed design teams in running operational scenarios during the design effort. FNI previously completed a model of the raw and treated water system associated with LBCR. This model will be updated with final pipeline alignments as they are developed as well as actual pump station characteristics. It is assumed the final raw water pipeline transient analysis will be provided under the Raw Water Pump Station final design scope and is hence not included in this scope of services.
3. Power Supply Coordination – There are major power supplies that will need to be brought to the Lake Pump Station and Water Treatment Plant sites. This function will support the NTMWD in coordination with the power provider(s) to begin the process to bring power to these sites. The estimated effort for this scope of services is based on a senior electrical engineer providing 16 hours per month for 12 months and an electrical engineer providing up to eight (8) hours per month for 12 months. The general functions of this position are listed below
- a. Management of power supply options to the Leonard Water Treatment Plant and Lake Pump Station site.
 - b. Correspond with utility agencies as necessary to coordinate power supply.
 - c. Review technical plans of the power agencies.
 - d. Coordinate with design teams to coordinate proposed power supply capacity and location.
 - e. Maintain schedule and budget for power supply activities for inclusion in the master program schedule and budget.
 - f. Attend meetings with NTMWD and staff and power supply agencies as required (approximately one meeting every other month)
 - g. Maintain power supply section of document control system and collaboration site.
 - h. Coordinate with the conflicts management team and Fannin County Electric Coop related to the distribution system impacted by the LBCR program.
4. Conflicts Management – The proposed reservoir impacts a series of public utilities and other infrastructure. This function will be to provide general management and tracking of these conflicts and the proposed resolution of these conflicts. The estimated effort of this scope of services is based on providing a conflicts manager for up to 12 hours per month for 12 months and an EIT providing up to 24 hours per month for 12 months. The general functions are listed below;
- a. Identify and maintain a database on all conflicts associated with the construction of the dam and reservoir.
 - b. Coordinate with various impacted agencies and owners on the process, cost, and schedule for relocation or abandonment of their facilities.
 - c. Advise NTMWD management on budget and contract needs to provide funding for the conflict resolutions.

- d. Report on the status of all conflict resolutions regarding the schedule and budget.
 - e. Maintain a documentation system on each conflict to show the history of contacts, resolutions, and issues.
 - f. Assist NTMWD right of way staff in maintaining the database on NTMWD-owned property to include actions needed to clear properties prior to reservoir impoundment.
5. Roadway Project Manager – There is a TXDOT Farm to Market road (FM 1396) that will require relocation due to the proposed reservoir. In addition, there are approximately 27 county road impacts that will be impacted by the reservoir. This function will serve as the NTMWD's Project Manager for the TxDOT and County Road design. There will not be a NTMWD staff Project Manager as a counterpart to this position. The estimated effort for this position is based upon a roadway P.E. providing up to 40 hours per month for 12 months, and a bridge designer providing up to 80 hours for review of up to three (3) submittals. Specifically, this function will provide the following services.
- a. TXDOT Roadway
 - i. Attend monthly meetings with NTMWD staff and the design consultant as required (12 meetings total)
 - ii. Attend up to ten (10) stake holder meetings
 - iii. QA review of the roadway plans, schedules, and budgets for conformance with the goals and objectives of the LBCR program.
 - iv. Organize and run submittal review meetings (3 meetings) to include Fannin County, Paris TXDOT District, or other interested agencies.
 - v. Represent the district as the technical lead for the NTMWD
 - vi. Provide a monthly activity report to the NTMWD
 - vii. Review design consultants invoices and recommend payment
 - viii. Coordinate with the NTMWD's Water Conveyance Program Manager
 - b. County Roads
 - i. Design Consultant selection
 - 1. Assist the NTMWD in developing a RFQ (if desired) or shortlist of firms to invite to provide statements of qualifications.
 - 2. Develop a consultant evaluation and scoring process for the NTMWD to use to select the roadway design consultant
 - 3. Organize and run one (1) selection meeting with NTMWD staff
 - 4. Review and assist NTMWD in selecting the design consultant as well as assist in negotiating the scope and fee by making recommendations to NTMWD Water Conveyance Program manager for changes to the scope and fee prior to going to the NTMWD Board for award.
 - ii. Attend monthly meetings with NTMWD staff and the design consultant as required (5 meetings total)
 - iii. Attend up to three (3) stake holder meetings
 - iv. QA review of the roadway plans, schedules, and budgets for conformance with the goals and objectives of the LBCR program.
 - v. Organize and run submittal review meeting (1 meeting) to include Fannin County, Paris TXDOT District, or other interested agencies.
 - vi. Represent the district as the technical lead for the NTMWD
 - vii. Provide a monthly activity report to the NTMWD
 - viii. Review design consultants invoices and recommend payment

- ix. Coordinate with the NTMWD's Water Conveyance Program Manager
6. Pipeline Detailed Design Consultant Selection Support – It is anticipated that the NTMWD will design the LBCR Pipelines using the following process; Raw Water Pipeline (RWPL) – FNI completed an alignment selection of this pipeline under previous contracts related to the LBCR 404 Permitting. The detailed design will be completed by two consultant teams. Freese and Nichols, Inc. will design Section A of the pipeline. Section B will be selected by the NTMWD and contract directly with the NTMWD. Treated Water Pipeline (TWPL) – FNI will complete the alignment study for the TWPL as part of this scope of services. The NTMWD will select and contract directly with two design consultants to complete the detailed design of this pipeline.
- a. As Program Manager, FNI will provide input to NTMWD's consultant selection for these detailed design teams. It is anticipated that FNI may be asked to provide the following services;
 - i. Input in to the scope of services that will be used for design teams.
 - ii. Mapping as required to support and select the pipeline design teams
 - iii. Review of the SOQ's and participation in the interview process
 - iv. Participation in the consultant evaluation process
7. Raw Water Pipeline Survey – To support the final design of the RWPL, FNI will subcontract with a survey consultant to perform the following tasks in order to obtain aerial photography and design survey for the RWPL alignment as well as produce the required permanent and temporary construction easement documents.
- a. Aerial Mapping
 - i. Aerial Control - Establish (133) horizontal and vertical control points on the Texas State Plane Coordinate System NAD 83(93) and NAVD 88 control. The project control for this work request will be provided by GPS Static & RTK methodology and will meet the control accuracies for topographic surveys. No differential leveling will be performed under this task. This item includes all aerial panel materials.
 - ii. Photogrammetry
 - 1. Provide color aerial photography (5 cm GSD, 2278' above mean terrain), airborne GPS, analytical aerial triangulation, digital topographic mapping (1"=50' scale standard with a 1' contour interval), and color digital orthophotos (1"=50' scale standard with a 3" pixel resolution) of the proposed RWPL corridor approximately 35.2 miles in length and 1200' wide. This approach will provide ASPRS Class 1 accuracy standard --- contours will have a vertical RMSE not to exceed 0.33', spot elevations and DTM points will have a vertical RMSE not to exceed 0.17', and well-defined planimetric features will have a horizontal RMSE not to exceed 0.5'. In densely wooded areas where heavy brush or tree cover fully obscures the ground, the contours will be shown as dashed lines and will be plotted as accurately as possible from the stereoscopic model, while making full use of spot elevations measured in places where the ground is visible.
 - b. Topographic Design Survey
 - i. Topographic/Design Survey for Obscured Areas from Aerial Photogrammetry – Provide a topographic survey of the obscured areas along the project. The

topographic survey shall locate all improvements within the survey area of the final pipeline centerline alignment and record a general description of the existing terrain (individual trees shall not be located but tree lines shall be identified). This shall include the top elevation of all manholes as well as the invert elevations of all conduits entering and exiting the manholes. Locate and reference the nearest mile marker at all railroad crossings.

- ii. **Topographic Survey Deliverables** – Sub consultant will prepare a final digital topographic/design survey drawing in AutoCAD 2013 file format at a scale of 1"=50'. The drawing shall show all features located, horizontal and vertical control points, existing visible utilities. Other deliverables shall include a copy of all field notes and field sketches, a hard copy coordinate list of points located in the field and a digital ASCII point list
- c. **Additional Survey Requested by Detailed Design Consultants** – The potential exists for the detailed design teams request additional topographic survey to complete their designs. These requests will be managed by the Program Management Team, but this scope item will be based on a per day rate for a survey crew to respond to the area requests and provide the deliverables. This scope of services provides up to 25 days of surveyor field/office time.
- d. **Easement Documents** – Although the NTMWD cannot utilize condemnation to acquire pipeline easements until the 404 Permit is received, there may be willing sellers along the pipeline easement that will sell without condemnation. This task will produce easement documents for the entire RWPL alignment so that NTMWD right of way will have the adequate documents to begin easement acquisition when the Board authorizes funding. Specifically FNI's sub consultants will;
 - i. **Update Previously Completed Ownership Map** – Research property ownership changes and obtain copies of deeds, subdivision plats, easements and ownership addresses of the affected parcels along the proposed pipeline alignment. Affected parcels are defined as parcels where there have been ownership changes since the alignment study was completed in 2013. This scope of services assumes there are 35 parcels that have changed ownership. Update final property map with new ownership data. Update existing landowners' database list for new Right-of-Entry letters. Perform the necessary field surveys and office calculations to produce the new tract lines on the final property map. The field surveying shall locate existing property corners and right-of-way marker on the affected parcels. The final property map shall be delivered in an AutoCAD 2013 file format.
 - ii. **Permanent Easements w/ Temporary Construction Exhibits** – Prepare permanent easements (with adjacent temporary construction easements) with exhibit and permanent easement metes & bounds description for up to 125 tracts that the proposed centerline will cross from the Leonard Treatment Plant to SH 56 south right-of-way line. Field notes and supporting drawings shall be 8.5"x 11" size. The surveyor shall submit a calculated closure for each easement. Easements shall be signed and sealed by a Registered Professional Land Surveyor, currently registered in the State of Texas. Each easement shall have attached to it a copy or the corresponding deed for that property. A draft copy of each easement shall be submitted to the District. After review by the District, the Surveyor shall incorporate

comments as appropriate and submit one final copy of the easements and deeds to the District.

- iii. Permit Easements with Centerline Description – Prepare permanent easements with centerline descriptions & exhibits for crossing permits for railroad, power and major gas transmission for up to 15 permits along the proposed alignment. Field notes and supporting drawings shall be 8.5"x 11" size. Easements shall be signed and sealed by a Registered Professional Land Surveyor, currently registered in the State of Texas. Each easement shall have attached to it a copy of the corresponding deed or easement for that permit. A draft copy of each easement shall be submitted to the District. After review by the District, the Surveyor shall incorporate comments as appropriate and submit one final copy of the easements and deeds to the District.

8. TWPL Corridor Study and Alignment Selection – This task generally consists of providing final pipeline alignment selection and preparation of aerial background plans, for the treated water pipeline from the future North Water Treatment Plant (NWTP) to future McKinney No 4 delivery point. This effort is divided into two major tasks. These are; (1) Task 1 – Treated Water Pipeline Corridor Study: This task will generally consist of pipeline corridor evaluation associated with a proposed water transmission pipeline from the NWTP to the McKinney 4 delivery point. The corridors will be evaluated based on the potential for a feasible alignment to exist and will be routed to avoid major conflicts, terrain features and development; and (2) Task 2 – Treated Water Pipeline Alignment Selection: FNI will perform the necessary environmental investigations, preliminary geological conditions record review, surveying, and engineering needed to identify the final treated water pipeline alignment from within the corridor selected in Task 1 for approximately 132,200 feet (25 miles) of 84" treated water pipeline. An alignment selection report with applicable mapping will be submitted as the deliverable for this task.

- a. Preliminary and General Items

- i. Kick-off Meeting - Conduct one meeting with the District to confirm the goals, schedule, and deliverables for the project.
- ii. Existing Data Collection - Obtain and review existing, readily available data for the pipeline corridor and existing pipeline and pump station plans:
 1. Previous Studies, Construction Drawings of Existing Facilities, Aerial Photographs, Soil Surveys, U.S.G.S. 7.5 minute Quadrangle Maps, Tax Record Property Owner Maps, Construction Plans of existing water and/or sewer lines, FEMA Maps, Other Maps and Data Sources.
- iii. Informal Meetings - Arrange for and participate in informal meetings with the District throughout the design phase to review progress and exchange ideas and information.

- b. Task 1 – Treated Water Pipeline Corridor Study

- i. Develop Project Corridor – Evaluate three 1/4 – mile-wide treated water pipeline corridors based upon environmental, geographic and topographic features in conjunction with project termini. Plot engineering constraints and other significant route information on color aerial, NCTCOG topo or other appropriate base map. Incorporate property line and landowner information that is readily available from tax appraisal district records.
- ii. Preliminary Determination of Roadway, Foreign Utility, Stream and Railroad Crossings – Contact various agencies and utility companies for information regarding

roadway, foreign utilities, stream, and railroad crossings along proposed corridors. Author correspondence to public and private utility companies with potential facilities in the area notifying them of the project and requesting information as to the location of any of their existing, proposed, or relocated facilities.

- iii. Preliminary Environmental Analysis – Advise on corridors based on a desktop review of environmental constraints and potential permitting issues. Participate in windshield surveys of the pipeline project corridors and revise recommendations as necessary.
- iv. Develop Corridor Selection Criteria – Develop corridor selection criteria including environmental issues, cost, landowner impact, construction constraints, engineering issues, etc. These criteria will be used to develop a corridor selection matrix from which the final corridor will be selected.
- v. Conduct Windshield Review of Pipeline Project Corridors – Conduct windshield survey, with representatives from the District, of the proposed project corridor with the intent to avoid and minimize environmental, permitting, and engineering issues and determine presence of any additional constraints.
- vi. Corridor Selection Meeting – Meet with the District to review the recommended corridor. Adjust the corridor based upon District comments prior to Task 2.
- vii. Corridor Selection Technical Memorandum (CSTM) – Prepare a report detailing the findings of the activities performed in the corridor selection for the proposed pipeline.
- viii. Submit Preliminary CSTM – Submit to the District for review six (6) copies of the memorandum.
- ix. Review Meeting – Meet with the District and obtain District’s comments on the Preliminary CSTM. Resolve any questions and resubmit final version of the memorandum prior to Task 2

c. Task 2 – Treated Water Pipeline Alignment Selection

- i. Assemble Mapping – Assemble updated mapping of the corridor area established in Task 1 and develop a project “map book” that will be used during the field review and alignment selection tasks. The map book will consist of 11x17 sheets at 1”=500’ scale and will be produced from GIS using the latest available aerial photographs for Fannin and Collin County as well as the County’s Appraisal District property information.
- ii. Preliminary Determination of Roadway, Foreign Utility, Stream and Railroad Crossings – Contact various agencies and utility companies for information regarding roadway, foreign utilities, stream, and railroad crossings along proposed alignment. Author correspondence to public and private utility companies with potential facilities in the area notifying them of the project and requesting information as to the location of any of their existing, proposed, or relocated facilities.
- iii. Develop Preliminary Route Alternatives – Develop up to three route alternatives for the proposed pipeline. Routes will be selected to avoid and minimize impacts to areas that may cause schedule delays or higher costs due to environmental permitting, easement or engineering issues. Develop route selection criteria in order to develop a route selection matrix.
- iv. Survey and Pedestrian Survey Permissions – A letter will be distributed to all potentially affected land owners on either side of the project corridor asking for permission to perform engineering and environmental pedestrian surveys and

property surveys in relation to the project. Manage the responses received from this letter and coordinate with the District staff on negative or non-responses to the letter to gain access to these properties.

- v. Survey – FNI will subcontract with a surveying firm to provide surveying services. The services listed below are based upon creation of an ownership map of properties within 100' of both sides of the pipeline corridor, establishing control for the pipeline alignment, and limited topographic survey along the main pipeline alignment. This scope of services covers surveying tasks for the existing 25 mile long pipeline corridor. A detailed scope of work is described below.

1. Ownership Data

- a. Obtain current abstract maps and landowner information from the Fannin & Collin County appraisal district for use in alignment evaluation and selection.
- b. Research property ownership and obtain copies of deeds, subdivision plats, easements and ownership addresses of the affected 194 parcels in Collin County and 23 parcels in Fannin County along the 25 miles (from SH 5 to the south end of the proposed Leonard Water Treatment Plant) of proposed waterline alignment. Prepare a deed plot of all ownerships and rights-of-way within one hundred feet either side of the proposed pipeline alignment. All properties shall be numbered to match the corresponding list of landowners prepared for the Right-of-Entry database.
- c. Ownership Map – Perform the necessary field surveys and office calculations to produce the final property map of the 217 parcels along the 25 miles of proposal waterline alignment. The field surveying shall locate existing property corners and right-of-way marker on the affected parcels. The final property map shall be delivered in an AutoCAD 2013 file format.

2. Control Points

- a. Control Points along the pipeline centerline- Establish up to seven (7) horizontal and vertical control from Texas State Plane Coordinate System NAD 83 and NAVD 88 control and tied to the existing Lower Bois D'Arc control network. Set horizontal and vertical points to be used for construction layout at the major roadway crossings (SH 5, FM 2933, FM 1827, FM 545, SH 78, FM 981, and SH 78). The project control for this work request shall be provided by GPS/VRS methodology and shall meet the control accuracies for topographic surveys. No differential leveling shall be performed under this task.

- vi. Conduct Engineering Pedestrian Survey of Project Corridor – Conduct field review of 25 mile corridor with the intent to avoid and minimize of constructability, permitting, and engineering issues and identify additional constraints. Environmental and Archeological pedestrian surveys will be conducted as part of the field review.

- vii. Geotechnical Desktop Analysis and Field Review – The following is the scope of services for the geotechnical investigation and memorandum for the project. The intent of this effort is not to be a detailed geotechnical investigation but a high level desktop analysis to identify potential geologic conditions that might affect pipeline alignment. No geotechnical borings or lab work will be accomplished.
- viii. Desktop Geologic Conditions Review: Review Sherman Sheets of Geologic Atlas of Texas, the Soil Survey of Fannin County, the Soil Survey of Collin County, and other available soils information to determine general subsurface conditions to be expected along the pipeline and based on these records, identify potential geologic conditions that might affect the pipeline alignment.
 - 1. Based on the desktop review Geotechnical Engineer will visit the proposed pipeline corridor in areas where existing data indicates potentially undesirable geologic conditions.
 - 2. Write a technical memorandum that discusses the findings from the desktop soils review and limited field visits.
- ix. Coordination with Fannin and Collin County Commissioners – Meet with Fannin and Collin County Commissioners to discuss requirements for County Road crossings such as angle of crossing, open cut allowance, and casing requirements. Meetings will be documented in Meeting Minutes.
- x. Coordination with TxDOT Representatives – Meet with Area TxDOT representatives to discuss crossings of TxDOT Jurisdictional roads to discuss requirements such as angle of crossing and roadway widening plans. In addition, an attempt to obtain crossing permits will be made even though final construction plans are not part of this scope. If TxDOT personnel will allow a crossing permit, permits will be developed and submitted for each crossing. These meetings will be summarized in Meeting Minutes.
- xi. Coordination with Major Petroleum Pipeline Owners – Meet with representatives from the Owners of major petroleum pipelines the pipeline corridor crosses to discuss crossing requirements, cathodic protection systems in place, and plans for parallel or pipeline upgrade projects. Meetings will be summarized in Meeting Minutes.
- xii. Coordination with Major Electrical Transmission Line Owners - Meet with representatives from the Owners of major electrical transmission lines (69 KV and higher) the pipeline corridor crosses to discuss crossing requirements and plans for parallel or line upgrade projects. Meetings will be summarized in Meeting Minutes.
- xiii. Coordination with Railroad Owners - Meet with representatives from the Owners of railroads the pipeline corridor crosses to discuss crossing requirements and plans for line upgrade projects. Meetings will be summarized in Meeting Minutes.
- xiv. Preliminary Determination of Foreign Utility Crossings – Contact various utility companies for information regarding utilities crossings along the pipeline corridor. Author correspondence to public and private utility companies with potential facilities in the area notifying them of the project and requesting information as to the location of any of their existing, proposed, or relocated facilities.
- xv. Permanent & Temporary Easement Width – Evaluate the permanent and temporary easement width required considering potential pipe materials, construction area required, future parallel pipelines, and construction loading during the construction

of those pipelines. Include recommendations in the alignment selection technical memorandum. It is assumed that since easements are being acquired well before start of construction and the potential for parallel pipelines, that temporary construction easements will not be acquired.

- xvi. Preliminary Alignment for Environmental Survey – Based on the previous tasks, determine a preliminary pipeline alignment based on minimal engineering concerns. This alignment will be used in the environmental pedestrian survey.

1. Environmental and Cultural Resources Survey

- a. The proposed pipeline is approximately 25 miles in length and will extend from the proposed NWTP near Leonard, Texas to an approximately 5-acre parcel of property owned by the City of McKinney for connection into the treated water distribution system at future the McKinney No. 4 delivery point. The 5-acre parcel of property is located north of the City of McKinney, Texas. It is our understanding that District intends to design and construct all proposed facilities to meet the terms and conditions of Nationwide Permit 12 – *Utility Line Activities*, without a pre-construction notification (PCN) and to avoid and minimize impacts to potential waters of the U.S., to the extent practicable that could trigger notification to the USACE. This scope assumes that the District will acquire right of entry for all property along the proposed pipeline right-of-way (ROW).
2. Compile Existing Information - Prior to conducting a pedestrian survey of the proposed project, FNI environmental scientists will assemble and review data such as aerial photographs, USGS topographic maps, National Wetlands Inventory (NWI) maps, the USGS National Hydrography Dataset (NHD), soils data within the limits of construction and proposed ROW, and information on potential threatened and endangered (T&E) species in the project vicinity.
3. Conduct Pedestrian Survey – FNI environmental scientists will conduct a pedestrian survey to make observations along the proposed pipeline alignment in order to document existing environmental conditions and assess potential project impacts. The pedestrian survey will be coordinated with the archeology consultant and design engineers. The presence and locations of potential waters of the U.S., including wetlands and potential T&E species habitat will be identified within the proposed ROW. FNI environmental scientists will delineate the boundaries of water crossings, including wetlands, streams, and impoundments, and will make a preliminary jurisdictional assessment of each waterbody. The results of the pedestrian survey will be documented in a Technical Memorandum.
4. Project Coordination – FNI environmental scientists will coordinate with the District, the project design engineer, and archeology consultant during project design to provide environmental input into the design of the project components. The purpose of this coordination will be to avoid and minimize impacts to waters of the U.S., known archeological resources, and T&E species that could potentially require mitigation. This coordination will include up to four (4) meetings with the District and/or the design engineer.

5. Archeological Survey – FNI will coordinate a cultural resources investigation to identify whether the proposed pipeline alignment might affect cultural resources that are eligible for or potentially eligible for listing in the National Register of Historic Places. This work will consist of three primary tasks including archival research, fieldwork, and a findings report. The report on the findings will be prepared to satisfy requirements of the USACE and the Texas Historical Commission (THC). A draft of the report will be provided to FNI and DISTRICT for review and comment. Upon incorporation of FNI and District comments, the final Draft Report will be submitted to the THC for review and concurrence. The report will be finalized based on THC’s comments, if any.
6. Freese and Nichols will notify the District if any of the following environmental permitting services are required. The following services can be provided upon written authorization by District.
 - a. Preparation of a Pre-Construction Notification for submittal to the USACE.
 - b. Preparation of a Preliminary Jurisdictional Determination (PJD) Report.
 - c. Preparation of an Individual Section 404 permit application.
 - d. Preparation of a mitigation plan for impacts to waters of the U.S. or other natural resources.
 - e. Conducting a conditional assessment (i.e., TXRAM) on waters of the U.S. potentially impacted by the proposed project.
 - f. Presence/absence surveys for federally listed threatened/endangered species.
 - g. Application for Texas Parks & Wildlife Department Sand and Gravel Permit.
 - h. Application for General Land Office Easement.
 - i. Consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act.
 - j. Other environmental services not specifically defined in this scope of services.
- xvii. Follow-up Pedestrian Survey – During the performance of the Environmental Pedestrian Survey task, it is assumed that up to 20% of the preliminary alignment may need re-routes to minimize environmental, cultural, or archeological impacts. Follow-up site visits to these re-route locations will be conducted as necessary to verify that the proposed re-routes minimize environmental concerns and do not pose engineering concerns.
- xviii. Alignment Selection – Optimize and develop a recommended alignment based on minimal environmental, permitting and engineering concerns, identifying issues associated with route and the reasons for re-routes.
- xix. Alignment Selection Meeting – Meet with the District to review the recommended alignment. Adjust the alignment based upon District comments prior to release of surveying. Survey to be completed in accordance with the Special Services.
- xx. Develop Preliminary System Hydraulics – Develop preliminary system hydraulics to include a pipeline diameter optimization based on the recommended alignment.

- xxi. Study Level Cost Opinion – Submit the Engineer’s probable cost opinion for the recommended pipeline alignment and alignment selection technical memorandum recommendations.
 - xxii. Alignment Selection Technical Memorandum (ASTM) – Prepare a report detailing the findings of the activities performed in the alignment selection for the proposed pipeline.
 - xxiii. Submit Preliminary ASTM – Submit to the District for review six (6) copies of the memorandum.
 - xxiv. Review Meeting – Meet with the District and obtain District’s comments on the Preliminary ASTM. Resolve questions and resubmit final version of the memorandum following completion of the Alignment Selection and Aerial background Plans tasks
9. Pipeline Design Standards - The primary purpose of this task is to establish standards for design of the RWPL and TWPL. These standards will be used for the final design phase where it is anticipated that multiple designers will be the “Engineer of Record” (one other than FNI for the RWPL and two for the TWPL) and will be responsible for adapting the standards as needed for the project, and for verifying that the standards are suitable for individual projects. This effort will standardize common items among the various design contracts so that plans, specifications, details, equipment, materials, and systems are consistent for the various design contracts. The standards should also give the Program Manager a basis for checking the designers’ work compared to preferred criteria. Approval from the Owners/Program Manager is required for deviation from the standards.
- a. This effort will produce the following deliverables: a standard specification book and standard details, and a Standard Design Criteria Manual. These documents will be in working form and will be finalized during the final design of the RWPL and TWPL. The “core” elements of these documents (critical specifications or design considerations) will be analyzed at length in this effort while “secondary” or “non-core” elements will be adopted from the Main Stem Trinity River Pipeline and North McKinney Pipeline Projects and included in the deliverables but without extensive analysis. The process over this scope of work will follow this general pattern.
 - i. Begin by adopting and then generalizing all specifications and standard details developed for the recently completed NTMWD Main Stem Trinity River Pipeline Project (MSPL) and North McKinney Pipeline Project (NMPL) to remove all project-specific information;
 - ii. Review core standardization specifications (“core specs”, see list below) and details and develop a list of discussion topics for the technical workshops;
 - iii. Conduct technical workshops (see Task 3) with NTMWD to review, update, and revise the core specs and details;
 - iv. Update the core specs and details and those specifications/details that are affected by the core specs (“non-core specs”);
 - v. Review of draft specs/details from step 4;
 - vi. Conduct follow-up workshops with NTMWD to review draft core and non-core specs and details;
 - vii. Write the Standard Design Criteria Manual (Task 2)
 - b. The seven steps of design standardization will produce the following deliverables:
 - i. Standard Specifications and Details (Divisions 0-48)

- ii. Standard Design Criteria Manual
- c. **Task 1 – Standard Specifications and Details (Divisions 0-48)** - Task 1 will begin by reproducing all specifications and standard details from all bid packages (removing redundancies) in the recently completed MSPL and NMPL and will follow the seven steps outlined in the Summary above.
- i. Core Specs (as listed below) will be analyzed extensively and their standard details will be revised. This will include value engineering, alternatives analysis, research, incorporation of NTMWD preferences, and updating.
 - ii. Non-Core Specs are all other specifications and standard details that will be part of the project specification book. These include all applicable specs and standard details from the MSPL and any new specs and details that will be required for the RWPL and TWPL. These non-core specs and their associated standard details will not be analyzed like the core specs; instead they will be generalized to remove all MSPL specific information and reviewed for compatibility, completeness, and coordination with the core specs and details. No changes will be made to these specifications and details adopted from the MSPL (except for generalization) unless required because of impacts from the core specs analysis.
 - iii. Deliverable: Draft Design Standards Spec Book and Details with core specs and standard details updated and non-core specs and details generalized (and revised where necessary because of core specs analysis).
 - iv. List of Core Specifications;
 - 1. DIVISION 1 – GENERAL REQUIREMENTS
 - a. 01 35 00 – Special Procedures
 - b. 01 45 16.16 – Hydrostatic Testing
 - 2. DIVISION 9 - FINISHES
 - a. 09 96 00 – High Performance Coatings
 - b. 09 97 16 – Pipeline Coatings and Linings
 - 3. DIVISION 27 - COMMUNICATIONS
 - a. 27 05 00 – Common Work Results for Communications
 - b. 27 05 26 – Grounding & Bonding for Communications Systems
 - c. 27 15 13 – Fiber Optic Network Systems
 - d. 27 15 23 – Communications Optical Fiber Horizontal Cabling
 - e. 27 15 23.01 – Fiber Optic Conduit Systems Components Along Pipelines
 - 4. DIVISION 31 – EARTHWORK
 - a. 31 23 23.33 – Flowable Fill
 - b. 31 23 33.16 – Trenching and Backfill
 - c. 31 35 23.23 – Articulated Concrete Blocks
 - d. 31 36 00 – Gabions
 - 5. DIVISION 33 – UTILITIES
 - a. 33 05 01.03 – Pre-stressed Concrete Pipe and Fittings
 - b. 33 05 23.33 – Pipeline Crossing
 - c. 33 10 13 – Disinfecting of Water Utility Distribution
 - d. 33 11 13.13 – Steel Pipe and Fittings
 - e. 33 12 16.13 – Miscellaneous Valves and Appurtenances
 - f. 33 12 16.16 – Air Release and Vacuum Valves

- g. 33 12 16.23 – Gate Valves
- h. 33 12 16.26 – Butterfly Valves

d. Task 2 – Standard Design Criteria Manual - The intent of this manual is to provide a narrative description of Owner design preferences and standards. The manual will be used by final design teams and the Program Manager in conjunction with the Standard Specifications and Details (Task 1). The manual will include permit and code requirements, industry design standards, owner design preferences, and design criteria. Deliverable: Draft Design Criteria Manual

i. Standard Design Criteria Manual Outline (draft concept; order of information and organization not final):

1. Introduction and Purpose
2. Pipeline Design Principles
 - a. Pipeline Material
 - b. Hydraulic design criteria
 - c. Corrosion
 - d. Appurtenances
 - e. Interconnections to Existing/Proposed Lines
 - f. Pipe Loadings
 - g. Access Roads
 - h. Crossings
 - i. Outlet Structures
 - j. Communications Along Pipeline
 - k. O&M Standards
 - l. Tunnels
3. Summary and Conclusion

e. Task 3 – Workshops with NTMWD in Development of Standards

- i. Design Standardization Workshops will be held on a regular basis with NTMWD to review research and make standardization decisions. The maximum number held under this scope of services is 10 workshops.

f. Task 4 - Detailed Design Engineers' Peer Review of Standards

- i. Distribute standard specifications, details, and Design Criteria Manual to Design Engineers for review. Participate in five (5) workshops with Design Engineers to discuss design standards and to receive comments.
- ii. After review of comments from Design Engineers, attend four additional workshops with Design Engineers and NTMWD to discuss incorporation of those comments to the final standards.
- iii. Incorporate comments and prepare and issue final design standard specifications and details and design criteria manual.

g. Task 5 - Civil 3D and CADD Standards for Pipelines

- i. FNI will meet with NTMWD's Engineering and GIS staff to determine NTMWD's preferences and requirements for the pipeline construction drawings, post construction record drawings, and GIS files. FNI will develop Civil 3D styles and templates for the pipeline project that will be used by all pipeline Design Engineers. The standards will be based on the NTMWD's preferences for presentation of information on the drawings, automation of design and drafting where feasible, consistent file management, and compatibility with the NTMWD's GIS system. The Civil 3D styles and templates will be structured to minimize difficulty for conversion to GIS.
- ii. FNI will provide electronic copies of the Civil 3D styles and templates. FNI will develop a user manual and conduct training for pipeline design consultants. Training will be for use of the standards, and assumes CADD technicians are familiar with basic Civil 3D techniques. FNI will assist with trouble shooting of problems with the Civil 3D standards. FNI will update styles and templates during the design phase, as changes are needed for new innovations from Design Engineers and up to one software upgrade.

h. Task 6 – Program Review of Detailed Design Teams' Submittals

- i. The Program Management Staff will review the Level, 1, 2, and 3 submittals from the three Detailed Design Teams (Non-FNI) for the TWPL and RWPL for general conformance to the Design Criteria and CAD Standards. It is anticipated that there will be 9 individual submittal packages for the Program Manager to review.

10. Reservoir Clearing, Perimeter Dams, and Boat Ramp Design – This task generally consists of providing preliminary and final design, construction contract documents, bid phase assistance and general representation during the construction phase for the specific components related to the development of the District's Lower Bois d'Arc Reservoir. The Components will generally include; (1) Reservoir Clearing Plans, (2) Removal, protection, or enhancement of the approximately 200 earthen ponds within or adjacent to the reservoir footprint, and (3) One Boat Ramp in the vicinity of the dam. This scope of services is based upon the preparation of one (1) set of construction contract documents (plans and specifications) for both the clearing and the perimeter ponds. The boat ramp is assumed to be added to the dam construction package already being developed. All will be administered within separate contracts by the selected Construction Manager at Risk (CMAR).

a. Basic Services

i. Preliminary and General Items

1. Kick-off Meeting - Conduct one meeting with District to confirm the goals, schedule, and deliverables for the project.
2. Determine Environmentally Sensitive Areas and Permitting Constraints - This will consist of coordination with ongoing permitting activities such that the design conforms to permitting constraints.
3. Informal Meetings - Arrange for and participate in informal meetings with District throughout the design phase to review progress and exchange ideas and information. Up to 8 meetings with the District are assumed that would be separate from other project related meetings.

4. Coordinate the design efforts outlined in this Scope of Services with the ongoing design and environmental permitting phases of the project such that the design conforms to permitting requirements and is consistent with other components
- ii. Preliminary Design - An initial identification of all potentially affected ponds (207) has already been accomplished. In order to assist the District with the handling of these ponds, the following tasks are proposed;
 1. Confirm identification of each pond and categorize each into the appropriate category;
 - a. Ponds fully within reservoir (estimated to be 87). These have the top of dam below 534 and will mostly be recommended for removal during the clearing process unless there is some benefit for construction or fish stocking.
 - b. Ponds within Ownership (est. 42). These have the top of dam above 534 but below 541 and will be recommended for removal during the clearing process.
 - c. Ponds partially within Ownership (est. 25). These have the top of dam above 541 and the toe below 541. The District will own portions of these dams and have an easement for all or portions of the rest. The District will need to negotiate with the owner for removal, which would be preferred, or for added protection, which may be needed.
 - d. Ponds partially within Easement (est. 53). These have the top of dam above 545 and the toe between 541 and 545. The District will not own any portion of these dams but will have an easement over a portion of the dam. The District will need to negotiate with the owner for removal, which may be preferred, or for added protection, which may be needed.
 - e. Ponds outside Property. These have the toe above 545. These have not been tallied and are assumed to be able to be left as is. Some may have an environmental benefit if removed
 2. Review and confirm or update guidelines for dams within each category. Initial recommendations are:
 - a. Ponds fully within reservoir (est. 87). Notch or remove these dams as they will be fully within District control. Some may be identified as useful for water supply during construction or as potential use for fish stocking prior to impoundment.
 - b. Ponds within Ownership (est. 42). Remove these dams to avoid future risks and reservoir conflict issues. Ponds will be fully within District control.
 - c. Ponds partially within Ownership (est. 25). Since the District will only own portions of these dams and have an easement for all or portions of the rest, the District will need to negotiate with the

- owner for removal, which would be preferred, or for added protection, which may be needed. Each dam will need to be reviewed individually and negotiations with the landowner held.
- d. Ponds partially within Easement (est. 53). These have the top of dam above 545 and the toe between 541 and 545. The District will not own any portion of these dams but will have an easement over a portion of the dam. The District will need to negotiate with the owner for removal, which may be preferred, or for added protection, which may be needed. Assuming the landowner wants to retain the pond, many of these may be left if deemed to have little risk to the District, but each will need to be reviewed individually.
 - e. Ponds outside Property. No actions will be taken unless they are found to have an environmental benefit if removed. That will be handled under a separate contract for mitigation.
3. Review lake frequency data and develop guidelines for needed protection levels. Meet with the District to refine those guidelines. The District will need separate legal counsel as to the level of protection to the District provided by the current flood easement contracts.
 4. Develop recommendations for each of the identified dams. This will include each dam, its relevant information, and the recommendations in the conflicts database. The dams partially within District ownership or easement will need an individual review. A site visit of these dams will be made if access to the dams is feasible. It is assumed that discussions with the landowners about whether they want to keep their dams will be held by the Owner. FNI will provide maps of each dam along with pertinent data and property information. For budgeting purposes, it is assumed that FNI will attend up to 20 meetings with landowners. Develop cost estimates for up to 20 dams that would need protection if not removed. This can be used by the District for negotiating purposes.
 5. Develop a photo log of each dam that is to remain in place to document current conditions prior to impoundment of the reservoir.
 6. Develop guidelines and general details for clearing within the prescribed clearing plan developed in the permitting process. Overlay the clearing plan on detailed maps of the reservoir and develop preliminary work maps for the clearing process. Access sites and recreational facilities mentioned in the plan are not included.
 7. Work with the District to select a location and design parameters for the boat ramp to be located at the dam site. It is assumed this ramp will be for only District use with no public access. Develop a preliminary design for the boat ramp.
 8. Prepare a Preliminary Design Report detailing the findings of the activities performed in this Preliminary Design Phase with respect to the clearing, perimeter ponds and boat ramp. Record recommendations and guidelines for the dams within each category and include maps showing all identified dams, their category, and specific recommendations. For the dams that are recommended to include some level of upgrade, provide conceptual level

figures of the needed improvements. Photo log will be included as an appendix.

9. Include pertinent data for each identified dam in the conflicts database for management during the construction phase. Include pertinent information about clearing needed on any property that is not owned by the District within the database for similar tracking.
10. Submit Preliminary Engineering Report – Submit to the District for review six (6) copies of the report.
11. Review Meeting – Meet with the District and obtain District’s comments on the Preliminary Design Report. Resolve any questions and resubmit final version of the report following completion of the Final Design Phase.
12. Study Level Cost Opinion – Submit the Engineer’s probable cost opinion for the recommended project and Preliminary Engineering Report recommendations.
13. Coordination with other Projects - Coordinate preliminary design efforts with the other ongoing project related efforts being performed under separate agreements by separate design or planning teams

iii. Bid Documents

1. Develop one set of contract documents for clearing and dam removal and upgrades. These are assumed to be let by the CMAR concurrently during dam construction with a schedule coordinated to match the diversion and impoundment schedule for the dam. Plan will include all dams designated for removal or for notching. Plans will include recommended added protection, if needed, for dams that are to remain. Prepare a separate set of drawings only for the boat ramp, to be included in the dam construction package. All specifications and contract documents will be included in the separate dam design contract.
2. Furnish District, when requested, the engineering data necessary for applications for routine permits required by local, state and federal authorities. Preparation of applications and supporting documents for government grants or for planning advances is an Additional Service.
3. Submit drawings, specifications, and Construction Contract Documents to the applicable federal and state agency(s) for approval, where required. It is assumed that no more than two of the dam modifications will need TCEQ approval for modifications. TCEQ approval for any additional dam modifications will be an additional service. It is also assumed that none of the activities will require an individual 404 permit from the Corps of Engineers or fall under a nationwide permit that requires notification.
4. Furnish such information necessary to utility companies whose facilities may be affected or services may be required for the Project.
5. Coordinate final design efforts with the other ongoing project related efforts being performed under separate agreements by separate design or planning teams.
6. Level 2 (60%) Design – No Level 2 Drawings will be developed for review and comment.
7. Level 3 (90%) Design

- a. Draft Final Drawings – Prepare required civil, geotechnical, and structural drawings. All drawings will be produced on AutoCAD Version 2004 (or later).
 - b. Specification Preparation – Prepare required front-end and technical specifications for the project.
 - c. State Agency / Permitting / Utility Coordination – Incorporate the requirements of various agencies and utility companies into Contract Documents.
 - d. Level 3 Design Submittal - A total of ten (10) sets of half-size (11"x17") Level 3 documents will be submitted to District for review.
 - e. Update Probable Construction Cost – Update the opinion of probable construction costs developed during the Level 2 Design Phase based on new information obtained during the Level 3 Design Phase, including quantity take-offs for the detailed design of all work items to be included.
 - f. Review Comments - District will consolidate their submittal review comments and provide to Engineer at the Review Meeting.
 - g. Level 3 Review Meeting - Meet with the District and obtain District's comments on the Level 3 Design Submittal. Resolve comments and address in the Final Bid Documents or prepare a written response of disagreement.
 - h. Issue Final Bid Documents – A total of ten (10) sets of half-size (11"x17") Final Bid Documents will be submitted to the District.
8. Coordination with other Projects - Coordinate final design efforts with the other ongoing project related efforts being performed under separate agreements by separate design or planning teams

iv. Advertisement and Bid Phase

1. Support the CMAR efforts for advertisement and bidding of the components.

- v. Construction Phase Services (General Representation) - General representation services described below are for the contract for the clearing and perimeter ponds. General Representation for the boat ramp will be included in the effort related to the dam. The fee included in the budget covers the incremental costs for those services. The tasks and budgets the services listed below assume that they are performed concurrently with the dam construction, as currently planned

1. Project Administration - Engineer will perform project administration services during the construction phase of the project. By performing these services, Engineer shall not have authority or responsibility to supervise, direct, or control the Contractor's work or the Contractor's means, methods, techniques, sequences, or procedures of construction. Engineer shall not have authority or responsibility for safety precautions and programs incident to the Contractor's work or failure of the Contractor to comply with laws, regulations, rules, ordinances, codes or orders applicable

to the Contractor furnishing and performing the work. Specific services to be performed by Engineer are as follows:

2. Review Contractor's Insurance Certificates - Review the Contractor's Insurance certificates and forward the certificates to District for acceptance by District's legal counsel. Engineer's review of the insurance certificates is only for the purpose of determining if the Contractor maintains the general types and amounts of insurance required by the contract documents, and is not a legal review to determine if the Contractor's insurance coverage complies with all applicable requirements.
3. Pre-construction Conference - At a date and time selected by District and at a facility provided by District, attend the pre-construction conference and assist District during the conference. With assistance from Engineer, District shall prepare an agenda for the conference, and prepare and distribute minutes. The pre-construction conference shall include a discussion of the Contractor's tentative schedules, procedures for transmittal and review of the Contractor's submittals, processing payment applications, critical work sequencing, change orders, record documents, and the Contractor's responsibilities for safety and first aid.
4. Construction Schedule Review - Review and comment on the Contractor's initial and updated construction schedule and advise District as to acceptability.
5. Construction Sequence Review - Analyze the Contractor's construction schedule, schedule of values, activity sequence, and construction procedures as applicable to District's ability to keep existing facilities in operation.
6. Review Contractor's Estimated Monthly Payments - Review the Contractor's initial and updated schedule of estimated monthly payments and advise District as to acceptability.
7. Site Visits - Make monthly visits to the construction site over the assumed 24 month construction period to observe progress of the work, and consult with the District and the Contractor concerning problems and progress of the work. It assumed that at least half of these visits, when possible, will be in conjunction with visits related to the dam construction.
8. Submittal Review - Review drawings and other data submitted by the Contractor as required by the construction contract documents. Engineer's review shall be for general conformity to the construction contract documents and shall not relieve the Contractor of any of his contractual responsibilities. Such reviews shall not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions and programs incident thereto. Engineer shall maintain a log of all submittals. The log shall include the submittal number, title, date received, review comments, date returned, date resubmitted, etc.
9. Warrantee and Test Review - Receive and review guarantees, bonds and certificates of inspection, and tests and approvals which are to be assembled by the Contractor in accordance with the construction contract documents and transmit them to District.
10. Request for Information - Interpret construction contract documents when requested by District or the Contractor. The Engineer shall maintain a log of

the requests for information (RFI log). The log will include the date of the request, a brief description, reviewer, and date of response.

11. Review Contractor's Monthly Payment Requests – Review monthly estimates for the purpose of making a full independent mathematical check of the Contractor's payment request and sign the estimate. District is responsible for verifying the quantities of work which are the basis of the payment requests and that the work complies with the Contract Documents.
12. Evaluation of Change Orders - Provide documentation and administer the processing of change orders, including applications for extension of construction time. Evaluate the cost and scheduling aspects of all change orders.
13. Claims Assistance - Act on claims of District and the Contractor relating to the acceptability of the work or the interpretation of the requirements of the construction contract documents. Work related to unusually complex or unreasonably numerous claims is considered Additional Services.
14. Final Inspection - Upon completion or correction of the items of work on the punch-list, conduct a final inspection with District and Contractor to determine if the work is completed. Provide written recommendations concerning final payment to District, including a list of items, if any, to be completed prior to making such payment.
15. Construction Records - Upon completion of the project, revise the construction contract drawings to conform to the construction records. Submit two copies of the prints and one set of 3 mil wash-off black-lined Mylar reproductions. An electronic version of both Drawings and Specifications shall be provided to District in electronic format on compact disk

b. Special Services

i. Geotechnical Engineering

1. Review the Geologic Atlas of Texas and USDA Soil Survey to study general geologic and soil conditions at the respective sites.
2. Travel to the sites to select locations for exploratory borings. Engineer will check visually for underground utility markers, other existing construction, and accessibility. Engineer will coordinate with subcontractor to clear necessary trees and vegetation to access borings at the Lower Bois d'Arc Reservoir site. Engineer, in coordination with the Surveying subcontractor, will locate and stake the borings.
3. Call the Texas 811 utility system, NTMWD, City of Bonham, and other appropriate providers to mark utilities within an appropriate radius of the boring locations.
4. Subcontract with a drilling contractor to drill a total of 6 borings for the boat ramp.

- a. Samples at all locations will be collected intermittently using continuous flight or hollow-stem augers and either split-spoon (Standard Penetration testing) or steel tube samplers.
 - b. Bedrock, in selected borings, will be sampled by coring with an NX core barrel.
5. Water levels will be observed and recorded during drilling and at completion. The boreholes will be backfilled with cement-bentonite grout to the ground surface at completion of field activities.
6. Provide an Engineer or Geologist to direct the drilling, log the borings, record field test data, and handle and transport the samples.
7. Select samples for laboratory testing, assign tests, deliver samples to a subcontracted laboratory selected by FNI, and review test results. Testing is expected to include classification tests (liquid and plastic limits and percent passing a #200 sieve or gradation), moisture content, unit dry weight, moisture-density tests, crumb dispersion tests, one dimensional swell tests, and unconfined compression tests.
8. Prepare a geotechnical data report of the geotechnical investigation to include:
 - a. Appendix with the boring locations, boring logs, laboratory test results, and a key to the symbols used.
 - b. Discussion of subsurface conditions and soil properties indicated by the field and laboratory work, and the implications for design.
 - c. Foundation recommendations and subgrade modification for the boat ramp.
9. Prepare a submittal, to be considered the 30% Design Submittal consisting of the Draft Final Geotechnical Data Report, drawings and draft preliminary design report, for review by the Owner. Meet with the Owner to discuss comments and incorporate comments into a final set of 30% Documents.
10. Attend scheduled project meetings
11. Meet with the client during the preliminary design phase as appropriate to discuss relevant geotechnical issues of the preliminary design efforts

ii. Surveying

1. FNI will subcontract with a surveying firm to provide surveying services as needed for needed ground survey to tie in borings, confirm key design locations, verify structure locations and elevations and address issues that arise during the design process regarding the topographic mapping.
11. RWPL Cathodic Protection Design – FNI’s subcontractor will provide corrosion control design for the RWPL. This scope of services only includes design services. Construction phase services and start up services will be required under a separate authorization. The design will be for the entire RWPL and will be inserted in to each detailed design consultant’s plan sets. Specifically, the following tasks will be performed;

a. Corrosion Study

- i. Review site, plans and other pertinent information
 1. Research – Foreign pipeline crossings, parallel systems and CP systems
 2. Electrical High Voltage (EHV) transmission lines
 3. Field Survey – Stray DC current interference sources
 4. Research – Changes in soil types, conditions, etc.
 5. Topography
 6. Review - Proposed pipeline design & materials
- ii. Conduct soil resistivities (every 1000 ft)
- iii. Analyze one soil samples provided by detailed design teams
- iv. Provide technical memo

b. Cathodic Protection Design

- i. Develop Corrosion design at pipeline 90% design (For both Steel/PCCP pipe material)
- ii. One (1) design review meeting – teleconference
- iii. Final bid ready design (Steel/PCCP)
- iv. Review 100% design (Steel/PCCP) – teleconference
- v. CP Construction Cost Estimate

North Texas Municipal
Water District

Part A.6.b

LAW OFFICES

McCALL, PARKHURST & HORTON

1400 MERCANTILE BANK BUILDING

DALLAS, TEXAS 75201

AREA CODE 214 748-9501

HILLARD PARKHURST
HOBBS H. McCALL
PAUL B. HORTON
ROBERT T. LEWIS
PETER M. TART
ROY M. POINSETT

JOHN D. McCALL (1892-1932)
CLARENCE E. CROWE (1903-1962)

January 6, 1970

North Texas Municipal Water District
P. O. Drawer C
Wylie, Texas. 75098

Gentlemen:

You have asked that we submit a letter stating our fee schedule and the scope of our services in acting as Bond Counsel for North Texas Municipal Water District with reference to the future issuance of various issues of bonds.

Generally, we will perform all usual and necessary Bond Counsel services directly connected with the authorization and issuance of each issue of bonds. Further, we will perform all other services indirectly connected with the issuance of such bonds, the performance of which services, in our opinion, might improve the marketability of the bonds, including our co-operation with the District's Financial Advisors in dealing with the bond rating agencies in New York in connection with legal matters.

Specifically, we will prepare and direct all legal proceedings with reference to the authorization and issuance of each issue of bonds, including the following:

1. Election proceedings, if and when required.
2. Preparation of all instruments pursuant to which the District's bonds will be authorized and issued, including bond indentures.
3. Obtain the approval of the bonds by the Attorney General of Texas, and their registration by the Comptroller of Public Accounts of the State of Texas.
4. In connection and co-operation with the District's Financial Advisors, direct the proceedings for the sale of the bonds.

5. Supervise the execution, authentication, and delivery of the bonds to the purchasers.
6. When so delivered, issue our approving opinion covering the validity of the bonds, it being understood and agreed that our approving opinion will be acceptable in the general market.
7. Advise with the District and its Financial Advisors in the preparation of the prospectus or notice of sale under which each issue of bonds will be offered to the public, to the end that the most favorable reception for such bonds may be obtained.

As to each issue of bonds (except refunding bonds) we propose the following schedule of fees, based on the principal amount of each separate issue:

For the first five million dollars thereof (with a minimum fee of \$2500),	1%
For the next five million dollars thereof,	1/2 of 1%
For the next five million dollars thereof,	1/4 of 1%
For the next five million dollars thereof,	1/8 of 1%

Our services do not include any direct responsibility for proceedings before administrative agencies, or any kind of litigation. However, if during the issuance of bonds any litigation develops regarding the issuance of bonds or the provisions made for their payment or security, we will advise and co-operate with your General Counsel in such litigation.

Our fee for any issue of bonds is to be paid at the time of the delivery of and payment for any such issue of bonds. If no bonds are actually issued and sold no fee will be due us.

Fees for refunding bonds and any issues in excess of twenty million dollars, and fees for mandamus suits in the Texas Supreme Court and any other special services not mentioned herein, will be negotiated between Bond Counsel and the District.

You have advised us that you now propose to authorize an issue of North Texas Municipal Water District Water Revenue Bonds, Series 1970, in the principal amount of \$9,200,000, with \$2,550,000 of such amount being for refunding outstanding bonds, and \$6,650,000 for providing construction money. Actually, you have just completed the issuance and delivery of an issue of North Texas Municipal Water District Water Revenue Bonds, Series 1969, in the principal amount of \$900,000, and we are aware that you had intended to include such amount in the Series 1970 issue, but circumstances required that the smaller amount be issued immediately because of the urgent necessity for that amount of money. Therefore, we are willing to regard the Series 1969 and Series 1970 Bonds as a single issue for the purpose of calculating the fee involved, and thereby reduce the aggregate fee. Our fee for the combined issues aggregating \$10,100,000 would be as follows:

1% of the first \$5,000,000 of construction money bonds:	\$50,000
1/2 of 1% of the next \$2,550,000 of construction money bonds:	\$12,750
Fee for \$2,550,000 of revenue refunding bond:	\$ 4,675
Total:	<u>\$67,425</u>
Less credit for fee paid for Series 1969 Bonds:	<u>9,000</u>
Net Fee for Series 1970 Bonds:	<u>\$58,425</u>

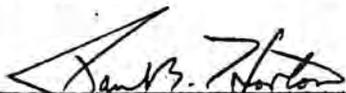
We might add that these fees are in line with those actually paid by the District in the past, and are in line with fees actually paid in similar transactions by a number of other water districts and river authorities in Texas. Our net fee for the Series 1970 Bonds would be approximately .64 of 1% of the entire Series, which, we believe, in view of the complexities and intricacies of the issue, combined with the refunding, is usual and reasonable for this type of financing. We can assure you that we will use our best efforts, as we have during the past nineteen or twenty years, to contribute to the continuing success of your District and the favorable marketing of your bonds.

If the arrangement suggested herein is satisfactory, please indicate by having the President of the Board execute one copy of this letter and return it to the undersigned.

Respectfully submitted,

McCALL, PARKHURST & HORTON

BY



Paul B. Horton

ACCEPTED this 19th day of January, 1970.

NORTH TEXAS MUNICIPAL WATER
DISTRICT

BY



President, Board of Directors

**AGREEMENT
FOR
INVESTMENT ADVISORY SERVICES
BY AND BETWEEN**

**NORTH TEXAS MUNICIPAL WATER DISTRICT
AND
FIRST SOUTHWEST ASSET MANAGEMENT, LLC**

This Investment Advisory Agreement (the "Agreement") is made by and between the North Texas Municipal Water District (the "Investor") and First Southwest Asset Management, LLC ("FSAM"). This agreement shall be effective as of the date of its acceptance by the Investor as indicated on the signature page hereof.

I. Terms and Conditions

This Agreement sets forth the terms and conditions governing the relationship of the Investor to FSAM with respect to securities and money which the Investor holds, from time to time, and which are available for investment or reinvestment (the "Portfolio"). This Agreement shall apply to any and all investable funds and securities in the Investor's Portfolio during the period in which this Agreement shall be in effect.

II. Investment Advisory Services

- A. Services.** With respect to the Portfolio, FSAM will endeavor to provide investment advisory services and cause to be executed such trades as determined in accordance with Section II.B below. FSAM agrees to provide professional services and its facilities and to direct and coordinate all programs of investing as may be considered and authorized by the Investor and to assume and pay those expenses incurred by FSAM in connection with the execution of investment decisions. Specifically, FSAM agrees to perform the following duties:
1. Review Investment Policy annually;
 2. Review cash flow projections;
 3. Recommend appropriate strategies based upon expected cash flow requirements;
 4. Advise the Investor on current market conditions and other general information;
 5. Analyze risk/return relationships between various investment alternatives;
 6. Assist in the selection of investment securities and as directed by the Investor, cause the transactions to be executed;
 7. Advise on the investment of the Portfolio in a manner consistent with the Investment Policy, the proceedings of the Investor and applicable state and federal rules and regulations; and
 8. Promptly send (or cause to be sent) trade confirmations to the Investor.
- B. Scope of Investment Decisions.** In performing the services listed in Section II.A above, FSAM shall not have discretionary authority and, accordingly, shall obtain approval from the Investor for the purchase or sale of securities prior to execution. The Investor hereby represents and acknowledges that its written investment policy and investment strategy includes its investment objectives and all portfolio limitations and restrictions, including, without limitation, acceptable levels of investment risk. The Investor also agrees to notify FSAM in writing ten business days in advance of the implementation of any changes in the Investor's investment objectives, investment limitations, and/or financial condition. Furthermore, the Investor will give FSAM immediate verbal

notice and written notice within five days of receipt of any trade confirmations should the Investor believe that any investment in the Portfolio violates the Investor's investment objectives or limitations.

- C. **Standard of Care.** In the administration of its duties, FSAM shall exercise the judgment and care, under prevailing circumstances, that a prudent person would exercise in the management of the person's own affairs, not for speculation, but for investment, considering, with regard to the entire Portfolio rather than any particular investment or security, the probable safety of capital and the probable income to be derived.
- D. **Settlement of Securities.** The purchase of individual securities shall be executed "delivery versus payment" (DVP) through the Investor's safekeeping agent. By so doing, Investor's funds will be released when and if the Investor has received, through the safekeeping agent, the designated securities purchased.
- E. **Return on the Portfolio.** The Investor expressly affirms and acknowledges that FSAM has not promised or guaranteed any stated or specified return on, or performance of, the Investor's investment portfolio.

III. Representations

- A. FSAM represents that it is registered as an investment advisor under the Investment Advisers Act of 1940 (the "Advisers Act") and is authorized and empowered to enter into this Agreement.
- B. The Investor represents and confirms that (1) the Investor has full power and authority to enter into this agreement; (2) the terms hereof do not violate any obligation by which the Investor is bound, whether arising by contract, operation of law, or otherwise; and (3) this Agreement has been duly authorized and will be binding on Investor according to its terms.
- C. The Investor agrees to:
 - 1. Provide FSAM with the schedule (if available) of estimated cash flow requirements related to the Portfolio, and promptly notify FSAM as to any changes in such estimated cash flow schedule;
 - 2. Provide FSAM, not less than monthly, with all relevant custodian, safekeeping and bank statements relating to all of the Portfolio; and
 - 3. Allow FSAM to rely upon all information regarding schedules or other information pertaining to the Portfolio as provided to it by the Investor as being true and accurate. FSAM shall have no responsibility to verify, through audit or investigation, the accuracy or completeness of such information and FSAM will not undertake to authenticate any such information.
- D. The Investor recognizes that there may be loss or depreciation of the current liquidation, immediate and ongoing value of any investment due to the fluctuation of market values. The Investor represents that no party to this Agreement has made any guarantee, either oral or written, that the Investor's investment objectives will be achieved. FSAM shall not be liable for any error in judgment and/or for any investment losses in the Portfolio in the absence of willful malfeasance, gross negligence, or violation of applicable law. Nothing in this Agreement shall constitute a waiver or limitation of any rights that the Investor may have under applicable state or federal law including without limitation, the state and federal securities laws.
- E. Investor represents and acknowledges that Investor has reviewed and understands the risk factors and fees associated with the Portfolio.

IV. Fees and Costs of FSAM

As consideration for the services provided by FSAM under this Agreement, FSAM will be entitled to a fee (the "Advisor Fee") determined in accordance with the schedule set forth in the fee schedule ("Schedule A"), a copy of which is attached hereto, is incorporated herein for all purposes and is being delivered to the Investor simultaneously with the execution, and as an integral part, of this Agreement. The obligation of FSAM to pay or incur expenses shall not include any costs incident to litigation, mandamus action, regulatory investigation, test case or other similar legal actions.

V. Reporting and Account Statements

FSAM will deliver or cause to be delivered to the Investor confirmation of transactions and/or periodic statements for the Portfolio as set forth in this Agreement. FSAM will also provide the Investor with an annual valuation of the Investor's Portfolio and any additional statements that may be required by applicable law, including the reporting provisions of the Public Funds Investment Act, or other applicable state law, with respect to transactions effected under this Agreement.

VI. Other Services

The investment advisory services provided hereunder by FSAM to the Investor are exclusive of any other services that FSAM may provide to the Investor.

VII. Execution of Investment Transactions

- A. **Affiliated Broker.** FSAM is affiliated through common ownership and control with Hilltop Securities ("HTS"), a registered broker/dealer with the Financial Industry Regulatory Authority ("FINRA"), the U.S. Securities and Exchange Commission ("SEC"), and various state and territorial regulatory authorities. Investor hereby authorizes FSAM to effect transactions for the Portfolio by execution through HTS. Where transactions are effected through HTS, HTS may act on an agency or principal basis to the extent permitted by law. Pursuant to Rule 206(3) of the Advisers Act, FSAM will obtain the Investor's consent on each investment transaction to allow FSC to act as a principal in acquiring a security to facilitate a trade. Fees for advisory services will be billed separately in accordance with the terms of this Agreement.
- B. **Bundling of Investment Transactions.** Transactions for each Investor account generally will be effected independently unless FSAM decides to purchase or sell the same securities for several Investors at approximately the same time. FSAM may (but is not obligated to) combine or "batch" such orders to obtain best execution. Under this procedure, transactions will be averaged as to price and will be allocated among FSAM's investors included in the "batch" group in proportion to the purchase and sale orders placed for each Investor in batch transactions.

VIII. Selection of Brokers

The Investor agrees that when FSAM effects or places orders for the execution of transactions for the Portfolio (other than situations where the Investor specifically instructs otherwise in writing), FSAM may allocate such transactions to such brokers and dealers for execution on such markets, at such prices as in the judgment of FSAM will be in the best interests of the Investor, taking into consideration, in the selection of such brokers and dealers, the available prices and rates of brokerage commissions and other relevant factors, without having to demonstrate that such factors are of a direct benefit to the Investor. Subject to the foregoing, FSAM will arrange for the execution of securities transactions for the Portfolio through brokers or dealers that FSAM reasonably believes will provide best execution.

IX. Non-Exclusive Relationship

The Investor hereby acknowledges that FSAM's services under this Agreement are nonexclusive, and that FSAM shall be free to render the same or similar services to other Investors. The Investor further

acknowledges that FSAM's advice is specific to each individual Investor's investment objectives, limitations and financial condition. Therefore FSAM, in the performance of its investment advisory duties, may give advice to, and take action on behalf of, other Investors that may differ from the advice given, or the timing and nature of the action taken, with respect to the Investor's Portfolio. Nothing in this Agreement shall be deemed to impose upon FSAM any obligation to purchase or sell, or to recommend for purchase or sale for the Investor's Portfolio, any security that FSAM or its affiliates may purchase or sell, for their own account or for the accounts of any other Investor if, at the sole discretion of FSAM, it is for any reason undesirable or impractical to take such action or make such recommendation for the Investor's Portfolio. The Investor also acknowledges that FSAM has varying fee structures and arrangements with other investors and may charge their investors different fees, which may be higher or lower than the fees charged with respect to the Investor's Portfolio for similar services.

X. Instructions from the Investor

Instructions may be given to FSAM by any officer or agent authorized by (1) the investment policy; (2) a duly executed "Authorization to Trade Public Funds" form provided by FSAM; or (3) a resolution of the governing body of Investor. FSAM may rely on such authorization until written notice to the contrary is delivered to FSAM by the Investor, and if the Investor does not deliver appropriate authorizing documentation, FSAM may accept instructions from any person reasonably believed by FSAM to be an officer of the Investor.

XI. Transactions Subject to Industry Regulations and Standards

All transactions shall be subject to the regulations of all applicable government authorities and self-regulatory agencies including, but not limited to, the constitutions and rules of the clearing agent, exchange, or market where executed. The Investor understands that FSAM is registered as an investment advisor under the Advisers Act, and as such is obligated to comply with all applicable laws and regulations, including those of the SEC and other regulatory and self-regulatory agencies, and agrees that FSAM shall not be liable to the Investor as a result of any action taken by FSAM to comply with any ruling, interpretation, or directive of such organizations. Further, Investor understands and agrees that FSAM will not accept any instructions from Investor which would require a violation of any such rules or regulations.

XII. Assignment

Neither FSAM nor the Investor may assign any of its rights, authorizations, or obligations under this Agreement without the prior written consent of the other party.

XIII. Term and Investor's Right of Cancellation

This Agreement shall become effective as of the date hereof and continue for two years after which time it may be continued for additional two-year periods with consent of both parties. Either party may terminate this Agreement upon delivering to the other party thirty (30) calendar days' prior written notice. In addition, the Investor may terminate this Agreement without penalty for a period of five (5) business days after the date it is executed by the Investor. The Investor may exercise this right by giving written notice to FSAM within the required time period. No penalty will be assessed for termination of this Agreement. In addition, the parties hereto agree that upon termination of this Agreement FSAM shall have no continuing obligation to the Investor regarding the investment of funds or performing any other services contemplated herein.

XIV. Custodial Arrangements

Custody of Portfolio assets will be maintained with a custodian selected by Investor and identified to FSAM (the "Custodian"). FSAM will not have custody of any assets in the Portfolio. Investor will be solely responsible for paying all fees or charges of the Custodian. Investor authorizes FSAM to give Custodian instructions for the purchase, sale, conversion, redemption, exchange or retention of any security, cash or cash equivalent or other investment for the Portfolio.

XV. Miscellaneous

- A. **Notices to the Investor.** All written communication to the Investor shall be sent to the Investor's address set forth on the signature page hereof or as directed in writing to FSAM by the Investor. Any notice, statement, or other communication mailed to the Investor by FSAM in accordance with this section will be deemed to be given to the Investor personally on the date it is so mailed, whether or not it is actually received by the Investor.
- B. **Notices to FSAM.** Any notice, statement, or other communication from the Investor to FSAM under this Agreement must be in written form and will be deemed to be given to FSAM upon actual receipt thereof by FSAM, whether such notice was mailed, personally delivered, or telecopied to:
- First Southwest Asset Management, LLC
300 W. 6th Street, Suite 1940
Austin, Texas 78701
Attention: Scott McIntyre
Fax Number: (512) 481-2020
- C. **Confidential Relationship.** All of the information and advice furnished by either party to the other under this Agreement, including their respective agents and employees, will be treated as strictly confidential by each party and will not be disclosed to third parties under any circumstances except as required by law.
- D. **Limitations of Liability.** Federal and state securities laws impose liabilities under certain circumstances on persons who do not act in good faith and, therefore, nothing in this Agreement shall in any way constitute a waiver or limitation of any rights that the Investor may have under federal and state securities laws.
- E. **Inconsistent Provisions; Agreements.** If any provisions of this Agreement should become or be found to be inconsistent with laws, rules, or regulations of any government or regulatory body having jurisdiction over the subject matter herein, such provisions shall be deemed modified or rescinded in accordance with any such laws, rules, or regulations. To the extent that the provisions of this Agreement are inconsistent with the provisions of any account agreement or clearing agreement with FSAM or its clearing agent, as the case may be, then the terms of such account agreement or clearing agreement shall govern and such terms shall supersede the inconsistent terms herein.
- F. **Invalid Provisions.** If any provision or condition of this Agreement shall be held to be invalid or unenforceable by any Court, or regulatory or self-regulatory agency or body, such invalidity or unenforceability shall attach only to such provision or condition. The validity of the remaining provisions and conditions shall not be affected, and this Agreement shall be carried out as if any such invalid or unenforceable provision or condition were not contained herein.
- G. **Waiver of Terms.** FSAM's failure to insist at any time upon strict compliance with any terms of this Agreement shall not constitute a waiver of any of FSAM's rights as described herein.
- H. **Governing Law.** This Agreement will be governed by and construed in accordance with the laws of the State of Texas, without regard to its principles of conflicts of laws.
- I. **Extraordinary Events.** Neither FSAM nor any of its officers, directors, shareholders, affiliates, general partners, employees, agents, or trustees shall be liable for losses caused directly or indirectly by government restrictions, exchange or market actions, suspensions of trading, wars, strikes, delays in the transmission of orders due to breakdown or failure of transmission or communication facilities, or any other causes beyond FSAM's reasonable control or anticipation.
- J. **Written Disclosure Statement.** Simultaneously with the execution of this Agreement, FSAM has delivered to the Investor Part II of its Form ADV as filed with the SEC, or a similar disclosure

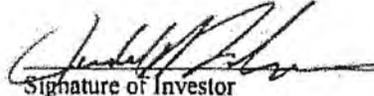
document, as its brochure pursuant to Rule 204.3 of the Advisers Act. The Investor's execution of this Agreement shall be deemed acknowledgment of receipt thereof.

- K. **Verification of Information.** The Investor represents and warrants to FSAM that all information furnished to FSAM in connection with the opening of the Portfolio (and all documents supplied by the Investor in this regard, including financial statements) are true, complete, and correct. FSAM is entitled to rely on this information until FSAM receives written notice of any change, which the Investor agrees to furnish promptly should any material changes occur.

[THE REMAINDER OF THIS PAGE IS INTENTIONALLY LEFT BLANK. THE NEXT PAGE IS A SIGNATURE PAGE.]

By signing this Agreement, the undersigned Investor acknowledges receipt of a copy of this Agreement, including Schedule A.

North Texas Municipal Water District


Signature of Investor

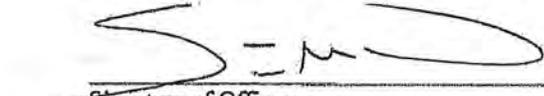
3/17/16
Date

Judith R. Sanderson
Print Name

Deputy Director
Capacity of Signatory

501 E Brown Street
Address
Wylie, Tx 75098

FIRST SOUTHWEST ASSET MANAGEMENT, LLC


Signature of Officer

3/21/16
Date

Scott McIntyre
Print Name

MANAGING DIRECTOR
Capacity of Signatory

SCHEDULE A

FEE SCHEDULE AND EXPENSE ITEMS

In consideration for the services rendered by First Southwest Asset Management, LLC ("FSAM") in connection with the investment of the Portfolio for the Investor, it is understood and agreed that a fully disclosed transaction-based fee of 2 basis points (0.02%) be subtracted from the investment yield at time of purchase, effectively reducing the yield on each security prior to delivery into the Investor's account by 1/50th of 1%.

Said fee includes all costs of services related to the investment services provided under this Agreement, and all reasonable travel and business expenses related to the performance of these services. Any other fees earned by FSAM relating to Investor transactions, shall be disclosed to the Investor.

Fee Calculation for Investment of Bond Proceeds into Flexible Repurchase Agreements ("Flex Repos") and Guaranteed Investment Contracts ("GIC's"): In the event that specific bond proceeds are invested by FSAM *as per Investor instruction* into either a Flex Repo or GIC, FSAM shall be entitled to the lesser of \$39,000 or 0.20 percent (0.0020) of the aggregate amount reasonably expected as of the issue date to be deposited over the term of the contract. This fully disclosed fee would be paid to FSAM by the winning bidder.



May 28, 2015

Mr. John Sweeden
Audit Committee Chairman
North Texas Municipal Water District
505 East Brown St.
Wylie, Texas 75098

Dear Mr. Sweeden:

You have requested that we audit the financial statements of each major fund of North Texas Municipal Water District (the District), as of September 30, 2015, and for the year then ended and the related notes to the financial statements, which collectively comprise the District's basic financial statements as listed in the table of contents. We are pleased to confirm our acceptance and our understanding of this audit engagement by means of this letter.

Accounting principles generally accepted in the United States of America require that management's discussion and analysis and budgetary comparison information, among other items, be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. As part of our engagement, we will apply certain limited procedures to the required supplementary information (RSI) in accordance with auditing standards generally accepted in the United States of America. These limited procedures will consist primarily of inquiries of management regarding their methods of measurement and presentation, and comparing the information for consistency with management's responses to our inquiries. We will not express an opinion or provide any form of assurance on the RSI. The following RSI is required by accounting principles generally accepted in the United States of America. This RSI will be subjected to certain limited procedures but will not be audited:

1. Management's Discussion and Analysis

Supplementary information other than RSI will accompany the District's basic financial statements. We will subject the following supplementary information to the auditing procedures applied in our audit of the basic financial statements and perform certain additional procedures, including comparing and reconciling the supplementary information to the underlying accounting and other records used to prepare the financial statements or to the financial statements themselves, and additional procedures in accordance with auditing standards generally accepted in the United States of America.

North Texas Municipal Water District
May 28, 2015

Page 2

We intend to provide an opinion on the following supplementary information in relation to the financial statements as a whole:

1. Sewer System Supplemental Schedules

Also, the document we submit to you will include the following other additional information that will not be subjected to the auditing procedures applied in our audit of the financial statements:

1. Introductory Section
2. Statistical Section

Audit Objectives

The objective of our audit is the expression of opinions as to whether your basic financial statements are fairly presented, in all material aspects, in conformity with generally accepted accounting principles and to report on the fairness of the supplementary information referred to above when considered in relation to the financial statements as a whole. The objective also includes reporting on internal control related to the financial statements and compliance with the provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a material effect on the financial statements in accordance with *Government Auditing Standards*. We cannot provide assurance that an unmodified opinion will be expressed. Circumstances may arise in which it is necessary for us to modify our opinions or add emphasis-of-matter or other-matter paragraphs. If our opinions on the financial statements or compliance are other than modified, we will discuss the reasons with you in advance. If, for any reason, we are unable to complete the audit or are unable to form or have not formed opinions, we may decline to express opinions or to issue a report as a result of this engagement.

Auditor Responsibilities

We will conduct our audit in accordance with auditing standards generally accepted in the United States of America (U.S. GAAS) and *Government Auditing Standards* issued by the Comptroller General of the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the basic financial statements are free from material misstatement. An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to error, fraudulent financial reporting, misappropriation of assets, or violations of laws, governmental regulations, grant agreements, or contractual agreements. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

North Texas Municipal Water District
May 28, 2015

Page 3

Because of the inherent limitations of an audit, together with the inherent limitations of internal control, an unavoidable risk that some material misstatements may not be detected exists, even though the audit is properly planned and performed in accordance with U.S. GAAS and *Government Auditing Standards* issued by the Comptroller General of the United States of America. In addition, an audit is not designed to detect immaterial misstatements or violations of laws or governmental regulations that do not have a direct and material effect on the financial statements. However, we will inform the appropriate level of management of any material errors, fraudulent financial reporting, or misappropriation of assets that comes to our attention. We will also inform the appropriate level of management of any violations of laws or governmental regulations that come to our attention, unless clearly inconsequential. Our responsibility as auditors is limited to the period covered by our audit and does not extend to any later periods for which we are not engaged as auditors.

In making our risk assessments, we consider internal control relevant to the District's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on the effectiveness of the District's internal control. However, we will communicate to you in writing concerning any significant deficiencies or material weaknesses in internal control relevant to the audit of the financial statements that we have identified during the audit.

As part of obtaining reasonable assurance about whether the financial statements are free of material misstatement, we will perform tests of the District's compliance with the provisions of applicable laws, regulations, contracts, and agreements. However, the objective of our audit will not be to provide an opinion on overall compliance and we will not express such an opinion.

Management Responsibilities

Our audit will be conducted on the basis that management acknowledge and understand that they have responsibility:

- a. For the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America;
- b. For the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to error, fraudulent financial reporting, misappropriation of assets, or violations of laws, governmental regulations, grant agreements, or contractual agreements; and
- c. To provide us with:

- i. Access to all information of which management is aware that is relevant to the preparation and fair presentation of the financial statements such as records, documentation, and other matters;
 - ii. Additional information that we may request from management for the purpose of the audit; and
 - iii. Unrestricted access to persons within the District from whom we determine it necessary to obtain audit evidence.
- d. For including the auditor's report in any document containing financial statements that indicates that such financial statements have been audited by the District's auditor;
- e. For identifying and ensuring that the District complies with the laws and regulations applicable to its activities; and
- f. For adjusting the financial statements to correct material misstatements and confirming to us in the management representation letter that the effects of any uncorrected misstatements aggregated by us during the current engagement and pertaining to the current year period(s) under audit are immaterial, both individually and in the aggregate, to the financial statements as a whole; and
- g. With respect to any nonattest services we perform, for (a) making all management decisions and performing all management functions; (b) assigning a competent individual to oversee the services; (c) evaluating the adequacy of the services performed; (d) evaluating and accepting responsibility for the results of the services performed; and (e) establishing and maintaining internal controls, including monitoring ongoing activities.
- h. With regard to the supplementary information referred to above: (a) for the preparation of the supplementary information in accordance with the applicable criteria; (b) to provide us with the appropriate written representations regarding supplementary information; (c) to include our report on the supplementary information in any document that contains the supplementary information and that indicates that we have reported on such supplementary information; and (d) to present the supplementary information with the audited consolidated financial statements, or if the supplementary information will not be presented with the audited consolidated financial statements, to make the audited financial statements readily available to the intended users of the supplementary information no later than the date of issuance by you of the supplementary information and our report thereon.

During the course of our engagement, we will request information and explanations from management regarding the District's operations, internal controls, future plans, specific transactions and accounting systems and procedures. At the conclusion of our engagement, we will require, as a precondition to the issuance of our report, that management provide certain representations in a written representation letter.

North Texas Municipal Water District
May 28, 2015

Page 5

The District agrees that as a condition of our engagement to perform an audit that management will, to the best of its knowledge and belief, be truthful, accurate and complete in all representations made to us during the course of the audit and in the written representation letter. The procedures we perform in our engagement and the conclusions we reach as a basis for our report will be heavily influenced by the written and oral representations that we receive from management. False or misleading representations could cause us to expend unnecessary efforts in the audit; or, worse, could cause a material error or a fraud to go undetected by our procedures. Thus, the District agrees that we will not be liable for any damages or otherwise responsible for any misstatements in the District's financial statements that we may fail to detect as a result of false or misleading representations that are made to us by management. Moreover, the District agrees to indemnify and hold us harmless from any claims and liabilities, including reasonable attorneys' fees, expert fees and costs of investigation and defense, arising out of or related to this engagement if false or misleading representations are made to us by any member of the District's management.

Reporting

We will issue a written report upon completion of our audit of the District's basic financial statements. Our report will be addressed to the governing body of the District. We cannot provide assurance that unmodified opinions will be expressed. Circumstances may arise in which it is necessary for us to modify our opinions, add an emphasis-of-matter or other-matter paragraph(s), or withdraw from the engagement.

In accordance with the requirements of *Government Auditing Standards*, we will also issue a written report describing the scope of our testing over internal control over financial reporting and over compliance with laws, regulations, and provisions of grants and contracts, including the results of that testing. However, providing an opinion on internal control and compliance over financial reporting will not be an objective of the audit and, therefore, no such opinion will be expressed.

Other

We understand that your employees will prepare all confirmations we request and will locate any documents or invoices selected by us for testing.

In the unlikely event that circumstances occur which we in our sole discretion believe could create a conflict with either the ethical standards of our firm or the ethical standards of our profession in continuing our engagement, we may suspend our services until a satisfactory resolution can be achieved or we may resign from the engagement. We will notify you of such conflict as soon as practicable, and will discuss with you any possible means of resolving them prior to suspending our services.

North Texas Municipal Water District
May 28, 2015

Page 6

Both of us agree that any dispute between you and Weaver and Tidwell, L.L.P., arising from the engagement, this agreement, or the breach of it, may, if negotiations and other discussion fail be first submitted to mediation in accordance with the provisions of the Commercial Mediation Rules of the American Arbitration Association (AAA) then in effect. Both of us agree to conduct any mediation in good faith and make reasonable efforts to resolve any dispute by mediation. Mediation is not a pre-condition to the arbitration provided for below and the failure or refusal by either party to request or participate in mediation shall not preclude the right of either party to initiate arbitration. We agree to conduct the mediation in Dallas, Texas or another mutually agreed upon location.

Both of us agree that any dispute arising from the engagement, this agreement or the breach of it shall be subject to binding arbitration under the provisions of the Federal Arbitration Act (9 U.S.C. § 1, et seq.) and of the Dispute Resolution Rules for Professional Accounting and Related Services Disputes of the AAA (the Rules), and judgment on the award rendered by the arbitrator may be entered in any court of competent jurisdiction. The arbitration shall be heard before one or more arbitrators selected in accordance with the Rules. The parties agree to conduct the arbitration in Dallas, Texas or another mutually agreed upon location. The arbitrator may only award direct damages and may not award consequential, exemplary, or punitive damages. The prevailing party in any arbitration or litigation shall be entitled to recover from the other party reasonable attorneys' and expert witness fees, court costs, and the administrative costs, arbitrator's fees, and expenses of the AAA incurred in the arbitration or litigation in addition to any other relief that may be awarded.

Notwithstanding the provisions of the immediately preceding paragraph, neither of us shall be compelled to arbitrate any dispute between us which arises out of any claim asserted against either of us by a third party, unless the third party (whether one or more) agrees to join the arbitration or can be compelled to join it.

If any term of this engagement letter is declared illegal, unenforceable, or unconscionable, that term shall be severed and the remaining terms of the engagement letter shall remain in force. Both of us agree that the arbitrator(s) or Court, as the case may be, should modify any term declared to be illegal, unenforceable, or unconscionable in a manner that will retain the intended term as closely as possible. If a dispute arising from the engagement or from this agreement or any term of it or any alleged breach of it is submitted to a Court for interpretation or adjudication, both of us irrevocably waive right to trial by jury and agree that the provisions of this engagement letter regarding damages, attorneys' fees, and expenses shall be applied and enforced by the Court.

North Texas Municipal Water District
May 28, 2015

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If you intend to publish or otherwise reproduce the financial statements and make reference to our firm, you agree to provide us with printers' proofs or masters for our review and approval before printing. You also agree to provide us with a copy of the final reproduced material for our approval before it is distributed.

During the course of the engagement, we may communicate with you or your personnel via fax or e-mail, and you should be aware that communication in those mediums contains a risk of misdirected or intercepted communications.

Mr. Shawn Parker is the engagement partner for the audit services specified in this letter. His responsibilities include supervising our services performed as part of this engagement and signing or authorizing another qualified firm representative to sign the audit report.

We estimate that the fee for our audit will be \$113,000. The fee estimate is based on anticipated cooperation from your personnel and the assumption that unexpected circumstances will not be encountered during the audit. If significant additional time is necessary, we will discuss it with you and arrive at a new fee estimate before we incur the additional costs. Our invoices for these fees will be rendered each month as work progresses and are payable on presentation. Our fee is based upon the complexity of the work to be performed and the tasks required. Fees for our services are due upon receipt of our invoice. For bills not paid within 60 days of the billing date, a late charge will be added to the outstanding balance. The late charge will be assessed at .5% on the unpaid balance per month, or payments are due in compliance with the Texas Local Government Code.

During the course of the audit we may observe opportunities for economy in, or improved controls over, your operations. We will bring such matters to the attention of the appropriate level of management, either orally or in writing.

The audit documentation for this engagement is the property of Weaver and Tidwell, L.L.P. and constitutes confidential information. However, we may be requested to make certain audit documentation available to regulators or other outside parties pursuant to authority given to it by law or regulation, or to peer reviewers. If requested, access to such audit documentation will be provided under the supervision of Weaver and Tidwell, L.L.P.'s personnel. Furthermore, upon request, we may provide copies of selected audit documentation to regulators or other outside parties. The regulators or other outside parties may intend, or decide, to distribute the copies of information contained therein to others, including other governmental agencies.

In accordance with the requirements of *Government Auditing Standards*, we have attached a copy of our latest external peer review of our firm for your consideration and files.

North Texas Municipal Water District
May 28, 2015

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Please sign and return the attached copy of this letter to indicate your acknowledgment of, and agreement with, the arrangements for our audit of the financial statements including our respective responsibilities.

We appreciate the opportunity to be your financial statement auditors and look forward to working with you and your staff.

Yours truly,

Weaver and Tidwell, L.L.P.

WEAVER AND TIDWELL, L.L.P.

SMP:res

RESPONSE:

This letter correctly sets forth the understanding.

Acknowledged and agreed on behalf of North Texas Municipal Water District by:

Signature:

Judd H. Salas

Title:

Deputy Director (Finance + Personnel)

Date:

6/2/15



CPAs & BUSINESS ADVISORS

System Review Report

October 4, 2013

To the Partners of Weaver and Tidwell, L.L.P.
and the National Peer Review Committee

We have reviewed the system of quality control for the accounting and auditing practice of Weave and Tidwell, L.L.P. (the firm) applicable to non-SEC issuers in effect for the year ended May 31, 2013. Our peer review was conducted in accordance with the Standards for Performing and Reporting on Peer Reviews established by the Peer Review Board of the American Institute of Certified Public Accountants. As a part of our peer review, we considered reviews by regulatory entities, if applicable, in determining the nature and extent of our procedures. The firm is responsible for designing a system of quality control and complying with it to provide the firm with reasonable assurance of performing and reporting in conformity with applicable professional standards in all material respects. Our responsibility is to express an opinion on the design of the system of quality control and the firm's compliance therewith based on our review. The nature, objectives, scope, limitations of, and the procedures performed in a System Review are described in the standards at www.aicpa.org/prsummary.

As required by the standards, engagements selected for review included engagements performed under *Government Auditing Standards*; audits of employee benefit plans, audits performed under FDICIA, and examinations of service organizations (Service Organizations Control (SOC) 1 and 2 engagements).

In our opinion, the system of quality control for the accounting and auditing practice of Weaver and Tidwell, L.L.P. applicable to non-SEC issuers in effect for the year ended May 31, 2013, has been suitably designed and complied with to provide the firm with reasonable assurance of performing and reporting in conformity with applicable professional standards in all material respects. Firms can receive a rating of *pass*, *pass with deficiency(ies)* or *fail*. Weaver and Tidwell, L.L.P. has received a peer review rating of *pass*.

A handwritten signature in cursive script that reads "Eide Bailly LLP".

Eide Bailly LLP

www.eidebailly.com

800 Nicollet Mall, Ste. 1300 | Minneapolis, MN 55402-7033 | T 612.253.6500 | F 612.253.6600 | EOE

Law Offices
Gay, McCall, Isaacks, & Roberts

A Professional Corporation
Attorneys and Counselors
777 East 15th Street
Plano, Texas 75074
972-424-8501 • Facsimile 972-424-5619

JOHN E. GAY
DAVID MCCALL+
LEWIS L. ISAACKS^+
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TEXAS BOARD OF LEGAL SPECIALIZATION
+ATTORNEY – MEDIATOR

August 25, 2015

Mr. Tom Kula, Executive Director
North Texas Municipal Water District
505 E. Brown Street
Wylie, Texas 75098

Re: Engagement letter for legal services

Dear Mr. Kula:

Our firm is pleased to present this engagement letter with regard to representation of North Texas Municipal Water District (NTMWD) as general counsel, in real estate and general contract matters, as well as representation in land acquisition required for various projects and needs of NTMWD. Our firm will also be prepared to assist you in any other area where requested. It has been our pleasure for one or more members of our firm to provide legal representation to NTMWD since its creation in the 1950's. We look forward to our continued relationship.

The firm's attorney's rate for representation will be \$275.00 per hour with legal assistant time being billed at \$150.00 per hour. This is a reduced rate from my standard hourly rate of \$400.00 per hour. In Eminent Domain cases a flat rate of \$7,500.00 per case plus expenses will continue to be the rate for representation through Special Commissioner's Hearing. After the Special Commissioner's Hearing has taken place if any Objections are filed to the Award the hourly rate will then be used.

Expenses related to our services will be included in our statements as they are incurred by us. Such expenses may include photocopying, filing and recording fees, long distance telephone

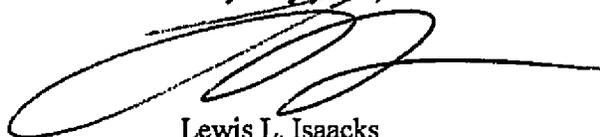
Mr. Tom Kula, Executive Director
North Texas Municipal Water District
August 25, 2015
Page 2

calls, postage and messenger charges, computerized legal research, and other actual out-of-pocket expenses. NTMWD may be asked to pay directly, certain larger costs, such as experts' fees, mediation fees, deposition costs, and outside vendors' charges, if any.

Our statements are rendered monthly and are due upon receipt. Statements will be sent to your attention at the address set forth above or via email. A statement that is not paid within 30 days of receipt will be considered overdue.

Again, our firm appreciates the opportunity to continue to represent North Texas Municipal Water District. If you have any questions about the contract or its terms, please do not hesitate to call. Otherwise, please sign the enclosed copy of this letter and return it to my attention. Should we need to discuss any aspect of this engagement please feel free to call.

Very truly yours,



Lewis L. Isaacks

Agreed to and accepted this 1st day of September 2015.

NORTH TEXAS MUNICIPAL WATER DISTRICT

By: Thomas Kula
TOM KULA, EXECUTIVE DIRECTOR



816 Congress Avenue, Suite 1900
Austin, Texas 78701
512.322.5800 p
512.472.0532 f
lglawfirm.com

1984 • Celebrating 30 Years • 2014

Mr. Rochelle's Direct Line: (512) 322-5810
mrochelle@lglawfirm.com

April 17, 2014

Mr. Jim Parks
North Texas Municipal Water District
P.O. Box 2408
Wylie, Texas 75098

VIA ELECTRONIC TRANSMISSION

Re: Billing Rates for Legal Services to North Texas Municipal Water District

Dear Jim:

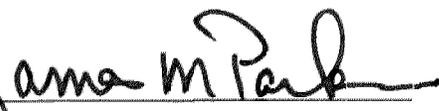
My firm and I have had the privilege of providing legal services to the North Texas Municipal Water District (the "District") for some time, pursuant to our employment agreement. We have appreciated the opportunity to provide these services, and we value the District as a client. Pursuant to our employment agreement, this letter will serve as notice of our intention to adjust our hourly billing rates on the matters we assist the District with, effective May 1, 2014, to the rates reflected in the attached "Hourly Billing Rate Schedule for 2014." These rates continue to represent a significant reduction in the 2014 hourly billing rates of the attorneys here at my firm.

Please call me if you have questions or concerns with these rate changes. I look forward to our continued representation of the North Texas Municipal Water District.

Sincerely,


Martin C. Rochelle

MCR/ldp
4336635
cc: Mr. Mike Rickman
Billing Office


Signature

4/21/2014
Date

JAMES M PARKS
Printed Name

HOURLY BILLING RATE SCHEDULE FOR 2014

Principals

Robert H. Lloyd	310
Paul G. Gosselink	310
Martin C. Rochelle	275
R. Lambeth Townsend	310
Georgia N. Crump	310
Geoffrey M. Gay	310
Lauren J. Kalisek	275
Michael A. Gershon	300
Thomas L. Brocato	300
Brad B. Castleberry	275
Duncan C. Norton	275
Ty H. Embrey	250
José E. de la Fuente	310
Chris L. Brewster	250
Sheila B. Gladstone	275
Jason T. Hill	250
David J. Klein	250

Associates

Jeffrey S. Reed	225
Amy M. Emerson	225
Sara R. Thornton	225
Stefanie P. Albright	225
Eileen L. McPhee	225
Melissa A. Long	225
Cristina D. Ramage	225
Nathan E. Vassar	225
Elizabeth P. Hernandez	225
Tyler O'Halloran	225
James T. Aldredge	225
Troupe Brewer	225

Signature

Printed Name

Date


4/21/2014

JAMES M PARKS

Legal and Technical Assistants, Analysts, Intern, Librarian

Richard A. Dyer	160
Fred L. Castro	115
Joe A. Jimenez	115
Jeff D. Goldstein	115
Holly N. Paxton	115
Paula L. McCormick	115
Judy Golden-Bentley	115
Paige L. Hamilton	115
Lissette M. Ruiz	115
Karen Mallios	115
Hannah Ging	115
Contract Paralegals	115
Clerks, Librarian	95
Paralegal Assistants	35

James M Parks
Signature

4/21/2014
Date

JAMES M PARKS
Printed Name

FY17 SWIFT Application Project Table -FUNDING (\$M)

Approx. Award Date	Reference Number	Contract Description	Typ	NTMWD Project Number	Assigned CMAR	TWDB Funding Category	Current Estimated Cost \$M	Escalation %/age	Total Estimated Cost \$M	Description	Supporting Documents Provided	
LOWER BOIS D'ARC CREEK RESERVIOR (LBCR)												
02/2017	1	LBCR - Additional Archaeological Services	6-Perm	101-0237-11	Program	Planning	\$ 0.640000	0%	\$ 0.640000	Archeological services for mitigation of sites	Reference Section 3.14 of DEIS (PDF Page 297 of 602 for discussion on archeological efforts	
02/2017	2	LBCR - Fannin County Rd and Bridge Imp - Final Design	1-Eng	101-0435-16	4	Design	\$ 1.089000	0%	\$ 1.089000	Final design of country road improvements to deconflict with reservoir	Reference Final Transportation Report 5-3-11.PDF file	
04/2017	3	LBCR - Payment to Bois d'Arc MUD	11-Cnstr		Program	Design	\$ 2.600000	0%	\$ 2.600000	Agreement to local water district to design and construct improvements to tr	N/A. Can provide future signed agreement	
04/2017	4	LBCR - EIS Additional Services	1-Eng	101-0192-09	Program	Planning	\$ 0.800000	0%	\$ 0.800000	Additional permitting professional services	N/A. Can provide contract at future date.	
04/2017	5	LBCR - 90" Pipeline Section A - Final Design	1-Eng	101-0424-16	5	Design	\$ 2.500000	0%	\$ 2.500000	Final design of 90" PL scheduled for May 17 start.	Reference LBCR RWPL Final PDR.PDF	
04/2017	6	LBCR - 90" Pipeline Section B - Final Design	1-Eng	101-0424-16	5	Design	\$ 2.500000	0%	\$ 2.500000	Final design of 90" PL scheduled for May 17 start.	Reference LBCR RWPL Final PDR.PDF	
04/2017	7	LBCR - 90" Pipeline Section C - Final Design	1-Eng	101-0424-16	5	Design	\$ 2.500000	0%	\$ 2.500000	Final design of 90" PL scheduled for May 17 start.	Reference LBCR RWPL Final PDR.PDF	
04/2017	8	LBCR - Conflict Relocations - Design	1-Eng		Program	Design	\$ 2.500000	0%	\$ 2.500000	Agreements with franchise utilities to remove conflicts	Reference LBCR Conflict Map.PDF	
06/2017	9	LBCR Additional Basic Engr/Planning Phase III B - Permitting	6-Perm	101-0351-14	Program	Planning	\$ 0.400000	0%	\$ 0.400000	Additional permitting professional services	N/A. Can provide contract at future date.	
07/2017	10	LBCR - Addtl Legal Services - Legal	5-Legal		Program	Planning	\$ 0.500000	0%	\$ 0.500000	Additional legal services	N/A. Can provide contract at future date.	
10/2017	11	LBCR - Mitigation - Additional Design	1-Eng	101-0366-14	2	Design	\$ 1.000000	0%	\$ 1.000000	Additional design for additional area based on most current mitigation plan.	Reference Section 1.8 of DEIS (PDF Page 79 of 602)	
10/2017	12	LBCR Program Management - Lake Operations Plan and Engineering/Disaster Response Plan	1-Eng	101-0374-14	Program	Planning	\$ 0.567000	0%	\$ 0.567000	Reservoir operations planning.	N/A. Can provide contract at future date.	
10/2017	13	LBCR - Additional Program Management - Design	1-Eng	101-0374-14	Program	Design	\$ 2.300000	0%	\$ 2.300000	Annual renewal of LBCR Program Management services	N/A. Can provide contract at future date.	
10/2017	14	LBCR Program Management - Shoreline Management Plan	1-Eng	101-0374-14	Program	Planning	\$ 0.300000	0%	\$ 0.300000	Reservoir operations planning.	N/A. Can provide contract at future date.	
02/2018	15	LBCR - Acquisition of Property (Includes Surveying & Legal) - Property*	4-Prop	101-0344-13	Program	Acquisition	\$ 8.120000	3%	\$ 8.363600	Future funding for final property acquisition in footprint of reservoir.	N/A.	
02/2018	16	LBCR - Acquisition of Property (Includes Surveying & Legal) - Property*	4-Prop	101-0344-13	Program	Acquisition	\$ 3.460000	3%	\$ 3.563800	Future funding for final property acquisition in footprint of reservoir.	N/A.	
02/2018	17	LBCR - Archeology Support and Permitting	6-Perm	101-0237-11	Program	Planning	\$ 6.750000	3%	\$ 6.952500	Archeological services for mitigation of sites	Reference Section 3.14 of DEIS (PDF Page 297 of 602 for discussion on archeological efforts	
04/2018	18	LBCR 90" Pipeline - Pipeline Right of Way (ROW) - Property*	4-Prop	101-0424-16	Program	Acquisition	\$ 7.080000	3%	\$ 7.292400	Future funding for 90-inch pipeline easements.	Reference LBCR RWPL Final PDR.PDF	
04/2018	19	LBCR - County Roads Relocation - Construction	11-Cnstr	101-0435-16	4	Construction	\$ 14.200000	3%	\$ 14.626000	Construction of country road improvements to deconflict with reservoir	Reference Final Transportation Report 5-3-11.PDF file	
04/2018	20	LBCR Dam - Construction*	11-Cnstr	101-0344-13	1	Construction	\$ 161.000000	3%	\$ 165.830000	Construction of LBCR Dam	Reference Final Dam PDR.PDF	
04/2018	21	LBCR - Conflict Relocations (Utilities, MUD CNN, North WTP Dam, & Lake Bonham Protection) - Construction*	11-Cnstr		Program	Construction	\$ 20.100000	3%	\$ 20.703000	Agreements with franchise utilities to remove conflicts	Reference LBCR Conflict Map.PDF	
04/2018	22	LBCR - FM 897 Relocation - Construction	11-Cnstr	101-0383-15	4	Construction	\$ 44.800000	3%	\$ 46.144000	Construction of new FM 897.	Reference Final Transportation Report 5-3-11.PDF file	
04/2018	23	LBCR - Riverby - Mitigation - Construction	11-Cnstr	101-0366-14	2	Construction	\$ 81.400000	3%	\$ 83.842000	Construction of mitigation on Riverby Ranch.	Reference Section 1.8 of DEIS (PDF Page 79 of 602)	
04/2018	24	LBCR - Riverby - Mitigation - Fence Construction	11-Cnstr	101-0366-14	2	Construction	\$ 1.130000	3%	\$ 1.163900	Construction of mitigation on Riverby Ranch.	Reference Section 1.8 of DEIS (PDF Page 79 of 602)	
04/2018	25	LBCR PS - Electrical Power Transmission - Construction*	11-Cnstr		Program	Construction	\$ 11.700000	3%	\$ 12.051000	Payment to construct transmission power to support RWPS	Reference LBCR Project Location Map.PDF showing locations	
04/2018	26	LBCR Clearing - Construction & Inspection	11-Cnstr	101-0344-13	1	Construction	\$ 5.755000	3%	\$ 5.927650	Clearing of reservoir footprint.	Reference Appendix T of the DEIS for the clearing plan.	
05/2018	27	LBCR Dam - Materials Testing - Construction*	11-Cnstr	101-0344-13	1	Construction	\$ 2.060000	3%	\$ 2.121800	Material testing for dam construction	Reference Final Dam PDR.PDF	
05/2018	28	LBCR - Conflict Relocations (Utilities, MUD CNN, North WTP Dam, & Lake Bonham Protection) - Inspection*	10-Insp		Program	Construction	\$ 0.164000	3%	\$ 0.168920	Inspection of franchise utility relocation	Reference LBCR Conflict Map.PDF	
05/2018	29	LBCR - County Roads Relocation-Materials Testing - Construction	11-Cnstr	101-0435-16	4	Construction	\$ 0.530000	3%	\$ 0.545900	Material testing for county road construction	Reference Final Transportation Report 5-3-11.PDF file	
05/2018	30	LBCR - FM 897 Relocation - Materials Testing - Construction	11-Cnstr	101-0383-15	4	Construction	\$ 2.120000	3%	\$ 2.183600	Material testing for FM 897 construction	Reference Final Transportation Report 5-3-11.PDF file	
05/2018	31	LBCR - Mitigation - Inspection*	10-Insp	101-0366-14	2	Construction	\$ 1.200000	3%	\$ 1.236000	Inspection services for mitigation construction	Reference Section 1.8 of DEIS (PDF Page 79 of 602)	
05/2018	32	LBCR Dam - Inspection*	10-Insp	101-0344-13	1	Construction	\$ 4.430000	3%	\$ 4.562900	Inspection services for dam construction	Reference Final Dam PDR.PDF	
05/2018	33	LBCR - County Roads Relocation - Inspection	10-Insp	101-0435-16	4	Construction	\$ 0.279000	3%	\$ 0.287370	Inspection services for county road construction	Reference Final Transportation Report 5-3-11.PDF file	
06/2018	34	LBCR - Lake Office - Design	1-Eng		Program	Design	\$ 0.206000	3%	\$ 0.212180	Future funding for design of NTMWD's admin. Office at reservoir	N/A	
07/2018	35	LBCR - 90" Pipeline and 84" Treated Water Line - CMAR Procurement Svcs - Construction	11-Cnstr	101-0424-16	5	Construction	\$ 0.250000	3%	\$ 0.257500	Funding for the procurement services that are part of the CMAR 5 (Pipelines	Reference CMAR 5 - Pipelines (Garney Construction) contract	
09/2018	36	LBCR - Boat Ramps and Parks - Design	1-Eng	101-0436-16	4	Design	\$ 0.546000	3%	\$ 0.562380	Future funding for the design of three recreational boat ramps	Reference Figure 22 of the LBCR Comprehensive Plan.PDF (Page 88)	
10/2018	37	LBCR - Archeology During Construction	11-Cnstr	101-0237-11	Program	Planning	\$ 1.000000	3%	\$ 1.030000	Future funding for archeology support during construction	Reference Section 3.14 of DEIS (PDF Page 297 of 602 for discussion on archeological efforts	
10/2018	38	LBCR - Additional Program Management - Design	1-Eng	101-0374-14	Program	Design	\$ 2.060000	3%	\$ 2.121800	Annual renewal of LBCR Program Management services	N/A. Can provide contract at future date.	
11/2018	39	LBCR - TSR - Procurement & Construction	11-Cnstr	101-0344-13	1	Construction	\$ 0.153000	3%	\$ 0.157590	Funding for the construction phase/procurement services that are part of the	Reference CMAR 1 - Dam and TSR (Archer Western) contract	
11/2018	40	LBCR PS - Discharge Pipeline - Construction*	11-Cnstr	101-0424-16	5	Construction	\$ 2.950000	3%	\$ 3.038500	Construction of the portion of the 90" pipeline that is on the Dam site	Reference LBCR RWPL Final PDR.PDF	
11/2018	41	LBCR PS - Construction*	11-Cnstr	101-0358-14	3	Construction	\$ 65.800000	3%	\$ 67.740000	Construction of the LBCR Raw Water Pump Station	Reference RWPS Prelim Design Report (Pump Station PDR_DRAFT.PDF)	
12/2018	42	LBCR PS - Inspection*	10-Insp	101-0358-14	3	Construction	\$ 0.356000	6%	\$ 0.377360	Construction inspection services for the raw water pump station	Reference RWPS Prelim Design Report (Pump Station PDR_DRAFT.PDF)	
02/2019	43	LBCR 90" Pipeline - Construction*	11-Cnstr	101-0424-16	5	Construction	\$ 176.000000	6%	\$ 186.560000	Construction of the main 90-inch raw water transmission pipeline	Reference LBCR RWPL Final PDR.PDF	
03/2019	44	LBCR - Lake Office - Construction	11-Cnstr		Program	Construction	\$ 2.060000	6%	\$ 2.183600	Future funding for construction of NTMWD's admin. Office at reservoir	N/A	
03/2019	45	LBCR 90" Pipeline - Inspection*	10-Insp	101-0424-16	5	Construction	\$ 0.960000	6%	\$ 0.960360	Construction inspection services for the raw water pipeline	Reference LBCR RWPL Final PDR.PDF	
03/2019	46	LBCR 90" Pipeline - Materials Testing - Construction	11-Cnstr	101-0424-16	5	Construction	\$ 1.060000	6%	\$ 1.123600	Material testing during construction of the raw water pipeline	Reference LBCR RWPL Final PDR.PDF	
06/2019	47	Leonard WTP Terminal Storage Reservoir - Phase I (210 MG) - Construction	Table Q23	11-Cnstr	101-0344-13	1	Construction	\$ 29.400000	6%	\$ 31.164000	Construction of the Terminal Storage Reservoir in Leonard	Reference LBCR TSR Site Analysis 01-23-14.PDF
07/2019	48	Leonard WTP Terminal Storage Reservoir - Phase I (210 MG) - Inspection	Table Q23	10-Insp	101-0344-13	1	Construction	\$ 0.294000	6%	\$ 0.311640	Construction inspection of the Terminal Storage Reservoir in Leonard	Reference LBCR TSR Site Analysis 01-23-14.PDF
07/2019	49	Leonard WTP Terminal Storage Reservoir - Phase I (210 MG) - Materials Testing - Construction	Table Q23	11-Cnstr	101-0344-13	1	Construction	\$ 1.060000	6%	\$ 1.123600	Construction material testing of the Terminal Storage Reservoir in Leonard	Reference LBCR TSR Site Analysis 01-23-14.PDF
09/2019	50	LBCR - Boat Ramps and Parks - Construction	11-Cnstr	101-0436-16	4	Construction	\$ 3.760000	6%	\$ 3.985600	Construction of the boat ramps in county comprehensive plan	Reference Figure 22 of the LBCR Comprehensive Plan.PDF (Page 88)	
10/2019	51	LBCR - Boat Ramps and Parks - Inspection	10-Insp	101-0436-16	4	Construction	\$ 0.037000	6%	\$ 0.039220	Construction inspection of the boat ramps in county comprehensive plan	Reference Figure 22 of the LBCR Comprehensive Plan.PDF (Page 88)	
10/2019	52	LBCR - Additional Program Management - Design	1-Eng	101-0374-14	Program	Construction	\$ 1.850000	6%	\$ 1.961000	Annual renewal of LBCR Program Management services	N/A. Can provide contract at future date.	
06/2020	53	LBCR - Final Riverby, etc. - Replanting and Monitoring - Mitigation*	7-Perm/Mit	101-0366-14	2	Construction	\$ 0.109000	9%	\$ 0.118810	Replanting and monitoring efforts at the Riverby mitigation area	Reference Section 1.8 of DEIS (PDF Page 79 of 602)	
06/2021	55	LBCR - Final Riverby, etc. - Replanting and Monitoring - Mitigation*	7-Perm/Mit	101-0366-14	2	Construction	\$ 0.109000	12%	\$ 0.122080	Replanting and monitoring efforts at the Riverby mitigation area	Reference Section 1.8 of DEIS (PDF Page 79 of 602)	
06/2022	57	LBCR - Final Riverby, etc. - Replanting and Monitoring - Mitigation*	7-Perm/Mit	101-0366-14	2	Construction	\$ 0.109000	15%	\$ 0.125350	Replanting and monitoring efforts at the Riverby mitigation area	Reference Section 1.8 of DEIS (PDF Page 79 of 602)	
TOTAL LOWER BOIS D'ARC CREEK RESERVIOR (LBCR)							\$ 686.549000		\$ 713.072510			
TREATMENT & TREATED WATER DISTRIBUTION												
02/2017	58	70 MGD Leonard WTP Site Phase I - Final Design	1-Eng	101-0384-15	3	Design	\$ 16.371000	0%	\$ 16.371000	Final design of the Leonard WTP	Reference WTP Prelim Design Technical Memorandums	
07/2017	59	90 MGD Leonard Water Treatment Plant HSPS - Final Design	1-Eng	101-0428-16	3	Design	\$ 4.430000	0%	\$ 4.430000	Final design of the High Service Pump Station at Leonard	N/A. Preliminary design underway. PDR to follow	
11/2017	60	Leonard WTP Terminal Storage Reservoir - Phase I (210 MG) - Design	1-Eng	101-0344-13	1	Design	\$ 1.742000	0%	\$ 1.742000	Final design of the TSR at Leonard	Reference LBCR TSR Site Analysis 01-23-14.PDF	
04/2018	61	84" PL from Leonard WTP to Hwy 5 Pump Station (McKinney No. 4) - Final Design	1-Eng	101-0425-16	5	Design	\$ 7.350000	3%	\$ 7.570500	Final design of the treated water pipeline	Reference prelim mapping (TWPL Align Alternates.PDF)	
04/2018	62	Leonard WTP Electrical/Transmission Line - Construction	11-Cnstr		Program	Construction	\$ 20.400000	3%	\$ 21.012000	Payment to construct transmission power to support Leonard WTP	Reference LBCR Project Location Map.PDF showing locations	
05/2018	63	Leonard WTP Electrical/Transmission Line - Inspection	10-Insp		Program	Construction	\$ 0.402000	3%	\$ 0.414060	Payment to inspect transmission power to support Leonard WTP	Reference LBCR Project Location Map.PDF showing locations	
09/2018	64	84" PL from Leonard WTP to Hwy 5 Pump Station (McKinney No. 4) - Property	4-Prop	101-0425-16	5	Acquisition	\$ 4.810000	3%	\$ 4.954300	Easement acquisition for the treated water pipeline	Reference prelim mapping (TWPL Align Alternates.PDF)	
12/2018	65	70 MGD Leonard WTP Site Phase I - Construction	11-Cnstr	101-0384-15	3	Construction	\$ 211.000000	6%	\$ 223.660000	Construction of the Leonard WTP	Reference WTP Prelim Design Technical Memorandums	
01/2019	66	70 MGD Leonard WTP Site Phase I - Inspection	10-Insp	101-0384-15	3	Construction	\$ 2.460000	6%	\$ 2.607600	Construction inspection of the Leonard WTP	Reference WTP Prelim Design Technical Memorandums	
01/2019	67	70 MGD Leonard WTP Site Phase I - Materials Testing - Construction	11-Cnstr	101-0384-15	3	Construction	\$ 1.060000	6%	\$ 1.123600	Construction material testing of the Leonard WTP	Reference WTP Prelim Design Technical Memorandums	
08/2019	70	84" PL from Leonard WTP to Hwy 5 Pump Station (McKinney No. 4) - Construction	11-Cnstr	101-0425-16	5	Construction	\$ 112.000000	6%	\$ 118.720000	Construction of the 84-inch treated water pipeline	Reference prelim mapping (TWPL Align Alternates.PDF)	
09/2019	71	84" PL from Leonard WTP to Hwy 5 Pump Station (McKinney No. 4) - Inspection	10-Insp	101-0425-16	5	Construction	\$ 0.569000	6%	\$ 0.603140	Construction inspection of the 84-inch treated water pipeline	Reference prelim mapping (TWPL Align Alternates.PDF)	
09/2019	72	84" PL from Leonard WTP to Hwy 5 Pump Station (McKinney No. 4) - Materials Testing - Construction	11-Cnstr	101-0425-16	5	Construction	\$ 1.060000	6%	\$ 1.123600	Construction material testing of the 84-inch treated water pipeline	Reference prelim mapping (TWPL Align Alternates.PDF)	
TOTAL TREATMENT & TREATED WATER DISTRIBUTION							\$ 383.654000		\$ 404.331800			
TOTAL SWIFT							\$ 1,070.203000		\$ 1,117.404310			

North Texas Municipal Water District
FY 17 SWIFT Multi-Year Funding Commitment
Lower Bois d'Arc Creek Reservoir & Treatment and Treated Water
Distribution

Part B

Supporting Documentation and Attachments

NORTH TEXAS MUNICIPAL WATER DISTRICT

RESOLUTION NO. 17-16

A RESOLUTION AUTHORIZING FILING OF AN APPLICATION FOR FINANCIAL ASSISTANCE FROM THE TEXAS WATER DEVELOPMENT BOARD FOR COSTS FOR LOWER BOIS D'ARC CREEK RESERVOIR AND TREATMENT AND TREATED WATER DISTRIBUTION IMPROVEMENTS.

BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE NORTH TEXAS MUNICIPAL WATER DISTRICT:

SECTION 1: That an application is hereby approved and authorized to be filed with the Texas Water Development Board seeking financial assistance in an amount not-to-exceed \$1,200,000,000 to provide for the costs of financing, acquiring, and constructing for the Lower Bois d'Arc Creek Reservoir, the Leonard Water Treatment Plant, a raw water pipeline from such Reservoir to such Treatment Plant, and a treated water pipeline from such Treatment Plant to the State Highway 5 Pump Station including, design, construction, inspection, testing, and right-of-way.

SECTION 2: That the Executive Director/General Manager or designee, be and is hereby designated the authorized representative of the North Texas Municipal Water District for purposes of furnishing such information and executing such documents as may be required in connection with the preparation and filing of such application for financial assistance and the rules of the Texas Water Development Board.

SECTION 3: That the following firms and individuals are hereby authorized and directed to aid and assist in the preparation and submission of such application and appear on behalf of and represent the North Texas Municipal Water District before any hearing held by the Texas Water Development Board on such application, to wit:

Financial Advisor: FirstSouthwest, a Division of Hilltop Securities, Inc., Fort Worth, Texas

Engineer: Steve Long, Reservoir Project Manager, North Texas Municipal Water District

Bond Counsel: McCall, Parkhurst & Horton, LLP, Dallas, Texas

PASSED AND APPROVED, this 27th day of April, 2017.

JOHN SWEEDEN, Secretary

TERRY SAM ANDERSON, President

(Seal)

From: [Erik Felthous](#)
To: [Daniel J. Sellars](#); [Holly Kellen](#)
Subject: FW: Resolution 17-16
Date: Wednesday, April 26, 2017 3:55:48 PM

From: Melisa Fuller **On Behalf Of** Tom Kula
Sent: Wednesday, April 26, 2017 3:50 PM
To: Judd Sanderson <jsanderson@NTMWD.COM>
Cc: Erik Felthous <efelthous@NTMWD.COM>; Terina Turner <tturner@NTMWD.COM>
Subject: Resolution 17-16

Judd,

Per Resolution No. 17-16, to be adopted by the Board of Directors in a regular meeting on April 27, 2017, I hereby designate you, Judd Sanderson, Deputy Director, as the authorized representative of the NTMWD for the purposes of furnishing such information and executing such documents as may be required in connection with the preparation and filing of such application for financial assistance and the rules of the Texas Water Development Board.

Please let me know if you need additional information.

Thanks,

Thomas W. Kula
Executive Director
North Texas Municipal Water District
501 E. Brown Street | Wylie, TX 75098
Office: 972.442.5405 | Cell 214.493.6167
tkula@ntmwd.com | www.ntmwd.com

Application Resolution - Certificate of Secretary

THE STATE OF TEXAS §
COUNTY OF _____ §
APPLICANT _____ §

I, the undersigned, Secretary of the _____ Texas,
DO HEREBY CERTIFY as follows:

1. That on the _____ day of _____, 20____, a regular/special meeting of the _____ was held; the duly constituted members of the _____ being as follows:

_____ all of whom were present at the meeting, except the following:

_____ Among other business considered at the meeting, the attached resolution entitled:

"A RESOLUTION by the _____ of the _____ requesting financial participation from the Texas Water Development Board; authorizing the filing of an application for financial participation; and making certain findings in connection therewith."

was introduced and submitted to the _____ for passage and adoption. After presentation and consideration of the resolution, and upon a motion made by _____ and seconded by _____, the resolution was passed and adopted by the _____ by the following vote:

_____ voted "For" _____ voted "Against" _____ abstained

all as shown in the official minutes of the _____ for this meeting.

2. That the attached resolution is a true and correct copy of the original on file in the official records of the _____; the qualified and acting members of the _____ on the date of this meeting are those persons shown above and, according to the records of my office, advance notice of the time, place, and purpose of meeting was given to each member of the _____; and that the meeting, and the deliberations of the public business described above, was open to the public and written notice of the meeting, including the subject of the resolution described above, was posted and given in advance of the meeting in compliance with the provisions of Chapter 551 of the Texas Government Code.

IN WITNESS WHEREOF, I have signed my name and affixed the seal of the _____, this the _____ day of _____, 20_____.

Secretary

(SEAL)

NORTH TEXAS MUNICIPAL WATER DISTRICT

BOARD OF DIRECTORS

Terry Sam Anderson	President	Mesquite
Robert Thurmond, Jr.	Vice President	Wylie
John Sweeden	Secretary	Richardson
Don Cates		Forney
Phil Dyer		Plano
Joe Farmer		Allen
William Forbus		Royse City
Marvin Fuller		Wylie
Bill Glass		Princeton
Don Gordon		Garland
Rod Hogan		Plano
Joe Joplin		McKinney
James Kerr		Allen
Bill Lofland		Rockwall
Michael Lopez		Forney
Jack May		Garland
Wayne May		Farmersville
Charles McKissick		McKinney
Jim Mellody		Royse City
John Murphy		Richardson
Larry Parks		Rockwall
Richard Peasley		Frisco
Bobby Robinson		Mesquite
Richard Sheehan		Princeton
Lynn Shuyler		Frisco

* * * * *

Thomas W. Kula
Executive Director/General Manager

NORTH TEXAS MUNICIPAL WATER DISTRICT

OCTOBER 2016

ADMINISTRATIVE MEMORANDUM NO. 4741

REGIONAL WATER SYSTEM CONTRACT REVENUE REFUNDING AND IMPROVEMENT BONDS RESOLUTION NO. 16-44

RECOMMENDATION

The Executive Director and NTMWD staff recommend the Board of Directors adopt Resolution No.16-44, *"A Resolution Authorizing the Issuance, Sale, and Delivery of North Texas Municipal Water District Regional Water System Revenue Refunding and Improvement Bonds, Series 2016, and Approving and Authorizing Instruments and Procedures Relating Thereto."*

BACKGROUND

At the September 22, 2016, Finance Committee Meeting, NTMWD staff and NTMWD's financial advisor, First Southwest Company, reviewed the process and procedure for the issuance of Regional Water System Refunding and Improvement Bonds. At this time, it is expected that approximately \$328 million of bonds will be issued on October 27, 2016, at a \$55 million premium and that the proceeds will be used to provide approximately \$279 million of funding for Regional Water System improvement projects including the construction of the Trinity Main Stem Pump Station and Pipeline (\$73 million) as recommended for approval by the Water Committee on September 22, 2016, a 70 MGD expansion to the Wylie WTP IV (\$73 million), Lower Bois d'Arc Creek Reservoir Mitigation Property (\$16 million), construction of Wylie WTP I Rapid Mix and Sedimentation Improvements (\$22 million), final design of the new 70 MGD Leonard Water Treatment Plant (\$16 million), and construction of the McKinney to Princeton Pipeline (\$14 million), among other Regional Water System improvement projects and to refund approximately \$99 million of outstanding 2008 bonds at favorable interest rates. The total amount of the bond issue is subject to change due to the refunding portion of the transaction and prevailing market conditions at the time of the bond sale.

NTMWD bond counsel, McCall, Parkhurst and Horton, LLP, has prepared the attached Preliminary Bond Resolution and First Southwest Company has prepared the attached Preliminary Official Statement. Representatives from both firms will be present at the Board meeting to review the documents and financing procedures.

RESOLUTION NO. 16-44

RESOLUTION AUTHORIZING THE ISSUANCE, SALE, AND DELIVERY OF NORTH TEXAS MUNICIPAL WATER DISTRICT WATER SYSTEM REVENUE REFUNDING AND IMPROVEMENT BONDS, SERIES 2016; AND APPROVING AND AUTHORIZING INSTRUMENTS AND PROCEDURES RELATING THERETO

WHEREAS, North Texas Municipal Water District (the "Issuer") is a political subdivision of the State of Texas, being a conservation and reclamation district created and functioning under Article 16, Section 59 of the Texas Constitution, pursuant to Chapter 62, Acts of 1951, 52nd Legislature of Texas, Regular Session, as amended (the "Act"); and

WHEREAS, among other bonds, the Issuer has previously issued and there are presently outstanding the following described bonds:

North Texas Municipal Water District Water System Revenue Bonds, Series 2008, in the original principal amount of \$111,780,000, dated June 15, 2008 (the "Series 2008 Bonds")

WHEREAS, the Issuer now desires to issue refunding bonds to refund all or part of the outstanding Series 2008 (the "Refundable Bonds") and those Refundable Bonds designated by an Authorized Office in the Approval Certificate, each as defined herein, the "Refunded Bonds"; and

WHEREAS, the Issuer also desires to provide funds with which to pay for certain improvements to its Water System (as defined herein), as further described herein; and

WHEREAS, the Issuer is authorized to issue the Series 2016 Bonds (hereinafter defined) pursuant to the District Act and Chapters 1207 and 1371, Texas Government Code, as amended, and other applicable laws; and

THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF NORTH TEXAS MUNICIPAL WATER DISTRICT THAT:

Section 1. AMOUNT AND PURPOSE OF THE BONDS. The bond or bonds of North Texas Municipal Water District (the "Issuer") are hereby authorized to be issued and delivered in the aggregate principal amount not to exceed \$390,000,000, for the purpose of providing funds for (i) IMPROVING THE NORTH TEXAS MUNICIPAL WATER DISTRICT WATER SYSTEM BY CONSTRUCTION OF THE WYLIE WATER TREATMENT PLANT NO 4 70 MGD EXPANSION, CONSTRUCTION OF THE TRINITY RIVER MAIN STEM PUMP STATION AND PIPELINE, CONSTRUCTION OF THE NORTH SYSTEM EXCHANGE PARKWAY 13.5 MG GROUND STORAGE FACILITIES, CONSTRUCTION OF THE NORTH MCKINNEY PIPELINE, AND OTHER SYSTEM IMPROVEMENTS; (ii) REFUNDING THE REFUNDED BONDS; (iii) MAKING A DEPOSIT TO THE RESERVE FUND (HEREINAFTER DEFINED); AND (iv) PAYING THE COSTS OF ISSUANCE OF SUCH BONDS.

Section 2. DESIGNATION OF THE BONDS. Each bond issued pursuant to this Resolution shall be designated: "NORTH TEXAS MUNICIPAL WATER DISTRICT WATER SYSTEM REVENUE REFUNDING AND IMPROVEMENT BOND, SERIES 2016", and initially there shall be issued, sold, and delivered hereunder a single fully registered bond, without interest coupons, payable in installments of principal (the "Initial Bond"), but the Initial Bond may be assigned and transferred and/or converted into and exchanged for a like aggregate principal amount of fully registered bonds, without interest coupons, having serial maturities, and in the denomination or denominations of \$5,000 or any integral multiple of \$5,000, all in the manner hereinafter provided. The term "Bonds" as used in this Resolution shall mean and include collectively the Initial Bond and all substitute bonds exchanged therefor, as well as all other substitute bonds and replacement bonds issued pursuant hereto, and the term "Bond" shall mean any of the Bonds.

Section 3. INITIAL DATE, DENOMINATION, NUMBER, MATURITIES, INITIAL REGISTERED OWNER, AND CHARACTERISTICS OF THE INITIAL BOND.

(a) As authorized by Chapters 1207 and 1371, Texas Government Code, as amended, the Executive Director, and the Deputy Director (Finance and Personnel) of the Issuer are each hereby designated as an "Authorized Officer" of the Issuer, and each is hereby authorized, appointed, and designated as the officer or employee of the Issuer authorized to act on behalf of the Issuer, which actions shall be evidenced by a certificate executed by such Authorized Officer (the "Approval Certificate") for a period not to extend beyond April 15, 2017, in the selling and delivering of the Bonds and carrying out the other procedures specified in this Resolution, including the use of a book-entry only system with respect to the Bonds and the execution of an appropriate letter of representations if deemed appropriate, the determining and fixing of the date and the date of delivery of the Bonds, any additional or different designation or title by which the Bond shall be known, the price at which the Bonds will be sold (but in no event less than 97% of the principal amount of the Bonds), the principal amount (not exceeding \$390,000,000) of the Bonds, the amount of each maturity of principal thereof, the due date of each such maturity (not exceeding forty years from the date of the Bonds), the rate of interest, to be borne by each such maturity (but in no event to result in the net effective interest rate on the Bonds exceeding 5.00%), the initial interest payment date, the date or dates of optional redemption thereof, any mandatory sinking fund redemption provisions, the procuring of bond insurance, if any, and approving modifications to this Resolution and executing such instruments, documents and agreements as may be necessary with respect thereto, and all other matters relating to the issuance, sale and delivery of the Bonds; provided that the refunding accomplished through the issuance of the Bonds must produce a present value debt service savings of at least 3.50% of the total principal amount of the Refunded Bonds, net of expenses and any Issuer contribution.

(b) The Initial Bond is hereby authorized to be issued, sold, and delivered hereunder as a single fully registered Bond, without interest coupons, in the denomination and aggregate principal amount set forth in the Approval Certificate (not exceeding \$390,000,000), numbered TR-1, payable in annual installments of principal to the initial registered owner thereof or to the registered assignee or assignees of said Bond or any portion or portions thereof (in each case, the "registered owner"), with the annual installments of principal of the Initial Bond to be payable on the dates, respectively, and in the principal amounts, respectively, and may and/or shall be prepaid or redeemed prior to the respective scheduled due dates of installments of principal thereof, all as set forth in the Approval Certificate.

(c) The Initial Bond (i) may and, if so provided in the Approval Certificate, shall be prepaid or paid on the respective scheduled due dates of installments of principal thereof, (ii) may be assigned and transferred, (iii) may be converted and exchanged for other bonds, (iv) shall have the characteristics, and (v) shall be signed and sealed, and the principal of and interest on the Initial Bond shall be payable, all as provided, and in the manner required or indicated, in the FORM OF INITIAL BOND set forth in this Resolution.

Section 4. INTEREST. The unpaid principal balance of the Initial Bond shall bear interest from the date of the Initial Bond to the respective scheduled due dates, or to the respective dates of prepayment or redemption, of the installments of principal of the Initial Bond, and said interest shall be payable, all in the manner provided and at the rates and on the dates stated in the Approval Certificate and the FORM OF INITIAL BOND set forth in this Resolution.

Section 5. FORM OF INITIAL BOND. The form of the Initial Bond, including the form of Registration Certificate of the Comptroller of Public Accounts of the State of Texas to be endorsed on the Initial Bond, shall be substantially as follows:

FORM OF INITIAL BOND

NO. TR-1 \$ _____ *

UNITED STATES OF AMERICA
STATE OF TEXAS
NORTH TEXAS MUNICIPAL WATER DISTRICT
WATER SYSTEM REVENUE REFUNDING AND IMPROVEMENT BOND,
SERIES 2016

NORTH TEXAS MUNICIPAL WATER DISTRICT (the "Issuer"), being a political subdivision of the State of Texas, hereby promises to pay to _____ * or to the registered assignee or assignees of this Bond or any portion or portions hereof (in each case, the "registered owner") the aggregate principal amount of _____ * DOLLARS (\$ _____ *) in annual installments of principal due and payable on SEPTEMBER 1 in each of the years, and in the respective principal amounts, as set forth in the following schedule:

<u>Year*</u>	<u>Principal Amount*</u>	<u>Year*</u>	<u>Principal Amount*</u>
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and to pay interest, calculated on the basis of a 360-day year composed of twelve 30-day months, from the date of initial delivery to the Purchaser (as defined in the Bond Resolution (hereinafter

* From Approval Certificate.

defined)), on the balance of each such installment of principal, respectively, from time to time remaining unpaid, at the rates as follows:

Year* Rate* Year* Rate*

with said interest being payable on each March 1 and September 1, commencing _____*, while this Bond or any portion hereof is outstanding and unpaid.

THE INSTALLMENTS OF PRINCIPAL OF AND THE INTEREST ON this Bond are payable in lawful money of the United States of America, without exchange or collection charges. The installments of principal and the interest on this Bond are payable to the registered owner hereof through the services of THE BANK OF NEW YORK MELLON TRUST COMPANY, NATIONAL ASSOCIATION, in Dallas, Texas, which is the "Paying Agent/Registrar" for this Bond. Payment of all principal of and interest on this Bond shall be made by the Paying Agent/ Registrar to the registered owner hereof on each principal and/or interest payment date by check dated as of such date, drawn by the Paying Agent/Registrar on, and payable solely from, funds of the Issuer required by the resolution authorizing the issuance of this Bond (the "Bond Resolution") to be on deposit with the Paying Agent/Registrar for such purpose as hereinafter provided; and such check shall be sent by the Paying Agent/Registrar by United States mail, first-class postage prepaid, on each such principal and/or interest payment date, to the registered owner hereof, at the address of the registered owner, as it appeared on the 15th day of the month next preceding each such date (the "Record Date") on the Registration Books kept by the Paying Agent/Registrar, as hereinafter described. The Issuer covenants with the registered owner of this Bond that on or before each principal and/or interest payment date for this Bond it will make available to the Paying Agent/Registrar, from the Interest and Redemption Fund confirmed by the Bond Resolution, the amounts required to provide for the payment, in immediately available funds, of all principal of and interest on this Bond, when due.

IF THE DATE for the payment of the principal of or interest on this Bond shall be a Saturday, Sunday, a legal holiday, or a day on which banking institutions in the City where the Paying Agent/Registrar is located are authorized by law or executive order to close, then the date for such payment shall be the next succeeding day which is not such a Saturday, Sunday, legal holiday, or day on which banking institutions are authorized to close; and payment on such date shall have the same force and effect as if made on the original date payment was due.

THIS BOND has been authorized in accordance with the Constitution and laws of the State of Texas for the purpose of providing funds for (i) IMPROVING THE NORTH TEXAS MUNICIPAL WATER DISTRICT WATER SYSTEM; (ii) REFUNDING \$ _____* IN PRINCIPAL AMOUNT OF THE ISSUER'S WATER SYSTEM REVENUE BONDS, SERIES 2008; (iii) MAKING A DEPOSIT TO THE RESERVE FUND (DEFINED IN THE BOND RESOLUTION); AND (iv) PAYING THE COSTS OF ISSUANCE OF THIS BOND.

* From Approval Certificate.

ON _____ 1, ____*, or any date thereafter, the unpaid installments of principal of this Bond may be prepaid or redeemed prior to their scheduled due dates, at the option of the Issuer, with funds derived from any available source, as a whole, or in part, and, if in part, the Issuer shall select and designate the installment or installments of principal, and the amount that is to be redeemed, and if less than a whole principal installment is to be called, the Issuer shall direct the Paying Agent/Registrar to call by lot or other customary method of random selection the portion of the principal installment to be redeemed (only in an integral multiple of \$5,000), at the redemption price of the principal amount to be prepaid or redeemed, plus accrued interest to the date fixed for prepayment or redemption.

**[THE PRINCIPAL INSTALLMENTS OF THIS BOND maturing on September 1, _____ and September 1, _____ are subject to mandatory prepayment or redemption prior to maturity in part, at a price equal to the principal amount of this Bond or portions hereof to be prepaid or redeemed plus accrued interest to the date of prepayment or redemption, on September 1 in the each of years and in the amounts as follows:

Principal Installment due on September 1, _____

<u>Years</u>	<u>Amounts</u>
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Principal Installment due on September 1, _____

<u>Years</u>	<u>Amounts</u>
--------------	----------------

The amount of any principal installment of this Bond required to be prepaid or redeemed pursuant to the operation of such mandatory prepayment or redemption provisions shall be reduced, at the option and direction of the Issuer, by the principal amount of such principal installment of this Bond which, at least 50 days prior to the mandatory prepayment or redemption date (1) shall have been acquired by the Issuer at a price not exceeding such principal amount plus accrued interest to the date of purchase thereof, (2) shall have been purchased by the Paying Agent/Registrar at the request of the Issuer at a price not exceeding such principal amount plus accrued interest to the date of purchase, or (3) shall have been prepaid or redeemed pursuant to the optional prepayment or redemption provisions and not theretofore credited against a mandatory prepayment or redemption requirement.]

* From Approval Certificate.

** From Approval Certificate, if applicable.

AT LEAST 30 days prior to the date fixed for any such prepayment or redemption a written notice of such prepayment or redemption shall be mailed by the Paying Agent/Registrar to the registered owner hereof. By the date fixed for any such prepayment or redemption due provision shall be made by the Issuer with the Paying Agent/Registrar for the payment of the required prepayment or redemption price for this Bond or the portion hereof which is to be so prepaid or redeemed, plus accrued interest thereon to the date fixed for prepayment or redemption. If such written notice of prepayment or redemption is given, and if due provision for such payment is made, all as provided above, this Bond, or the portion thereof which is to be so prepaid or redeemed, thereby automatically shall be treated as prepaid or redeemed prior to its scheduled due date, and shall not bear interest after the date fixed for its prepayment or redemption, and shall not be regarded as being outstanding except for the right of the registered owner to receive the prepayment or redemption price plus accrued interest to the date fixed for prepayment or redemption from the Paying Agent/Registrar out of the funds provided for such payment. The Paying Agent/Registrar shall record in the Registration Books all such prepayments or redemptions of principal of this Bond or any portion hereof.

THIS BOND, to the extent of the unpaid principal balance hereof, or any unpaid portion hereof in any integral multiple of \$5,000, may be assigned by the initial registered owner hereof and shall be transferred only in the Registration Books of the Issuer kept by the Paying Agent/Registrar acting in the capacity of registrar for the Bonds, upon the terms and conditions set forth in the Bond Resolution. Among other requirements for such transfer, this Bond must be presented and surrendered to the Paying Agent/Registrar for cancellation, together with proper instruments of assignment, in form and with guarantee of signatures satisfactory to the Paying Agent/Registrar, evidencing assignment by the initial registered owner of this Bond, or any portion or portions hereof in any integral multiple of \$5,000, to the assignee or assignees in whose name or names this Bond or any such portion or portions hereof is or are to be transferred and registered. Any instrument or instruments of assignment satisfactory to the Paying Agent/Registrar may be used to evidence the assignment of this Bond or any such portion or portions hereof by the initial registered owner hereof. A new bond or bonds payable to such assignee or assignees (which then will be the new registered owner or owners of such new Bond or Bonds) or to the initial registered owner as to any portion of this Bond which is not being assigned and transferred by the initial registered owner, shall be delivered by the Paying Agent/Registrar in conversion of and exchange for this Bond or any portion or portions hereof, but solely in the form and manner as provided in the next paragraph hereof for the conversion and exchange of this Bond or any portion hereof. The registered owner of this Bond shall be deemed and treated by the Issuer and the Paying Agent/Registrar as the absolute owner hereof for all purposes, including payment and discharge of liability upon this Bond to the extent of such payment, and the Issuer and the Paying Agent/Registrar shall not be affected by any notice to the contrary.

AS PROVIDED above and in the Bond Resolution, this Bond, to the extent of the unpaid principal balance hereof, may be converted into and exchanged for a like aggregate principal amount of fully registered bonds, without interest coupons, payable to the assignee or assignees duly designated in writing by the initial registered owner hereof, or to the initial registered owner as to any portion of this Bond which is not being assigned and transferred by the initial registered owner, in any denomination or denominations in any integral multiple of \$5,000 (subject to the requirement

hereinafter stated that each substitute bond issued in exchange for any portion of this Bond shall have a single stated principal maturity date), upon surrender of this Bond to the Paying Agent/Registrar for cancellation, all in accordance with the form and procedures set forth in the Bond Resolution. If this Bond or any portion hereof is assigned and transferred or converted each bond issued in exchange for any portion hereof shall have a single stated principal maturity date corresponding to the due date of the installment of principal of this Bond or portion hereof for which the substitute bond is being exchanged, and shall bear interest at the rate applicable to and borne by such installment of principal or portion thereof. No such bond shall be payable in installments, but shall have only one stated principal maturity date. AS PROVIDED IN THE BOND RESOLUTION, THIS BOND IN ITS PRESENT FORM MAY BE ASSIGNED AND TRANSFERRED OR CONVERTED ONCE ONLY, and to one or more assignees, but the bonds issued and delivered in exchange for this Bond or any portion hereof may be assigned and transferred, and converted, subsequently, as provided in the Bond Resolution. The Issuer shall pay the Paying Agent/Registrar's standard or customary fees and charges for transferring, converting, and exchanging this Bond or any portion thereof, but the one requesting such transfer, conversion, and exchange shall pay any taxes or governmental charges required to be paid with respect thereto. The Paying Agent/Registrar shall not be required to make any such assignment, conversion, or exchange during the period commencing with the close of business on any Record Date and ending with the opening of business on the next following principal or interest payment date.

IN THE EVENT any Paying Agent/Registrar for this Bond is changed by the Issuer, resigns, or otherwise ceases to act as such, the Issuer has covenanted in the Bond Resolution that it promptly will appoint a competent and legally qualified substitute therefor, and promptly will cause written notice thereof to be mailed to the registered owner of this Bond.

IT IS HEREBY certified, recited, and covenanted that this Bond has been duly and validly authorized, issued, sold, and delivered; that all acts, conditions, and things required or proper to be performed, exist, and be done precedent to or in the authorization, issuance, and delivery of this Bond have been performed, existed, and been done in accordance with law; that this Bond is a special obligation of the Issuer which, together with other bonds, are secured by and payable from a first lien on and pledge of the "Pledged Revenues" as defined in the Bond Resolution, which include the "Net Revenues of the District's Water System", as defined in the Bond Resolution, including specifically revenues derived pursuant to existing water supply contracts between the Issuer and the Cities of Allen, Farmersville, Forney, Frisco, Garland, McKinney, Mesquite, Plano, Princeton, Richardson, Rockwall, Royse City, and Wylie, Texas, which cities are currently the Member Cities constituting the territory and boundaries of the Issuer, water supply contracts relating to the District's Water System with any other cities which hereafter may become Member Cities, and water supply contracts with other cities and customers in connection with the District's Water System.

THE ISSUER has reserved the right, subject to the restrictions stated in the Bond Resolution, to issue Additional Bonds payable from and secured by a first lien on and pledge of the "Pledged Revenues" on a parity with this Bond.

THE ISSUER also has reserved the right to amend the Bond Resolution with the approval of the registered owners of 51% in principal amount of all outstanding bonds secured by and payable from a first lien on and pledge of the "Pledged Revenues".

THE REGISTERED OWNER hereof shall never have the right to demand payment of this Bond or the interest hereon out of any funds raised or to be raised by taxation or from any source whatsoever other than specified in the Bond Resolution.

BY BECOMING the registered owner of this Bond, the registered owner thereby acknowledges all of the terms and provisions of the Bond Resolution, agrees to be bound by such terms and provisions, acknowledges that the Bond Resolution is duly recorded and available for inspection in the official minutes and records of the governing body of the Issuer, and agrees that the terms and provisions of this Bond and the Bond Resolution constitute a contract between the registered owner hereof and the Issuer.

IN WITNESS WHEREOF, the Issuer has caused this Bond to be signed with the manual or facsimile signature of the President of the Board of Directors of the Issuer and countersigned with the manual or facsimile signature of the Secretary of the Board of Directors of the Issuer, has caused the official seal of the Issuer to be duly impressed, or placed in facsimile, on this Bond, and has caused this Bond to be dated _____, 2016.

xxxxx
Secretary, Board of Directors,
North Texas Municipal Water District

xxxxx
President, Board of Directors,
North Texas Municipal Water District

(DISTRICT SEAL)

**FORM OF REGISTRATION CERTIFICATE OF THE
COMPTROLLER OF PUBLIC ACCOUNTS:**

COMPTROLLER'S REGISTRATION CERTIFICATE:

REGISTER NO.

I hereby certify that this Bond has been examined, certified as to validity, and approved by the Attorney General of the State of Texas, and that this Bond has been registered by the Comptroller of Public Accounts of the State of Texas.

Witness my signature and seal this

Comptroller of Public Accounts of the State of Texas

(COMPTROLLER'S SEAL)

* From Approval Certificate.

Section 6. ADDITIONAL CHARACTERISTICS OF THE BONDS. Registration and Transfer. (a) The Issuer shall keep or cause to be kept at the principal corporate trust office of THE BANK OF NEW YORK MELLON TRUST COMPANY, NATIONAL ASSOCIATION, in Dallas, Texas (the "Paying Agent/Registrar") books or records of the registration and transfer of the Bonds (the "Registration Books"), and the Issuer hereby appoints the Paying Agent/Registrar as its registrar and transfer agent to keep such books or records and make such transfers and registrations under such reasonable regulations as the Issuer and Paying Agent/Registrar may prescribe; and the Paying Agent/Registrar shall make such transfers and registrations as herein provided. The Paying Agent/Registrar shall obtain and record in the Registration Books the address of the registered owner of each Bond to which payments with respect to the Bonds shall be mailed, as herein provided; but it shall be the duty of each registered owner to notify the Paying Agent/Registrar in writing of the address to which payments shall be mailed, and such interest payments shall not be mailed unless such notice has been given. The Issuer shall have the right to inspect the Registration Books during regular business hours of the Paying Agent/Registrar, but otherwise the Paying Agent/Registrar shall keep the Registration Books confidential and, unless otherwise required by law, shall not permit their inspection by any other entity. Registration of each Bond may be transferred in the Registration Books only upon presentation and surrender of such Bond to the Paying Agent/Registrar for transfer of registration and cancellation, together with proper written instruments of assignment, in form and with guarantee of signatures satisfactory to the Paying Agent/Registrar, evidencing (i) the assignment of the Bond, or any portion thereof in any integral multiple of \$5,000, to the assignee or assignees thereof, and (ii) the right of such assignee or assignees to have the Bond or any such portion thereof registered in the name of such assignee or assignees. Upon the assignment and transfer of any Bond or any portion thereof, a new substitute Bond or Bonds shall be issued in conversion and exchange therefor in the manner herein provided. The Initial Bond, to the extent of the unpaid principal balance thereof, may be assigned and transferred by the initial registered owner thereof once only, and to one or more assignees designated in writing by the initial registered owner thereof. All Bonds issued and delivered in conversion of and exchange for the Initial Bond shall be in any denomination or denominations of any integral multiple of \$5,000 (subject to the requirement hereinafter stated that each substitute Bond shall have a single stated principal maturity date), shall be in the form prescribed in the FORM OF SUBSTITUTE BOND set forth in this Resolution, and shall have the characteristics, and may be assigned, transferred, and converted as hereinafter provided. If the Initial Bond or any portion thereof is assigned and transferred or converted the Initial Bond must be surrendered to the Paying Agent/Registrar for cancellation, and each Bond issued in exchange for any portion of the Initial Bond shall have a single stated principal maturity date, and shall not be payable in installments; and each such Bond shall have a principal maturity date corresponding to the due date of the installment of principal or portion thereof for which the substitute Bond is being exchanged; and each such Bond shall bear interest at the single rate applicable to and borne by such installment of principal or portion thereof for which it is being exchanged. If only a portion of the Initial Bond is assigned and transferred, there shall be delivered to and registered in the name of the initial registered owner substitute Bonds in exchange for the unassigned balance of the Initial Bond in the same manner as if the initial registered owner were the assignee thereof. If any Bond or portion thereof other than the Initial Bond is assigned and transferred or converted each Bond issued in exchange therefor shall have the same principal maturity date and bear interest at the same rate as the Bond for which it is exchanged. A form of assignment shall be printed or endorsed on each Bond, excepting the Initial Bond, which shall be executed by the registered owner or its duly authorized attorney or representative to evidence an

assignment thereof. Upon surrender of any Bonds or any portion or portions thereof for transfer of registration, an authorized representative of the Paying Agent/Registrar shall make such transfer in the Registration Books, and shall deliver a new fully registered substitute Bond or Bonds, having the characteristics herein described, payable to such assignee or assignees (which then will be the registered owner or owners of such new Bond or Bonds), or to the previous registered owner in case only a portion of a Bond is being assigned and transferred, all in conversion of and exchange for said assigned Bond or Bonds or any portion or portions thereof, in the same form and manner, and with the same effect, as provided in Section 6(d), below, for the conversion and exchange of Bonds by any registered owner of a Bond. The Issuer shall pay the Paying Agent/Registrar's standard or customary fees and charges for making such transfer and delivery of a substitute Bond or Bonds, but the one requesting such transfer shall pay any taxes or other governmental charges required to be paid with respect thereto. The Paying Agent/Registrar shall not be required to make transfers of registration of any Bond or any portion thereof (i) during the period commencing with the close of business on any Record Date and ending with the opening of business on the next following principal or interest payment date, or, (ii) with respect to any Bond or any portion thereof called for redemption prior to maturity, within 45 days prior to its redemption date.

(b) Ownership of Bonds. The entity in whose name any Bond shall be registered in the Registration Books at any time shall be deemed and treated as the absolute owner thereof for all purposes of this Resolution, whether or not such Bond shall be overdue, and the Issuer and the Paying Agent/Registrar shall not be affected by any notice to the contrary; and payment of, or on account of, the principal of, premium, if any, and interest on any such Bond shall be made only to such registered owner. All such payments shall be valid and effectual to satisfy and discharge the liability upon such Bond to the extent of the sum or sums so paid.

(c) Payment of Bonds and Interest. The Issuer hereby further appoints the Paying Agent/Registrar to act as the paying agent for paying the principal of and interest on the Bonds, and to act as its agent to convert and exchange or replace Bonds, all as provided in this Resolution. The Paying Agent/Registrar shall keep proper records of all payments made by the Issuer and the Paying Agent/Registrar with respect to the Bonds, and of all conversions and exchanges of Bonds, and all replacements of Bonds, as provided in this Resolution.

(d) Conversion and Exchange or Replacement; Authentication. Each Bond issued and delivered pursuant to this Resolution, to the extent of the unpaid principal balance or principal amount thereof, may, upon surrender of such Bond at the principal corporate trust office of the Paying Agent/Registrar, together with a written request therefor duly executed by the registered owner or the assignee or assignees thereof, or its or their duly authorized attorneys or representatives, with guarantee of signatures satisfactory to the Paying Agent/Registrar, may, at the option of the registered owner or such assignee or assignees, as appropriate, be converted into and exchanged for fully registered bonds, without interest coupons, in the form prescribed in the FORM OF SUBSTITUTE BOND set forth in this Resolution, in the denomination of \$5,000, or any integral multiple of \$5,000 (subject to the requirement hereinafter stated that each substitute Bond shall have a single stated maturity date), as requested in writing by such registered owner or such assignee or assignees, in an aggregate principal amount equal to the unpaid principal balance or principal amount of any Bond or Bonds so surrendered, and payable to the appropriate registered owner,

assignee, or assignees, as the case may be. If the Initial Bond is assigned and transferred or converted each substitute Bond issued in exchange for any portion of the Initial Bond shall have a single stated principal maturity date, and shall not be payable in installments; and each such Bond shall have a principal maturity date corresponding to the due date of the installment of principal or portion thereof for which the substitute Bond is being exchanged; and each such Bond shall bear interest at the single rate applicable to and borne by such installment of principal or portion thereof for which it is being exchanged. If any Bond or portion thereof (other than the Initial Bond) is assigned and transferred or converted, each Bond issued in exchange therefor shall have the same principal maturity date and bear interest at the same rate as the Bond for which it is being exchanged. Each substitute Bond shall bear a letter and/or number to distinguish it from each other Bond. The Paying Agent/Registrar shall convert and exchange or replace Bonds as provided herein, and each fully registered bond delivered in conversion of and exchange for or replacement of any Bond or portion thereof as permitted or required by any provision of this Resolution shall constitute one of the Bonds for all purposes of this Resolution, and may again be converted and exchanged or replaced. It is specifically provided that any Bond authenticated in conversion of and exchange for or replacement of another Bond on or prior to the first scheduled Record Date for the Initial Bond shall bear interest from the date of the Initial Bond, but each substitute Bond so authenticated after such first scheduled Record Date shall bear interest from the interest payment date next preceding the date on which such substitute Bond was so authenticated, unless such Bond is authenticated after any Record Date but on or before the next following interest payment date, in which case it shall bear interest from such next following interest payment date; provided, however, that if at the time of delivery of any substitute Bond the interest on the Bond for which it is being exchanged is due but has not been paid, then such Bond shall bear interest from the date to which such interest has been paid in full. THE INITIAL BOND issued and delivered pursuant to this Resolution is not required to be, and shall not be, authenticated by the Paying Agent/Registrar, but on each substitute Bond issued in conversion of and exchange for or replacement of any Bond or Bonds issued under this Resolution there shall be printed a certificate, in the form substantially as follows:

"PAYING AGENT/REGISTRAR'S AUTHENTICATION CERTIFICATE

It is hereby certified that this Bond has been issued under the provisions of the Bond Resolution described in this Bond; and that this Bond has been issued in conversion of and exchange for or replacement of a bond, bonds, or a portion of a bond or bonds of an issue which originally was approved by the Attorney General of the State of Texas and registered by the Comptroller of Public Accounts of the State of Texas.

THE BANK OF NEW YORK MELLON TRUST
COMPANY, NATIONAL ASSOCIATION
Paying Agent/Registrar

Dated

Authorized Representative"

An authorized representative of the Paying Agent/Registrar shall, before the delivery of any such Bond, date and manually sign the above Certificate, and no such Bond shall be deemed to be issued or outstanding unless such Certificate is so executed. The Paying Agent/Registrar promptly shall cancel all Bonds surrendered for conversion and exchange or replacement. No additional ordinances, orders, or resolutions need be passed or adopted by the governing body of the Issuer or any other body or person so as to accomplish the foregoing conversion and exchange or replacement of any Bond or portion thereof, and the Paying Agent/Registrar shall provide for the printing, execution, and delivery of the substitute Bonds in the manner prescribed herein, and said Bonds shall be of type composition printed on paper with lithographed or steel engraved borders of customary weight and strength. Pursuant to Section 1201.067, Texas Government Code, the duty of conversion and exchange or replacement of Bonds as aforesaid is hereby imposed upon the Paying Agent/Registrar, and, upon the execution of the above Paying Agent/Registrar's Authentication Certificate, the converted and exchanged or replaced Bond shall be valid, incontestable, and enforceable in the same manner and with the same effect as the Initial Bond which originally was issued pursuant to this Resolution, approved by the Attorney General, and registered by the Comptroller of Public Accounts. The Issuer shall pay the Paying Agent/Registrar's standard or customary fees and charges for transferring, converting, and exchanging any Bond or any portion thereof, but the one requesting any such transfer, conversion, and exchange shall pay any taxes or governmental charges required to be paid with respect thereto as a condition precedent to the exercise of such privilege of conversion and exchange. The Paying Agent/Registrar shall not be required to make any such conversion and exchange or replacement of Bonds or any portion thereof (i) during the period commencing with the close of business on any Record Date and ending with the opening of business on the next following principal or interest payment date, or, (ii) with respect to any Bond or portion thereof called for redemption prior to maturity, within 45 days prior to its redemption date.

(e) In General. All Bonds issued in conversion and exchange or replacement of any other Bond or portion thereof, (i) shall be issued in fully registered form, without interest coupons, with the principal of and interest on such Bonds to be payable only to the registered owners thereof, (ii) may be transferred and assigned, (iii) may be converted and exchanged for other Bonds, (iv) shall have the characteristics, (v) shall be signed and sealed, and (vi) the principal of and interest on the Bonds shall be payable, all as provided, and in the manner required or indicated, in the FORM OF SUBSTITUTE BOND set forth in this Resolution.

(f) Payment of Fees and Charges. The Issuer hereby covenants with the registered owners of the Bonds that it will (i) pay the standard or customary fees and charges of the Paying Agent/Registrar for its services with respect to the payment of the principal of and interest on the Bonds, when due, and (ii) pay the fees and charges of the Paying Agent/Registrar for services with respect to the transfer of registration of Bonds, and with respect to the conversion and exchange of Bonds solely to the extent above provided in this Resolution.

(g) Substitute Paying Agent/Registrar. The Issuer covenants with the registered owners of the Bonds that at all times while the Bonds are outstanding the Issuer will provide a competent and legally qualified bank, trust company, financial institution, or other agency to act as and perform the services of Paying Agent/Registrar for the Bonds under this Resolution, and that the Paying

Agent/Registrar will be one entity. The Issuer reserves the right to, and may, at its option, change the Paying Agent/Registrar upon not less than 120 days written notice to the Paying Agent/Registrar, to be effective not later than 60 days prior to the next principal or interest payment date after such notice. In the event that the entity at any time acting as Paying Agent/Registrar (or its successor by merger, acquisition, or other method) should resign or otherwise cease to act as such, the Issuer covenants that promptly it will appoint a competent and legally qualified bank, trust company, financial institution, or other agency to act as Paying Agent/Registrar under this Resolution. Upon any change in the Paying Agent/Registrar, the previous Paying Agent/Registrar promptly shall transfer and deliver the Registration Books (or a copy thereof), along with all other pertinent books and records relating to the Bonds, to the new Paying Agent/Registrar designated and appointed by the Issuer. Upon any change in the Paying Agent/Registrar, the Issuer promptly will cause a written notice thereof to be sent by the new Paying Agent/Registrar to each registered owner of the Bonds, by United States mail, first-class postage prepaid, which notice also shall give the address of the new Paying Agent/Registrar. By accepting the position and performing as such, each Paying Agent/Registrar shall be deemed to have agreed to the provisions of this Resolution, and a certified copy of this Resolution shall be delivered to each Paying Agent/Registrar.

Section 7. FORM OF SUBSTITUTE BONDS. The form of all Bonds issued in conversion and exchange or replacement of any other Bond or portion thereof, including the form of Paying Agent/Registrar's Certificate to be printed on each of such Bonds, and the Form of Assignment to be printed on each of the Bonds, shall be, respectively, substantially as follows, with such appropriate variations, omissions, or insertions as are permitted or required by this Resolution.

FORM OF SUBSTITUTE BOND

Unless this Bond is presented by an authorized representative of The Depository Trust Company, a New York corporation (together with any successor security depository appointed pursuant to the Indenture referred to herein, "DTC") to the Trustee named herein or its agent for registration of transfer, exchange, or payment, and any Bond issued is registered in the name of Cede & Co. or in such other name as is requested by an authorized representative of DTC (and any payment is made to Cede & Co. or to such other entity as is requested by an authorized representative of DTC), ANY TRANSFER, PLEDGE, OR OTHER USE HEREOF FOR VALUE OR OTHERWISE BY OR TO ANY PERSON IS WRONGFUL inasmuch as the registered owner hereof, Cede & Co., has an interest herein.

As provided in the Indenture, until the termination of the system of book-entry only transfers through DTC, and notwithstanding any other provision of the Indenture to the contrary, this Bond may be transferred, in whole but not in part, only to a nominee of DTC, or by a nominee of DTC to DTC or a nominee of DTC, or by DTC or a nominee of DTC to any successor securities depository or any nominee thereof.

NO. R-____

PRINCIPAL AMOUNT
\$ _____

UNITED STATES OF AMERICA
STATE OF TEXAS
NORTH TEXAS MUNICIPAL WATER DISTRICT
WATER SYSTEM REVENUE REFUNDING AND IMPROVEMENT BOND,
SERIES 2016

<u>INTEREST RATE</u>	<u>MATURITY DATE</u>	<u>ISSUE DATE</u>	<u>CUSIP NO.</u>
%		_____, 2016	

ON THE MATURITY DATE specified above NORTH TEXAS MUNICIPAL WATER DISTRICT (the "Issuer"), being a political subdivision of the State of Texas, hereby promises to pay to CEDE & CO., or to the registered assignee hereof (either being hereinafter called the "registered owner") the principal amount of _____ and to pay interest thereon, calculated on the basis of a 360-day year composed of twelve 30-day months, from the Issue Date specified above, to the Maturity Date specified above, or the date of redemption prior to maturity, at the interest rate per annum specified above; with interest being payable semiannually on each March 1 and September 1, commencing _____*, except that if the date of authentication of this Bond is later than the first Record Date (hereinafter defined), such principal amount shall bear interest from the interest payment date next preceding the date of authentication, unless such date of authentication is after any Record Date but on or before the next following interest payment date, in which case such principal amount shall bear interest from such next following interest payment date.

THE PRINCIPAL OF AND INTEREST ON this Bond are payable in lawful money of the United States of America, without exchange or collection charges. The principal of this Bond shall be paid to the registered owner hereof upon presentation and surrender of this Bond at maturity or upon the date fixed for its redemption prior to maturity, at the principal corporate trust office of THE BANK OF NEW YORK MELLON TRUST COMPANY, NATIONAL ASSOCIATION, in Dallas, Texas, which is the "Paying Agent/Registrar" for this Bond. The payment of interest on this Bond shall be made by the Paying Agent/Registrar to the registered owner hereof on each interest payment date by check dated as of such interest payment date, drawn by the Paying Agent/Registrar on, and payable solely from, funds of the Issuer required by the resolution authorizing the issuance of the Bonds (the "Bond Resolution") to be on deposit with the Paying Agent/Registrar for such purpose as hereinafter provided; and such check shall be sent by the Paying Agent/Registrar by United States mail, first-class postage prepaid, on each such interest payment date, to the registered owner hereof, at the address of the registered owner, as it appeared on the 15th day of the month next preceding each such date (the "Record Date") on the Registration Books kept by the Paying Agent/Registrar, as hereinafter described. However, notwithstanding the foregoing provisions, the payment of such interest may be made by any other method acceptable to the Paying Agent/Registrar and requested

* Date of delivery to the Purchaser (as defined in Section 31 of this Resolution).

by, and at the risk and expense of, the registered owner hereof. Any accrued interest due upon the redemption of this Bond prior to maturity as provided herein shall be paid to the registered owner at the principal corporate trust office of the Paying Agent/Registrar upon presentation and surrender of this Bond for redemption and payment at the principal corporate trust office of the Paying Agent/Registrar. The Issuer covenants with the registered owner of this Bond that on or before each principal payment date, interest payment date, and accrued interest payment date for this Bond it will make available to the Paying Agent/Registrar, from the Interest and Redemption Fund confirmed by the Bond Resolution, the amounts required to provide for the payment, in immediately available funds, of all principal of and interest on the Bonds, when due.

IF THE DATE for the payment of the principal of or interest on this Bond shall be a Saturday, Sunday, a legal holiday, or a day on which banking institutions in the City where the Paying Agent/Registrar is located are authorized by law or executive order to close, then the date for such payment shall be the next succeeding day which is not such a Saturday, Sunday, legal holiday, or day on which banking institutions are authorized to close; and payment on such date shall have the same force and effect as if made on the original date payment was due.

THIS BOND is one of an issue of Bonds initially dated _____*, 2016, authorized in accordance with the Constitution and laws of the State of Texas in the principal amount of \$ _____* for the purpose of (i) IMPROVING THE NORTH TEXAS MUNICIPAL WATER DISTRICT WATER SYSTEM; (ii) REFUNDING \$ _____* IN PRINCIPAL AMOUNT OF THE ISSUER'S WATER SYSTEM REVENUE BONDS, SERIES 2008; (iii) MAKING A DEPOSIT TO THE RESERVE FUND (DEFINED IN THE BOND RESOLUTION); AND (iv) PAYING THE COSTS OF ISSUANCE OF THE BONDS.

ON _____ 1, _____*, or any date thereafter, the Bonds may be redeemed prior to their scheduled maturities, at the option of the Issuer, with funds derived from any available source, as a whole, or in part, and, if in part, the Issuer shall select and designate the maturity, or maturities, and the amount that is to be redeemed, and if less than a whole maturity is to be redeemed, the Issuer shall direct the Paying Agent/Registrar to call by lot or other customary method of random selection the Bonds or portions thereof to be redeemed (provided that the Bonds to be redeemed only in integral multiples of \$5,000), at the redemption price of the principal amount of the Bonds to be redeemed, plus accrued interest to the date fixed for redemption.

**[THE BONDS maturing on September 1, _____ and September 1, _____ (the "Term Bonds") are subject to mandatory redemption prior to maturity in part, by lot or other customary random method selected by the Paying Agent/Registrar, at a redemption price equal to the principal amount of the Term Bonds or portions thereof to be redeemed plus accrued interest to the redemption date, on September 1 in each of the years and in the principal amounts as follows:

Term Bonds maturing on September 1, _____

Years

Amounts

* From Approval Certificate.

** If applicable, from Approval Certificate.

Term Bonds maturing on September 1, _____

Years

Amounts

The principal amount of the Term Bonds of a maturity required to be redeemed pursuant to the operation of such mandatory redemption provisions shall be reduced, at the option and direction of the Issuer, by the principal amount of the Term Bonds of such maturity which, at least 50 days prior to the mandatory redemption date (1) shall have been acquired by the Issuer at a price not exceeding the principal amount of such Term Bonds plus accrued interest to the date of purchase thereof, and delivered to the Paying Agent/Registrar for cancellation, (2) shall have been purchased and canceled by the Paying Agent/Registrar at the request of the Issuer at a price not exceeding the principal amount of such Term Bonds plus accrued interest to the date of purchase, or (3) shall have been redeemed pursuant to the optional redemption provisions and not theretofore credited against a mandatory redemption requirement.]

DURING ANY PERIOD in which ownership of the Bonds is determined by a book entry at a securities depository for the Bonds, if fewer than all of the Bonds of the same maturity and bearing the same interest rate are to be redeemed, the particular Bonds of such maturity and bearing such interest rate shall be selected in accordance with the arrangements between the Issuer and the securities depository.

AT LEAST 30 days prior to the date fixed for any redemption of Bonds or portions thereof prior to maturity at the option of the Issuer, a written notice of such redemption shall be sent by the Paying Agent/Registrar by United States mail, first-class postage prepaid, to the registered owner appearing on the Registration Books at the close of business on the day next preceding the date of mailing of such notice; provided, however, that any notice so mailed shall be conclusively presumed to have been duly given and the failure to receive such notice, or any defect therein shall not affect the validity or effectiveness of the proceedings for the redemption of any Bond at the option of the Issuer. By the date fixed for any such redemption due provision shall be made with the Paying Agent/Registrar for the payment of the required redemption price for the Bonds or portions thereof which are to be so redeemed, plus accrued interest thereon to the date fixed for redemption. If such written notice of redemption is mailed and if due provision for such payment is made, all as provided above, the Bonds or portions thereof which are to be so redeemed thereby automatically shall be treated as redeemed prior to their scheduled maturities, and they shall not bear interest after the date fixed for redemption, and they shall not be regarded as being outstanding except for the right of the registered owner to receive the redemption price plus accrued interest from the Paying Agent/Registrar out of the funds provided for such payment. If a portion of any Bond shall be redeemed a substitute Bond or Bonds having the same maturity date, bearing interest at the same rate, in any denomination or denominations in any integral multiple of \$5,000, at the written request of the registered owner, and in aggregate principal amount equal to the unredeemed portion thereof, will be issued to the registered owner upon the surrender thereof for cancellation, at the expense of the Issuer, all as provided in the Bond Resolution.

THIS BOND OR ANY PORTION OR PORTIONS HEREOF IN ANY INTEGRAL MULTIPLE OF \$5,000 may be assigned and shall be transferred only in the Registration Books of the Issuer kept by the Paying Agent/Registrar acting in the capacity of registrar for the Bonds, upon the terms and conditions set forth in the Bond Resolution. Among other requirements for such assignment and transfer, this Bond must be presented and surrendered to the Paying Agent/Registrar, together with proper instruments of assignment, in form and with guarantee of signatures satisfactory to the Paying Agent/Registrar, evidencing assignment of this Bond or any portion or portions hereof in any integral multiple of \$5,000 to the assignee or assignees in whose name or names this Bond or any such portion or portions hereof is or are to be transferred and registered. The form of Assignment printed or endorsed on this Bond shall be executed by the registered owner or its duly authorized attorney or representative, to evidence the assignment hereof. A new Bond or Bonds payable to such assignee or assignees (which then will be the new registered owner or owners of such new Bond or Bonds), or to the previous registered owner in the case of the assignment and transfer of only a portion of this Bond, may be delivered by the Paying Agent/Registrar in conversion of and exchange for this Bond, all in the form and manner as provided in the next paragraph hereof for the conversion and exchange of other Bonds. The Issuer shall pay the Paying Agent/Registrar's standard or customary fees and charges for making such transfer, but the one requesting such transfer shall pay any taxes or other governmental charges required to be paid with respect thereto. The Paying Agent/Registrar shall not be required to make transfers of registration of this Bond or any portion hereof during the period commencing with the close of business on any Record Date and ending with the opening of business on the next following principal or interest payment date. The registered owner of this Bond shall be deemed and treated by the Issuer and the Paying Agent/Registrar as the absolute owner hereof for all purposes, including payment and discharge of liability upon this Bond to the extent of such payment, and the Issuer and the Paying Agent/Registrar shall not be affected by any notice to the contrary.

ALL BONDS OF THIS SERIES are issuable solely as fully registered bonds, without interest coupons, in the denomination of any integral multiple of \$5,000. As provided in the Bond Resolution, this Bond may, at the request of the registered owner or the assignee or assignees hereof, be converted into and exchanged for a like aggregate principal amount of fully registered bonds, without interest coupons, payable to the appropriate registered owner, assignee, or assignees, as the case may be, having the same maturity date, and bearing interest at the same rate, in any denomination or denominations in any integral multiple of \$5,000 as requested in writing by the appropriate registered owner, assignee, or assignees, as the case may be, upon surrender of this Bond to the Paying Agent/Registrar for cancellation, all in accordance with the form and procedures set forth in the Bond Resolution. The Issuer shall pay the Paying Agent/Registrar's standard or customary fees and charges for transferring, converting, and exchanging any Bond or any portion thereof, but the one requesting such transfer, conversion, and exchange shall pay any taxes or governmental charges required to be paid with respect thereto as a condition precedent to the exercise of such privilege of conversion and exchange. The Paying Agent/Registrar shall not be required to make any such conversion and exchange during the period commencing with the close of business on any Record Date and ending with the opening of business on the next following principal or interest payment date.

IN THE EVENT any Paying Agent/Registrar for the Bonds is changed by the Issuer, resigns, or otherwise ceases to act as such, the Issuer has covenanted in the Bond Resolution that it promptly will appoint a competent and legally qualified substitute therefor, and promptly will cause written notice thereof to be mailed to the registered owners of the Bonds.

IT IS HEREBY certified, recited, and covenanted that this Bond has been duly and validly authorized, issued, sold, and delivered; that all acts, conditions, and things required or proper to be performed, exist, and be done precedent to or in the authorization, issuance, and delivery of this Bond have been performed, existed, and been done in accordance with law; that this Bond is a special obligation of the Issuer which, together with other bonds, are secured by and payable from a first lien on and pledge of the "Pledged Revenues" as defined in the Bond Resolution, which include the "Net Revenues of the District's Water System", as defined in the Bond Resolution, including specifically revenues derived pursuant to existing water supply contracts between the Issuer and the Cities of Allen, Farmersville, Forney, Frisco, Garland, McKinney, Mesquite, Plano, Princeton, Richardson, Rockwall, Royse City, and Wylie, Texas, which cities are currently the Member Cities constituting the territory and boundaries of the Issuer, water supply contracts relating to the District's Water System with any other cities which hereafter may become Member Cities, and water supply contracts with other cities and customers in connection the District's Water System.

THE ISSUER has reserved the right, subject to the restrictions stated in the Bond Resolution, to issue Additional Bonds payable from and secured by a first lien on and pledge of the "Pledged Revenues" on a parity with this Bond and series of which it is a part.

THE ISSUER also has reserved the right to amend the Bond Resolution with the approval of the registered owners of 51% in principal amount of all outstanding bonds secured by and payable from a first lien on and pledge of the "Pledged Revenues".

THE REGISTERED OWNER hereof shall never have the right to demand payment of this Bond or the interest hereon out of any funds raised or to be raised by taxation or from any source whatsoever other than specified in the Bond Resolution.

BY BECOMING the registered owner of this Bond, the registered owner thereby acknowledges all of the terms and provisions of the Bond Resolution, agrees to be bound by such terms and provisions, acknowledges that the Bond Resolution is duly recorded and available for inspection in the official minutes and records of the governing body of the Issuer, and agrees that the terms and provisions of this Bond and the Bond Resolution constitute a contract between each registered owner hereof and the Issuer.

IN WITNESS WHEREOF, the Issuer has caused this Bond to be signed with the manual or facsimile signature of the President of the Board of Directors of the Issuer and attested and countersigned with the manual or facsimile signature of the Secretary of the Board of Directors of the Issuer, and has caused the official seal of the Issuer to be duly impressed, or placed in facsimile, on this Bond.

XXXXXX
Secretary, Board of Directors
North Texas Municipal Water District

XXXXXX
President, Board of Directors
North Texas Municipal Water District

(DISTRICT SEAL)

FORM OF PAYING AGENT/REGISTRAR'S AUTHENTICATION CERTIFICATE

PAYING AGENT/REGISTRAR'S AUTHENTICATION CERTIFICATE

It is hereby certified that this Bond has been issued under the provisions of the Bond Resolution described in this Bond; and that this Bond has been issued in conversion of and exchange for or replacement of a bond, bonds, or a portion of a bond or bonds of an issue which originally was approved by the Attorney General of the State of Texas and registered by the Comptroller of Public Accounts of the State of Texas.

THE BANK OF NEW YORK MELLON TRUST
COMPANY, NATIONAL ASSOCIATION
Paying Agent/Registrar

Dated :

Authorized Representative

FORM OF ASSIGNMENT

ASSIGNMENT

FOR VALUE RECEIVED, the undersigned sells, assigns and transfers unto

Please Insert Social Security or
Other Identifying Number of Assignee

/ _____ /

(Name and Address of Assignee)

the within Bond and does hereby irrevocably constitute and appoint _____
to transfer said Bond on the books kept for registration thereof with full power of substitution in the
premises.

Date: _____

Signature Guaranteed: _____

NOTICE: The signature to this assignment must correspond with the name as it appears upon the face of the within Bond in every particular, without alteration or enlargement or any change whatever; and

NOTICE: Signature(s) must be guaranteed by an eligible guarantor institution participating in a Securities Transfer Association recognized signature guarantee program.

Section 8. ADDITIONAL DEFINITIONS. That as used in this Resolution the following terms shall have the meanings set forth below, unless the text hereof specifically indicates otherwise:

The term "Additional Bonds" shall mean the additional parity revenue bonds permitted to be authorized in the future in this Resolution.

The term "Board" shall mean the Board of Directors of the Issuer, being the governing body of the Issuer, and it is further resolved that the declarations and covenants of the Issuer contained in this Resolution are made by, and for and on behalf of the Board and the Issuer, and are binding upon the Board and the Issuer for all purposes.

The terms "Bond Resolution" and "Resolution" mean this resolution authorizing the Bonds.

The term "Bonds" means collectively the Initial Bond as described and defined in Sections 1 and 2 of this Resolution, and all substitute bonds exchanged therefor as well as all other substitute and replacement bonds issued pursuant to this Resolution.

The term "Contracts" shall mean collectively: (a) the original separate water supply contracts between the Issuer and each of the current Member Cities, respectively, and all amendments thereto, with each of said contracts initially having been authorized at elections held in each of the current Member Cities, respectively, on December 5, 1953, except for (i) such contract with the City of Richardson, which is dated April 7, 1965, and was amended on July 2, 1973, and modified in October, 1973, (ii) such contract with the City of Allen, Texas, which is dated as of October 1, 1998 (the "Allen Contract"), and (iii) such contract with the City of Frisco, Texas, which is dated as of October 1, 2001 (the "Frisco Contract"), as all of said contracts (except the Allen Contract and the Frisco Contract, which have not been amended or modified since the respective dates thereof), as amended, have been further amended, modified, combined, consolidated, and wholly replaced by a single "North Texas Municipal Water District Regional Water Supply Facilities Amendatory Contract" dated as of August 1, 1988, executed between the Issuer and each of such Member Cities, (b) any water supply contracts relating to the System with any other cities which hereafter may become Member Cities, and (c) all water supply contracts between the Issuer and other cities and customers in connection the District's Water System.

The terms "District" and "Issuer" shall mean North Texas Municipal Water District.

The terms "District's System" and "System" shall mean all of the Issuer's existing water storage, treatment, transportation, distribution, and supply facilities, and other properties, which heretofore have been acquired or constructed with the proceeds from the sale of all bonds or other obligations ever issued by the Issuer which have been payable from or secured by a lien on or pledge

of any part of the "Net Revenues of the System," or with revenues from said System, together with all future improvements, enlargements, extensions, and additions to any of the foregoing, and all future new facilities, which are acquired or constructed with the proceeds from the sale of the Parity Bonds and any Additional Bonds or money from the Contingency Fund (hereinafter described) or any water supply facilities which are deliberately and specifically, at the option of the Board, made a part of the System by resolution of the Board, and all repairs to and replacements of the System. Said terms do not include any Issuer facilities which provide waste treatment or disposal or other wastewater services of any kind. Said terms do not include any facilities acquired or constructed by the Issuer with any proceeds from the issuance of "Special Facilities Bonds," which are hereby defined as being revenue obligations of the Issuer which are not issued as Additional Bonds, and which are payable from any source, contract or revenues whatsoever other than the Pledged Revenues; and Special Facilities Bonds may be issued for any lawful purposes and made payable from any source, contract, or revenues whatsoever other than the Pledged Revenues.

The term "Gross Revenues of the System" shall mean all of the revenues, income, rentals, rates, fees, and charges of every nature derived by the Board or the Issuer from the operation and/or ownership of the System, including specifically all payments and amounts received by the Board or the Issuer from the Contracts, and all investments, interest, and income from any Fund created pursuant to this Resolution.

The term "Member Cities" shall mean collectively the Cities of Allen, Farmersville, Forney, Frisco, Garland, McKinney, Mesquite, Plano, Princeton, Richardson, Rockwall, Royse City, and Wylie, Texas, together with all cities which hereafter may become Member Cities as provided in the Act.

The terms "Net Revenues of the District's Water System" and "Net Revenues of the System" shall mean the Gross Revenues of the System less the Operation and Maintenance Expense of the System.

The term "Operation and Maintenance Expense of the System" shall mean all costs of operation and maintenance of the System including, but not limited to, repairs and replacements, operating personnel, the cost of utilities, supervision, engineering, accounting, auditing, legal services, insurance premiums, and any other supplies, services, administrative costs, and equipment necessary for proper operation and maintenance of the System, payments to any public or private entity made for the purchase of water, storage right, or other interests in water, or for the use or operation of any property or facilities, payments to the United States of America with respect to the operation, maintenance, and use of Lavon Dam and Reservoir and/or any other reservoirs or facilities in connection with the Issuer's sources of water for the System, and payments made by the Issuer in satisfaction of judgments or other liabilities resulting from claims not covered by Issuer's insurance. Depreciation shall not be considered an item of Operation and Maintenance Expense.

The term "Parity Bonds" shall mean, collectively, (i) the Bonds, (ii) the outstanding North Texas Municipal Water District Water System Revenue Bonds, Series 2006 (the "Series 2006 Bonds"), dated as of April 15, 2006, authorized by a resolution of the Board on April 27, 2006 (the "Series 2006 Bond Resolution"), (iii) the outstanding North Texas Municipal Water District Water System Revenue Bonds, Series 2006A (the "Series 2006A Bonds"), dated as of November 15, 2006,

authorized by a resolution of the Board on November 16, 2006 (the "Series 2006A Bond Resolution"), (iv) the outstanding North Texas Municipal Water District Water System Revenue Bonds, Series 2008 (the "Series 2008 Bonds"), dated as of June 15, 2008, authorized by a resolution of the Board on June 26, 2008 (the "Series 2008 Bond Resolution"), (v) the outstanding North Texas Municipal Water District Water System Revenue Bonds, Series 2009A (the "Series 2009A Bonds"), dated as of March 1, 2009, authorized by a resolution of the Board on February 24, 2009 (the "Series 2009A Bond Resolution"), (vi) the outstanding North Texas Municipal Water District Water System Revenue Bonds, Series 2009B (the "Series 2009B Bonds"), dated as of July 15, 2009, authorized by a resolution of the Board on July 23, 2009 (the "Series 2009B Bond Resolution"), (vii) the outstanding North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds, Series 2009C (the "Series 2009C Bonds"), dated as of November 15, 2009, authorized by a resolution of the Board on October 22, 2009 (the "Series 2009C Bond Resolution"), (viii) the outstanding North Texas Municipal Water District Water System Revenue Bonds, Taxable Series 2009D (Build America Bonds - Direct Payment) (the "Series 2009D Bonds"), dated as of November 15, 2009, authorized by a resolution of the Board on October 22, 2009 (the "Series 2009D Bond Resolution"), (ix) the North Texas Municipal Water District Water System Revenue Bonds, Series 2010 (the "Series 2010 Bonds"), dated March 15, 2010, authorized by a resolution of the Board on October 28, 2010 (the "Series 2010 Bond Resolution"), (x) the North Texas Municipal Water District Water System Revenue Bonds, Taxable Series 2010A (Build America Bonds - Direct Payment) (the "Series 2010A Bonds"), dated March 15, 2010, authorized by a resolution of the Board on October 28, 2010 (the "Series 2010A Bonds"), (xi) the North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds, Series 2012 (the "Series 2012 Bonds"), dated as of June 15, 2012, authorized by a resolution of the Board on June 28, 2012 (the "Series 2012 Bond Resolution"), (xii) the North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds, Series 2014 (the "Series 2014 Bonds"), dated as of June 15, 2014, authorized by a resolution of the Board on June 26, 2014 (the "Series 2014 Bond Resolution"), and the North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds, Series 2015, dated as of April 15, 2015, authorized by a resolution of the Board on April 23, 2015 (the "Series 2015 Bond Resolution").

The term "Pledged Revenues" shall mean: (a) the Net Revenues of the System and (b) any additional revenues, income, receipts, or other resources, including, without limitation, any grants, donations, or income received or to be received from the United States Government, or any other public or private source, whether pursuant to an agreement or otherwise, which in the future may, at the option of the Issuer, be pledged to the payment of the Parity Bonds or the Additional Bonds.

The term "year" or "fiscal year" shall mean the Issuer's fiscal year, which currently begins on October 1 of each calendar year, but which subsequently may be any other 12 month period hereafter established by the Issuer as a fiscal year for the purposes of any resolution authorizing the Bonds or any Additional Bonds.

Section 9. PLEDGE. (a) The Bonds authorized by this Resolution are hereby designated as, and shall be, "Additional Bonds" as permitted by Sections 22 and 23, respectively, of the Series 2006 Bond Resolution, the Series 2006A Bond Resolution, the Series 2008 Bond Resolution, the Series 2009A Bond Resolution, the Series 2009B Bonds Resolution, the Series 2009C Bond Resolution, the Series 2009D Bond Resolution, the Series 2010 Bond Resolution, the Series 2010A

Bond Resolution, the Series 2012 Bond Resolution, the Series 2014 Bond Resolution, and the Series 2015 Bond Resolution and it is hereby determined, declared, and resolved that all of the Parity Bonds, including the Bonds authorized by this Resolution, are and shall be secured and payable equally and ratably on a parity, and that Sections 8 through 26 of this Resolution substantially restate and are supplemental to and cumulative of the applicable and pertinent provisions of the resolutions authorizing the issuance of the previously issued Parity Bonds, respectively, with Sections 8 through 26 of this Resolution being equally applicable to all of the Parity Bonds, including the Bonds.

(b) The Parity Bonds and any Additional Bonds, and the interest thereon, are and shall be secured by and payable from a first lien on and pledge of the Pledged Revenues, and the Pledged Revenues are further pledged to the establishment and maintenance of the Interest and Redemption Fund, the Reserve Fund and the Contingency Fund as provided in this Resolution.

Section 10. REVENUE FUND. There has been created and established and there shall be maintained on the books of the Issuer, and accounted for separate and apart from all other funds of the Issuer, a special fund to be entitled the "North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds Revenue Fund" (hereinafter called the "Revenue Fund"). All Gross Revenues of the System (excepting the investment interest and income from the Interest and Redemption Fund, the Reserve Fund, and the Contingency Fund) shall be credited to the Revenue Fund immediately upon receipt. All Operation and Maintenance Expenses of the System shall be paid from such Gross Revenues credited to the Revenue Fund, as a first charge against same.

Section 11. INTEREST AND REDEMPTION FUND. For the sole purpose of paying the principal of and interest on all outstanding Parity Bonds and any Additional Bonds, as the same come due, there has been created and established and there shall be maintained at The Bank of New York Mellon Trust Company, National Association, or at the option of the Issuer at any time hereafter, established and maintained at any national bank having a capital and surplus in excess of \$25,000,000, a separate fund to be entitled the "North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds Interest and Redemption Fund" (hereinafter called the "Interest and Redemption Fund").

Section 12. RESERVE FUND. There has been created and established, and there shall be maintained at The Bank of New York Mellon Trust Company, National Association, or at the option of the Issuer at any time hereafter, established and maintained at any national bank having a capital and surplus in excess of \$25,000,000, a separate fund to be entitled the "North Texas Municipal Water District Regional Water System Revenue Refunding and Improvement Bonds Reserve Fund" (hereinafter called the "Reserve Fund"). The Reserve Fund shall be used solely for the purpose of finally retiring the last of the outstanding Parity Bonds and Additional Bonds, or for paying principal of and interest on any outstanding Parity Bonds and Additional Bonds, when and to the extent the amount in the Interest and Redemption Fund is insufficient for such purpose.

Section 13. CONTINGENCY FUND. There has been created and established, and there shall be maintained at The Bank of New York Mellon Trust Company, National Association, or at the option of the Issuer at any time hereafter, established and maintained at any national bank having a capital and surplus in excess of \$25,000,000, a separate fund to be entitled the "North Texas

Municipal Water District Water System Revenue Refunding and Improvement Bonds Contingency Fund" (hereinafter called the "Contingency Fund"). The Contingency Fund shall be used solely for the purpose of paying the costs of improvements, enlargements, extensions, or additions to the System, and unexpected or extraordinary repairs or replacements of the System for which System funds are not otherwise available, or for paying unexpected or extraordinary Operation and Maintenance Expenses of the System for which System funds are not otherwise available, or for paying principal of and interest on any Parity Bonds or Additional Bonds, when and to the extent the amount in the Interest and Redemption Fund is insufficient for such purpose

Section 14. DEPOSITS OF PLEDGED REVENUES; INVESTMENTS. (a) The Pledged Revenues shall be deposited into the Interest and Redemption Fund, the Reserve Fund, and the Contingency Fund when and as required by this Resolution.

(b) Money in any Fund established or maintained pursuant to the this Resolution may, at the option of the Issuer, be placed in secured time deposits or secured certificates of deposit, or be invested in direct obligations of the United States of America, obligations guaranteed or insured by the United States of America, which, in the opinion of the Attorney General of the United States, are backed by its full faith and credit or represent its general obligations, including, but not limited to, evidences of indebtedness issued, insured, or guaranteed by such governmental agencies as the Federal Home Loan Banks, Government National Mortgage Association, Farmers Home Administration, Federal Home Loan Mortgage Association, or Small Business Administration; provided that all such deposits and investments shall be made in such manner that the money required to be expended from any Fund will be available at the proper time or times. Such investments shall be valued in terms of current market value as of the 20th day of August of each year. Interest and income derived from such deposits and investments shall be credited to the Fund from which the deposit or investment was made. Such investments shall be sold promptly when necessary to prevent any default in connection with the Parity Bonds or Additional Bonds.

Section 15. FUNDS SECURED. Money in all Funds described in this Resolution, to the extent not invested, shall be secured in the manner prescribed by law for securing funds of the Issuer.

Section 16. DEBT SERVICE REQUIREMENTS. (a) Promptly after the delivery of the Initial Bond the Issuer shall cause to be deposited to the credit of the Interest and Redemption Fund, from the proceeds received from the sale and delivery of the Initial Bond, all accrued interest, if any, to be used to pay part of the interest coming due on the Bonds.

(b) The Issuer shall transfer from the Pledged Revenues and deposit to the credit of the Interest and Redemption Fund the amounts, at the times, as follows:

(1) such amounts, deposited in approximately equal monthly installments on or before the 25th day of each month hereafter as will be sufficient, together with other amounts, if any, then on hand in the Interest and Redemption Fund and available for such purpose, to pay the interest scheduled to accrue and come due on all of the Parity Bonds on the next succeeding interest payment date; and

(2) such amounts, deposited in approximately equal monthly installments on or before the 25th day of each month hereafter as will be sufficient, together with other amounts, if any, then on hand in the Interest and Redemption Fund and available for such purpose, to pay the principal scheduled to mature and come due, and/or mandatorily required to be redeemed prior to maturity, on all of the Parity Bonds on the next succeeding principal payment date.

Section 17. RESERVE REQUIREMENTS. The Issuer is required to accumulate and maintain in the Reserve Fund an aggregate amount of money and/or investments equal in market value to the average annual principal and interest requirements on all outstanding Parity Bonds (the "Reserve Required Amount"). Immediately after the delivery of the Initial Bond, the District shall deposit to the credit of the Reserve Fund, from the proceeds from the sale and delivery of the Initial Bond, an amount of money, if any, which will cause the Reserve Fund to contain, together with the other money and/or investments then on hand therein, an amount of money and/or investments equal in market value to the Reserve Required Amount. No deposits shall be made into the Reserve Fund as long as the money and investments in the Reserve Fund are at least equal in market value to the Reserve Required Amount; but if and whenever the market value of money and investments in the Reserve Fund is reduced below said Reserve Required Amount because of a decrease in market value of investments, then the Issuer shall require the Member Cities to increase their payments under their respective Contracts as soon as practicable, and in any event within one year, in an amount sufficient to restore the amount of such decrease; and in the event the Reserve Fund is used pay the principal of or interest on the Bonds because of insufficient amounts being available in the Interest and Redemption Fund, then the Issuer shall require the Member Cities to increase their payments under the their respective Contracts as soon as practicable, and in any event within one year, in an amount sufficient to restore the Reserve Fund to the Reserve Required Amount, and the Issuer shall deposit, in the Reserve Fund, in approximately equal periodic payments, not less than annual, such amounts as are required to cause the Reserve Fund to contain the Reserve Required Amount within five years from any date of the use of the Reserve Fund to pay such principal or interest. So long as the Reserve Fund contains the Reserve Required Amount, all amounts in excess thereof shall be deposited to the credit of the Interest and Redemption Fund on or before September 1 of each year.

Section 18. CONTINGENCY REQUIREMENTS. There is now on hand in the Contingency Fund an amount of money and/or investments at least equal in market value to \$500,000. No additional deposits are required to be made to the credit of the Contingency Fund unless and until such amount therein is reduced or depleted. If and when such amount in the Contingency Fund is reduced or depleted then, subject and subordinate to making the required deposits to the credit of the Interest and Redemption Fund and the Reserve Fund, such reduction or depletion shall be restored from amounts which shall be provided for such purpose in the Issuer's Annual Budget for the next ensuing fiscal year or years; provided that the Issuer is not required to budget more than \$200,000 for such purpose during any one fiscal year. So long as the Contingency Fund contains money and investments not less than the amount of \$500,000 in market value, any surplus in the Contingency Fund over said amount may be withdrawn and used for any lawful purpose.

Section 19. DEFICIENCIES; EXCESS PLEDGED REVENUES. (a) If on any occasion there shall not be sufficient Pledged Revenues to make the required deposits into the Interest and Redemption Fund, the Contingency Fund, and the Reserve Fund, then such deficiency shall be made up as soon as possible from the next available Pledged Revenues, or from any other sources lawfully available for such purpose.

(b) Subject to making the required deposits to the credit of the Interest and Redemption Fund, the Contingency Fund, and the Reserve Fund, when and as required by this Resolution, or any Resolution authorizing the issuance of Additional Bonds, the excess Pledged Revenues may be used for any lawful purpose; provided that at the time each Annual Budget is prepared all such excess revenues which are not pledged to the payment of junior or subordinate lien bonds or other obligations of the Issuer, and which have not been committed by formal resolution or order of the Board for a specific purpose, and which exceed twenty-five percent of the Operation and Maintenance Expenses of the Issuer for the fiscal year then ending, shall be applied to the payment of Operation and Maintenance Expenses of the Issuer for the next ensuing fiscal year, and the Annual Budget shall be prepared accordingly.

Section 20. PAYMENT OF PARITY BONDS AND ADDITIONAL BONDS. Semiannually on or before the first day of each March and September while any of the Parity Bonds or Additional Bonds are outstanding and unpaid, the Issuer shall make available to the paying agents therefor, out of the Interest and Redemption Fund, the Contingency Fund, or the Reserve Fund, if necessary, money sufficient to pay such interest on and such principal of the Parity Bonds and Additional Bonds as will accrue or mature on such March 1 or September 1, as the case may be. The paying agents shall destroy all paid Parity Bonds and Additional Bonds, and furnish the Issuer with an appropriate certificate of cancellation or destruction.

Section 21. FINAL DEPOSITS; GOVERNMENTAL OBLIGATIONS. (a) Any Parity Bond or Additional Bond shall be deemed to be paid, retired, and no longer outstanding, when payment of the principal of, redemption premium, if any, on such Parity Bond or Additional Bond, plus interest thereon to the due date thereof (whether such date be by reason of maturity, upon redemption, or otherwise) either (i) shall have been made or caused to be made in accordance with the terms thereof (including the giving of any required notice of redemption), or (ii) shall have been provided by irrevocably depositing with a paying agent therefor, (1) money sufficient to make such payment or (2) Government Obligations, as hereinafter defined in this Section, certified by an independent public accounting firm of national reputation to mature as to principal and interest in such amounts and at such times as will insure the availability, without reinvestment, of sufficient money to make such payment, and all necessary and proper fees, compensation, and expenses of such paying agent pertaining to the Parity Bonds and Additional Bonds with respect to which such deposit is made shall have been paid or the payment thereof provided for to the satisfaction of such paying agent. At such time as a Parity Bond or Additional Bond shall be deemed to be paid hereunder, as aforesaid, it shall no longer be secured by or entitled to the benefits of any Bond Resolution or a lien on and pledge of the Pledged Revenues, and shall be entitled to payment solely from such money or Government Obligations.

(b) Any moneys so deposited with a paying agent may at the direction of the Issuer also be invested in Government Obligations, maturing in the amounts and times as hereinbefore set forth, and all income from all Government Obligations in the hands of the paying agent pursuant to this Section which is not required for the payment of the Parity Bonds and Additional Bonds, the redemption premium, if any, and interest thereon, with respect to which such moneys has been so deposited, shall be turned over to the Issuer.

(c) The Issuer covenants that no deposit will be made or accepted under clause (ii) of this Section and no use made of any such deposit which would cause the Parity Bonds or any Additional Bonds to be treated as arbitrage bonds within the meaning of the Internal Revenue Code of 1986, as amended.

(d) For the purpose of this Section, the term "Government Obligations" shall mean direct obligations of the United States of America, including obligations the principal of and interest on which are unconditionally guaranteed by the United States of America, and which may be United States Treasury obligations such as its State and Local Government Series, and which may be in book-entry form.

(e) Notwithstanding any provisions of this Resolution, all money or Government Obligations set aside and held in trust pursuant to the provisions of this Section for the payment of Parity Bonds and Additional Bonds, the redemption premium, if any, and interest thereon, shall be applied to and used for the payment of Parity Bonds and Additional Bonds, the redemption premium, if any, and interest thereon.

(f) Notwithstanding the foregoing, the Issuer covenants that with respect to the Parity Bonds it will provide a paying agent/registrars to perform the services thereof provided for by this Resolution the same as if they had not been defeased, and the Issuer shall make proper arrangements to provide and pay for such paying agent and registrar services.

Section 22. ADDITIONAL BONDS. (a) The Issuer shall have the right and power at any time and from time to time, and in one or more Series or issues, to authorize, issue, and deliver additional parity revenue bonds (herein called "Additional Bonds"), in accordance with law, in any amounts, for any lawful purpose relating to the System, including the refunding of any Parity Bonds or Additional Bonds. Such Additional Bonds, if and when authorized, issued, and delivered in accordance with this Resolution, shall be secured by and made payable equally and ratably on a parity with the Parity Bonds, and all other outstanding Additional Bonds, from a first lien on and pledge of the Pledged Revenues.

(b) The Interest and Redemption Fund and the Reserve Fund, established by this Resolution shall secure and be used to pay all Additional Bonds as well as the Parity Bonds. However, each Resolution under which Additional Bonds are issued shall provide and require that, in addition to the amounts required by the provisions of this Resolution and the provisions of any other Resolution or Resolutions authorizing Additional Bonds to be deposited to the credit of the Interest and Redemption Fund, the Issuer shall deposit to the credit of the Interest and Redemption Fund at least such amounts as are required for the payment of all principal of and interest on said Additional Bonds then being issued, as the same come due; and that the aggregate amount to be

accumulated and maintained in the Reserve Fund shall be increased, if and to the extent necessary, to an amount not less than the average annual principal and interest requirements of all Parity Bonds and Additional Bonds which will be outstanding after the issuance and delivery of the then proposed Additional Bonds; and that the required additional amount shall be so accumulated by the deposit in the Reserve Fund of all or any part of said required additional amount in cash immediately after the delivery of the then proposed Additional Bonds, or, at the option of the Issuer, by the deposit of said required additional amount (or any balance of said required additional amount not deposited in cash as permitted above) within five years from the date of such installment or series of Additional Bonds, and in approximately equal installments, not less than annual.

(c) All calculations of average annual principal and interest requirements made pursuant to this Section shall be made as of and from the date of the Additional Bonds then proposed to be issued.

(d) The principal of all Additional Bonds must be scheduled to be paid or mature on September 1 of the years in which such principal is scheduled to be paid or mature; and all interest thereon must be payable on March 1 and September 1.

Section 23. FURTHER REQUIREMENTS FOR ADDITIONAL BONDS. Additional Bonds shall be issued only in accordance with this Resolution, but notwithstanding any provisions of this Resolution to the contrary, no installment, Series, or issue of Additional Bonds shall be issued or delivered unless the President and the Secretary of the Board sign a written certificate to the effect that the Issuer is not in default as to any covenant, condition, or obligation in connection with all outstanding Parity Bonds and Additional Bonds, and the Resolutions authorizing same, and that the Interest and Redemption Fund and the Reserve Fund each contains the amount then required to be therein, and either (a) an independent registered professional engineer of the State of Texas or a firm of such engineers executes a certificate or report to the effect that in his or its opinion the Pledged Revenues in each complete fiscal year thereafter will be at least equal to 1.25 times the average annual principal and interest requirements of all Parity Bonds and Additional Bonds to be outstanding after the delivery of the then proposed Additional Bonds, or (b) in the alternative to (a), above, the President and Secretary of the Board sign a written certificate to the effect that, based upon an opinion of legal counsel to the Issuer, there are Contracts then in effect pursuant to which the Member Cities and others which are parties to such Contracts are obligated to make minimum payments to the Issuer at such times (including during periods when water is not available to such member Cities and others) and in such amounts as shall be necessary to provide to the Issuer Net Revenues of the System sufficient to pay when due all principal of and interest on all Parity Bonds and Additional Bonds to be outstanding after the issuance of the proposed Additional Bonds, and to make the deposits into the Reserve Fund as required under this Resolution.

Section 24. GENERAL COVENANTS. The Issuer further covenants and agrees that:

(a) PERFORMANCE. It will faithfully perform at all times any and all covenants, undertakings, stipulations, and provisions contained in this Resolution and each resolution authorizing the issuance of Additional Bonds, and in each and every Parity Bond and Additional Bond; that it will promptly pay or cause to be paid the principal of and interest on every Bond and Additional Bond, on the dates and in the places and manner prescribed in such resolutions and Parity

Bonds or Additional Bonds; and that it will, at the times and in the manner prescribed, deposit or cause to be deposited the amounts required to be deposited into the Interest and Redemption Fund and the Reserve Fund; and any holder of the Parity Bonds or Additional Bonds may require the Issuer, its Board, and its officials and employees, to carry out, respect, or enforce the covenants and obligations of this Resolution or any resolution authorizing the issuance of Additional Bonds, by all legal and equitable means, including specifically, but without limitation, the use and filing of mandamus proceedings, in any court of competent jurisdiction, against the Issuer, its Board, and its officials and employees.

(b) **ISSUER'S LEGAL AUTHORITY.** It is a duly created and existing conservation and reclamation district of the State of Texas pursuant to Article 16, Section 59 of the Texas Constitution, and Chapter 62, Acts of the 52nd Legislature of the State of Texas, Regular Session, 1951, as amended (originally compiled as Vernon's Ann. Tex. Civ. St. Article 8280-141), and is duly authorized under the laws of the State of Texas to create and issue the Parity Bonds; that all action on its part for the creation and issuance of the Parity Bonds has been duly and effectively taken, and that the Parity Bonds in the hands of the holders and owners thereof are and will be valid and enforceable special obligations of the Issuer in accordance with their terms.

(c) **TITLE.** It has or will obtain lawful title to, or the lawful right to use and operate, the lands, buildings, and facilities constituting the System, that it warrants that it will defend, the title to or lawful right to use and operate, all the aforesaid lands, buildings, and facilities, and every part thereof, for the benefit of the holders and owners of the Parity Bonds and Additional Bonds against the claims and demands of all persons whomsoever, that it is lawfully qualified to pledge the Pledged Revenues to the payment of the Parity Bonds and Additional Bonds in the manner prescribed herein, and has lawfully exercised such rights.

(d) **LIENS.** It will from time to time and before the same become delinquent pay and discharge all taxes, assessments, and governmental charges, if any, which shall be lawfully imposed upon it, or the System, that it will pay all lawful claims for rents, royalties, labor, materials, and supplies which if unpaid might by law become a lien or charge thereon, the lien of which would be prior to or interfere with the liens hereof, so that the priority of the liens granted hereunder shall be fully preserved in the manner provided herein, and that it will not create or suffer to be created any mechanic's, laborer's, materialman's, or other lien or charge which might or could be prior to the liens hereof, or do or suffer any matter or thing whereby the liens hereof might or could be impaired; provided, however, that no such tax, assessment, or charge, and that no such claims which might be used as the basis of a mechanic's, laborer's, materialman's, or other lien or charge, shall be required to be paid so long as the validity of the same shall be contested in good faith by the Issuer.

(e) **OPERATION OF SYSTEM.** While the Parity Bonds or any Additional Bonds are outstanding and unpaid it will cause the System to be continuously and efficiently operated and maintained in good condition, repair, and working order, and at a reasonable cost.

(f) **FURTHER ENCUMBRANCE.** While the Parity Bonds or any Additional Bonds are outstanding and unpaid, it shall not additionally encumber the Pledged Revenues in any manner, except as permitted in this Resolution in connection with Additional Bonds, unless said encumbrance is made junior and subordinate in all respects to the liens, pledges, covenants, and

agreements of this Resolution and any resolution authorizing the issuance of Additional Bonds; but the right of the Issuer and the Board to issue revenue bonds payable from a subordinate lien on the Pledged Revenues is specifically recognized and retained.

(g) **SALE OF PROPERTY.** While the Parity Bonds or any Additional Bonds are outstanding and unpaid, it will maintain its current legal corporate status as a conservation and reclamation district, and the Issuer shall not sell, convey, mortgage, or in any manner transfer title to, or lease, or otherwise dispose of the entire System, or any significant or substantial part thereof; provided that whenever it deems it necessary to dispose of any machinery, fixtures, and equipment, it may sell or otherwise dispose of such machinery, fixtures, and equipment when it has made arrangements to replace the same or provide substitutes therefor, unless it is determined by the Board that no such replacement or substitute is necessary.

(h) **INSURANCE.** (1) It will cause to be insured such parts of the System as would usually be insured by corporations operating like properties, with a responsible insurance company or companies, against risks, accidents, or casualties against which and to the extent insurance is usually carried by corporations operating like properties, including fire and extended coverage insurance. Public liability and property damage insurance shall also be carried unless the general counsel for Issuer, or the Attorney General of Texas, gives a written opinion to the effect that the Issuer, the Board, and its officers and employees, are not liable for claims which would be protected by such insurance. At any time while any contractor engaged in construction work shall be fully responsible therefor, the Issuer shall not be required to carry insurance on the works being constructed, but the contractor shall be required to carry appropriate insurance. All such policies shall be open to the inspection of the owners of the Parity Bonds and Additional Bonds and their representatives at all reasonable times.

(2) Upon the happening of any loss or damage covered by insurance from one or more of said causes, the Issuer shall make due proof of loss and shall do all things necessary or desirable to cause the insuring companies to make payment in full directly to the Issuer. The proceeds of insurance covering such property, together with any other funds necessary and available for such purpose, shall be used forthwith by the Issuer for repairing the property damaged or replacing the property destroyed; provided, however, that if said insurance proceeds and other funds are insufficient for such purpose, then said insurance proceeds pertaining to the System shall be used promptly as follows:

(a) for the redemption prior to maturity of the Parity Bonds and Additional Bonds, if any, ratably in the proportion that the outstanding principal of each Series or issue of Parity Bonds or Additional Bonds bears to the total outstanding principal of all Parity Bonds and Additional Bonds; provided that if on any such occasion the principal of any such Series or issue is not subject to redemption, it shall not be regarded as outstanding in making the foregoing computation; or

(b) if none of the outstanding Parity Bonds or Additional Bonds is subject to redemption, then for the purchase on the open market and retirement of said Parity Bonds and Additional Bonds, in the same proportion as prescribed in the foregoing clause (a), to the extent practicable; provided that the purchase price for any such Parity Bond or

Additional Bonds shall not exceed the redemption price of such Parity Bond or Additional Bond on the first date upon which it becomes subject to redemption; or

(c) to the extent that the foregoing clauses (a) and (b) cannot be complied with at the time, the insurance proceeds, or the remainder thereof, shall be deposited in a special and separate trust fund, at an official depository of the Issuer, to be designated the Insurance Account. The Insurance Account shall be held until such time as the foregoing clauses (a) and/or (b) can be complied with, or until other funds become available which, together with the Insurance Account, will be sufficient to make the repairs or replacements originally required, whichever of said events occurs first.

(3) The annual audit hereinafter required shall contain a list of all such insurance policies carried, together with a statement as to whether or not all insurance premiums upon such policies have been paid.

(i) **RATE COVENANT.** It will fix, establish, maintain, and collect such rentals, rates, charges, and fees for the use and availability of the System as are necessary to produce Gross Revenues of the System sufficient, together with any other Pledged Revenues, (a) to pay all Operation and Maintenance Expenses of the System and (b) to make all payments and deposits required to be made into the Interest and Redemption Fund, and to maintain the Reserve Fund and the Contingency Fund, when and as required by the resolutions authorizing all Parity Bonds and Additional Bonds.

(j) **RECORDS.** Proper books of record and account will be kept in which full, true, and correct entries will be made of all dealings, activities, and transactions relating to the System, the Pledged Revenues, and all Funds described in this Resolution; and all books, documents, and vouchers relating thereto shall at all reasonable times be made available for inspection upon request of any owner of a Parity Bond or Additional Bond.

(k) **AUDITS.** Each year while any of the Parity Bonds or Additional Bonds is outstanding, an audit will be made of its books and accounts relating to the System and the Pledged Revenues by an independent certified public accountant or an independent firm of certified public accountants. As soon as practicable after the close of each year, and when said audit has been completed and made available to the Issuer, a copy of such audit for the preceding year shall be mailed to the Municipal Advisory Council of Texas and to any bondholders who shall so request in writing. Such annual audit reports shall be open to the inspection of the bondholders and their agents and representatives at all reasonable times.

(l) **GOVERNMENTAL AGENCIES.** It will comply with all of the terms and conditions of any and all agreements applicable to the System and the Parity Bonds or Additional Bonds entered into between the Issuer and any governmental agency, and the Issuer will take all action necessary to enforce said terms and conditions; and the Issuer will obtain and keep in full force and effect all franchises, permits, and other requirements necessary with respect to the acquisition, construction, operation, and maintenance of the System.

(m) **CONTRACTS.** It will comply with the terms and conditions of the Contracts, and any amendments thereto, and will cause the Member Cities and other cities and customers to comply with all of their obligations thereunder by all lawful means; provided that the Contracts will not be rescinded, modified, or amended in any way which would materially affect adversely the operation of the System or the rights of the owners of the Parity Bonds and Additional Bonds; provided further that, without violating this Section 24(m), the Contracts may be modified or amended to change the allocation of the Annual Requirement (as defined in the Contracts) among the Member Cities by changing the basis for determination of each Member City's minimum amount of each Annual Requirement.

(n) **ANNUAL BUDGET.** On or before the first day of the second calendar month prior to the beginning of each fiscal year, it will prepare the preliminary Annual Budget of Operation and Maintenance Expenses of the System for the ensuing fiscal year, and any amounts required to be deposited to the credit of the Contingency Fund during the ensuing fiscal year, and such budget shall include a showing as to the proposed expenditures for such ensuing fiscal year. In the Annual Budget for each fiscal year provisions shall be made for payment of the. If the owners of ten per centum (10%) in aggregate principal amount of the Parity Bonds and Additional Bonds then outstanding shall so request on or before the 15th day of the aforesaid month, the Board shall hold a public hearing on or before the 15th day of the following month, at which any such owner may appear in person or by agent or attorney and present any objections he may have to the final adoption of such budget. Notice of the time and place of such hearing shall be published twice, once in each of two successive weeks, in daily newspapers (and if no daily newspaper is published in any one of such cities, in a weekly newspaper published in such cities) of general circulation published in Dallas, Texas, the date of the first publication to be at least fourteen days before the date fixed for the hearing, and copies of such notice shall be mailed at least ten days before the hearing to each owner of a Parity Bond or Additional Bond who shall have filed his or her name and address with the Secretary of the Board for such purpose. The Issuer further covenants that on or before the first day of each fiscal year it will finally adopt the Annual Budget of Operation and Maintenance Expenses of the System for such fiscal year (hereinafter sometimes call the "Annual Budget") and that except as otherwise provided herein the total expenditures in any division thereof will not exceed the total expenditures in the corresponding division in the preliminary budget. If for any reason the Board shall not have adopted the Annual Budget before the first day of any fiscal year, the budget for the preceding fiscal year shall be deemed to be in force until the adoption of the Annual Budget. The Operation and Maintenance Expenses of the System incurred in any fiscal year will not exceed the reasonable and necessary amount thereof, and the Board will not expend any amount or incur any obligation for maintenance, repair, and operation in excess of the amounts provided therefor in the Annual Budget; provided, however, that if at any time the Board shall determine that the amount of the appropriation for any item in the Annual Budget is in excess of the amount which will be required for such item, the Board may by resolution reduce such appropriation and make an appropriation for any item or items not covered by the Annual Budget or increase the appropriation for any other item or items by an amount not exceeding the amount of such reduction; and provided, further, that the Board may at any time by resolution adopt an Amended or Supplemental Annual Budget for the remainder of the then current fiscal year in case of an emergency caused by some extraordinary occurrence which shall be recited in such resolution.

Section 25. AMENDMENT OF RESOLUTION. (a) The owners of Parity Bonds and Additional Bonds aggregating 51% in principal amount of the aggregate principal amount of then outstanding Parity Bonds and Additional Bonds shall have the right from time to time to approve any amendment to any resolution authorizing the issuance of any Parity Bonds or Additional Bonds, which may be deemed necessary or desirable by the Issuer, provided, however, that nothing herein contained shall permit or be construed to permit the amendment of the terms and conditions in said resolutions or in the Parity Bonds or Additional Bonds so as to:

(1) Make any change in the maturity of the outstanding Parity Bonds or Additional Bonds;

(2) Reduce the rate of interest borne by any of the outstanding Parity Bonds or Additional Bonds;

(3) Reduce the amount of the principal payable on the outstanding Parity Bonds or Additional Bonds;

(4) Modify the terms of payment of principal of or interest on the outstanding Parity Bonds or Additional Bonds, or impose any conditions with respect to such payment;

(5) Affect the rights of the holders of less than all of the Parity Bonds and Additional Bonds then outstanding;

(6) Change the minimum percentage of the principal amount of Parity Bonds and Additional Bonds necessary for consent to such amendment.

(b) If at any time the Issuer shall desire to amend a resolution under this Section, the Issuer shall cause notice of the proposed amendment to be published in a financial newspaper or journal published in the City of New York, New York, once during each calendar week for at least two successive calendar weeks. Such notice shall briefly set forth the nature of the proposed amendment and shall state that a copy thereof is on file at the principal office of each paying agent for any of the Parity Bonds or Additional Bonds for inspection by all owners of Parity Bonds and Additional Bonds. Such publication is not required, however, if notice in writing is given to each holder of Parity Bonds and Additional Bonds.

(c) Whenever at any time not less than thirty days, and within one year, from the date of the first publication of said notice or other service of written notice the Issuer shall receive an instrument or instruments executed by the owners of at least 51% in aggregate principal amount of all Parity Bonds and Additional Bonds then outstanding, which instrument or instruments shall refer to the proposed amendment described in said notice and which specifically consent to and approve such amendment in substantially the form of the copy thereof on file as aforesaid, the Issuer may adopt the amendatory resolution in substantially the same form.

(d) Upon the adoption of any amendatory resolution pursuant to the provisions of this Section, the resolution being amended shall be deemed to be amended in accordance with the amendatory resolution, and the respective rights, duties, and obligations of the Issuer and all the

owners of then outstanding Parity Bonds and Additional Bonds and all future Additional Bonds shall thereafter be determined, exercised, and enforced hereunder, subject in all respects to such amendment.

(e) Any consent given by the owner of a Parity Bond or Additional Bond pursuant to the provisions of this Section shall be irrevocable for a period of six months from the date of the first publication of the notice provided for in this Section, and shall be conclusive and binding upon all future holders or owners of the same Parity Bond or Additional Bond during such period. Such consent may be revoked at any time after six months from the date of the first publication of such notice by the owner who gave such consent, or by a successor in title, by filing notice thereof with each Paying Agent for each Series of Parity Bonds and Additional Bonds, and the Issuer, but such revocation shall not be effective if the owners of 51% in aggregate principal amount of the then outstanding Parity Bonds and Additional Bonds as in this Section defined have, prior to the attempted revocation, consented to and approved the amendment.

(f) For the purpose of this Section, the ownership of and other matters relating to the Parity Bonds shall be determined from the registration books kept by the registrar therefor.

Section 26. DAMAGED, MUTILATED, LOST, STOLEN, OR DESTROYED BONDS.

(a) Replacement Bonds. In the event any outstanding Bond is damaged, mutilated, lost, stolen, or destroyed, the Paying Agent/Registrar shall cause to be printed, executed, and delivered, a new bond of the same principal amount, maturity, and interest rate, as the damaged, mutilated, lost, stolen, or destroyed Bond, in replacement for such Bond in the manner hereinafter provided.

(b) Application for Replacement Bonds. Application for replacement of damaged, mutilated, lost, stolen, or destroyed Bonds shall be made by the registered owner thereof to the Paying Agent/Registrar. In every case of loss, theft, or destruction of a Bond, the registered owner applying for a replacement bond shall furnish to the Issuer and to the Paying Agent/Registrar such security or indemnity as may be required by them to save each of them harmless from any loss or damage with respect thereto. Also, in every case of loss, theft, or destruction of a Bond, the registered owner shall furnish to the Issuer and to the Paying Agent/Registrar evidence to their satisfaction of the loss, theft, or destruction of such Bond, as the case may be. In every case of damage or mutilation of a Bond, the registered owner shall surrender to the Paying Agent/Registrar for cancellation the Bond so damaged or mutilated.

(c) No Default Occurred. Notwithstanding the foregoing provisions of this Section, in the event any such Bond shall have matured, and no default has occurred which is then continuing in the payment of the principal of, redemption premium, if any, or interest on the Bond, the Issuer may authorize the payment of the same (without surrender thereof except in the case of a damaged or mutilated Bond) instead of issuing a replacement Bond, provided security or indemnity is furnished as above provided in this Section.

(d) Charge for Issuing Replacement Bonds. Prior to the issuance of any replacement bond, the Paying Agent/Registrar shall charge the registered owner of such Bond with all legal, printing, and other expenses in connection therewith. Every replacement bond issued pursuant to

the provisions of this Section by virtue of the fact that any Bond is lost, stolen, or destroyed shall constitute a contractual obligation of the Issuer whether or not the lost, stolen, or destroyed Bond shall be found at any time, or be enforceable by anyone, and shall be entitled to all the benefits of this Resolution equally and proportionately with any and all other Bonds duly issued under this Resolution.

(e) Authority for Issuing Replacement Bonds. In accordance with Section 1201.067, Texas Government Code, this Section of this Resolution shall constitute authority for the issuance of any such replacement bond without necessity of further action by the governing body of the Issuer or any other body or person, and the duty of the replacement of such bonds is hereby authorized and imposed upon the Paying Agent/Registrar, and the Paying Agent/Registrar shall authenticate and deliver such Bonds in the form and manner and with the effect, as provided in Section 6(d) of this Resolution for Bonds issued in conversion and exchange for other Bonds.

Section 27. COVENANTS REGARDING TAX-EXEMPTION. (a) Covenants. The Issuer covenants to refrain from any action which would adversely affect, or to take such action to assure, the treatment of the Bonds as obligations described in section 103 of the Code, the interest on which is not includable in the "gross income" of the holder for purposes of federal income taxation. In furtherance thereof, the Issuer covenants as follows:

(1) to take any action to assure that no more than 10 percent of the proceeds of the Bonds or the projects financed therewith (less amounts deposited into a reserve fund, if any) are used for any "private business use," as defined in section 141(b)(6) of the Code, or if more than 10 percent of the proceeds or the projects financed therewith are so used, such amounts, whether or not received by the Issuer, with respect to such private business use, do not, under the terms of this Resolution or any underlying arrangement, directly or indirectly, secure or provide for the payment of more than 10 percent of the debt service on the Bonds, in contravention of section 141(b)(2) of the Code;

(2) to take any action to assure that in the event that the "private business use" described in subsection (a) hereof exceeds five percent of the proceeds of the Bonds or the projects financed therewith (less amounts deposited into a reserve fund, if any) then the amount in excess of five percent is used for a "private business use" which is "related" and not "disproportionate," within the meaning of section 141(b)(3) of the Code, to the governmental use;

(3) to take any action to assure that no amount which is greater than the lesser of \$5,000,000, or five percent of the proceeds of the Bonds (less amounts deposited into a reserve fund, if any) is, directly or indirectly, used to finance loans to persons, other than state or local governmental units, in contravention of section 141(c) of the Code;

(4) to refrain from taking any action that would otherwise result in the Bonds being treated as "private activity bonds" within the meaning of section 141(b) of the Code;

(5) to refrain from taking any action that would result in the Bonds being "federally guaranteed" within the meaning of section 149(b) of the Code;

(6) to refrain from using any portion of the proceeds of the Bonds, directly or indirectly, to acquire or to replace funds which were used, directly or indirectly, to acquire investment property (as defined in section 148(b)(2) of the Code) which produces a materially higher yield over the term of the Bonds, other than investment property acquired with --

(A) proceeds of the Bonds invested for a reasonable temporary period of 3 years or less or, in the case of a refunding bond, for a period of 30 days or less until such proceeds are needed for the purpose for which the Bonds are issued,

(B) amounts invested in a bona fide debt service fund, within the meaning of section 1.148-1(b) of the Treasury Regulations, and

(C) amounts deposited in any reasonably required reserve or replacement fund to the extent such amounts do not exceed 10 percent of the stated principal amount (or, in the case of a discount, the issue price) of the Bonds;

(7) to otherwise restrict the use of the proceeds of the Bonds or amounts treated as proceeds of the Bonds, as may be necessary, so that the Bonds do not otherwise contravene the requirements of section 148 of the Code (relating to arbitrage), section 149(g) of the Code (relating to hedge bonds), and, to the extent applicable, section 149(d) of the Code (relating to advance refundings); and

(8) to pay to the United States of America at least once during each five-year period (beginning on the date of delivery of the Bonds) an amount that is at least equal to 90 percent of the "Excess Earnings," within the meaning of section 148(f) of the Code and to pay to the United States of America, not later than 60 days after the Bonds have been paid in full, 100 percent of the amount then required to be paid as a result of Excess Earnings under section 148(f) of the Code.

For purposes of the foregoing (a)(1) and (a)(2), the Issuer understands that the term "proceeds" includes "disposition proceeds" as defined in the Treasury Regulations and, in the case of refunding bonds, transferred proceeds (if any) and proceeds of the refunded bonds expended prior to the date of issuance of the Bonds.

(b) Compliance with Code. It is the understanding of the Issuer that the covenants contained herein are intended to assure compliance with the Code and any regulations or rulings promulgated by the U.S. Department of the Treasury pursuant thereto. In the event that regulations or rulings are hereafter promulgated which modify or expand provisions of the Code, as applicable to the Bonds, the Issuer will not be required to comply with any covenant contained herein to the extent that such failure to comply, in the opinion of nationally-recognized bond counsel, will not adversely affect the exemption from federal income taxation of interest on the Bonds under section 103 of the Code. In the event that regulations or rulings are hereafter promulgated which impose additional requirements which are applicable to the Bonds, the Issuer agrees to comply with the additional requirements to the extent necessary, in the opinion of nationally-recognized bond

counsel, to preserve the exemption from federal income taxation of interest on the Bonds under section 103 of the Code. In furtherance of such intention, the Issuer hereby authorizes and directs its President or Executive Director to execute any documents, certificates or reports required by the Code and to make such elections, on behalf of the Issuer, which may be permitted by the Code as are consistent with the purpose for the issuance of the Bonds. The Issuer covenants to comply with the covenants contained in this section after defeasance of the Bonds.

(c) Rebate Fund. In order to facilitate compliance with the above covenant (a)(8), a "Rebate Fund" is hereby established by the Issuer for the sole benefit of the United States of America, and such fund shall not be subject to the claim of any other person, including without limitation, the bondholders. The Rebate Fund is established for the additional purpose of compliance with section 148 of the Code.

(d) Written Procedures. Unless superseded by another action of the Issuer to ensure compliance with the covenants contained herein regarding private business use, remedial actions, arbitrage and rebate, the Issuer hereby adopts and establishes the instructions attached hereto as Exhibit A as their written procedures applicable to Bonds issued pursuant to the Contract.

Section 28 ALLOCATION OF, AND LIMITATION ON, EXPENDITURES FOR THE PROJECT; DISPOSITION OF THE PROJECT. (a) The Issuer covenants to account for the expenditure of Bond proceeds and investment earnings to be used for the construction or acquisition of the property constituting the projects financed or refinanced with proceeds of the sale of the Bonds on its books and records by allocating proceeds to expenditures within 18 months of the later of the date that (1) the expenditure is made or (2) such construction or acquisition is completed. The foregoing notwithstanding, the Issuer shall not expend proceeds of the Bonds or investment earnings thereon more than 60 days after the earlier of (1) the fifth anniversary of the delivery of the Bonds or (2) the date the Bonds are retired, unless the Issuer obtains an opinion of nationally-recognized bond counsel that such expenditure will not adversely affect the tax-exempt status of the Bonds. For purposes hereof, the Issuer shall not be obligated to comply with this covenant if it obtains an opinion that such failure to comply will not adversely affect the excludability for federal income tax purposes from gross income of the interest on the Bonds.

(b) The Issuer covenants that the property constituting the projects financed or refinanced with proceeds of the Bonds will not be sold or otherwise disposed in a transaction resulting in the receipt by the Issuer of cash or other compensation, unless the Issuer obtains an opinion of nationally-recognized bond counsel that such sale or other disposition will not adversely affect the tax-exempt status of the Bonds. For purposes of the foregoing, the portion of the property comprising personal property and disposed in the ordinary course shall not be treated as a transaction resulting in the receipt of cash or other compensation. For purposes hereof, the Issuer shall not be obligated to comply with this covenant if it obtains an opinion that such failure to comply will not adversely affect the excludability for federal income tax purposes from gross income of the interest on the Bonds.

Section 29 CUSTODY, APPROVAL, AND REGISTRATION OF BONDS; BOND COUNSEL'S OPINION, CUSIP NUMBERS, PREAMBLE, AND INSURANCE. The President of the Board of Directors of the Issuer and any Authorized Officer is hereby authorized to have

control of the Initial Bond issued hereunder and all necessary records and proceedings pertaining to the Initial Bond pending its delivery and its investigation, examination, and approval by the Attorney General of the State of Texas, and its registration by the Comptroller of Public Accounts of the State of Texas. Upon registration of the Initial Bond said Comptroller of Public Accounts (or a deputy designated in writing to act for said Comptroller) shall manually sign the Comptroller's Registration Certificate on the Initial Bond, and the seal of said Comptroller shall be impressed, or placed in facsimile, on the Initial Bond. The approving legal opinion of the Issuer's Bond Counsel and the assigned CUSIP numbers may, at the option of the Issuer, be printed on the Initial Bond or on any Bond issued and delivered in conversion of and exchange or replacement of any Bond, but neither shall have any legal effect, and shall be solely for the convenience and information of the registered owners of the Bonds. The preamble to this Resolution is hereby adopted and made a part hereof for all purposes. If insurance is obtained on any of the Bonds, the Initial Bond and all the Bonds for which insurance has been obtained shall bear an appropriate legend concerning insurance as provided by the insurer.

Section 30. INTEREST EARNINGS ON BOND PROCEEDS. Interest earnings derived from the investment of proceeds from the sale of the Initial Bond, other than proceeds deposited in accordance with Section 16 hereof or deposited pursuant to the Escrow Agreement authorized by Section 33 hereof, shall be used along with other available proceeds for improving the District's Water System; provided that after such use, if any of such interest earnings remain on hand, such interest earnings on bond proceeds which are required to be rebated to the United States of America pursuant to Section 27 hereof in order to prevent the Bonds from being arbitrage bonds shall be so rebated and not considered as interest earnings for the purposes of this Section.

Section 31. SALE OF BONDS; PURCHASE AGREEMENT. Pursuant to the authorizations in Section 3 hereof, as approved by an Authorized Officer, the Bonds may be sold either pursuant to the taking of bids therefor as provided in an Official Notice of Sale or pursuant to a purchase agreement (the "Purchase Agreement") with a purchaser or purchasers (collectively, the "Purchaser") to be approved by an Authorized Officer, and any supplements thereto which may be necessary to accomplish the issuance of Bonds. Such Purchase Agreement is hereby authorized to be dated, executed and delivered on behalf of the Issuer by an Authorized Officer, with such changes therein as shall be approved by an Authorized Officer, the execution thereof by an Authorized Officer to constitute evidence of such approval. The delegation of authority to an Authorized Officer to approve the final terms of the Bonds as set forth in this Resolution is, and the decisions made by an Authorized Officer pursuant to such delegated authority will be, in the best interests of the Issuer, and an Authorized Officer is authorized to make a finding to such effect in the Approval Certificate.

Section 32. OFFICIAL STATEMENT. A Preliminary Official Statement relating to the Bonds, in substantially the form as submitted to the Board of Directors at this meeting, is hereby approved and authorized to be distributed to prospective investors and other interested parties in connection with the underwriting and sale of the Bonds, with such changes therein as shall be approved by an Authorized Officer, including such changes as are necessary for distribution as a final Official Statement. It is further officially found, determined, and declared that the statements and representations contained in said Preliminary Official Statement are true and correct in all material respects. The use and distribution by the Purchaser of the Official Statement relating to the Bonds, is hereby approved. For the purpose of review by the Purchaser prior to purchasing the

Bonds, the Issuer deems said Preliminary Official Statement to have been "final as of its date" within the meaning of Securities and Exchange Commission Rule 15c2-12.

Section 33. REFUNDING OF REFUNDED BONDS; ESCROW AGREEMENT. (a) The Refunded Bonds are hereby directed to be called for redemption prior to maturity and shall be redeemed on the dates specified in the Approval Certificate. As soon as practicable after sale of the Bonds, a Notice of Redemption shall be delivered to the paying agent/registrars for the Refunded Bonds to notify, in accordance with the requirements of the Series 2008 Bond Resolution, the owners of the Refunded Bonds of the call for redemption thereof.

(b) Concurrently with the delivery of the Bonds, the Issuer shall cause to be deposited an amount from the proceeds from the sale of the Bonds, together with, to the extent necessary, available funds of the Issuer, with the paying agent/registrars for the Refunded Bonds, sufficient to provide for the refunding and redemption, on the date fixed for redemption, of all of the Refunded Bonds, in accordance with Subchapter C of Chapter 1207, Texas Government Code, as amended. The President of the Board of Directors of the Issuer and the Secretary of the Board of Directors of the Issuer are hereby authorized, for and on behalf of the Issuer, to execute an Escrow Agreement in substantially the form set forth in Exhibit B hereto to accomplish such purpose. In addition, an Authorized Officer is authorized to transfer and deposit such cash from available funds (including surplus funds in the Interest and Redemption Fund and/or the Reserve Fund), as may be necessary for the Escrow Fund described in such Escrow Agreement. It is hereby found and determined that the refunding of the Refunded Bonds is advisable and necessary in order to restructure the principal and interest requirements of the Issuer and to achieve a present value savings in debt service.

Section 34. DTC REGISTRATION. The Bonds initially shall be issued and delivered in such manner that no physical distribution of the Bonds will be made to the public, and the Depository Trust Company ("DTC"), New York, New York, initially will act as depository for the Bonds. DTC has represented that it is a limited purpose trust company incorporated under the laws of the State of New York, a member of the Federal Reserve System, a "clearing corporation" within the meaning of the New York Uniform Commercial Code, and a "clearing agency" registered under Section 17A of the federal Securities Exchange Act of 1934, as amended, and the Issuer accepts, but in no way verifies, such representations. The Initial Bond authorized by this Resolution shall be delivered to and registered in the name of the Purchaser. However, it is a condition of delivery and sale that the Purchaser, immediately after such delivery, shall cause the Paying Agent/Registrar, as provided for in this Resolution, to cancel said Initial Bond and deliver in exchange therefor a substitute Bond for each maturity of such Initial Bond, with each such substitute Bond to be registered in the name of CEDE & CO., the nominee of DTC, and it shall be the duty of the Paying Agent/Registrar to take such action. It is expected that DTC will hold the Bonds on behalf of the Purchaser and/or the DTC Participants, as defined and described in the Official Statement referred to and approved in Section 32 hereof (the "DTC Participants"). So long as each Bond is registered in the name of CEDE & CO., the Paying Agent/Registrar shall treat and deal with DTC in all respects the same as if it were the actual and beneficial owner thereof. It is expected that DTC will maintain a book entry system which will identify beneficial ownership of the Bonds by DTC Participants in integral amounts of \$5,000, with transfers of ownership being effected on the records of DTC and the DTC Participants pursuant to rules and regulations established by them, and that the substitute Bonds initially deposited with DTC shall be immobilized and not be further exchanged

for substitute Bonds except as hereinafter provided. The Issuer is not responsible or liable for any functions of DTC, will not be responsible for paying any fees or charges with respect to its services, will not be responsible or liable for maintaining, supervising, or reviewing the records of DTC or the DTC Participants, or protecting any interests or rights of the beneficial owners of the Bonds. It shall be the duty of the Purchaser and the DTC Participants to make all arrangements with DTC to establish this book-entry system, the beneficial ownership of the Bonds, and the method of paying the fees and charges of DTC. The Issuer does not represent, nor does it in any way covenant that the initial book-entry system established with DTC will be maintained in the future. The Issuer reserves the right and option at any time in the future, in its sole discretion, to terminate the DTC (CEDE & CO.) book-entry only registration requirement described above, and to permit the Bonds to be registered in the name of any owner. If the Issuer exercises its right and option to terminate such requirement, it shall give written notice of such termination to the Paying Agent/ Registrar and to DTC, and thereafter the Paying Agent/Registrar shall, upon presentation and proper request, register any Bond in any name as provided for in this Resolution. Notwithstanding the initial establishment of the foregoing book-entry system with DTC, if for any reason any of the originally delivered substitute Bonds is duly filed with the Paying Agent/Registrar with proper request for transfer and substitution, as provided for in this Resolution, substitute Bonds will be duly delivered as provided in this Resolution, and there will be no assurance or representation that any book-entry system will be maintained for such Bonds.

Section 35. FURTHER PROCEDURES. The President, Vice President, and/or the Secretary of the Board of Directors of the Issuer, the Executive Director and General Manager of the Issuer, and all other officers, employees, and agents of the Issuer, and each of them, shall be and they are hereby expressly authorized, empowered, and directed from time to time and at any time to do and perform all such acts and things and to execute, acknowledge, and deliver in the name and on behalf of the Issuer all such instruments, whether or not herein mentioned, as may be necessary or desirable in order to carry out the terms and provisions of this Resolution, the Bond Purchase Agreement, the Bonds, the sale and delivery of the Initial Bond and the Bonds, and all details in connection therewith. In case any officer whose signature shall appear on any Bond shall cease to be such officer before the delivery of such Bond, such signature shall nevertheless be valid and sufficient for all purposes the same as if such officer had remained in office until such delivery.

Section 36. CONTINUING DISCLOSURE UNDERTAKING.

(a) Annual Reports.

The Issuer shall provide or cause to be provided annually to the MSRB, (1) within six months after the end of each fiscal year ending in or after 2016, financial information and operating data of the general type included in the final Official Statement authorized by Section 32 of this Resolution, (i) with respect to the Issuer, in tables numbered 1 through 5, and (ii) with respect to each Significant Obligated Persons, in Appendix C, and (2) when and if available, audited financial statements of the Issuer and each Significant Obligated Person. Any financial statements so to be provided shall be prepared in accordance with generally accepted accounting principles or such other accounting principles as the Issuer or any such Significant Obligated Person may be required to employ from time to time pursuant to state law or regulation. If the audit of such financial statements of the Issuer or a Significant Obligated Person is not complete within 12 months after the

respective fiscal year end, then the Issuer shall provide or cause to be provided by each Significant Obligated Person unaudited financial statements within such 12-month period and audited financial statements when and if the audit report on such statements become available.

If the Issuer or any such Significant Obligated Person changes its fiscal year, the Issuer will notify or cause the Significant Obligated Person to notify the MSRB of the change (and of the date of the new fiscal year end) prior to the next date by which the Issuer or any such Significant Obligated Person otherwise would be required to provide financial information and operating data pursuant to this Section.

The financial information and operating date to be provided pursuant to this Section may be set forth in full in one or more documents or may be included by specific reference to any document (including an official statement or other offering document, if it is available from the MSRB) that theretofore has been provided to the MSRB or filed with the SEC

(b) Event Notices.

The Issuer shall notify the MSRB, in a timely manner, of any of the following events with respect to the Bonds, not in excess of ten Business Days after occurrence of the event:

1. Principal and interest payment delinquencies;
2. Non-payment related defaults, if material;
3. Unscheduled draws on debt service reserves reflecting financial difficulties;
4. Unscheduled draws on credit enhancements reflecting financial difficulties;
5. Substitution of credit or liquidity providers, or their failure to perform;
6. Adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the security, or other material events affecting the tax status of the security;
7. Modifications to the rights of security holders, if material;
8. Bond calls, if material, and tender offers;
9. Defeasances;
10. Release, substitution or sale of property securing repayment of the securities, if material;
11. Rating changes;

12. Bankruptcy, insolvency, receivership or similar event of the Issuer or a Significant Obligated Person;

13. The consummation of a merger, consolidation, or acquisition involving the Issuer or a Significant Obligated Person or the sale of all or substantially all of the assets of the Issuer or a Significant Obligated Person, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material; and

14. Appointment of a successor or additional trustee or the change of name of a trustee, if material.

The Issuer shall notify the MSRB, in a timely manner, of any failure by the Issuer to provide financial information or operating data in accordance with Section 36(c) of this Resolution by the time required by such Section. As used in clause 12 above, the phrase "bankruptcy, insolvency, receivership or similar event" means the appointment of a receiver, fiscal agent, or similar officer for the Issuer in a proceeding under the U.S. Bankruptcy Code or in any other proceeding under state or federal law in which a court or governmental authority has assumed jurisdiction over substantially all of the assets or business of the Issuer, or if jurisdiction has been assumed by leaving the Board of Directors and official or officers of the Issuer in possession but subject to the supervision and orders of a court or governmental authority, or the entry of an order confirming a plan of reorganization, arrangement or liquidation by a court or governmental authority having supervision or jurisdiction over substantially all of the assets or business of the Issuer.

(c) Limitations, Disclaimers, and Amendments.

The Issuer shall be obligated to observe and perform or cause a Significant Obligated Person to observe and perform the covenants specified in this Section for so long as, but only for so long as, such Significant Obligated persons remains a "Significant Obligated Person" with respect to the Bonds, except that the Issuer in any event will give notice of any deposit made in accordance with Section 21 hereof that causes Bonds no longer to be Outstanding.

The provisions of this Section are for the sole benefit of the Holders and beneficial owners of the Bonds, and nothing in this Section, express or implied, shall give any benefit or any legal or equitable right, remedy, or claim hereunder to any other person. The Issuer undertakes to provide or cause to be provided only the financial information, operating data, financial statements, and notices which it has expressly agreed to provide pursuant to this Section and does not hereby undertake to provide or cause to be provided any other information that may be relevant or material to a complete presentation of the Issuer's or any Significant Obligated Person's financial results, condition or prospects or hereby undertake to update any information provided in accordance with this Section or otherwise, except as expressly provided herein. The Issuer does not make any representation or warranty concerning such information or its usefulness to a decision to invest in or sell Bonds at any future date.

UNDER NO CIRCUMSTANCES SHALL THE ISSUER BE LIABLE TO THE HOLDER OR BENEFICIAL OWNER OF ANY BOND OR ANY OTHER PERSON, IN CONTRACT OR TORT, FOR DAMAGES RESULTING IN WHOLE OR IN PART FROM ANY BREACH BY THE ISSUER, WHETHER NEGLIGENT OR WITHOUT FAULT ON ITS PART, OF ANY COVENANT SPECIFIED IN THIS SECTION, BUT EVERY RIGHT AND REMEDY OF ANY SUCH PERSON, IN CONTRACT OR TORT, FOR OR ON ACCOUNT OF ANY SUCH BREACH SHALL BE LIMITED TO AN ACTION FOR MANDAMUS OR SPECIFIC PERFORMANCE.

No default by the Issuer in observing or performing its obligations under this Section shall comprise a breach of or default under this Resolution for purposes of any other provision of this Resolution.

Nothing in this Section is intended or shall act to disclaim, waive, or otherwise limit the duties of the Issuer under federal and state securities laws.

Should the Rule be amended to obligate the Issuer to make filings with or provide notices to entities other than the MSRB, the Issuer hereby agrees to undertake such obligation with respect to the Bonds in accordance with the Rule as amended. The provisions of this Section may be amended by the Issuer from time to time to adapt to changed circumstances that arise from a change in legal requirements, a change in law, or a change in the identify, nature, status, or type of operations of the Issuer or any Significant Obligated Person, but only if (1) the provisions of this Section, as so amended, would have permitted an underwriter to purchase or sell Bonds in the primary offering of the Bonds in compliance with the Rule, taking into account any amendments or interpretations of the Rule since such offering as well s such changed circumstances and (2) either (a) the Holders of a majority in aggregate principal amount (or any greater amount required by any other provision of this Resolution that authorizes such an amendment) of the outstanding Bonds consent to such amendment or (b) a Person that is unaffiliated with the Issuer (such as nationally recognized bond counsel) determined that such amendment will not materially impair the interest of the Holders and beneficial owners of the Bonds. If the Issuer so amends the provisions of this Section, it shall include with any amended financial information or operating data next provided in accordance with Subsection (a) hereof an explanation, in narrative form, of the reason for the amendment and of the impact of any change in the type of financial information or operating data so provided. The Issuer may also amend or repeal the provisions of this continuing disclosure agreement if the SEC amends or repeals the applicable provision of the Rule or a court of final jurisdiction enters judgment that such provisions of the Rule are invalid, but only if and to the extent that the provisions of this sentence would not prevent an underwriter from lawfully purchasing or selling Bonds in the primary offering of the Bonds.

(d) Definitions.

As used in this Section, the following terms have the meanings ascribed to such terms below:

"*MSRB*" means the Municipal Securities Rulemaking Board.

"*Rule*" means SEC Rule 15c2-12, as amended from time to time.

"SEC" means the United States Securities and Exchange Commission and any successor to its duties.

"*Significant Obligated Person*" means, at any point in time, any Member City or other party contracting with the Issuer, in either case whose payments to the Issuer for the use of or service from the System in the calendar year preceding any such determination exceeded 10% of the Gross Revenues of the System.

Section 37. ATTORNEY GENERAL FEES. The District hereby authorizes and directs payment, from legally available funds of the District, of the nonrefundable examination fee of the Attorney General of the State of Texas required by Section 1202.004, Texas Government Code, as amended.

Section 38. REPEAL OF CONFLICTING RESOLUTIONS. All resolutions and all parts of any resolutions which are in conflict or inconsistent with this Resolution are hereby repealed and shall be of no further force or effect to the extent of such conflict or inconsistency.

Section 39. SECURITY INTEREST. Chapter 1208, Government Code, applies to the issuance of the Bonds and the pledge of the Pledged Revenues granted by the Issuer under Section 9 of this Resolution, and is therefore valid, effective, and perfected. If Texas law is amended at any time while the Bonds are outstanding and unpaid such that the pledge of the Pledged Revenues granted by the Issuer under Section 9 of this Resolution is to be subject to the filing requirements of Chapter 9, Business & Commerce Code, then in order to preserve to the registered owners of the Bonds the perfection of the security interest in said pledge, the Issuer agrees to take such measures as it determines are reasonable and necessary under Texas law to comply with the applicable provisions of Chapter 9, Business & Commerce Code and enable a filing to perfect the security interest in said pledge to occur.

Section 40. EFFECTIVENESS. This Resolution shall be effective from and after the date of adoption thereof by the Issuer; provided, however, if the Bonds authorized by this Resolution are not issued prior to April 15, 2017, this Resolution shall be void ab initio and shall be of no force and effect.

EXHIBIT "A"

WRITTEN PROCEDURES RELATING TO CONTINUING COMPLIANCE WITH FEDERAL TAX COVENANTS

A. Arbitrage. With respect to the investment and expenditure of the proceeds of the Bonds and any Additional Bonds (the "Obligations") the Issuer's Executive Director and Director of Finance (the "Responsible Persons") will :

For Obligations issued for newly acquired property or constructed property:

- instruct the appropriate person or persons that the construction, renovation or acquisition of the facilities must proceed with due diligence and that binding contracts for the expenditure of at least 5% of the proceeds of the Obligations will be entered into within 6 months of the date of delivery of the Obligations ("Issue Date");
- monitor that at least 85% of the proceeds of the Obligations to be used for the construction, renovation or acquisition of any facilities are expended within 3 years of the Issue Date;
- restrict the yield of the investments (other than those in the Reserve Fund) to the yield on the Obligations after 3 years of the Issue Date;
- monitor all amounts deposited into a sinking fund or funds, e.g., the Interest and Redemption Fund and the Reserve Fund, to assure that the maximum amount invested at a yield higher than the yield on the Obligations does not exceed an amount equal to the debt service on the Obligations in the succeeding 12 month period plus a carryover amount equal to one-twelfth of the principal and interest payable on the Obligations for the immediately preceding 12-month period;
- assure that no more than 50% of the proceeds of the Obligations are invested in an investment with a guaranteed yield for 4 years or more;
- assure that the maximum amount of the Reserve Fund invested at a yield higher than the yield on the Obligations will not exceed the lesser of (1) 10% of the original principal amount of the Obligations, (2) 125% of the average annual debt service on the Obligations measured as of the Issue Date, or (3) 100% of the maximum annual debt service on the Obligations as of the Issue Date;

For Obligations issued for refunding purposes:

- monitor the actions of the escrow agent (to the extent an escrow is funded with proceeds) to assure compliance with the applicable provisions of the escrow agreement, including with respect to reinvestment of cash balances;

For all Obligations:

- maintain any official action of the Issuer (such as a reimbursement resolution) stating its intent to reimburse itself with the proceeds of the Obligations any amount expended prior to the Issue Date for the acquisition, renovation or construction of the facilities;
- assure that the applicable information return (e.g., IRS Form 8038-G, 8038-GC, or any successor forms) is timely filed with the IRS;
- assure that, unless excepted from rebate and yield restriction under section 148(f) of the Code, excess investment earnings are computed and paid to the U.S. government at such time and in such manner as directed by the IRS (i) at least every 5 years after the Issue Date and (ii) within 30 days after the date the Obligations are retired.

B. Private Business Use. With respect to the use of the facilities financed or refinanced with the proceeds of the Obligations the Responsible Persons will:

- monitor the date on which the facilities are substantially complete and available to be used for the purpose intended;
- monitor whether, at any time the Obligations are outstanding, any person, other than the Issuer, the employees of the Issuer, the agents of the Issuer or members of the general public has any contractual right (such as a lease, purchase, management or other service agreement) with respect to any portion of the facilities;
- monitor whether, at any time the Obligations are outstanding, any person, other than the Issuer, the employees of the Issuer, the agents of the Issuer or members of the general public has a right to use the output of the facilities (e.g., water, gas, electricity);
- monitor whether, at any time the Obligations are outstanding, any person, other than the Issuer, the employees of the Issuer, the agents of the Issuer or members of the general public has a right to use the facilities to conduct or to direct the conduct of research;
- determine whether, at any time the Obligations are outstanding, any person, other than the Issuer, has a naming right for the facilities or any other contractual right granting an intangible benefit;
- determine whether, at any time the Obligations are outstanding, the facilities are sold or otherwise disposed of; and
- take such action as is necessary to remediate any failure to maintain compliance with the covenants contained in the resolution authorizing the Obligations.

C. **Record Retention.** The Responsible Persons will maintain or cause to be maintained all records relating to the investment and expenditure of the proceeds of the Obligations and the use of the facilities financed or refinanced thereby for a period ending three (3) years after the complete extinguishment of the Obligations. If any portion of the Obligations is refunded with the proceeds of another series of tax-exempt obligations, such records shall be maintained until the three (3) years after the refunding obligations are completely extinguished. Such records can be maintained in paper or electronic format.

D. **Responsible Persons.** Each Responsible Person shall receive appropriate training regarding the Issuer's accounting system, contract intake system, facilities management and other systems necessary to track the investment and expenditure of the proceeds and the use of the facilities financed with the proceeds of the Obligations. The foregoing notwithstanding, the Responsible Persons are authorized and instructed to retain such experienced advisors and agents as may be necessary to carry out the purposes of these instructions.

EXHIBIT "B"

FORM OF ESCROW AGREEMENT

ESCROW AGREEMENT

North Texas Municipal Water District Water System Revenue Bonds, Series 2008

THIS ESCROW AGREEMENT, dated as of August 15, 2016 (herein, together with any amendments or supplements hereto, called the "Agreement") is entered into by and between North Texas Municipal Water District (the "Issuer") and The Bank of New York Mellon Trust Company, National Association, as escrow agent (herein, together with any successor in such capacity, called the "Escrow Agent"). The addresses of the Issuer and the Escrow Agent are shown on Exhibit "A" attached hereto and made a part hereof.

WITNESSETH:

WHEREAS, the Issuer heretofore issued and there presently remain outstanding the obligations (the "Refunded Obligations") described in the Verification Report of Grant Thornton LLP (the "Report") relating to the Refunded Obligations, attached hereto as Exhibit "B" and made a part hereof ; and

WHEREAS, the Refunded Obligations are scheduled to mature in such years, bear interest at such rates, and be payable at such times and in such amounts as are set forth in the Report; and

WHEREAS, when firm banking arrangements have been made for the payment of principal and interest to the maturity or redemption dates of the Refunded Obligations, then the Refunded Obligations shall no longer be regarded as outstanding except for the purpose of receiving payment from the funds provided for such purpose; and

WHEREAS, Chapter 1207, Texas Government Code ("Chapter 1207") authorizes the Issuer to issue refunding bonds and to deposit the proceeds from the sale thereof, and any other available funds or resources, directly with any place of payment (paying agent) for any of the Refunded Obligations, and such deposit, if made before such payment dates and in sufficient amounts, shall constitute the making of firm banking and financial arrangements for the discharge and final payment of the Refunded Obligations; and

WHEREAS, Chapter 1207 further authorizes the Issuer to enter into an escrow agreement with any such paying agent for any of the Refunded Obligations with respect to the safekeeping, investment, administration and disposition of any such deposit, upon such terms and conditions as the Issuer and such paying agent may agree, provided that such deposits may be invested only in direct obligations of the United States of America, including obligations the principal of and interest on which are unconditionally guaranteed by the United States of America, and which may be in book entry form, and which shall mature and/or bear interest payable at such times and in such amounts as will be sufficient to provide for the scheduled payment of principal and interest on the Refunded Obligations when due; and

WHEREAS, the Escrow Agent, as successor to J.P. Morgan Chase Bank and The Bank of New York Trust Company, National Association, is the paying agent for the Refunded Obligations and this Agreement constitutes an escrow agreement of the kind authorized and required by said Chapter 1207; and

WHEREAS, Chapter 1207 makes it the duty of the Escrow Agent to comply with the terms of this Agreement and timely make available to the other places of payment (paying agents) for the Refunded Obligations the amounts required to provide for the payment of the principal of and interest on such obligations when due, and in accordance with their terms, but solely from the funds, in the manner, and to the extent provided in this Agreement; and

WHEREAS, the issuance, sale, and delivery of North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds, Series 2016 (the "Refunding Obligations") have been issued, sold and delivered for the purpose, among others, of obtaining the funds required to provide for the payment of the principal of the Refunded Obligations at their respective maturity dates or dates of redemption and the interest thereon to such dates; and

WHEREAS, the Issuer desires that, concurrently with the delivery of the Refunding Obligations to the purchasers thereof, certain proceeds of the Refunding Obligations, together with certain other available funds of the Issuer, if applicable, shall be applied to purchase certain direct obligations of the United States of America hereinafter defined as the "Escrowed Securities" for deposit to the credit of the Escrow Fund created pursuant to the terms of this Agreement and to establish a beginning cash balance (if needed) in such Escrow Fund; and

WHEREAS, the Escrowed Securities shall mature and the interest thereon shall be payable at such times and in such amounts so as to provide moneys which, together with cash balances from time to time on deposit in the Escrow Fund, will be sufficient to pay interest on the Refunded Obligations as it accrues and becomes payable and the principal of the Refunded Obligations on their maturity dates or dates of redemption; and

WHEREAS, to facilitate the receipt and transfer of proceeds of the Escrowed Securities, particularly those in book entry form, the Issuer desires to establish the Escrow Fund at the principal corporate trust office of the Escrow Agent; and

WHEREAS, the Escrow Agent is herein also referred to as the "Paying Agent," and any paying agent for the Refunded Obligations, acting through the Escrow Agent, is also a party to this Agreement, as a paying agent for the Refunded Obligations to acknowledge their acceptance of the terms and provisions of this Agreement in such capacity.

NOW, THEREFORE, in consideration of the mutual undertakings, promises and agreements herein contained, the sufficiency of which hereby are acknowledged, and to secure the full and timely payment of principal of and the interest on the Refunded Obligations, the Issuer and the Escrow Agent mutually undertake, promise, and agree for themselves and their respective representatives and successors, as follows:

ARTICLE I

DEFINITIONS AND INTERPRETATIONS

Section 1.01. Definitions. Unless the context clearly indicates otherwise, the following terms shall have the meanings assigned to them below when they are used in this Agreement:

"Code" means the Internal Revenue Code of 1986, as amended, or to the extent applicable the Internal Revenue Code of 1954, together with any other applicable provisions of any successor federal income tax laws.

"Escrow Fund" means the fund created by this Agreement to be administered by the Escrow Agent pursuant to the provisions of this Agreement.

"Escrowed Securities" means the direct noncallable, not pre-payable United States Treasury obligations and obligations the due timely payment of which is unconditionally guaranteed by the United States of America, which may be United States Treasury obligations such as its State and Local Government Series, which may be in book-entry form, described in the Report or cash or other direct obligations of the United States of America substituted therefor pursuant to Article IV of this Agreement.

Section 1.02. Other Definitions. The terms "Agreement", "Issuer", "Escrow Agent", "Refunded Obligations", "Refunding Obligations," "Report" and "Paying Agent", when they are used in this Agreement, shall have the meanings assigned to them in the preamble to this Agreement.

Section 1.03. Interpretations. The titles and headings of the articles and sections of this Agreement have been inserted for convenience and reference only and are not to be considered a part hereof and shall not in any way modify or restrict the terms hereof. This Agreement and all of the terms and provisions hereof shall be liberally construed to effectuate the purposes set forth herein and to achieve the intended purpose of providing for the refunding of the Refunded Obligations in accordance with applicable law.

ARTICLE II

DEPOSIT OF FUNDS AND ESCROWED SECURITIES

Section 2.01. Deposits in the Escrow Fund. Concurrently with the sale and delivery of the Refunding Obligations the Issuer shall deposit, or cause to be deposited, with the Escrow Agent, for deposit in the Escrow Fund, the funds and Escrowed Securities described in the Report, and the Escrow Agent shall, upon the receipt thereof, acknowledge such receipt to the Issuer in writing.

ARTICLE III

CREATION AND OPERATION OF ESCROW FUND

Section 3.01. Escrow Fund. The Escrow Agent has created on its books a special trust fund and irrevocable escrow to be known as the "North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds, Series 2016 Escrow Fund" (the "Escrow Fund"). The Escrow Agent hereby agrees that upon receipt thereof it will irrevocably deposit to the credit of the Escrow Fund the funds and the Escrowed Securities described in the Report. Such deposit, all proceeds therefrom, and all cash balances from time to time on deposit therein (a) shall be the property of the Escrow Fund, (b) shall be applied only in strict conformity with the terms and conditions of this Agreement, and (c) are hereby irrevocably pledged to the payment of the principal of and interest on the Refunded Obligations, which payment shall be made by timely transfers of such amounts at such times as are provided for in Section 3.02 hereof. When the final transfers have been made for the payment of such principal of and interest on the Refunded Obligations, any balance then remaining in the Escrow Fund shall be transferred to the Issuer, and the Escrow Agent shall thereupon be discharged from any further duties hereunder.

Section 3.02. Payment of Principal and Interest. The Escrow Agent is hereby irrevocably instructed to transfer from the cash balances from time to time on deposit in the Escrow Fund, the amounts required to pay the principal of the Refunded Obligations at their respective maturity dates and interest thereon to such maturity dates in the amounts and at the times shown in the Report.

Section 3.03. Sufficiency of Escrow Fund. The Issuer represents (based solely upon the report) that the successive receipts of the principal of and interest on the Escrowed Securities will assure that the cash balance on deposit from time to time in the Escrow Fund will be at all times sufficient to provide moneys for transfer to the Paying Agent at the times and in the amounts required to pay the interest on the Refunded Obligations as such interest comes due and the principal of the Refunded Obligations as the Refunded Obligations mature, all as more fully set forth in the Report. If, for any reason, at any time, the cash balances on deposit or scheduled to be on deposit in the Escrow Fund shall be insufficient to transfer the amounts required by each place of payment (paying agent) for the Refunded Obligations to make the payments set forth in Section 3.02 hereof, notice of any such insufficiency shall be given to the Issuer by the Escrow Agent as promptly as practicable as hereinafter provided, but neither the Escrow Agent nor the Issuer shall in any manner be responsible for any insufficiency of funds in the Escrow Fund.

Section 3.04. Trust Fund. The Escrow Agent shall hold at all times the Escrow Fund, the Escrowed Securities and all other assets of the Escrow Fund, wholly segregated from all other funds and securities on deposit with the Escrow Agent; it shall never allow the Escrowed Securities or any other assets of the Escrow Fund to be commingled with any other funds or securities of the Escrow Agent; and it shall hold and dispose of the assets of the Escrow Fund only as set forth herein. The Escrowed Securities and other assets of the Escrow Fund shall always be maintained by the Escrow Agent as trust funds for the benefit of the owners of the Refunded Obligations; and a special account thereof shall at all times be maintained on the books of the Escrow Agent. The owners of the Refunded Obligations shall be entitled to the same preferred claim and first lien upon the Escrowed Securities, the proceeds thereof, and all other assets of the Escrow Fund to which they are entitled

as owners of the Refunded Obligations. The amounts received by the Escrow Agent under this Agreement shall not be considered as a banking deposit by the Issuer, and the Escrow Agent shall have no right to title with respect thereto except as a constructive trustee and Escrow Agent under the terms of this Agreement. The amounts received by the Escrow Agent under this Agreement shall not be subject to warrants, drafts or checks drawn by the Issuer or, except to the extent expressly herein provided, by the Paying Agent.

Section 3.05. Security for Cash Balances. Cash balances from time to time on deposit in the Escrow Fund shall, to the extent not insured by the Federal Deposit Insurance Corporation or its successor, be continuously secured by a pledge of direct obligations of, or obligations unconditionally guaranteed by, the United States of America, having a market value at least equal to such cash balances.

ARTICLE IV

LIMITATION ON INVESTMENTS

Section 4.01. Except as provided in Sections 3.02, 4.02, 4.03 and 4.04 hereof, the Escrow Agent shall not have any power or duty to invest or reinvest any money held hereunder, or to make substitutions of the Escrowed Securities, or to sell, transfer or otherwise dispose of the Escrowed Securities.

Section 4.02. Reinvestment of Certain Cash Balances in Escrow by Escrow Agent. In addition to the Escrowed Securities listed in the Report, the Escrow Agent shall reinvest cash balances shown in the Report in United States Treasury Certificates of Indebtedness, Notes or Bonds - State and Local Government Series with an interest rate equal to zero percent (0%) (the "Zero SLGs") to the extent such Obligations are available from the Department of Treasury. All such re-investments shall be made only from the portion of cash balances derived from the maturing principal of and interest on any Escrowed Securities. Unless otherwise instructed by the Issuer in accordance with Section 4.03 hereof, the Escrow Agent shall acquire any Zero SLGs on the dates the Escrowed Securities listed in the Report mature, as shown in the Report, or on the first date Zero SLGs become available thereafter. The Escrow Agent shall purchase Zero SLGs that only mature on the dates shown in the Report.

Section 4.03. Substitutions and Reinvestments. At the discretion of the Issuer, the Escrow Agent shall reinvest cash balances representing receipts from the Escrowed Securities, make substitutions of the Escrowed Securities or redeem the Escrowed Securities and reinvest the proceeds thereof or hold such proceeds as cash, together with other moneys or securities held in the Escrow Fund provided that the Issuer delivers to the Escrow Agent the following:

- (1) an opinion by an independent certified public accountant that after such substitution or reinvestment the principal amount of the securities in the Escrow Fund (which shall be noncallable, not pre-payable direct obligations of the United States of America), together with the interest thereon and other available moneys, will be sufficient to pay, without further investment or reinvestment, as the same become due in accordance with the

Report, the principal of, interest on and premium, if any, on the Refunded Obligations which have not previously been paid, and

(2) an unqualified opinion of nationally recognized municipal bond counsel to the effect that (a) such substitution or reinvestment will not cause the Refunded Obligations to be "arbitrage bonds" within the meaning of Section 103 of the Code or the regulations thereunder in effect on the date of such substitution or reinvestment, or otherwise make the interest on the Refunded Obligations subject to federal income taxation, and (b) such substitution or reinvestment complies with the Constitution and laws of the State of Texas and with all relevant documents relating to the issuance of the Refunded Obligations.

The Escrow Agent shall have no responsibility or liability for loss or otherwise with respect to investments made at the direction of the Issuer.

Section 4.04. Substitution for Escrowed Securities. Concurrently with the initial deposit by the Issuer with the Escrow Agent, but not thereafter, the Issuer, at its option, may substitute cash or direct noncallable and not pre-payable obligations of the United States Treasury (i.e., Treasury obligations which mature and are payable in a stated amount on the maturity date thereof, and for which there are no payments other than the payment made on the maturity date) (the "Substitute Obligations") for Escrowed Securities, if any, but only if such Substitute Obligations

- (a) are in an amount, and/or mature in an amount, which is equal to or greater than the amount payable on the maturity date of the obligation listed in the Report for which such Substitute Obligation is substituted,
- (b) mature on or before the maturity date of the obligation listed in the Report for which such Substitute Obligation is substituted, and
- (c) produce the amount necessary to pay the interest on and principal of the Refunded Obligations, as set forth in the Report, as verified by a certified public accountant or a firm of certified public accountants.

If, concurrently with the initial deposit by the Issuer with the Escrow Agent, any such Substitute Obligations are so substituted for any Escrowed Securities, the Issuer may, at any time thereafter, substitute for such Substitute Obligations the same Escrowed Securities for which such Substitute Obligations originally were substituted.

Section 4.05. Arbitrage. The Issuer hereby covenants and agrees that it shall never request the Escrow Agent to exercise any power hereunder or permit any part of the money in the Escrow Fund or proceeds from the sale of Escrowed Securities to be used directly or indirectly to acquire any securities or obligations if the exercise of such power or the acquisition of such securities or obligations would cause any Refunding Obligations or Refunded Obligations to be an "arbitrage bond" within the meaning of the Code.

ARTICLE V

APPLICATION OF CASH BALANCES

Section 5.01. In General. Except as provided in Sections 3.02, 4.02, 4.03 and 4.04 hereof, no withdrawals, transfers, or reinvestment shall be made of cash balances in the Escrow Fund.

ARTICLE VI

RECORDS AND REPORTS

Section 6.01. Records. The Escrow Agent will keep books of record and accounts in which complete and correct entries shall be made of all transactions relating to the receipts, disbursements, allocations and application of the money and Escrowed Securities deposited to the Escrow Fund and all proceeds thereof, and such books shall be available for inspection at reasonable hours and under reasonable conditions by the Issuer and the owners of the Refunded Obligations.

Section 6.02. Reports. While this Agreement remains in effect, the Escrow Agent annually shall prepare and send to the Issuer a written report summarizing all transactions relating to the Escrow Fund during the preceding year, including, without limitation, credits to the Escrow Fund as a result of interest payments on or maturities of the Escrowed Securities and transfers from the Escrow Fund for payments on the Refunded Obligations or otherwise, together with a detailed statement of all Escrowed Securities and the cash balance on deposit in the Escrow Fund as of the end of such period.

ARTICLE VII

CONCERNING THE PAYING AGENTS AND ESCROW AGENT

Section 7.01. Representations. The Escrow Agent hereby represents that it has all necessary power and authority to enter into this Agreement and undertake the obligations and responsibilities imposed upon it herein, and that it will carry out all of its obligations hereunder.

Section 7.02. Limitation on Liability. The liability of the Escrow Agent to transfer funds for the payment of the principal of and interest on the Refunded Obligations shall be limited to the proceeds of the Escrowed Securities and the cash balances from time to time on deposit in the Escrow Fund. Notwithstanding any provision contained herein to the contrary, neither the Escrow Agent nor the Paying Agent shall have any liability whatsoever for the insufficiency of funds from time to time in the Escrow Fund or any failure of the obligors of the Escrowed Securities to make timely payment thereon, except for the obligation to notify the Issuer as promptly as practicable of any such occurrence.

The recitals herein and in the proceedings authorizing the Refunding Obligations shall be taken as the statements of the Issuer and shall not be considered as made by, or imposing any obligation or liability upon, the Escrow Agent. The Escrow Agent is not a party to the proceedings authorizing the Refunding Obligations or the Refunded Obligations and is not responsible for nor

bound by any of the provisions thereof (except as a place of payment and paying agent and/or a Paying Agent/Registrar therefor). In its capacity as Escrow Agent, it is agreed that the Escrow Agent need look only to the terms and provisions of this Agreement.

The Escrow Agent makes no representations as to the value, conditions or sufficiency of the Escrow Fund, or any part thereof, or as to the title of the Issuer thereto, or as to the security afforded thereby or hereby, and the Escrow Agent shall not incur any liability or responsibility in respect to any of such matters.

It is the intention of the parties hereto that the Escrow Agent shall never be required to use or advance its own funds or otherwise incur personal financial liability in the performance of any of its duties or the exercise of any of its rights and powers hereunder.

The Escrow Agent shall not be liable for any action taken or neglected to be taken by it in good faith in any exercise of reasonable care and believed by it to be within the discretion or power conferred upon it by this Agreement, nor shall the Escrow Agent be responsible for the consequences of any error of judgment; and the Escrow Agent shall not be answerable except for its own action, neglect or default, nor for any loss unless the same shall have been through its negligence or willful misconduct.

Unless it is specifically otherwise provided herein, the Escrow Agent has no duty to determine or inquire into the happening or occurrence of any event or contingency or the performance or failure of performance of the Issuer with respect to arrangements or contracts with others, with the Escrow Agent's sole duty hereunder being to safeguard the Escrow Fund, to dispose of and deliver the same in accordance with this Agreement. If, however, the Escrow Agent is called upon by the terms of this Agreement to determine the occurrence of any event or contingency, the Escrow Agent shall be obligated, in making such determination, only to exercise reasonable care and diligence, and in event of error in making such determination the Escrow Agent shall be liable only for its own willful misconduct or its negligence. In determining the occurrence of any such event or contingency the Escrow Agent may request from the Issuer or any other person such reasonable additional evidence as the Escrow Agent in its discretion may deem necessary to determine any fact relating to the occurrence of such event or contingency, and in this connection may make inquiries of, and consult with, among others, counsel at any time.

The Escrow Agent may rely and shall be protected in acting or refraining from acting upon any resolution, certificate, written investment direction, statement, instrument, opinion, notice or other paper or document believed by it to be genuine and to have been signed or presented by the property party. The Escrow Agent need not investigate any fact or matter stated in the document.

The Escrow Agent may execute any of the trusts or powers hereunder or perform any duties hereunder with directly or by or through its agents or attorneys and may in all cases pay reasonable compensation to any agent or attorney retained or employed by it in connection therewith.

Section 7.03. Compensation. (a) Concurrently with the sale and delivery of the Refunding Obligations, the Issuer shall pay to the Escrow Agent, as a fee for performing the services hereunder and for all expenses incurred or to be incurred by the Escrow Agent in the administration of this Agreement, the sum of \$_____, the sufficiency of which is hereby acknowledged by the Escrow Agent. In the event that the Escrow Agent is requested to perform any extraordinary services hereunder, the Issuer hereby agrees to pay reasonable fees to the Escrow Agent for such extraordinary services and to reimburse the Escrow Agent for all expenses incurred by the Escrow Agent in performing such extraordinary services, and the Escrow Agent hereby agrees to look only to the Issuer for the payment of such fees and reimbursement of such expenses. The Escrow Agent hereby agrees that in no event shall it ever assert any claim or lien against the Escrow Fund for any fees for its services, whether regular or extraordinary, as Escrow Agent, or in any other capacity, or for reimbursement for any of its expenses.

(b) The Paying Agent is the place of payment (paying agent) for the Refunded Obligations. Concurrently with the sale and delivery of the Refunding Obligations the Issuer shall pay to the Paying Agent the sum of \$_____, the sufficiency of which is hereby acknowledged by the Paying Agent, for redemption fees for the Refunded Obligations; and the Paying Agent warrants that such sum is sufficient for such purpose. The Issuer covenants to timely pay for all future paying agency services of the Paying Agent for the Refunded Obligations in accordance with the paying agent fee schedule now in effect through the final payment of the Refunded Obligations, the sufficiency of which is hereby acknowledged by the Paying Agent. Additionally, the Paying Agent has agreed to look only to the Issuer for the payment of such fees and reimbursement of such expenses, and for the benefit of the registered owners of the Refunded Obligations, to perform the services as Paying Agent without regard to the future payment of such fees and expenses. The Paying Agent shall in no event assert any claim or lien against the Escrow Fund for any fees for their services, whether regular or extraordinary, as Paying Agent, or in any other capacity, or for reimbursement for any of its expenses.

(c) Upon receipt of the aforesaid specific sums stated in subsections (a) and (b) of this Section 7.03 for Escrow Agent and paying agency fees, expenses, and services, the Escrow Agent shall acknowledge such receipt to the Issuer in writing.

Section 7.04. Successor Escrow Agents. If at any time the Escrow Agent or its legal successor or successors should become unable, through operation of law or otherwise, to act as escrow agent hereunder, or if its property and affairs shall be taken under the control of any state or federal court or administrative body because of insolvency or bankruptcy or for any other reason, a vacancy shall forthwith exist in the office of Escrow Agent hereunder. In such event the Issuer, by appropriate action, promptly shall appoint an Escrow Agent to fill such vacancy. If no successor Escrow Agent shall have been appointed by the Issuer within 60 days, a successor may be appointed by the owners of a majority in principal amount of the Refunded Obligations then outstanding by an instrument or instruments in writing filed with the Issuer, signed by such owners or by their duly authorized attorneys-in-fact. If, in a proper case, no appointment of a successor Escrow Agent shall be made pursuant to the foregoing provisions of this section within three months after a vacancy shall have occurred, the owner of any Refunded Obligation may apply to any court of competent jurisdiction to appoint a successor Escrow Agent. Such court may thereupon, after such notice, if any, as it may deem proper, prescribe and appoint a successor Escrow Agent.

Any successor Escrow Agent shall be a corporation organized and doing business under the laws of the United States or the State of Texas, authorized under such laws to exercise corporate trust powers, authorized under Texas law to act as an escrow agent, having its principal office and place of business in the State of Texas, having a combined capital and surplus of at least \$5,000,000 and subject to the supervision or examination by Federal or State authority.

Any successor Escrow Agent shall execute, acknowledge and deliver to the Issuer and the Escrow Agent an instrument accepting such appointment hereunder, and the Escrow Agent shall execute and deliver an instrument transferring to such successor Escrow Agent, subject to the terms of this Agreement, all the rights, powers and trusts of the Escrow Agent hereunder. Upon the request of any such successor Escrow Agent, the Issuer shall execute any and all instruments in writing for more fully and certainly vesting in and confirming to such successor Escrow Agent all such rights, powers and duties.

The Escrow Agent at the time acting hereunder may at any time resign and be discharged from the trust hereby created by giving not less than sixty (60) days' written notice to the Issuer and publishing notice thereof, specifying the date when such resignation will take effect, in a newspaper printed in the English language and with general circulation in New York, New York, such publication to be made once at least three (3) weeks prior to the date when the resignation is to take effect. No such resignation shall take effect unless a successor Escrow Agent shall have been appointed by the owners of the Refunded Obligations or by the Issuer as herein provided and such successor Escrow Agent shall be a paying agent for the Refunded Obligations and shall have accepted such appointment, in which event such resignation shall take effect immediately upon the appointment and acceptance of a successor Escrow Agent.

Under any circumstances, the Escrow Agent shall pay over to its successor Escrow Agent proportional parts of the Escrow Agent's fee and, if applicable, its Paying Agent's fee hereunder.

ARTICLE VIII

MISCELLANEOUS

Section 8.01. Notice. Any notice, authorization, request, or demand required or permitted to be given hereunder shall be in writing and shall be deemed to have been duly given when mailed by registered or certified mail, postage prepaid addressed to the Issuer or the Escrow Agent at the address shown on Exhibit "A" attached hereto. The United States Post Office registered or certified mail receipt showing delivery of the aforesaid shall be conclusive evidence of the date and fact of delivery. Any party hereto may change the address to which notices are to be delivered by giving to the other parties not less than ten (10) days prior notice thereof. Prior written notice of any amendment to this Agreement contemplated pursuant to Section 8.08 and immediate written notice of any incidence of a severance pursuant to Section 8.04 shall be sent to Moody's Investors Service, Attn: Public Finance Rating Desk/Refunded Bonds, 99 Church Street, New York, New York 10007, Standard & Poor's Rating Services, a Standard & Poor's Financial Services LLC business, Attn: Municipal Bond Department, 25 Broadway, New York, New York 10004, Fitch, Inc., One State

Street Plaza, New York, New York 10004, and MBIA Insurance Corporation, 113 King Street, Armonk, New York 10504, Attn: Insured Portfolio Management.

Section 8.02. Termination of Responsibilities. Upon the taking of all the actions as described herein by the Escrow Agent, the Escrow Agent shall have no further obligations or responsibilities hereunder to the Issuer, the owners of the Refunded Obligations or to any other person or persons in connection with this Agreement.

Section 8.03. Binding Agreement. This Agreement shall be binding upon the Issuer and the Escrow Agent and their respective successors and legal representatives, and shall inure solely to the benefit of the owners of the Refunded Obligations, the Issuer, the Escrow Agent and their respective successors and legal representatives.

Section 8.04. Severability. In case any one or more of the provisions contained in this Agreement shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions of this Agreement, but this Agreement shall be construed as if such invalid or illegal or unenforceable provision had never been contained herein.

Section 8.05. Texas Law Governs. This Agreement shall be governed exclusively by the provisions hereof and by the applicable laws of the State of Texas.

Section 8.06. Time of the Essence. Time shall be of the essence in the performance of obligations from time to time imposed upon the Escrow Agent by this Agreement.

Section 8.07. Effective date of Agreement. This Agreement shall be effective upon receipt by the Escrow Agent of the funds described in the Report and the Escrowed Securities, together with the specific sums stated in subsections (a) and (b) of Section 7.03 for Escrow Agent and paying agency fees, expenses, and services.

Section 8.08. Amendments. This Agreement shall not be amended except to cure any ambiguity or formal defect or omission in this Agreement. No amendment shall be effective unless the same shall be in writing and signed by the parties thereto. No such amendment shall adversely affect the rights of the holders of the Refunded Obligations.

IN WITNESS WHEREOF, the parties hereto have each caused this Agreement to be executed by their duly authorized officers and attested as of the date first written above.

NORTH TEXAS MUNICIPAL WATER DISTRICT

President

ATTEST:

Secretary

(Issuer Seal)

THE BANK OF NEW YORK MELLON TRUST
COMPANY, NATIONAL ASSOCIATION

By: _____
Title: _____

INDEX TO EXHIBITS

- Exhibit "A" Addresses of the Issuer and the Escrow Agent
Exhibit "B" Verification Report of Grant Thornton LLP

EXHIBIT A

ADDRESSES OF THE ISSUER AND THE ESCROW AGENT

ISSUER

North Texas Municipal Water District
505 East Brown
Wylie, Texas 75098

Attention: Executive Director

ESCROW AGENT

The Bank of New York Mellon Trust Company, National Association
2001 Bryan Avenue, 11th Floor
Dallas, Texas 75201

Attention: Corporate Trust Department

EXHIBIT "B"

VERIFICATION REPORT OF GRANT THORNTON LLP

This Preliminary Official Statement and the information contained herein are subject to completion or amendment. These securities may not be sold nor may offers to buy be accepted prior to the time the Preliminary Official Statement is delivered in final form. Under no circumstances shall the Preliminary Official Statement constitute an offer to sell or the solicitation of an offer to buy nor shall there be any sale of these securities in any jurisdiction in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of such jurisdiction.

FSC Continuing Disclosure Services
A Division of Hilltop Securities

PRELIMINARY OFFICIAL STATEMENT

Ratings:
Moody's: "AAA"
S&P: "AAA"
(See "OTHER INFORMATION - Ratings" herein)

(See "Continuing Disclosure of Information" herein)

Dated October 20, 2016

NEW ISSUE - Book-Entry-Only

In the opinion of Bond Counsel, interest on the Bonds will be excludable from gross income for purposes of federal income taxation under statutes, regulations, published rulings and court decisions existing on the date of such opinion, subject to the matters described under "Tax Matters" herein, including the alternative minimum tax on corporations.



\$327,600,000*
NORTH TEXAS MUNICIPAL WATER DISTRICT
WATER SYSTEM REVENUE REFUNDING AND IMPROVEMENT BONDS, SERIES 2016

Dated Date: October 15, 2016

Due: September 1, as shown below

Interest Accrues: Delivery Date (defined below)

PAYMENT TERMS . . . Interest on the \$327,600,000* North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds, Series 2016, (the "Bonds") will accrue from the date of initial delivery thereof (the "Delivery Date"), will be payable on March 1 and September 1 of each year commencing March 1, 2017, until maturity or prior redemption and will be calculated on the basis of a 360-day year consisting of twelve 30-day months. The definitive Bonds will be initially registered and delivered only to Cede & Co., the nominee of The Depository Trust Company ("DTC") pursuant to the Book-Entry-Only System described herein. Beneficial ownership of the Bonds may be acquired in denominations of \$5,000 or integral multiples thereof. No physical delivery of the Bonds will be made to the owners thereof. Principal of and interest on the Bonds will be payable by the Paying Agent/Registrar to Cede & Co., which will make distribution of the amounts so paid to the beneficial owners of the Bonds. See "The Bonds - Book-Entry-Only System" herein. The initial Paying Agent/Registrar is The Bank of New York Mellon Trust Company, National Association, Dallas, Texas (see "THE BONDS - Paying Agent/Registrar").

AUTHORITY FOR ISSUANCE . . . The Bonds are special obligations of the North Texas Municipal Water District (the "District") secured by and payable, both as to principal and interest, solely from and secured by a first lien on and pledge of the "Pledged Revenues" as defined in the Resolution authorizing the issuance of the Bonds, which includes the "Net Revenues of the District's Water System" and certain other revenues derived from the ownership and operation of the District's Water System, including amounts payable under water supply contracts with the thirteen Member Cities (as defined herein), other customer cities and other customers. The District has not covenanted or obligated itself to pay the Bonds from monies raised or to be raised from taxation or from any other source of funds of the District other than "Pledged Revenues." See "THE BONDS - Security and Source of Payment".

PURPOSE . . . Proceeds from the sale of the Bonds will be used for the purpose of providing funds for (i) construction of the Wylie Water Treatment Plant No. 4 70 MGD Expansion, construction of the Trinity River Main Stem Pump Station and Pipeline, construction of the North System Exchange Parkway 13.5 MG Ground Storage Facilities, construction of the North McKinney Pipeline, and other System improvements; (ii) refunding a portion of the District's outstanding debt (the "Refunded Obligations") for debt service savings; (iii) funding a debt service reserve fund, and (iv) paying the costs incident to the issuance and delivery of the Bonds.

MATURITY SCHEDULE*

CUSIP Prefix: 662903⁽¹⁾

Amount	Maturity September 1	Rate	Yield ⁽²⁾	CUSIP Suffix ⁽¹⁾	Amount	Maturity September 1	Rate	Yield ⁽²⁾	CUSIP Suffix ⁽¹⁾
\$ 7,965,000	2017				\$ 12,080,000	2032			
4,490,000	2018				12,685,000	2033			
7,320,000	2019				13,315,000	2034			
7,545,000	2020				14,000,000	2035			
7,770,000	2021				14,715,000	2036			
8,000,000	2022				15,470,000	2037			
8,240,000	2023				16,255,000	2038			
8,485,000	2024				10,390,000	2039			
8,745,000	2025				10,910,000	2040			
9,010,000	2026				11,455,000	2041			
9,455,000	2027				12,030,000	2042			
9,930,000	2028				12,630,000	2043			
10,440,000	2029				13,260,000	2044			
10,960,000	2030				13,925,000	2045			
11,505,000	2031				14,620,000	2046			

(1) CUSIP is a registered trademark of the American Bankers Association. CUSIP data herein is provided by CUSIP Global Services, managed by S&P Capital IQ on behalf of the American Bankers Association. This data is not intended to create a database and does not serve in any way as a substitute for the CUSIP Services. CUSIP numbers are provided for convenience of reference only. None of the District, the Financial Advisor, or the Initial Purchaser is responsible for the selection or correctness of the CUSIP numbers set forth herein.

(2) Initial reoffering yield represents the initial offering yield to the public which has been established by the Initial Purchaser for offers to the public and which may be subsequently changed by the Initial Purchaser and is the sole responsibility of the Initial Purchaser. The initial reoffering yields indicated above represent the lower of the yields resulting when priced to maturity or to the first call date.

REDEMPTION OPTION . . . The District reserves the right, at its option, to redeem Bonds having stated maturities on and after September 1, 2027, in whole or in part, in principal amounts of \$5,000 or any integral multiple thereof, on September 1, 2026, or any date thereafter, at a price equal to the principal amount thereof plus accrued interest to the date of redemption (see "The Bonds - Optional Redemption").

LEGALITY . . . The Bonds are offered for delivery when, as and if issued and received by the Initial Purchaser (as defined herein) and subject to the approving opinion of the Attorney General of Texas and the opinion of McCall, Parkhurst & Horton L.L.P., Dallas, Texas, Bond Counsel (see Appendix C, "Form of Bond Counsel's Opinion").

DELIVERY . . . It is expected that the Bonds will be available for delivery through The Depository Trust Company on November 30, 2016.

BIDS DUE THURSDAY, OCTOBER 27, 2016, AT 10:00 AM, CDT

* Preliminary, subject to change. See "Adjustment of Principal Amount and/or Types of Bids" in the Notice of Sale for the Bonds.

This Official Statement, which includes the cover page, Schedule and the Appendices hereto, does not constitute an offer to sell or the solicitation of an offer to buy in any jurisdiction to any person to whom it is unlawful to make such offer, solicitation, or sale.

No dealer, broker, salesperson, or other person has been authorized to give information or to make any representation other than those contained in this Official Statement, and, if given or made, such other information or representations must not be relied upon.

For purposes of compliance with Rule 15c2-12 of the Securities and Exchange Commission (the "Rule"), this document constitutes an "official statement" of the District with respect to the Bonds that has been "deemed final" by the District as of its date except for the omission of no more than the information permitted by the Rule.

The information set forth herein has been obtained from the District and other sources believed to be reliable, but such information is not guaranteed as to accuracy or completeness and is not to be construed as the representation, promise, or guarantee of the Financial Advisor. This Official Statement contains, in part, estimates and matters of opinion which are not intended as statements of fact, and no representation is made as to the correctness of such estimates and opinions, or that they will be realized. Any information and expressions of opinion herein contained are subject to change without notice, and neither the delivery of this Official Statement nor any sale made hereunder shall, under any circumstances, create any implication that there has been no change in the affairs of the District or other matters described herein since the date hereof. See "Continuing Disclosure of Information" for a description of the District's undertaking to provide certain information on a continuing basis.

Neither the District nor its Financial Advisor make any representation as to the accuracy, completeness, or adequacy of the information supplied by The Depository Trust Company for use in this Official Statement.

The cover page of this Official Statement contains certain information for general reference only and is not intended as a summary of the respective offering. Investors should read the entire Official Statement, including all schedules and appendices hereto, to obtain information essential to making an informed investment decision.

The agreements of the District and others related to the Bonds are contained solely in the contracts described herein. Neither this Official Statement nor any other statement made in connection with the offer or sale of the Bonds is to be construed as constituting an agreement with the purchaser of the Bonds. INVESTORS SHOULD READ THE ENTIRE OFFICIAL STATEMENT, INCLUDING ALL SCHEDULES AND APPENDICES ATTACHED HERETO, TO OBTAIN INFORMATION ESSENTIAL TO MAKING AN INFORMED INVESTMENT DECISION.

This Official Statement contains "forward-looking" statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended. Such statements may involve known and unknown risks, uncertainties, and other factors which may cause the actual results, performance, and achievements to be different from future results, performance, and achievements expressed or implied by such forward-looking statements. Investors are cautioned that the actual results could differ materially from those set forth in the forward-looking statements.

The Bonds are exempt from registration with the Securities and Exchange Commission and consequently have not been registered therewith. The registration, qualification, or exemption of the Bonds in accordance with applicable securities law provisions of the jurisdiction in which the Bonds have been registered, qualified or exempted should not be regarded as a recommendation thereof.

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The cover page hereof, this page, the appendices included herein and any addenda, supplement or amendment hereto, are part of the Official Statement.

PRELIMINARY OFFICIAL STATEMENT SUMMARY

This summary is subject in all respects to the more complete information and definitions contained or incorporated in this Official Statement. The offering of the Bonds to potential investors is made only by means of this entire Official Statement. No person is authorized to detach this summary from this Official Statement or to otherwise use it without the entire Official Statement.

- THE DISTRICT** North Texas Municipal Water District (the "District") is a conservation and reclamation district and political subdivision of the State of Texas, created and functioning under Article 16, Section 59, of the Texas Constitution, pursuant to Chapter 62, Acts of the 52nd Legislature of Texas, Regular Session, 1951, as amended (the "District Act").
- THE BONDS** The Bonds are issued as \$327,600,000* Water System Revenue Refunding and Improvement Bonds, Series 2016, (the "Bonds"). The Bonds mature on September 1 in each of the years and in the amounts shown on the cover page hereof (see "THE BONDS – Description of the Bonds").
- PAYMENT OF INTEREST** Interest on the Bonds accrues from the date of initial delivery thereof (the "Delivery Date"), and is payable on March 1, 2017, and each September 1 and March 1 thereafter until maturity or prior redemption (see "THE BONDS - Description of the Bonds" and "THE BONDS – Optional Redemption").
- RESERVE FUND REQUIREMENT** The District is required to accumulate and maintain in the Reserve Fund (as defined herein) an aggregate amount of money and/or investments equal in market value to the average annual principal and interest requirements (the "Reserve Required Amount") on all outstanding Parity Bonds (as defined herein).
- AUTHORITY FOR ISSUANCE** The Bonds are issued pursuant to the District Act (as defined herein), Chapters 1207 and 1371, Texas Government Code, as amended, and other applicable laws (see "THE BONDS - Authority for Issuance").
- SECURITY FOR THE BONDS** The Bonds are special obligations of the District payable both as to principal and interest solely from and secured by a first lien on and pledge of the "Pledged Revenues" as defined in the Resolution which include the "Net Revenues of the District's Water System" and certain other revenues derived from the ownership and operation of the District's Water System, including the fees and charges received under water supply contracts with thirteen Member Cities (as defined herein), other customer cities and other customers. The Bonds are on a parity in all respects with the \$1,147,775,000 currently outstanding amount of Water System Revenue Bonds (the "Outstanding Bonds") (the Bonds and the Outstanding Bonds, collectively, the "Parity Bonds") and any Additional Bonds issued on a parity with the Parity Bonds under the Resolution. The Bonds are not payable from monies raised or to be raised by taxation or from any other source of funds of the District other than Pledged Revenues (see "THE BONDS - Security and Source of Payment").
- OPTIONAL REDEMPTION** The District reserves the right, at its option, to redeem Bonds having stated maturities on and after September 1, 2027, in whole or in part in principal amounts of \$5,000 or any integral multiple thereof, on September 1, 2026, or any date thereafter, at a price equal to the principal amount thereof plus accrued interest to the date of redemption (see "THE BONDS - Optional Redemption").
- TAX EXEMPTION** In the opinion of Bond Counsel, the interest on the Bonds will be excludable from gross income for federal income tax purposes under existing law, subject to the matters described under the caption "TAX MATTERS" herein, including the alternative minimum tax on corporations.
- USE OF PROCEEDS** Proceeds from the sale of the Bonds will be used for the purpose of providing funds for (i) construction of the Wylie Water Treatment Plant No. 4 70 MGD Expansion, construction of the Trinity River Main Stem Pump Station and Pipeline, construction of the North System Exchange Parkway 13.5 MG Ground Storage Facilities, construction of the North McKinney Pipeline, and other System improvements; (ii) refunding a portion of the District's outstanding debt (the "Refunded Obligations") for debt service savings; (iii) funding a debt service reserve fund, and (iv) paying the costs incident to the issuance and delivery of the Bonds.
- RATINGS** The Bonds and the Outstanding Bonds are rated "A" by Moody's Investors Service, Inc. ("Moody's") and "AAA" by S&P Global Ratings, a business unit of Standard & Poor's Financial Services LLC ("S&P") (see "OTHER INFORMATION - Ratings").
- BOOK-ENTRY-ONLY SYSTEM** The definitive Bonds will be initially registered and delivered only to Cede & Co., the nominee of DTC pursuant to the Book-Entry-Only System described herein. Beneficial ownership of the Bonds may be acquired in denominations of \$5,000 or integral multiples thereof within a maturity. No physical delivery of the Bonds will be made to the beneficial owners thereof. Principal and interest on the Bonds will be payable by the Paying Agent/Registrar to Cede & Co., which will make distribution of the amounts so paid to the beneficial owners of the Bonds (see "THE BONDS - Book-Entry-Only System").
- PAYMENT RECORD** The District has never defaulted in payment of its bonds including the Parity Bonds.

* Preliminary, subject to change. See "Adjustment of Principal Amount and/or Types of Bids" in the Notice of Sale for the Bonds.

**NORTH TEXAS MUNICIPAL WATER DISTRICT
DISTRICT OFFICIALS, STAFF AND CONSULTANTS**

BOARD OF DIRECTORS

**Terry Sam Anderson, Mesquite, President
Robert Thurmond, Jr., Wylie, Vice President
John F. Sweeden, Richardson, Secretary**

ALLEN Joe Farmer James Kerr	FARMERSVILLE Wayne May	FORNEY Don Cates Michael Lopez	FRISCO Richard Peasley Lynn Shuyler
GARLAND Don Gordon Jack May	McKINNEY Joe Joplin Charles McKissick	MESQUITE Bobby Robinson	PLANO Phil Dyer James R. Hogan
RICHARDSON John Murphy	ROCKWALL Bill Lofland Larry Parks	ROYSE CITY Jim Mellody Bill Forbus	WYLIE Marvin Fuller
PRINCETON Richard Sheehan Bill Glass			

EXECUTIVE MANAGEMENT

Executive Director/General Manager Thomas W. Kula
 Deputy Director of Finance & Personnel. Judd R. Sanderson
 Deputy Director of Engineering & CIP. Joseph M. Stankiewicz
 Deputy Director of Operations & Maintenance. Mike Rickman

CONSULTANTS AND ADVISORS

General Counsel..... Gay, McCall, Isaacs, Gordon & Roberts
 Plano, Texas
 Bond Counsel..... McCall, Parkhurst & Horton L.L.P
 Dallas, Texas
 Financial AdvisorFirstSouthwest, a Division of Hilltop Securities Inc.
 Fort Worth, Texas

For additional information regarding the District, please contact:

Mr. Rodney Rhoades North Texas Municipal Water District P. O. Box 2408 Wylie, Texas 75098 (972) 442-5405	or	Mr. David K. Medanich FirstSouthwest, a Division of Hilltop Securities Inc. 777 Main Street, Suite 1200 Fort Worth, TX 76102 (817) 332-9710
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PRELIMINARY OFFICIAL STATEMENT

RELATING TO

\$327,600,000*

**NORTH TEXAS MUNICIPAL WATER DISTRICT
WATER SYSTEM REVENUE REFUNDING AND IMPROVEMENT BONDS, SERIES 2016**

INTRODUCTION

This Official Statement, which includes the Appendices hereto, provides certain information regarding the issuance of \$327,600,000* North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds, Series 2016 (the "Bonds"). Capitalized terms used in this Official Statement have the same meanings assigned to such terms in the Resolution authorizing the Bonds (the "Bond Resolution" or "Resolution") to be adopted on the date of sale of the Bonds which will authorize the issuance of the Bonds, except as otherwise indicated herein.

There follows in this Official Statement descriptions of the Bonds and certain information regarding the North Texas Municipal Water District (the "District") and its finances. All descriptions of documents contained herein are only summaries and are qualified in their entirety by reference to each such document. Copies of such documents may be obtained from the District's Financial Advisor, FirstSouthwest, a Division of Hilltop Securities Inc. ("FirstSouthwest"), Dallas, Texas.

THE NORTH TEXAS MUNICIPAL WATER DISTRICT

The North Texas Municipal Water District (the "District") is a conservation and reclamation district and political subdivision of the State of Texas, created and functioning under Article 16, Section 59, of the Texas Constitution pursuant to Chapter 62, Acts of 1951, 52nd Legislature of Texas, Regular Session, 1951, as amended (the "District Act"). The District was created for the purpose of providing a source of water supply for municipal, domestic and industrial use and for the treatment, processing and transportation of such water to its 13 Member Cities (as defined below) and other customers located in North Central Texas, which it does through the Regional Water System (the "Water System"). Under the Constitution and the Statutes, the District has broad powers to effectuate flood control and the conservation and use, for all beneficial purposes, of storm and floodwaters and unappropriated flow waters and, as a necessary aid to these purposes, the specific authority to construct, own and operate water supply, treatment and distribution facilities and sewage gathering, transmission and disposal facilities, and to collect, transport, treat, dispose of, and control all municipal, domestic, industrial, or communal waste, whether in fluid, solid or composite state.

The District currently serves a 2,200 square-mile area located in nine counties in the State of Texas and comprises all of the territory of its current District Member Cities, viz., Garland, Princeton, Plano, Mesquite, Wylie, Rockwall, Farmersville, McKinney, Richardson, Allen, Forney, Frisco, and Royse City (together with any cities which subsequently become District Member Cities, the "Member Cities"). The District's Administrative Office is located at 501 East Brown Street, Wylie, Texas. The District is governed by a 25-member Board of Directors. Each Member City having a population of 5,000 or more is represented by two members on the Board of Directors and each Member City of less than 5,000 is represented by one member on the Board of Directors. Members of the Board of Directors are appointed by the governing bodies of the respective Member Cities for two-year terms.

PLAN OF FINANCING

PURPOSE . . . Proceeds from the sale of the Bonds will be used for the purpose of providing funds for (i) construction of the Wylie Water Treatment Plant No. 4 70 MGD Expansion, construction of the Trinity River Main Stem Pump Station and Pipeline, construction of the North System Exchange Parkway 13.5 MG Ground Storage Facilities, construction of the North McKinney Pipeline, and other System improvements; (ii) refunding a portion of the District's outstanding debt (the "Refunded Obligations") for debt service savings; (iii) funding a debt service reserve fund, and (iv) paying the costs incident to the issuance and delivery of the Bonds.

REFUNDED OBLIGATIONS . . . The principal and interest due on the Refunded Obligations are to be paid on the scheduled interest payment dates and the redemption dates thereof, from funds to be deposited pursuant to a certain Escrow Agreement (the "Escrow Agreement") between the District and The Bank of New York Mellon Trust Company, National Association, Dallas, Texas (the "Escrow Agent"). The Resolution provides that from the proceeds of the sale of the Bonds received from the Initial Purchaser (hereinafter defined), together with other available funds of the District, the District will deposit with the Escrow Agent an amount which, together with the Federal Securities (defined below) purchased with a portion of the Bond proceeds and the interest to be earned on such Federal Securities, will be sufficient to accomplish the discharge and final payment of the Refunded Obligations on their respective redemption dates. Such funds will be held by the Escrow Agent in a special escrow fund (the "Escrow Fund") and used to purchase direct obligations of the United States of America (the "Federal Securities"). Under the Escrow Agreement, the Escrow Fund is irrevocably pledged to the payment of the principal of and interest on the Refunded Obligations.

* Preliminary, subject to change. See "Adjustment of Principal Amount and/or Types of Bids" in the Notice of Sale for the Bonds.

Grant Thornton LLP, a nationally recognized accounting firm, will verify at the time of delivery of the Bonds to the Initial Purchaser the mathematical accuracy of the schedules that demonstrate the Federal Securities will mature and pay interest in such amounts which, together with uninvested funds, if any, in the Escrow Fund, will be sufficient to pay, when due, the principal of and interest on the Refunded Obligations. **Such maturing principal of and interest on the Federal Securities will not be available to pay the Bonds** (see "OTHER INFORMATION - Verification of Arithmetical and Mathematical Computations").

By the deposit of the Federal Securities and cash, if necessary, with the Escrow Agent pursuant to the Escrow Agreement, the District will have effected the defeasance of all of the Refunded Obligations in accordance with the law. It is the opinion of Bond Counsel that as a result of such defeasance and in reliance upon the report of Grant Thornton LLP, the Refunded Obligations will be outstanding only for the purpose of receiving payments from the Federal Securities and any cash held for such purpose by the Escrow Agent and such Refunded Obligations will not be deemed as being outstanding obligations of the District payable from Pledged Revenues.

SOURCES AND USES OF PROCEEDS . . . The proceeds from the sale of the Bonds and contributions from the District, if any, will be applied approximately as follows:

<u>Sources of Funds</u>	
Principal Amount of Bonds	\$ -
Reoffering Premium	-
Total Sources of Funds	<u>\$ -</u>
<u>Uses of Funds</u>	
Deposit to Construction Fund	\$ -
Deposit to Debt Service Reserve Fund	-
Deposit to Escrow Fund	-
Costs of Issuance	-
Total Uses of Funds	<u>\$ -</u>

THE BONDS

DESCRIPTION OF THE BONDS . . . The Bonds are dated October 15, 2016, and mature on September 1 in each of the years and in the amounts shown on the cover page hereof. Interest will accrue from the date of initial delivery of the Bonds (the "Delivery Date"), will be computed on the basis of a 360-day year of twelve 30-day months, and will be payable on each March 1 and September 1, commencing March 1, 2017, until maturity or prior redemption. The Bonds will be issued only in fully registered form in any integral multiple of \$5,000 for any one maturity and will be initially registered and delivered only to Cede & Co., the nominee of The Depository Trust Company ("DTC") pursuant to the Book-Entry-Only System described herein. No physical delivery of the Bonds will be made to the owners thereof. Principal of and interest on the Bonds will be payable by the Paying Agent/Registrar (hereinafter defined) to Cede & Co., which will make distribution of the amounts so paid to the beneficial owners of the Bonds. See "Book-Entry-Only System" herein.

AUTHORITY FOR ISSUANCE . . . The Bonds are being issued pursuant to the provisions and authority provided by the District Act, Chapters 1207 and 1371, Texas Government Code, as amended, and other applicable laws. Under the Texas Constitution and statutes and the District Act, the District has broad powers to (1) impound, control, store, preserve, treat, transmit and use storm and floodwater, the water of rivers and streams, and underground water, for irrigation, power, and all other useful purposes, and to supply water for municipal, domestic, power, industrial and commercial uses and purposes, and all other beneficial uses and purposes; (2) collect, transport, process, treat, dispose of, and control, all municipal, domestic, industrial, or commercial waste whether in fluid, solid, or composite state, including specifically the control, abatement, or reduction of all types of pollution, and (3) to refund obligations issued for the foregoing purposes.

SECURITY AND SOURCE OF PAYMENT . . . The Bonds are special obligations of the District payable as to principal and interest solely from and secured by a first lien on and pledge of the "Pledged Revenues" as defined in the Resolution authorizing and securing all Parity Bonds (hereinafter defined) and Additional Bonds, which include the "Net Revenues of the District's Water System" and certain other revenues derived from the ownership and operation of the District's Water System, including amounts payable under water supply contracts with its Member Cities, other customer cities and other customers. Debt service and all operation and maintenance expenses are supported by minimum annual payments as required pursuant to stated terms and conditions contained in such contracts with the Member Cities. See "WATER CONTRACTS" herein. The Bonds are on a parity in all respects with the \$1,147,775,000 outstanding principal amount of Water System Revenue Bonds (the "Outstanding Bonds") (the Bonds and the Outstanding Bonds, collectively, the "Parity Bonds") and any additional bonds issued on a parity with the Parity Bonds ("Additional Bonds") under the Resolution. The District has not covenanted or obligated itself to pay the Bonds from monies raised or to be raised by taxation or from any other source of funds of the District, other than the Pledged Revenues.

Dated Date	Issue Amount	Outstanding Bonds ⁽¹⁾	Issue Description
6/15/2008	\$ 111,780,000	\$ 96,115,000	Water System Revenue Bonds, Series 2008
3/1/2009	9,930,000	9,930,000	Water System Revenue Bonds, Series 2009A
7/15/2009	43,980,000	25,750,000	Water System Revenue Bonds, Series 2009B
11/15/2009	34,330,000	13,575,000	Water System Revenue Refunding & Improvement Bonds, Series 2009C
11/15/2009	109,520,000	103,740,000	Water System Revenue Bonds, Taxable Series 2009D-Build America Bonds
10/15/2010	31,720,000	14,250,000	Water System Revenue Bonds, Series 2010
10/15/2010	108,345,000	108,345,000	Water System Revenue Bonds Taxable, Series 2010A-Build America Bonds
6/15/2012	358,835,000	312,720,000	Water System Revenue Refunding & Improvement Bonds, Series 2012
6/15/2014	171,430,000	167,230,000	Water System Revenue Refunding & Improvement Bonds, Series 2014
4/15/2015	302,125,000	296,120,000	Water System Revenue Refunding & Improvement Bonds, Series 2015
		<u>\$ 1,147,775,000</u>	

(1) As of September 1, 2016. Does not include the Bonds. Includes the Refunded Obligations.

RATE COVENANT . . . The District has covenanted in the Resolution to fix, establish, maintain, and collect such rentals, rates, charges, and fees for the use and availability of the System as are necessary to produce Gross Revenues of the System sufficient, together with any other Pledged Revenues, (a) to pay all Operation and Maintenance Expenses of the System and (b) to make all payments and deposits required to be made into the Interest and Redemption Fund, and to maintain the Reserve Fund and the Contingency Fund, when and as required by the Resolution authorizing all Parity Bonds and Additional Bonds.

RESERVE FUND REQUIREMENT . . . The District is required to accumulate and maintain in (the "Reserve Fund") an aggregate amount of money and/or investments equal in market value to the average annual principal and interest requirements on all outstanding Parity Bonds (the "Reserve Required Amount"). After the delivery of the Bonds and the deposit of a portion of the proceeds thereof into the Reserve Fund, the Reserve Fund will contain an amount at least equal to Reserve Required Amount. No deposits shall be made into the Reserve Fund as long as the cash and investments in the Reserve Fund are at least equal in market value to the Reserve Required Amount; but if and whenever the market value of cash and investments in the Reserve Fund is reduced below said Reserve Required Amount because of a decrease in market value of investments, then the District shall require the Member Cities to increase their payments under the Contracts (as hereinafter defined) as soon as practicable, and in any event within one year, in an amount sufficient to restore the amount of such decrease; and in the event the Reserve Fund is used to pay the principal of or interest on the Parity Bonds because of insufficient amounts being available in the Interest and Redemption Fund, then the District shall require the Member Cities to increase their payments under the Contracts as soon as practicable, and in any event within one year, in an amount sufficient to restore the Reserve Fund to the Reserve Required Amount, and the District shall deposit, in the Reserve Fund, in approximately equal periodic payments, not less than annual, such amounts as are required to cause the Reserve Fund to contain the Reserve Required Amount within five years from any date of the use of the Reserve Fund to pay such principal or interest. Investments held for the benefit of the Reserve Fund are required to be valued in terms of current market value as of the 20th day of August of each year. So long as the Reserve Fund contains the Reserve Required Amount, all amounts in excess thereof shall be deposited to the credit of the Interest and Redemption Fund on or before September 1 of each year.

OPTIONAL REDEMPTION . . . The District reserves the right, at its option, to redeem Bonds having stated maturities on and after September 1, 2027, in whole or in part in principal amounts of \$5,000 or any integral multiple thereof, on September 1, 2026, or any date thereafter, at a price equal to the principal amount thereof plus accrued interest to the date of redemption. If fewer than all of the Bonds are to be redeemed, the District may select the maturities and amounts of Bonds to be redeemed. If less than a whole maturity is to be redeemed, the Bonds, or portions thereof, to be redeemed shall be selected by lot or other customary method of random selection (or by DTC in accordance with the procedures while the Bonds are in the Book-Entry-Only System). If a Bond (or any portion of the principal sum thereof) shall have been called for redemption and notice of such redemption shall have been given, such Bond (or the principal amount thereof to be redeemed) shall become due and payable on such redemption date and interest thereon shall cease to accrue from and after the redemption date, provided funds for the payment of the redemption price and accrued interest thereon are held by the Paying Agent/Registrar on the redemption date.

MANDATORY SINKING FUND REDEMPTION . . . In addition to being subject to optional redemption as provided above, should the Initial Purchaser select a combination of Serial Bonds and Term Bonds, the Term Bonds are subject to mandatory sinking fund redemption prior to maturity at a price of par plus accrued interest to the redemption date from amounts required to be deposited in the Bond Fund.

NOTICE OF REDEMPTION . . . Not less than 30 days prior to a redemption date for the Bonds, the District shall cause a notice of redemption to be sent by United States mail, first class, postage prepaid, to the registered owners of the Bonds to be redeemed, in whole or in part, at the address of the registered owner appearing on the registration books of the Paying Agent/Registrar at the close of business on the business day next preceding the date of mailing such notice. ANY NOTICE SO MAILED SHALL BE CONCLUSIVELY PRESUMED TO HAVE BEEN DULY GIVEN, WHETHER OR NOT THE REGISTERED OWNER

RECEIVES SUCH NOTICE. NOTICE HAVING BEEN SO GIVEN, THE BONDS CALLED FOR REDEMPTION SHALL BECOME DUE AND PAYABLE ON THE SPECIFIED REDEMPTION DATE, AND NOTWITHSTANDING THAT ANY BOND OR PORTION THEREOF HAS NOT BEEN SURRENDERED FOR PAYMENT, INTEREST ON SUCH BOND OR PORTION THEREOF SHALL CEASE TO ACCRUE.

DEFEASANCE . . . The Resolution provides for the defeasance of Bonds when the payment of the principal of such Bonds, plus interest thereon to the due date thereof (whether such due date be by reason of maturity, redemption, or otherwise), is provided by irrevocably depositing with a paying agent or other authorized entity, in trust (1) money sufficient to make such payment and/or (2) Government Obligations, certified by an independent public accounting firm of national reputation to mature as to principal and interest in such amounts and at such times to ensure the availability, without reinvestment, of sufficient money to make such payment, and all necessary and proper fees, compensation and expenses of the paying agent for the Bonds. The Bonds provide that "Government Obligations" means the following obligations, which may or may not be in book-entry form (i) direct, obligations of the United States of America, including obligations that are unconditionally guaranteed by the United States of America, and which may be United States Treasury Obligations such as its State and Local Government Series, and which may be in book-entry form.

Upon such deposit as described above, such Bonds shall no longer be regarded to be outstanding or unpaid. Provided, however, the District has the option, to be exercised at the time of the defeasance of the Bonds, to call for redemption, at an earlier date, those Bonds which have been defeased to their maturity date, if the District (i) in the proceedings providing the firm banking and financial arrangements, expressly reserves the right to call the Bonds for redemption; (ii) gives notice of the reservation of that right to the owners of the Bonds immediately following the making of the firm banking and financial arrangements; and (iii) directs that notice of the reservation be included in any redemption notices that it authorizes.

AMENDMENTS . . . The District may, with the written consent of the holders of a majority in aggregate principal amount of the Bonds then outstanding, amend the provisions of the Resolution; except that, without consent of the registered owners of all of the Bonds then outstanding, no such amendment, addition or rescission may (1) make any change in the maturity of the outstanding Parity Bonds or Additional Bonds; (2) reduce the rate of interest borne by any of the outstanding Parity Bonds or Additional Bonds; (3) reduce the amount of the principal payable on the outstanding Parity Bonds or Additional Bonds; (4) modify the terms of payment of principal or interest on the outstanding Parity Bonds or Additional Bonds, or impose any conditions with respect to such payment; (5) affect the rights of the holders of less than all of the Parity Bonds and Additional Bonds then outstanding; (6) change the minimum percentage of the principal amount of Parity Bonds and Additional Bonds necessary for consent to such amendment.

BOOK-ENTRY-ONLY SYSTEM . . . *This section describes how ownership of the Bonds is to be transferred and how the principal of and interest on the Bonds are to be paid to and credited by the Depository Trust Company ("DTC") while the Bonds are registered in its nominee name. The information in this section concerning DTC and the Book-Entry-Only System has been provided by DTC for use in disclosure documents such as this Official Statement. The District believes the source of such information to be reliable, but takes no responsibility for the accuracy or completeness thereof.*

The District cannot and does not give any assurance that (1) DTC will distribute payments of debt service on the Bonds, or redemption or other notices, to DTC Participants, (2) DTC Participants or others will distribute debt service payments paid to DTC or its nominee (as the registered owner of the Bonds), or redemption or other notices, to the Beneficial Owners, or that they will do so on a timely basis, or (3) DTC will serve and act in the manner described in this Official Statement. The current rules applicable to DTC are on file with the United States Securities and Exchange Commission, and the current procedures of DTC to be followed in dealing with DTC Participants are on file with DTC.

The Depository Trust Company ("DTC"), New York, New York, will act as securities depository for the Bonds. The Bonds will be issued as fully-registered securities registered in the name of Cede & Co. (DTC's partnership nominee) or such other name as may be requested by an authorized representative of DTC. One fully-registered security certificate will be issued for the Bonds in the aggregate principal amount thereof and will be deposited with DTC.

DTC, the world's largest depository, is a limited-purpose trust company organized under the New York Banking Law, a "banking organization" within the meaning of the New York Banking Law, a member of the Federal Reserve System, a "clearing corporation" within the meaning of the New York Uniform Commercial Code, and a "clearing agency" registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934. DTC holds and provides asset servicing for over 3.5 million issues of U.S. and non-U.S. equity issues, corporate and municipal debt issues, and money market instruments (from over 100 countries) that DTC's participants ("Direct Participants") deposit with DTC. DTC also facilitates the post-trade settlement among Direct Participants of sales and other securities transactions in deposited securities, through electronic computerized book-entry transfers and pledges between Direct Participants' accounts. This eliminates the need for physical movement of securities certificates. Direct Participants include both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, clearing corporations, and certain other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation ("DTCC"). DTCC is the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others such as both U.S. and non-U.S. securities brokers and dealers, banks, trust

companies, and clearing corporations that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly ("Indirect Participants"). DTC has a Standard & Poor's rating of "AA+". The DTC Rules applicable to its Participants are on file with the Securities and Exchange Commission. More information about DTC can be found at www.dtcc.com.

Purchases of Bonds under the DTC system must be made by or through Direct Participants, which will receive a credit for the Bonds on DTC's records. The ownership interest of each actual purchaser of each Bond ("Beneficial Owner") is in turn to be recorded on the Direct and Indirect Participants' records. Beneficial Owners will not receive written confirmation from DTC of their purchase, but Beneficial Owners are expected to receive written confirmations providing details of the transactions, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the Beneficial Owners entered into the transaction. Transfers of ownership interest in the Bonds are to be accomplished by entries made on the books of Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in the Bonds, except in the event that use of the book-entry system for the Bonds is discontinued.

To facilitate subsequent transfers, all Bonds deposited by Direct Participants with DTC are registered in the name of DTC's partnership nominee, Cede & Co., or such other name as may be requested by an authorized representative of DTC. The deposit of Bonds with DTC and their registration in the name of Cede & Co. or such other DTC nominee do not effect any change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of the Bonds; DTC's records reflect only the identity of the Direct Participant to whose account such Bonds are credited, which may or may not be the Beneficial Owners. The Participants will remain responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants, and by Direct Participants and Indirect Participants to Beneficial Owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time.

Redemption notices shall be sent to DTC. If less than all of the Bonds within an issue are being redeemed, DTC's practice is to determine by lot the amount of the interest of each Direct Participant in such issue to be redeemed.

Neither DTC nor Cede & Co. will consent or vote with respect to the Bonds unless authorized by a Direct Participant in accordance with DTC's procedures. Under its usual procedures, DTC mails an Omnibus Proxy to the District as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.'s consenting or voting rights to those Direct Participants to whose accounts the Bonds are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Payments on the Bonds will be made to DTC. DTC's practice is to credit Direct Participants' accounts, upon DTC's receipt of funds and corresponding detail information from the District or the Paying Agent/Registrar on payable dates in accordance with their respective holdings shown on DTC's records. Payments by Participants to Beneficial Owners will be governed by standing instructions and customary practices, as in the case with securities held for the accounts of customers in bearer form or registered in "street name," and will be the responsibility of such Participant and not of DTC, the Paying Agent or the District, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment to DTC is the responsibility of the District, disbursement of such payments to Direct Participants shall be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners shall be the responsibility of Direct and Indirect Participants.

DTC may discontinue providing its services as securities depository with respect to the Bonds at any time by giving reasonable notice to the District and the Paying Agent/Registrar. Under such circumstances, in the event that a successor securities depository is not obtained, Bond certificates are required to be printed and delivered.

The District may decide to discontinue use of the system of book-entry transfers through DTC (or a successor securities depository). In that event, Bonds will be printed and delivered.

Use of Certain Terms in Other Sections of this Official Statement. In reading this Official Statement it should be understood that while the Bonds are in the Book-Entry-Only System, references in other sections of this Official Statement to registered owners should be read to include the person for which the Participant acquires an interest in the Bonds, but (i) all rights of ownership must be exercised through DTC and the Book-Entry-Only System, and (ii) except as described above, notices that are to be given to registered owners under the Resolution will be given only to DTC.

Information concerning DTC and the Book-Entry-Only System has been obtained from DTC and is not guaranteed as to accuracy or completeness by, and is not to be construed as a representation by the District, the Financial Advisor or the Underwriters.

Effect of Termination of Book-Entry-Only System. In the event the Book-Entry-Only System with respect to the Bonds is discontinued by DTC, or the use of the Book-Entry-Only System with respect to the Bonds is discontinued by the District, printed bond certificates will be issued to the respective holders of the Bonds, as the case may be, and the respective Bonds will be subject to transfer, exchange, and registration provisions as set forth in the Resolution, summarized under "Transfer, Exchange, and Registration" below.

PAYING AGENT/REGISTRAR . . . The initial paying agent/registrar is The Bank of New York Mellon Trust Company, National Association, Dallas, Texas (the "Paying Agent/Registrar"). In the Resolution, the District retains the right to replace the Paying Agent/Registrar. The District covenants to maintain and provide a Paying Agent/Registrar at all times until the Bonds are duly paid and any successor Paying Agent/Registrar shall be a commercial bank or trust company organized under the laws of the State of Texas or other entity duly qualified and legally authorized to serve as and perform the duties and services of Paying Agent/Registrar for the Bonds. Upon any change in the Paying Agent/Registrar for the Bonds, the District agrees to promptly cause a written notice thereof to be sent to each registered owner of the Bonds by United States mail, first class, postage prepaid, which notice shall also give the address of the new Paying Agent/Registrar.

TRANSFER, EXCHANGE AND REGISTRATION . . . In the event the Book-Entry-Only System should be discontinued, the Bonds may be transferred and exchanged on the registration books of the Paying Agent/Registrar only upon presentation and surrender to the Paying Agent/Registrar and such transfer or exchange shall be without expense or service charge to the registered owner, except for any tax or other governmental charges required to be paid with respect to such registration, exchange and transfer. Bonds may be assigned by the execution of an assignment form on the respective Bonds or by other instrument of transfer and assignment acceptable to the Paying Agent/Registrar. New Bonds will be delivered by the Paying Agent/Registrar, in lieu of the Bonds being transferred or exchanged, at the designated office of the Paying Agent/Registrar, or sent by United States mail, first class, postage prepaid, to the new registered owner or his designee. To the extent possible, new Bonds issued in an exchange or transfer of Bonds will be delivered to the registered owner or assignee of the registered owner in not more than three business days after the receipt of the Bonds to be canceled, and the written instrument of transfer or request for exchange duly executed by the registered owner or his duly authorized agent, in form satisfactory to the Paying Agent/Registrar. New Bonds registered and delivered in an exchange or transfer shall be in any integral multiple of \$5,000 for any one maturity and for a like aggregate principal amount as the Bonds surrendered for exchange or transfer. See "Book-Entry-Only System" herein for a description of the system to be utilized initially in regard to ownership and transferability of the Bonds. Neither the District nor the Paying Agent/Registrar shall be required to transfer or exchange any Bond called for redemption (i) during the period commencing with the close of business on any Record Date and ending with the opening of business on the next following principal or interest payment date, or by (ii) with respect to any Bond or portion thereof called for redemption within 45 days prior to its redemption date.

RECORD DATE FOR INTEREST PAYMENT . . . The record date ("Record Date") for the interest payable on the Bonds on any interest payment date means the close of business on the 15th day of the preceding month.

BONDHOLDERS' REMEDIES . . . The Resolution does not establish specific events of default with respect to the Bonds. Under State law and the Resolution, there is no right to the acceleration of maturity of the Bonds upon the failure of the District to observe any covenant under the Resolution. No assurance can be given that a mandamus or other legal action to enforce a remedy under the Resolution would be successful. The enforcement of any such remedy may be difficult and time consuming. The Resolution does not provide for the appointment of a trustee to represent the interests of the bondholders upon any failure of the District to perform in accordance with the terms of the Resolution, or upon any other condition. Furthermore, the District is eligible to seek relief from its creditors under Chapter 9 of the U.S. Bankruptcy Code. Although Chapter 9 provides for the recognition of a security interest represented by a specifically pledged source of revenues, the pledge of contract revenues of a bankrupt entity is not specifically recognized as a security interest under Chapter 9. Chapter 9 also includes an automatic stay provision that would prohibit, without Bankruptcy Court approval, the prosecution of any other legal action by creditors or bondholders of an entity which has sought protection under Chapter 9. Therefore, should the District avail itself of Chapter 9 protection from creditors, the ability to enforce the remedies under the Resolution would be subject to the approval of the Bankruptcy Court (which could require that the action be heard in Bankruptcy Court instead of other federal or state courts); and the Bankruptcy Code provides for broad discretionary powers of a Bankruptcy Court in administering any proceeding brought before it. The District may not be placed into bankruptcy involuntarily. The opinion of Bond Counsel will note that all opinions relative to the enforceability of the Resolution and the Bonds are qualified with respect to the customary rights of debtors relative to their creditors. In addition, based on recent Texas Court decisions, it is unclear whether statutory language authorizing local governments such as the District to sue and be sued has effectively waived the local governments immunity from suits for money damages. Further, while such decisions also could affect the ability of a registered owner to seek specific performance of a covenant made by Member City under the Contracts or by the District in the Resolution or other bond document, the remedy of mandamus has not been at issue in these cases.

WATER CONTRACTS

Revenues of the Water System are derived from payments to the District under water purchase contracts with Member Cities and other customers and other funds pledged under the Resolution. The aforementioned are the only source of revenues for the payment of debt service on the Bonds. Except as otherwise indicated, capitalized terms used in this section have the same meanings assigned to such terms in the Amendatory Contract (as herein defined).

The District initially entered into eleven separate treated water supply contracts with its original eleven Member Cities (the "Initial Contracting Parties"), whereby the District agreed and assumed the responsibility to deliver to such cities treated water in the volume contracted for, to the extent water is available in the Lavon Reservoir located on the East Fork of the Trinity River in Collin County.

It was determined and acknowledged that the existing water supply in Lavon Reservoir was inadequate to provide the estimated future treated water supply requirements of the Initial Contracting Parties and others beyond approximately the year 1992. Therefore, the District entered into a single "Regional Water Supply Facilities Amendatory Contract" (the "Amendatory Contract") with the Initial Contracting Parties, dated and effective August 1, 1988, enabling the District to acquire and construct additional treated water supply and water treatment facilities necessary to accommodate projected long-term requirements.

Pursuant to the Amendatory Contract the District has acquired, constructed and completed, as needed, additional water supplies, transportation and treatment facilities at Lake Texoma on the Red River in Grayson County, Jim Chapman Dam and Reservoir on the Sulphur River in Hopkins and Delta Counties; on the East Fork of the Trinity River in Kaufman County and at Lake Tawakoni on the Sabine River in Grayson County, and proposes to acquire, construct and develop, as needed, other facilities wherever located to enable the District to supply treated water as needed to Contracting Parties and others (collectively, the "Projects").

None of the amendments or modifications to the separate aforesaid water supply contracts with the Initial Contracting Parties which have occurred as a result of entering into the Amendatory Contract has in any way had an adverse effect on the operation of the System or the rights of the owners of any Bonds, as the Amendatory Contract provides security for the Bonds and obligates the Initial Contracting Parties to make and assume unconditional, specific payments with respect to the System and the Bonds. The provisions of the Amendatory Contract are similar in concept, essence and intent to the provisions of the aforesaid separate contracts and basically restate, reorganize, and expand same, including certain clarifications and updating. The Amendatory Contract, dated and effective on August 1, 1988, supersedes all of the contracts, agreements and arrangements between each of the Initial Contracting Parties with respect to the System, treated water from the System and the Bonds, and constitutes the sole agreement between the parties thereto as of the date of this Official Statement.

The City of Allen entered into a "Regional Water Supply Facilities Contract" dated as of October 1, 1998 (the "Allen Contract") with the District and the City of Frisco entered into a "Regional Water Supply Facilities Contract" dated October 1, 2001 (the "Frisco Contract") with the District. Both contracts are substantially similar to the Amendatory Contract. The Amendatory Contract, the Allen Contract and the Frisco Contract are sometimes herein referred to collectively, as the "Member Cities Contract" or the "Contracts". The Initial Contracting parties, the City of Allen, and the City of Frisco are sometimes herein referred to collectively as the "Contracting Parties" or the "Member Cities".

The Contracts shall continue in force and effect until all Bonds and all interest thereon shall have been paid or provided for, and thereafter shall continue in force and effect during the entire useful life of the System. It is the intention of the Contracting Parties and the District that the System shall be the sole and exclusive source of all treated water supply for each of the Contracting Parties and the District will use its best efforts to furnish and remain in position to furnish treated water sufficient for all reasonable treated water requirements of each Contracting Party, but its obligation shall be limited to the amount of treated water available to the System, and provided that the maximum rate of delivery shall be consistent with the capacities and capabilities of System facilities and shall not exceed the amounts fixed on an equitable and uniform basis by the District's Board of Directors.

As among the Contracting Parties, if water from the System must be rationed such rationing shall, within the limits permitted by law, be done by the District on the basis of the relative actual total amount of all treated water from the entire System taken by each Contracting Party, respectively, during the last preceding Annual Payment Period in which rationing was not necessary. However, any reduction in the amount of delivery of water will not relieve each of the Contracting Parties of the obligation to pay its proportionate share of the Annual Payment sufficient to pay District's operating and maintenance expenses and to satisfy all financial obligations under any Resolution or indenture relating to bonds, including the Bonds.

For the purpose of calculating the amount of each Annual Requirement for which each Contracting Party is unconditionally liable, without offset or deduction, each Contracting Party during each Annual Payment Period shall be deemed to have taken and used the minimum annual average daily amount of System treated water specified for such Contracting Party as follows (the greater of):

15.310 MGD for the City of Allen	73.205 MGD for the City of Plano
.768 MGD for the City of Farmersville	1.122 MGD for the City of Princeton
4.455 MGD for the City of Forney	30.190 MGD for the City of Richardson
26.041 MGD for the City of Frisco	8.998 MGD for the City of Rockwall
37.594 MGD for the City of Garland	1.288 MGD for the City of Royse City
27.810 MGD for the City of McKinney	4.717 MGD for the City of Wylie
22.733 MGD for the City of Mesquite	

or (1) the maximum number of MGD actually taken from the System by such Contracting Party during any previous Water Year during the term of the Contracts; it being agreed and understood that any use of System water in any Water Year by any Contracting Party in excess of (i) the minimum amount specified for it, above, or (ii) as determined in accordance with this clause (2), will establish a new minimum amount to be effective for the next following Annual Payment Period and thereafter until any previously increased minimum amount is further exceeded in any subsequent Water Year, with each such increase in minimums to be effective for the next following Annual Payment Period.

All payments by each Contracting Party are to be made solely from the revenues of its combined waterworks and sewer system, and such payments constitute operating expenses of its combined waterworks and sewer system. Each Contracting Party agrees in the Contracts to fix and collect such rates and charges for water and sewer services to be supplied by its combined waterworks and sewer system as will produce revenues in an amount equal to at least (i) all of its payments under the Contracts and (ii) all other amounts required to be paid from said revenues by law and the provisions of the ordinances or Resolution authorizing its revenue bonds or other obligations now or hereafter outstanding.

Each Contracting Party's share of the Annual Requirement shall be redetermined, after consultation with each Contracting Party, at any time during any Annual Payment Period, to the extent deemed necessary or advisable by the District, if: (i) the District commences supplying System treated water to any Additional Contracting Parties; (ii) unusual, extraordinary, or unexpected expenditures for Operation and Maintenance Expenses are required which are not provided for in the District's Annual Budget for the System or in any Bond Resolution; (iii) Operation and Maintenance Expenses are substantially less than estimated; (iv) the District issues bonds which require an increase in the Bond Service Component of the Annual Payment; or (v) the District receives either significantly more or significantly less revenues or other amounts than those anticipated.

THE DISTRICT'S WATER SYSTEM

The District currently provides water service to areas having an estimated population in excess of 1,600,000, including the 13 Member Cities, 33 other area customer cities and water supply corporations. The average daily requirement of the District's water customers during the 2014-15 water year was 219 MGD. Existing transmission system and treatment facilities have a capacity of 807 MGD.

EXISTING WATER SUPPLY

Lake Lavon ("Lavon"). The District's water supply is currently obtained from Lavon located on the East Fork of the Trinity River approximately 60 miles north of its confluence with the main stem of the Trinity River and about 25 miles northeast of the City of Dallas. Lavon was constructed and is owned by the United States Army Corps of Engineers (the "USACE") and the District's access to the water storage capacity of the reservoir exists pursuant to a contract with the USACE executed on March 16, 1954 and amended on May 12, 1967. The District owns storage and utilization rights to the entire conservation pool in Lavon, consisting of 380,000 acre feet of storage, and a Texas Commission on Environmental Quality ("TCEQ") Water Right Permit for 118,670 acre-feet per year, which provides a safe daily yield of approximately 103 MGD. The District also has the right to divert and reuse up to 64 MGD of water discharged to Lavon from the District's Wilson Creek wastewater treatment plant.

Lake Texoma. On August 7, 1985, the District issued Water System Revenue Bonds for the construction of and development of an intake structure, pump station, pipeline and other facilities necessary to divert 75 MGD of raw water from Lake Texoma in Grayson County, approximately 50 miles north of Lake Lavon. A Clean Water Act Section 404 Permit to utilize 75,000 acre-feet of storage space in Lake Texoma for municipal and industrial use was also issued by the USACE, and the District has received permits from the TCEQ to divert and transport the Texoma water to its water treatment plant located in Wylie, Texas. On April 26, 2010, the District executed a contract with the USACE for an additional 100,000 acre feet of storage in Lake Texoma and received a Water Right Permit from the TCEQ to divert and transport an additional 101 MGD of raw water from Lake Texoma.

Lake Jim Chapman. The District has contracted with the USACE for approximately 37% of the storage capacity of Lake Jim Chapman which provides the District a safe yield of approximately 45 MGD. Completion and deliberate impoundment of the

lake occurred on September 28, 1991. Construction of the intake, pump station and pipeline facilities to transport water to Lavon was completed in late 1995.

East Fork Raw Water Supply Project. In April 2006, the District issued Water System Revenue Bonds to construct a 2,000 acre wetlands, diversion pump station, conveyance pump station, 40 miles of conveyance pipeline and related facilities to reclaim up to 90 MGD of the District's return flows from the East Fork of the Trinity River which is pumped back into Lavon. The project was completed in 2008.

Lake Tawakoni Raw Water Project. In October 2005, the District entered into a contract with the Sabine River Authority (SRA) for the purchase of 40,000 acre-feet per annum of raw water from Lake Tawakoni. Pursuant to the contract, the District also has the option to purchase any additional raw water that SRA may have available. In November 2006, the District issued Water System Revenue Bonds to construct approximately 30 miles of pipeline and two 75 MGD pump stations to convey raw water from Lake Tawakoni to Lavon. The project was completed in 2008.

FUTURE WATER SUPPLY

The District continues to plan and develop additional resources to meet the needs of its service area. At this time the District is actively pursuing many options for development of additional supplies including construction of the Trinity Main Stem Pump Station and Raw Water Pipeline. This project is planned to provide an additional 50 MGD of reclaimed water to the East Fork Raw Water Supply Project and is scheduled to be in service in 2018. The District is also pursuing the Lower Bois D'Arc Creek Reservoir in Fannin County. The reservoir is projected to supply an additional 108 MGD and is currently scheduled to be in service in 2022.

RAW WATER TREATMENT AND DISTRIBUTION FACILITIES

The District's Wylie raw water transmission facilities consist of three raw water pump stations and six raw water pipelines, which deliver water from Lavon to treatment plants. The pump stations have a total of 17 pumps with a combined total of 19,500 horsepower. Raw water is delivered to raw water pump stations No. 1 and 2 from Lavon through an intake structure and 60" diameter pipeline, and an intake structure and 10' by 10' conduit respectively. Raw Water Pump Station No. 3 pumps directly from Lake Lavon from an open wet well constructed below the ground level of the pump station. Raw water pumps have a combined capacity in excess of 940 MGD.

Raw water treatment facilities include four treatment plants located at the primary plant site in Wylie, Texas, with a combined treatment capability of 770 MGD, one 30 MGD treatment plant located near Lake Tawakoni and one 7 MGD treatment plant located in Bonham, Texas. Pertinent features of the treatment facilities include chemical buildings with storage and chemical feeders, rapid mix basins, flocculation and sedimentation basins, dual media filters, high service pump stations, clearwell storage, remote control facilities and residuals lagoons.

Treated water distribution facilities include high service pump stations at the treatment plants, a network of pipelines from the treatment plant to Member Cities and customers, storage reservoirs and booster pump stations at various points in the system. The District owns and operates treated water storage reservoirs with a combined capacity of 410,000,000 gallons.

OTHER DISTRICT SYSTEMS

In addition to its Water System, the District, in cooperation with certain area cities, has established and implemented the Trinity East Fork Regional Wastewater System, the Upper East Fork Wastewater Interceptor System, the Stewart Creek Regional Wastewater System, Muddy Creek Regional Wastewater System, Sabine Creek Regional Wastewater System, Panther Creek Regional Wastewater System, Lower East Fork Wastewater Interceptor System, and the Regional Solid Waste Disposal System wherein the District, pursuant to contracts and other agreements, has accepted the responsibility to design, acquire, construct, complete, operate, maintain, and from time to time enlarge, improve and expand the systems to provide facilities to adequately receive, transport, treat and dispose of wastewater and solid waste of such cities and future additional member cities. These Regional Systems were created, exist and operate as completely separate and independent Regional Systems, and except for moderate cost-sharing enterprises, the financial transactions and other activities associated with the operation and maintenance of each system are kept separate and apart, and are not in any manner commingled or connected with any of the other systems. Revenues from the Trinity East Fork Regional Wastewater System, the Upper East Fork Regional Wastewater Interceptor System, the Stewart Creek Regional Wastewater System, Muddy Creek Regional Wastewater System, Sabine Creek Regional Wastewater System, Panther Creek Regional Wastewater System, Lower East Fork Wastewater Interceptor System, and the Regional Solid Waste Disposal System are not pledged to the payment of the Bonds.

HISTORICAL OPERATING INFORMATION

The following table presents financial information for the Water System of the District for each fiscal year ended September 30, 2011 through September 30, 2015. Excluded from this data are revenues and expenses of the District not related to the Water System, and therefore the figures below exclude the revenues and expenses of any other System of the District. This selected information has been prepared to summarize the revenues, expenses and amount available to pay debt service historically generated from the Water System. The financial statements of the District for the year ended September 30, 2015, appear in Appendix A hereto.

TABLE 1 - WATER SYSTEM SCHEDULE OF SELECTED OPERATING DATA

	Fiscal Year Ended September 30,				
	2015	2014	2013	2012	2011
Revenues					
Water Sales	\$ 215,871,181	\$ 197,954,585	\$ 184,641,152	\$ 161,588,387	\$ 148,712,453
Interest Income	1,396,948	513,007	894,079	1,429,167	1,627,297
Other	4,676,344	7,100,198	4,417,036	7,951,978	5,433,917
	<u>\$ 221,944,473</u>	<u>\$ 205,567,790</u>	<u>\$ 189,952,267</u>	<u>\$ 170,969,532</u>	<u>\$ 155,773,667</u>
Expenses ⁽¹⁾					
Maintenance and Operation	\$ 90,107,624	\$ 96,087,668 ⁽²⁾	\$ 77,927,881	\$ 72,661,331	\$ 72,425,807
US Government Contract	2,458,600	2,458,601	2,458,600	2,458,601	2,991,805
	<u>\$ 92,566,224</u>	<u>\$ 98,546,269</u>	<u>\$ 80,386,481</u>	<u>\$ 75,119,932</u>	<u>\$ 75,417,612</u>
Net Available for Debt Service	<u>\$ 129,378,249</u>	<u>\$ 107,021,521</u>	<u>\$ 109,565,786</u>	<u>\$ 95,849,600</u>	<u>\$ 80,356,055</u>
Water System Revenue Bonds Outstanding (as of 8-1-16) ⁽³⁾					\$ 1,384,325,000
Average Annual Principal and Interest Requirements, 2017-2045 ⁽³⁾					\$ 75,140,390
Coverage of Average Annual Principal and Interest Requirements by 9-30-15 Net Available for Debt Service					1.73 times
Maximum Annual Principal and Interest Requirements, 2019 ⁽³⁾					\$ 113,225,229
Coverage of Maximum Annual Principal and Interest Requirements by 9-30-15 Net Available for Debt Service					1.15 times
Interest and Sinking Fund (as of 9-1-16)					\$ 8,098,668
Contingency Fund (as of 9-1-16)					\$ 18,926,019
Reserve Fund (as of 9-1-16)					\$ 73,685,677

(1) Excludes depreciation.

(2) Increase due to additional power and chemical costs.

(3) Includes the Bonds; does not include the Refunded Obligations.

PENSION PLAN

The District provides pension benefits for all of its eligible full-time employees through an Aetna Life Insurance Company group pension defined benefit fund contract (the "Plan"). The District's annual minimum contribution is actuarially calculated based on the amount required to prevent the unfunded accrued liability from increasing. The contribution is determined using the projected unit cost method. The significant actuarial assumptions used to compute the actuarially determined contribution requirement are the same as those used to compute the pension benefit obligation. As of January 1, 2015, the unfunded actuarial accrued liability of the District was \$20,658,405, with a funded ratio (ratio of assets to accrued liabilities) of 74.96%. The unfunded actuarial accrued liability is amortized over a period of 30 years. Employees make no contributions to the Plan. For the Plan years ended December 31, 2010, 2011, 2012, 2013 and 2014 the District made contributions of \$3,345,000, \$3,925,000, \$5,022,000, \$4,945,000 and \$5,595,000 respectively. See "APPENDIX A – EXCERPTS FROM THE ANNUAL FINANCIAL REPORT – Note 9 – Retirement Plan" for a more detailed discussion of the Plan.

OTHER POST-EMPLOYMENT BENEFITS

The District provides other post-employment benefits ("OPEB") in the form of health and dental insurance benefits for certain retirees and their spouses up to age 65. These benefits are funded 100 percent by the District for the currently eligible retirees and their spouses. The District has established an irrevocable trust fund to accumulate assets for the payment of future OPEB benefits. For fiscal year 2015, the District contributed \$1,246,083 to the program. See "APPENDIX A – EXCERPTS FROM THE ANNUAL FINANCIAL REPORT", Note 13 – Other Postemployment Benefits.

TABLE 2 – FISCAL YEAR END 2015 WATER SALES

	Payment	% of Total
Allen ⁽¹⁾	\$ 11,526,433	5.34%
Farmersville ⁽¹⁾	515,054	0.24%
Forney ⁽¹⁾	3,254,110	1.51%
Frisco ⁽¹⁾	19,405,423	8.99%
Garland ⁽¹⁾	25,901,319	12.00%
McKinney (Nos. 1-3) ⁽¹⁾	20,322,537	9.42%
Mesquite ⁽¹⁾	15,595,969	7.23%
Plano ⁽¹⁾	50,563,812	23.43%
Princeton ⁽¹⁾	950,916	0.44%
Richardson ⁽¹⁾	20,750,908	9.61%
Rockwall ⁽¹⁾	6,267,068	2.90%
Royse City ⁽¹⁾	1,047,690	0.49%
Wylie ⁽¹⁾	3,380,185	1.57%
Ables Springs	159,516	0.07%
Bonham	1,350,400	0.63%
Caddo Basin SUD	653,450	0.30%
Cash SUD	615,368	0.29%
College Mound WSC	124,856	0.06%
Copeville WSC	179,304	0.08%
East Fork SUD	760,319	0.35%
Fairview	1,763,238	0.82%
Fate	468,583	0.22%
Fate #2	1,117,146	0.52%
Forney Lake WSC	653,149	0.30%
Gasonia-Scurry WSC	202,526	0.09%
GTUA	500,598	0.23%
Josephine	115,279	0.05%
Kaufman	936,063	0.43%
Kaufman Four One	1,062,410	0.49%
Lavon SUD	451,336	0.21%
Little Elm	2,431,249	1.13%
Lucas	1,214,612	0.56%
Melissa	503,587	0.23%
Milligan WSC	284,334	0.13%
Mt. Zion WSC	294,536	0.14%
Murphy	2,729,333	1.26%
Nevada WSC	88,500	0.04%
Nevada WSC #2	149,778	0.07%
North Collin WSC	690,699	0.32%
Parker	1,038,202	0.48%
Prosper	1,929,288	0.89%
Rose Hill SUD	302,302	0.14%
Rowlett	6,208,457	2.88%
Sachse (Nos. 1-2)	2,595,216	1.20%
Seis Lagos MUD	227,359	0.11%
Sunnyvale	1,183,127	0.55%
Terrell	2,954,000	1.37%
Wylie NE SUD	399,681	0.19%
Total 2015 Water Sales	\$ 215,819,225	100.00%

(1) Member Cities.

TABLE 3 - PRICE AND TERMS - EXISTING WATER CONTRACTS

Member Cities	2015-2016 Water Rates			
	Annual Minimum 1,000/Gallons	Rate Per 1,000/Gallons	Annual Minimum Charge	Excess Water Rate 1,000/Gallons
Allen	6,011,208	\$2.29	\$ 13,765,666	\$0.41
Farmersville	280,467	\$2.29	642,269	\$0.41
Forney	1,625,905	\$2.29	3,723,322	\$0.41
Frisco	9,977,663	\$2.29	22,848,848	\$0.41
Garland	13,721,955	\$2.29	31,423,277	\$0.41
McKinney	10,150,735	\$2.29	23,245,183	\$0.41
Mesquite	8,297,666	\$2.29	19,001,655	\$0.41
Plano	26,719,809	\$2.29	61,188,363	\$0.41
Princeton	485,886	\$2.29	1,112,679	\$0.41
Richardson	11,019,311	\$2.29	25,234,222	\$0.41
Rockwall	3,330,881	\$2.29	7,627,717	\$0.41
Royse City	526,912	\$2.29	1,206,628	\$0.41
Wylie	1,721,763	\$2.29	3,942,837	\$0.41
Total Member Cities	93,870,161		214,962,669	
Customer Cities				
Ables Springs WSC	75,600	\$2.34	\$ 176,904	\$0.46****
Bonham	640,000	\$2.29**	1,465,600	*
Caddo Basin SUD	321,512	\$2.34	752,338	\$0.46
Cash SUD	305,643	\$2.34	715,205	\$0.46
College Mound WSC	66,769	\$2.34	156,239	\$0.46
Copeville WSC	88,587	\$2.34	207,294	*
East Fork SUD	379,152	\$2.34	887,216	\$0.46
Fairview	887,811	\$2.34	2,077,478	\$0.46
Fate	279,932	\$2.34	655,041	\$0.46
Fate No. 2	529,453	\$2.34	1,238,920	*
Forney Lake WSC	329,424	\$2.34	770,852	\$0.46
Gastonia-Scurry WSC	110,490	\$2.34	258,547	\$0.46
GTUA	237,250	\$2.34	555,165	*
Josephine	57,407	\$2.34	134,332	\$0.46
Kaufman	459,989	\$2.34	1,076,374	***
Kaufman Four-One	528,801	\$2.34	1,237,394	\$0.46
Lavon WSC	225,073	\$2.34	526,671	\$0.46
Little Elm	1,176,245	\$2.34	2,752,413	*
Lucas	628,590	\$2.34	1,470,901	\$0.46
Melissa	244,431	\$2.34	571,969	\$0.46
Milligan WSC	149,894	\$2.34	350,752	*
Mt. Zion WSC	159,302	\$2.34	372,767	\$0.46
Murphy	1,384,066	\$2.34	3,238,714	\$0.46
Nevada WSC	47,179	\$2.34	110,399	\$0.46
Nevada WSC No. 2	70,985	\$2.34	166,105	*
North Collin WSC	346,058	\$2.34	809,776	\$0.46
Parker	533,654	\$2.34	1,248,750	\$0.46
Prosper	923,205	\$2.34	2,160,300	***
Rose Hill SUD	143,271	\$2.34	335,254	*
Rowlett	3,192,039	\$2.34	7,469,371	*
Sachse	1,332,153	\$2.34	3,117,238	\$0.46
Seis Lagos MUD	112,806	\$2.34	263,966	\$0.46
Sunnyvale	595,071	\$2.34	1,392,466	*
Terrell	1,400,000	\$2.34	3,276,000	*
Wylie N.E. WSC	197,289	\$2.34	461,656	\$0.46
Total Customer Cities	18,159,131		\$ 42,460,367	
Grand Total	112,029,292		\$ 257,423,035	

* Excess Water Rates Subject to Contract Minimums.
 ** Pays Member Rate.
 *** Water consumed over Minimum Annual Demand shall be charged at a rate of \$2.34/1,000 gallons.
 **** Water consumed over 365,000,000 gallons shall be charged at a rate of \$2.34/1,000 gallons

DEBT INFORMATION

TABLE 4 - DEBT SERVICE REQUIREMENTS

Fiscal Year Ending 9/30	Outstanding Debt ⁽¹⁾			The Bonds ⁽²⁾			Total Outstanding Debt	% of Principal Retired
	Principal	Interest	Total	Principal	Interest	Total		
2017	\$ 42,225,000	\$ 50,773,693	\$ 92,998,693	\$ 7,965,000	\$ 11,298,291	\$ 19,263,291	\$ 112,261,984	
2018	44,100,000	48,846,392	92,946,392	4,490,000	14,769,850	19,259,850	112,206,242	
2019	44,360,000	46,910,079	91,270,079	7,320,000	14,635,150	21,955,150	113,225,229	
2020	46,215,000	44,931,877	91,146,877	7,545,000	14,415,550	21,960,550	113,107,427	14.75%
2021	47,330,000	42,723,462	90,053,462	7,770,000	14,189,200	21,959,200	112,012,662	
2022	46,355,000	40,430,948	86,785,948	8,000,000	13,956,100	21,956,100	108,742,048	
2023	49,345,000	38,169,936	87,514,936	8,240,000	13,716,100	21,956,100	109,471,036	
2024	51,580,000	35,741,495	87,321,495	8,485,000	13,468,900	21,953,900	109,275,395	
2025	49,185,000	33,217,551	82,402,551	8,745,000	13,214,350	21,959,350	104,361,901	35.34%
2026	51,450,000	30,802,261	82,252,261	9,010,000	12,952,000	21,962,000	104,214,261	
2027	53,895,000	28,251,007	82,146,007	9,455,000	12,501,500	21,956,500	104,102,507	
2028	53,730,000	25,932,862	79,662,862	9,930,000	12,028,750	21,958,750	101,621,612	
2029	55,145,000	23,198,173	78,343,173	10,440,000	11,532,250	21,972,250	100,315,423	
2030	56,820,000	20,431,252	77,251,252	10,960,000	11,010,250	21,970,250	99,221,502	58.52%
2031	60,550,000	18,124,979	78,674,979	11,505,000	10,462,250	21,967,250	100,642,229	
2032	63,495,000	15,286,071	78,781,071	12,080,000	9,887,000	21,967,000	100,748,071	
2033	40,450,000	12,434,233	52,884,233	12,685,000	9,283,000	21,968,000	74,852,233	
2034	42,275,000	10,360,929	52,635,929	13,315,000	8,648,750	21,963,750	74,599,679	
2035	38,925,000	8,194,328	47,119,328	14,000,000	7,983,000	21,983,000	69,102,328	80.86%
2036	23,700,000	6,121,307	29,821,307	14,715,000	7,283,000	21,998,000	51,819,307	
2037	17,890,000	4,804,478	22,694,478	15,470,000	6,547,250	22,017,250	44,711,728	
2038	18,650,000	3,823,136	22,473,136	16,255,000	5,773,750	22,028,750	44,501,886	
2039	19,440,000	2,800,865	22,240,865	10,390,000	4,961,000	15,351,000	37,591,865	
2040	13,345,000	1,736,154	15,081,154	10,910,000	4,441,500	15,351,500	30,432,654	92.47%
2041	6,095,000	1,050,800	7,145,800	11,455,000	3,896,000	15,351,000	22,496,800	
2042	6,400,000	807,000	7,207,000	12,030,000	3,323,250	15,353,250	22,560,250	
2043	6,720,000	551,000	7,271,000	12,630,000	2,721,750	15,351,750	22,622,750	
2044	7,055,000	282,200	7,337,200	13,260,000	2,090,250	15,350,250	22,687,450	
2045	-	-	-	13,925,000	1,427,250	15,352,250	15,352,250	98.94%
2046	-	-	-	14,620,000	731,000	15,351,000	15,351,000	100.00%
	<u>\$ 1,056,725,000</u>	<u>\$ 596,738,469</u>	<u>\$ 1,653,463,469</u>	<u>\$ 327,600,000</u>	<u>\$ 273,148,241</u>	<u>\$ 600,748,241</u>	<u>\$ 2,254,211,710</u>	

(1) Does not include the Refunded Obligations, and does not reflect receipt of subsidy payments for outstanding "Build America Bonds." Preliminary, subject to change.

(2) Average life of the issue – 17.095 Years. Interest on the Bonds has been calculated at the average rate of 3.51% for purposes of illustration. Preliminary, subject to change.

ANTICIPATED ISSUANCE OF DEBT . . . The District does not anticipate issuing additional Water System Revenue debt within the ensuing 12 month period.

SUMMARY OF CERTAIN PROVISIONS OF THE BOND RESOLUTION

The following statements summarize certain portions of the Bond Resolution to be adopted by the Board of Directors authorizing the issuance, sale and delivery of the Bonds and do not purport to be comprehensive or definitive and are qualified in their entirety by reference to the Resolution.

ADDITIONAL DEFINITIONS. As used in the Resolution the following terms shall have the meanings set forth below, unless the text hereof specifically indicates otherwise:

ADDITIONAL DEFINITIONS. That was used in the Resolution the following terms shall have the meanings set forth below, unless the text hereof specifically indicates otherwise:

The term "Additional Bonds" shall mean the additional parity revenue bonds permitted to be authorized in the future in this Resolution.

The term "Board" shall mean the Board of Directors of the Issuer, being the governing body of the Issuer, and it is further resolved that the declarations and covenants of the Issuer contained in the Resolution are made by, and for and on behalf of the Board and the Issuer, and are binding upon the Board and the Issuer for all purposes.

The terms "Bond Resolution" and "Resolution" mean the resolution authorizing the Bonds.

The term "Bonds" means collectively the Initial Bond as described and defined in the Resolution, and all substitute bonds exchanged therefor as well as all other substitute and replacement bonds issued pursuant to this Resolution.

The term "Contracts" shall mean collectively: (a) the original separate water supply contracts between the Issuer and each of the current Member Cities, respectively, and all amendments thereto, with each of said contracts initially having been authorized at elections held in each of the current Member Cities, respectively, on December 5, 1953, except for (i) such contract with the City of Richardson, which is dated April 7, 1965, and was amended on July 2, 1973, and modified in October, 1973, (ii) such contract with the City of Allen, Texas, which is dated as of October 1, 1998 (the "Allen Contract"), and (iii) such contract with the City of Frisco, Texas, which is dated as of October 1, 2001 (the "Frisco Contract"), as all of said contracts (except the Allen Contract and the Frisco Contract, which have not been amended or modified since the respective dates thereof), as amended, have been further amended, modified, combined, consolidated, and wholly replaced by a single "North Texas Municipal Water District Regional Water Supply Facilities Amendatory Contract" dated as of August 1, 1988, executed between the Issuer and each of such Member Cities, (b) any water supply contracts relating to the System with any other cities which hereafter may become Member Cities, and (c) all water supply contracts between the Issuer and other cities and customers in connection the District's Water System.

The terms "District" and "Issuer" shall mean North Texas Municipal Water District.

The terms "District's System" and "System" shall mean all of the Issuer's existing water storage, treatment, transportation, distribution, and supply facilities, and other properties, which heretofore have been acquired or constructed with the proceeds from the sale of all bonds or other obligations ever issued by the Issuer which have been payable from or secured by a lien on or pledge of any part of the "Net Revenues of the System," or with revenues from said System, together with all future improvements, enlargements, extensions, and additions to any of the foregoing, and all future new facilities, which are acquired or constructed with the proceeds from the sale of the Parity Bonds and any Additional Bonds or money from the Contingency Fund (hereinafter described) or any water supply facilities which are deliberately and specifically, at the option of the Board, made a part of the System by resolution of the Board, and all repairs to and replacements of the System. Said terms do not include any Issuer facilities which provide waste treatment or disposal or other wastewater services of any kind. Said terms do not include any facilities acquired or constructed by the Issuer with any proceeds from the issuance of "Special Facilities Bonds," which are hereby defined as being revenue obligations of the Issuer which are not issued as Additional Bonds, and which are payable from any source, contract or revenues whatsoever other than the Pledged Revenues; and Special Facilities Bonds may be issued for any lawful purposes and made payable from any source, contract, or revenues whatsoever other than the Pledged Revenues.

The term "Gross Revenues of the System" shall mean all of the revenues, income, rentals, rates, fees, and charges of every nature derived by the Board or the Issuer from the operation and/or ownership of the System, including specifically all payments and amounts received by the Board or the Issuer from the Contracts, and all investments, interest, and income from any Fund created pursuant to this Resolution.

The term "Member Cities" shall mean collectively the Cities of Allen, Farmersville, Forney, Frisco, Garland, McKinney, Mesquite, Plano, Princeton, Richardson, Rockwall, Royse City, and Wylie, Texas, together with all cities which hereafter may become Member Cities as provided in the Act.

The terms "Net Revenues of the District's Water System" and "Net Revenues of the System" shall mean the Gross Revenues of the System less the Operation and Maintenance Expense of the System.

The term "Operation and Maintenance Expense of the System" shall mean all costs of operation and maintenance of the System including, but not limited to, repairs and replacements, operating personnel, the cost of utilities, supervision, engineering, accounting, auditing, legal services, insurance premiums, and any other supplies, services, administrative costs, and equipment necessary for proper operation and maintenance of the System, payments to any public or private entity made for the purchase of water, storage right, or other interests in water, or for the use or operation of any property or facilities, payments to the United States of America with respect to the operation, maintenance, and use of Lavon Dam and Reservoir and/or any other reservoirs or facilities in connection with the Issuer's sources of water for the System, and payments made by the Issuer in satisfaction of judgments or other liabilities resulting from claims not covered by Issuer's insurance. Depreciation shall not be considered an item of Operation and Maintenance Expense.

The term "Parity Bonds" shall mean, collectively, (i) the Bonds, (ii) the outstanding North Texas Municipal Water District Water System Revenue Bonds, Series 2006 (the "Series 2006 Bonds"), dated as of April 15, 2006, authorized by a resolution of the Board on April 27, 2006 (the "Series 2006 Bond Resolution"), (iii) the outstanding North Texas Municipal Water District Water System Revenue Bonds, Series 2006A (the "Series 2006A Bonds"), dated as of November 15, 2006, authorized by a resolution of the Board on November 16, 2006 (the "Series 2006A Bond Resolution"), (iv) the outstanding North Texas Municipal Water District Water System Revenue Bonds, Series 2008 (the "Series 2008 Bonds"), dated as of June 15, 2008, authorized by a resolution of the Board on June 26, 2008 (the "Series 2008 Bond Resolution"), (v) the outstanding North Texas Municipal Water District Water System Revenue Bonds, Series 2009A (the "Series 2009A Bonds"), dated as of March 1, 2009, authorized by a resolution of the Board on February 24, 2009 (the "Series 2009A Bond Resolution"), (vi) the outstanding North Texas Municipal Water District Water System Revenue Bonds, Series 2009B (the "Series 2009B Bonds"), dated as of July 15, 2009, authorized by a resolution of the Board on July 23, 2009 (the "Series 2009B Bond Resolution"), (vii) the outstanding North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds, Series 2009C (the "Series 2009C Bonds"), dated as of November 15, 2009, authorized by a resolution of the Board on October 22, 2009 (the "Series 2009C Bond Resolution"), (viii) the outstanding North Texas Municipal Water District Water System Revenue Bonds, Taxable Series 2009D (Build America Bonds - Direct Payment) (the "Series 2009D Bonds"), dated as of November 15, 2009, authorized by a resolution of the Board on October 22, 2009 (the "Series 2009D Bond Resolution"), (ix) the North Texas Municipal Water District Water System Revenue Bonds, Series 2010 (the "Series 2010 Bonds"), dated March 15, 2010, authorized by a resolution of the Board on October 28, 2010 (the "Series 2010 Bond Resolution"), (x) the North Texas Municipal Water District Water System Revenue Bonds, Taxable Series 2010A (Build America Bonds - Direct Payment) (the "Series 2010A Bonds"), dated March 15, 2010, authorized by a resolution of the Board on October 28, 2010 (the "Series 2010A Bonds"), (xi) the North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds, Series 2012 (the "Series 2012 Bonds"), dated as of June 15, 2012, authorized by a resolution of the Board on June 28, 2012 (the "Series 2012 Bond Resolution"), (xii) the North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds, Series 2014 (the "Series 2014 Bonds"), dated as of June 15, 2014, authorized by a resolution of the Board on June 26, 2014 (the "Series 2014 Bond Resolution"), and the North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds, Series 2015, dated as of April 15, 2015, authorized by a resolution of the Board on April 23, 2015 (the "Series 2015 Bond Resolution").

The term "Pledged Revenues" shall mean: (a) the Net Revenues of the System and (b) any additional revenues, income, receipts, or other resources, including, without limitation, any grants, donations, or income received or to be received from the United States Government, or any other public or private source, whether pursuant to an agreement or otherwise, which in the future may, at the option of the Issuer, be pledged to the payment of the Parity Bonds or the Additional Bonds.

The term "year" or "fiscal year" shall mean the Issuer's fiscal year, which currently begins on October 1 of each calendar year, but which subsequently may be any other 12 month period hereafter established by the Issuer as a fiscal year for the purposes of any resolution authorizing the Bonds or any Additional Bonds.

PLEDGE. (a) The Bonds authorized by this Resolution are hereby designated as, and shall be, "Additional Bonds" as permitted by Sections 22 and 23, respectively, of the Series 2006 Bond Resolution, the Series 2006A Bond Resolution, the Series 2008 Bond Resolution, the Series 2009A Bond Resolution, the Series 2009B Bonds Resolution, the Series 2009C Bond Resolution, the Series 2009D Bond Resolution, the Series 2010 Bond Resolution, the Series 2010A Bond Resolution, the Series 2012 Bond Resolution, the Series 2014 Bond Resolution, and the Series 2015 Bond Resolution and it is hereby determined, declared, and resolved that all of the Parity Bonds, including the Bonds authorized by this Resolution, are and shall be secured and payable equally and ratably on a parity, and that Sections 8 through 26 of this Resolution substantially restate and are supplemental to and cumulative of the applicable and pertinent provisions of the resolutions authorizing the issuance of the previously issued Parity Bonds, respectively, with Sections 8 through 26 of the Resolution being equally applicable to all of the Parity Bonds, including the Bonds.

(b) The Parity Bonds and any Additional Bonds, and the interest thereon, are and shall be secured by and payable from a first lien on and pledge of the Pledged Revenues, and the Pledged Revenues are further pledged to the establishment and maintenance of the Interest and Redemption Fund, the Reserve Fund and the Contingency Fund as provided in this Resolution.

REVENUE FUND. There has been created and established and there shall be maintained on the books of the Issuer, and accounted for separate and apart from all other funds of the Issuer, a special fund to be entitled the "North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds Revenue Fund" (hereinafter called the "Revenue Fund"). All Gross Revenues of the System (excepting the investment interest and income from the Interest and Redemption Fund, the Reserve Fund, and the Contingency Fund) shall be credited to the Revenue Fund immediately upon receipt. All Operation and Maintenance Expenses of the System shall be paid from such Gross Revenues credited to the Revenue Fund, as a first charge against same.

INTEREST AND REDEMPTION FUND. For the sole purpose of paying the principal of and interest on all outstanding Parity Bonds and any Additional Bonds, as the same come due, there has been created and established and there shall be maintained at The Bank of New York Mellon Trust Company, National Association, or at the option of the Issuer at any time hereafter, established and maintained at any national bank having a capital and surplus in excess of \$25,000,000, a separate fund to be entitled the "North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds Interest and Redemption Fund" (hereinafter called the "Interest and Redemption Fund").

RESERVE FUND. There has been created and established, and there shall be maintained at The Bank of New York Mellon Trust Company, National Association, or at the option of the Issuer at any time hereafter, established and maintained at any national bank having a capital and surplus in excess of \$25,000,000, a separate fund to be entitled the "North Texas Municipal Water District Regional Water System Revenue Refunding and Improvement Bonds Reserve Fund" (hereinafter called the "Reserve Fund"). The Reserve Fund shall be used solely for the purpose of finally retiring the last of the outstanding Parity Bonds and Additional Bonds, or for paying principal of and interest on any outstanding Parity Bonds and Additional Bonds, when and to the extent the amount in the Interest and Redemption Fund is insufficient for such purpose.

CONTINGENCY FUND. There has been created and established, and there shall be maintained at The Bank of New York Mellon Trust Company, National Association, or at the option of the Issuer at any time hereafter, established and maintained at any national bank having a capital and surplus in excess of \$25,000,000, a separate fund to be entitled the "North Texas Municipal Water District Water System Revenue Refunding and Improvement Bonds Contingency Fund" (hereinafter called the "Contingency Fund"). The Contingency Fund shall be used solely for the purpose of paying the costs of improvements, enlargements, extensions, or additions to the System, and unexpected or extraordinary repairs or replacements of the System for which System funds are not otherwise available, or for paying unexpected or extraordinary Operation and Maintenance Expenses of the System for which System funds are not otherwise available, or for paying principal of and interest on any Parity Bonds or Additional Bonds, when and to the extent the amount in the Interest and Redemption Fund is insufficient for such purpose

DEPOSITS OF PLEDGED REVENUES; INVESTMENTS. (a) The Pledged Revenues shall be deposited into the Interest and Redemption Fund, the Reserve Fund, and the Contingency Fund when and as required by the Resolution.

(b) Money in any Fund established or maintained pursuant to the this Resolution may, at the option of the Issuer, be placed in secured time deposits or secured certificates of deposit, or be invested in direct obligations of the United States of America, obligations guaranteed or insured by the United States of America, which, in the opinion of the Attorney General of the United States, are backed by its full faith and credit or represent its general obligations, including, but not limited to, evidences of indebtedness issued, insured, or guaranteed by such governmental agencies as the Federal Home Loan Banks, Government National Mortgage Association, Farmers Home Administration, Federal Home Loan Mortgage Association, or Small Business Administration; provided that all such deposits and investments shall be made in such manner that the money required to be expended from any Fund will be available at the proper time or times. Such investments shall be valued in terms of current market value as of the 20th day of August of each year. Interest and income derived from such deposits and investments shall be credited to the Fund from which the deposit or investment was made. Such investments shall be sold promptly when necessary to prevent any default in connection with the Parity Bonds or Additional Bonds.

FUNDS SECURED. Money in all Funds described in this Resolution, to the extent not invested, shall be secured in the manner prescribed by law for securing funds of the Issuer.

DEBT SERVICE REQUIREMENTS. (a) Promptly after the delivery of the Initial Bond the Issuer shall cause to be deposited to the credit of the Interest and Redemption Fund, from the proceeds received from the sale and delivery of the Initial Bond, all accrued interest, if any, to be used to pay part of the interest coming due on the Bonds.

(b) The Issuer shall transfer from the Pledged Revenues and deposit to the credit of the Interest and Redemption Fund the amounts, at the times, as follows:

- (1) such amounts, deposited in approximately equal monthly installments on or before the 25th day of each month hereafter as will be sufficient, together with other amounts, if any, then on hand in the Interest and Redemption Fund and available for such purpose, to pay the interest scheduled to accrue and come due on all of the Parity Bonds on the next succeeding interest payment date; and

- (2) such amounts, deposited in approximately equal monthly installments on or before the 25th day of each month hereafter as will be sufficient, together with other amounts, if any, then on hand in the Interest and Redemption Fund and available for such purpose, to pay the principal scheduled to mature and come due, and/or mandatorily required to be redeemed prior to maturity, on all of the Parity Bonds on the next succeeding principal payment date.

RESERVE REQUIREMENTS. The Issuer is required to accumulate and maintain in the Reserve Fund an aggregate amount of money and/or investments equal in market value to the average annual principal and interest requirements on all outstanding Parity Bonds (the "Reserve Required Amount"). Immediately after the delivery of the Initial Bond, the District shall deposit to the credit of the Reserve Fund, from the proceeds from the sale and delivery of the Initial Bond, an amount of money, if any, which will cause the Reserve Fund to contain, together with the other money and/or investments then on hand therein, an amount of money and/or investments equal in market value to the Reserve Required Amount. No deposits shall be made into the Reserve Fund as long as the money and investments in the Reserve Fund are at least equal in market value to the Reserve Required Amount; but if and whenever the market value of money and investments in the Reserve Fund is reduced below said Reserve Required Amount because of a decrease in market value of investments, then the Issuer shall require the Member Cities to increase their payments under their respective Contracts as soon as practicable, and in any event within one year, in an amount sufficient to restore the amount of such decrease; and in the event the Reserve Fund is used pay the principal of or interest on the Bonds because of insufficient amounts being available in the Interest and Redemption Fund, then the Issuer shall require the Member Cities to increase their payments under their respective Contracts as soon as practicable, and in any event within one year, in an amount sufficient to restore the Reserve Fund to the Reserve Required Amount, and the Issuer shall deposit, in the Reserve Fund, in approximately equal periodic payments, not less than annual, such amounts as are required to cause the Reserve Fund to contain the Reserve Required Amount within five years from any date of the use of the Reserve Fund to pay such principal or interest. So long as the Reserve Fund contains the Reserve Required Amount, all amounts in excess thereof shall be deposited to the credit of the Interest and Redemption Fund on or before September 1 of each year.

CONTINGENCY REQUIREMENTS. There is now on hand in the Contingency Fund an amount of money and/or investments at least equal in market value to \$500,000. No additional deposits are required to be made to the credit of the Contingency Fund unless and until such amount therein is reduced or depleted. If and when such amount in the Contingency Fund is reduced or depleted then, subject and subordinate to making the required deposits to the credit of the Interest and Redemption Fund and the Reserve Fund, such reduction or depletion shall be restored from amounts which shall be provided for such purpose in the Issuer's Annual Budget for the next ensuing fiscal year or years; provided that the Issuer is not required to budget more than \$200,000 for such purpose during any one fiscal year. So long as the Contingency Fund contains money and investments not less than the amount of \$500,000 in market value, any surplus in the Contingency Fund over said amount may be withdrawn and used for any lawful purpose.

DEFICIENCIES; EXCESS PLEDGED REVENUES. (a) If on any occasion there shall not be sufficient Pledged Revenues to make the required deposits into the Interest and Redemption Fund, the Contingency Fund, and the Reserve Fund, then such deficiency shall be made up as soon as possible from the next available Pledged Revenues, or from any other sources lawfully available for such purpose.

(b) Subject to making the required deposits to the credit of the Interest and Redemption Fund, the Contingency Fund, and the Reserve Fund, when and as required by this Resolution, or any Resolution authorizing the issuance of Additional Bonds, the excess Pledged Revenues may be used for any lawful purpose; provided that at the time each Annual Budget is prepared all such excess revenues which are not pledged to the payment of junior or subordinate lien bonds or other obligations of the Issuer, and which have not been committed by formal resolution or order of the Board for a specific purpose, and which exceed twenty-five percent of the Operation and Maintenance Expenses of the Issuer for the fiscal year then ending, shall be applied to the payment of Operation and Maintenance Expenses of the Issuer for the next ensuing fiscal year, and the Annual Budget shall be prepared accordingly.

PAYMENT OF PARITY BONDS AND ADDITIONAL BONDS. Semiannually on or before the first day of each March and September while any of the Parity Bonds or Additional Bonds are outstanding and unpaid, the Issuer shall make available to the paying agents therefor, out of the Interest and Redemption Fund, the Contingency Fund, or the Reserve Fund, if necessary, money sufficient to pay such interest on and such principal of the Parity Bonds and Additional Bonds as will accrue or mature on such March 1 or September 1, as the case may be. The paying agents shall destroy all paid Parity Bonds and Additional Bonds, and furnish the Issuer with an appropriate certificate of cancellation or destruction.

FINAL DEPOSITS; GOVERNMENTAL OBLIGATIONS. (a) Any Parity Bond or Additional Bond shall be deemed to be paid, retired, and no longer outstanding, when payment of the principal of, redemption premium, if any, on such Parity Bond or Additional Bond, plus interest thereon to the due date thereof (whether such date be by reason of maturity, upon redemption, or otherwise) either (i) shall have been made or caused to be made in accordance with the terms thereof (including the giving of any required notice of redemption), or (ii) shall have been provided by irrevocably depositing with a paying agent therefor, (1) money sufficient to make such payment or (2) Government Obligations, as hereinafter defined in this Section, certified by an independent public accounting firm of national reputation to mature as to principal and interest in such amounts and at such times as will insure the availability, without reinvestment, of sufficient money to make such payment, and all necessary and

proper fees, compensation, and expenses of such paying agent pertaining to the Parity Bonds and Additional Bonds with respect to which such deposit is made shall have been paid or the payment thereof provided for to the satisfaction of such paying agent. At such time as a Parity Bond or Additional Bond shall be deemed to be paid hereunder, as aforesaid, it shall no longer be secured by or entitled to the benefits of any Bond Resolution or a lien on and pledge of the Pledged Revenues, and shall be entitled to payment solely from such money or Government Obligations.

(b) Any moneys so deposited with a paying agent may at the direction of the Issuer also be invested in Government Obligations, maturing in the amounts and times as hereinbefore set forth, and all income from all Government Obligations in the hands of the paying agent pursuant to this Section which is not required for the payment of the Parity Bonds and Additional Bonds, the redemption premium, if any, and interest thereon, with respect to which such moneys has been so deposited, shall be turned over to the Issuer.

(c) The Issuer covenants that no deposit will be made or accepted under clause (ii) of this Section and no use made of any such deposit which would cause the Parity Bonds or any Additional Bonds to be treated as arbitrage bonds within the meaning of the Internal Revenue Code of 1986, as amended.

(d) For the purpose of this Section, the term "Government Obligations" shall mean direct obligations of the United States of America, including obligations the principal of and interest on which are unconditionally guaranteed by the United States of America, and which may be United States Treasury obligations such as its State and Local Government Series, and which may be in book-entry form.

(e) Notwithstanding any provisions of this Resolution, all money or Government Obligations set aside and held in trust pursuant to the provisions of this Section for the payment of Parity Bonds and Additional Bonds, the redemption premium, if any, and interest thereon, shall be applied to and used for the payment of Parity Bonds and Additional Bonds, the redemption premium, if any, and interest thereon.

(f) Notwithstanding the foregoing, the Issuer covenants that with respect to the Parity Bonds it will provide a paying agent/registrars to perform the services thereof provided for by this Resolution the same as if they had not been defeased, and the Issuer shall make proper arrangements to provide and pay for such paying agent and registrar services.

ADDITIONAL BONDS. (a) The Issuer shall have the right and power at any time and from time to time, and in one or more Series or issues, to authorize, issue, and deliver additional parity revenue bonds (herein called "Additional Bonds"), in accordance with law, in any amounts, for any lawful purpose relating to the System, including the refunding of any Parity Bonds or Additional Bonds. Such Additional Bonds, if and when authorized, issued, and delivered in accordance with this Resolution, shall be secured by and made payable equally and ratably on a parity with the Parity Bonds, and all other outstanding Additional Bonds, from a first lien on and pledge of the Pledged Revenues.

(b) The Interest and Redemption Fund and the Reserve Fund, established by this Resolution shall secure and be used to pay all Additional Bonds as well as the Parity Bonds. However, each Resolution under which Additional Bonds are issued shall provide and require that, in addition to the amounts required by the provisions of this Resolution and the provisions of any other Resolution or Resolutions authorizing Additional Bonds to be deposited to the credit of the Interest and Redemption Fund, the Issuer shall deposit to the credit of the Interest and Redemption Fund at least such amounts as are required for the payment of all principal of and interest on said Additional Bonds then being issued, as the same come due; and that the aggregate amount to be accumulated and maintained in the Reserve Fund shall be increased, if and to the extent necessary, to an amount not less than the average annual principal and interest requirements of all Parity Bonds and Additional Bonds which will be outstanding after the issuance and delivery of the then proposed Additional Bonds; and that the required additional amount shall be so accumulated by the deposit in the Reserve Fund of all or any part of said required additional amount in cash immediately after the delivery of the then proposed Additional Bonds, or, at the option of the Issuer, by the deposit of said required additional amount (or any balance of said required additional amount not deposited in cash as permitted above) within five years from the date of such installment or series of Additional Bonds, and in approximately equal installments, not less than annual.

(c) All calculations of average annual principal and interest requirements made pursuant to this Section shall be made as of and from the date of the Additional Bonds then proposed to be issued.

(d) The principal of all Additional Bonds must be scheduled to be paid or mature on September 1 of the years in which such principal is scheduled to be paid or mature; and all interest thereon must be payable on March 1 and September 1.

FURTHER REQUIREMENTS FOR ADDITIONAL BONDS. Additional Bonds shall be issued only in accordance with this Resolution, but notwithstanding any provisions of this Resolution to the contrary, no installment, Series, or issue of Additional Bonds shall be issued or delivered unless the President and the Secretary of the Board sign a written certificate to the effect that the Issuer is not in default as to any covenant, condition, or obligation in connection with all outstanding Parity Bonds and Additional Bonds, and the Resolutions authorizing same, and that the Interest and Redemption Fund and the Reserve Fund each contains the amount then required to be therein, and either (a) an independent registered professional engineer of the State of Texas or a firm of such engineers executes a certificate or report to the effect that in his or its opinion the Pledged Revenues in

each complete fiscal year thereafter will be at least equal to 1.25 times the average annual principal and interest requirements of all Parity Bonds and Additional Bonds to be outstanding after the delivery of the then proposed Additional Bonds, or (b) in the alternative to (a), above, the President and Secretary of the Board sign a written certificate to the effect that, based upon an opinion of legal counsel to the Issuer, there are Contracts then in effect pursuant to which the Member Cities and others which are parties to such Contracts are obligated to make minimum payments to the Issuer at such times (including during periods when water is not available to such member Cities and others) and in such amounts as shall be necessary to provide to the Issuer Net Revenues of the System sufficient to pay when due all principal of and interest on all Parity Bonds and Additional Bonds to be outstanding after the issuance of the proposed Additional Bonds, and to make the deposits into the Reserve Fund as required under this Resolution.

GENERAL COVENANTS. The Issuer further covenants and agrees that:

(a) **PERFORMANCE.** It will faithfully perform at all times any and all covenants, undertakings, stipulations, and provisions contained in this Resolution and each resolution authorizing the issuance of Additional Bonds, and in each and every Parity Bond and Additional Bond; that it will promptly pay or cause to be paid the principal of and interest on every Bond and Additional Bond, on the dates and in the places and manner prescribed in such resolutions and Parity Bonds or Additional Bonds; and that it will, at the times and in the manner prescribed, deposit or cause to be deposited the amounts required to be deposited into the Interest and Redemption Fund and the Reserve Fund; and any holder of the Parity Bonds or Additional Bonds may require the Issuer, its Board, and its officials and employees, to carry out, respect, or enforce the covenants and obligations of this Resolution or any resolution authorizing the issuance of Additional Bonds, by all legal and equitable means, including specifically, but without limitation, the use and filing of mandamus proceedings, in any court of competent jurisdiction, against the Issuer, its Board, and its officials and employees.

(b) **ISSUER'S LEGAL AUTHORITY.** It is a duly created and existing conservation and reclamation district of the State of Texas pursuant to Article 16, Section 59 of the Texas Constitution, and Chapter 62, Acts of the 52nd Legislature of the State of Texas, Regular Session, 1951, as amended (originally compiled as Vernon's Ann. Tex. Civ. St. Article 8280-141), and is duly authorized under the laws of the State of Texas to create and issue the Parity Bonds; that all action on its part for the creation and issuance of the Parity Bonds has been duly and effectively taken, and that the Parity Bonds in the hands of the holders and owners thereof are and will be valid and enforceable special obligations of the Issuer in accordance with their terms.

(c) **TITLE.** It has or will obtain lawful title to, or the lawful right to use and operate, the lands, buildings, and facilities constituting the System, that it warrants that it will defend, the title to or lawful right to use and operate, all the aforesaid lands, buildings, and facilities, and every part thereof, for the benefit of the holders and owners of the Parity Bonds and Additional Bonds against the claims and demands of all persons whomsoever, that it is lawfully qualified to pledge the Pledged Revenues to the payment of the Parity Bonds and Additional Bonds in the manner prescribed herein, and has lawfully exercised such rights.

(d) **LIENS.** It will from time to time and before the same become delinquent pay and discharge all taxes, assessments, and governmental charges, if any, which shall be lawfully imposed upon it, or the System, that it will pay all lawful claims for rents, royalties, labor, materials, and supplies which if unpaid might by law become a lien or charge thereon, the lien of which would be prior to or interfere with the liens hereof, so that the priority of the liens granted hereunder shall be fully preserved in the manner provided herein, and that it will not create or suffer to be created any mechanic's, laborer's, materialman's, or other lien or charge which might or could be prior to the liens hereof, or do or suffer any matter or thing whereby the liens hereof might or could be impaired; provided, however, that no such tax, assessment, or charge, and that no such claims which might be used as the basis of a mechanic's, laborer's, materialman's, or other lien or charge, shall be required to be paid so long as the validity of the same shall be contested in good faith by the Issuer.

(e) **OPERATION OF SYSTEM.** While the Parity Bonds or any Additional Bonds are outstanding and unpaid it will cause the System to be continuously and efficiently operated and maintained in good condition, repair, and working order, and at a reasonable cost.

(f) **FURTHER ENCUMBRANCE.** While the Parity Bonds or any Additional Bonds are outstanding and unpaid, it shall not additionally encumber the Pledged Revenues in any manner, except as permitted in this Resolution in connection with Additional Bonds, unless said encumbrance is made junior and subordinate in all respects to the liens, pledges, covenants, and agreements of this Resolution and any resolution authorizing the issuance of Additional Bonds; but the right of the Issuer and the Board to issue revenue bonds payable from a subordinate lien on the Pledged Revenues is specifically recognized and retained.

(g) **SALE OF PROPERTY.** While the Parity Bonds or any Additional Bonds are outstanding and unpaid, it will maintain its current legal corporate status as a conservation and reclamation district, and the Issuer shall not sell, convey, mortgage, or in any manner transfer title to, or lease, or otherwise dispose of the entire System, or any significant or substantial part thereof; provided that whenever it deems it necessary to dispose of any machinery, fixtures, and equipment, it may sell or otherwise dispose of such machinery, fixtures, and equipment when it has made arrangements to replace the same or provide substitutes therefor, unless it is determined by the Board that no such replacement or substitute is necessary.

(h) **INSURANCE.** (1) It will cause to be insured such parts of the System as would usually be insured by corporations operating like properties, with a responsible insurance company or companies, against risks, accidents, or casualties against which and to the extent insurance is usually carried by corporations operating like properties, including fire and extended coverage insurance. Public liability and property damage insurance shall also be carried unless the general counsel for Issuer, or the Attorney General of Texas, gives a written opinion to the effect that the Issuer, the Board, and its officers and employees, are not liable for claims which would be protected by such insurance. At any time while any contractor engaged in construction work shall be fully responsible therefor, the Issuer shall not be required to carry insurance on the works being constructed, but the contractor shall be required to carry appropriate insurance. All such policies shall be open to the inspection of the owners of the Parity Bonds and Additional Bonds and their representatives at all reasonable times.

(2) Upon the happening of any loss or damage covered by insurance from one or more of said causes, the Issuer shall make due proof of loss and shall do all things necessary or desirable to cause the insuring companies to make payment in full directly to the Issuer. The proceeds of insurance covering such property, together with any other funds necessary and available for such purpose, shall be used forthwith by the Issuer for repairing the property damaged or replacing the property destroyed; provided, however, that if said insurance proceeds and other funds are insufficient for such purpose, then said insurance proceeds pertaining to the System shall be used promptly as follows:

(a) for the redemption prior to maturity of the Parity Bonds and Additional Bonds, if any, ratably in the proportion that the outstanding principal of each Series or issue of Parity Bonds or Additional Bonds bears to the total outstanding principal of all Parity Bonds and Additional Bonds; provided that if on any such occasion the principal of any such Series or issue is not subject to redemption, it shall not be regarded as outstanding in making the foregoing computation; or

(b) if none of the outstanding Parity Bonds or Additional Bonds is subject to redemption, then for the purchase on the open market and retirement of said Parity Bonds and Additional Bonds, in the same proportion as prescribed in the foregoing clause (a), to the extent practicable; provided that the purchase price for any such Parity Bond or Additional Bonds shall not exceed the redemption price of such Parity Bond or Additional Bond on the first date upon which it becomes subject to redemption; or

(c) to the extent that the foregoing clauses (a) and (b) cannot be complied with at the time, the insurance proceeds, or the remainder thereof, shall be deposited in a special and separate trust fund, at an official depository of the Issuer, to be designated the Insurance Account. The Insurance Account shall be held until such time as the foregoing clauses (a) and/or (b) can be complied with, or until other funds become available which, together with the Insurance Account, will be sufficient to make the repairs or replacements originally required, whichever of said events occurs first.

(3) The annual audit hereinafter required shall contain a list of all such insurance policies carried, together with a statement as to whether or not all insurance premiums upon such policies have been paid.

(i) **RATE COVENANT.** It will fix, establish, maintain, and collect such rentals, rates, charges, and fees for the use and availability of the System as are necessary to produce Gross Revenues of the System sufficient, together with any other Pledged Revenues, (a) to pay all Operation and Maintenance Expenses of the System and (b) to make all payments and deposits required to be made into the Interest and Redemption Fund, and to maintain the Reserve Fund and the Contingency Fund, when and as required by the resolutions authorizing all Parity Bonds and Additional Bonds.

(j) **RECORDS.** Proper books of record and account will be kept in which full, true, and correct entries will be made of all dealings, activities, and transactions relating to the System, the Pledged Revenues, and all Funds described in this Resolution; and all books, documents, and vouchers relating thereto shall at all reasonable times be made available for inspection upon request of any owner of a Parity Bond or Additional Bond.

(k) **AUDITS.** Each year while any of the Parity Bonds or Additional Bonds is outstanding, an audit will be made of its books and accounts relating to the System and the Pledged Revenues by an independent certified public accountant or an independent firm of certified public accountants. As soon as practicable after the close of each year, and when said audit has been completed and made available to the Issuer, a copy of such audit for the preceding year shall be mailed to the Municipal Advisory Council of Texas and to any bondholders who shall so request in writing. Such annual audit reports shall be open to the inspection of the bondholders and their agents and representatives at all reasonable times.

(l) **GOVERNMENTAL AGENCIES.** It will comply with all of the terms and conditions of any and all agreements applicable to the System and the Parity Bonds or Additional Bonds entered into between the Issuer and any governmental agency, and the Issuer will take all action necessary to enforce said terms and conditions; and the Issuer will obtain and keep in full force and effect all franchises, permits, and other requirements necessary with respect to the acquisition, construction, operation, and maintenance of the System.

(m) **CONTRACTS.** It will comply with the terms and conditions of the Contracts, and any amendments thereto, and will cause the Member Cities and other cities and customers to comply with all of their obligations thereunder by all lawful means; provided that the Contracts will not be rescinded, modified, or amended in any way which would materially affect adversely the operation of the System or the rights of the owners of the Parity Bonds and Additional Bonds; provided further that, without violating this Section 24(m), the Contracts may be modified or amended to change the allocation of the Annual Requirement (as defined in the Contracts) among the Member Cities by changing the basis for determination of each Member City's minimum amount of each Annual Requirement.

(n) **ANNUAL BUDGET.** On or before the first day of the second calendar month prior to the beginning of each fiscal year, it will prepare the preliminary Annual Budget of Operation and Maintenance Expenses of the System for the ensuing fiscal year, and any amounts required to be deposited to the credit of the Contingency Fund during the ensuing fiscal year, and such budget shall include a showing as to the proposed expenditures for such ensuing fiscal year. In the Annual Budget for each fiscal year provisions shall be made for payment of the. If the owners of ten per centum (10%) in aggregate principal amount of the Parity Bonds and Additional Bonds then outstanding shall so request on or before the 15th day of the aforesaid month, the Board shall hold a public hearing on or before the 15th day of the following month, at which any such owner may appear in person or by agent or attorney and present any objections he may have to the final adoption of such budget. Notice of the time and place of such hearing shall be published twice, once in each of two successive weeks, in daily newspapers (and if no daily newspaper is published in any one of such cities, in a weekly newspaper published in such cities) of general circulation published in Dallas, Texas, the date of the first publication to be at least fourteen days before the date fixed for the hearing, and copies of such notice shall be mailed at least ten days before the hearing to each owner of a Parity Bond or Additional Bond who shall have filed his or her name and address with the Secretary of the Board for such purpose. The Issuer further covenants that on or before the first day of each fiscal year it will finally adopt the Annual Budget of Operation and Maintenance Expenses of the System for such fiscal year (hereinafter sometimes call the "Annual Budget") and that except as otherwise provided herein the total expenditures in any division thereof will not exceed the total expenditures in the corresponding division in the preliminary budget. If for any reason the Board shall not have adopted the Annual Budget before the first day of any fiscal year, the budget for the preceding fiscal year shall be deemed to be in force until the adoption of the Annual Budget. The Operation and Maintenance Expenses of the System incurred in any fiscal year will not exceed the reasonable and necessary amount thereof, and the Board will not expend any amount or incur any obligation for maintenance, repair, and operation in excess of the amounts provided therefor in the Annual Budget; provided, however, that if at any time the Board shall determine that the amount of the appropriation for any item in the Annual Budget is in excess of the amount which will be required for such item, the Board may by resolution reduce such appropriation and make an appropriation for any item or items not covered by the Annual Budget or increase the appropriation for any other item or items by an amount not exceeding the amount of such reduction; and provided, further, that the Board may at any time by resolution adopt an Amended or Supplemental Annual Budget for the remainder of the then current fiscal year in case of an emergency caused by some extraordinary occurrence which shall be recited in such resolution.

AMENDMENT OF RESOLUTION. (a) The owners of Parity Bonds and Additional Bonds aggregating 51% in principal amount of the aggregate principal amount of then outstanding Parity Bonds and Additional Bonds shall have the right from time to time to approve any amendment to any resolution authorizing the issuance of any Parity Bonds or Additional Bonds, which may be deemed necessary or desirable by the Issuer, provided, however, that nothing herein contained shall permit or be construed to permit the amendment of the terms and conditions in said resolutions or in the Parity Bonds or Additional Bonds so as to:

- (1) Make any change in the maturity of the outstanding Parity Bonds or Additional Bonds;
- (2) Reduce the rate of interest borne by any of the outstanding Parity Bonds or Additional Bonds;
- (3) Reduce the amount of the principal payable on the outstanding Parity Bonds or Additional Bonds;
- (4) Modify the terms of payment of principal of or interest on the outstanding Parity Bonds or Additional Bonds, or impose any conditions with respect to such payment;
- (5) Affect the rights of the holders of less than all of the Parity Bonds and Additional Bonds then outstanding;
- (6) Change the minimum percentage of the principal amount of Parity Bonds and Additional Bonds necessary for consent to such amendment.

(b) If at any time the Issuer shall desire to amend a resolution under this Section, the Issuer shall cause notice of the proposed amendment to be published in a financial newspaper or journal published in the City of New York, New York, once during each calendar week for at least two successive calendar weeks. Such notice shall briefly set forth the nature of the proposed amendment and shall state that a copy thereof is on file at the principal office of each paying agent for any of the Parity Bonds or Additional Bonds for inspection by all owners of Parity Bonds and Additional Bonds. Such publication is not required, however, if notice in writing is given to each holder of Parity Bonds and Additional Bonds.

(c) Whenever at any time not less than thirty days, and within one year, from the date of the first publication of said notice or other service of written notice the Issuer shall receive an instrument or instruments executed by the owners of at least 51% in aggregate principal amount of all Parity Bonds and Additional Bonds then outstanding, which instrument or instruments shall refer to the proposed amendment described in said notice and which specifically consent to and approve such amendment in substantially the form of the copy thereof on file as aforesaid, the Issuer may adopt the amendatory resolution in substantially the same form.

(d) Upon the adoption of any amendatory resolution pursuant to the provisions of this Section, the resolution being amended shall be deemed to be amended in accordance with the amendatory resolution, and the respective rights, duties, and obligations of the Issuer and all the owners of then outstanding Parity Bonds and Additional Bonds and all future Additional Bonds shall thereafter be determined, exercised, and enforced hereunder, subject in all respects to such amendment.

(e) Any consent given by the owner of a Parity Bond or Additional Bond pursuant to the provisions of this Section shall be irrevocable for a period of six months from the date of the first publication of the notice provided for in this Section, and shall be conclusive and binding upon all future holders or owners of the same Parity Bond or Additional Bond during such period. Such consent may be revoked at any time after six months from the date of the first publication of such notice by the owner who gave such consent, or by a successor in title, by filing notice thereof with each Paying Agent for each Series of Parity Bonds and Additional Bonds, and the Issuer, but such revocation shall not be effective if the owners of 51% in aggregate principal amount of the then outstanding Parity Bonds and Additional Bonds as in this Section defined have, prior to the attempted revocation, consented to and approved the amendment.

(f) For the purpose of this Section, the ownership of and other matters relating to the Parity Bonds shall be determined from the registration books kept by the registrar therefor.

DAMAGED, MUTILATED, LOST, STOLEN, OR DESTROYED BONDS. (a) Replacement Bonds. In the event any outstanding Bond is damaged, mutilated, lost, stolen, or destroyed, the Paying Agent/Registrar shall cause to be printed, executed, and delivered, a new bond of the same principal amount, maturity, and interest rate, as the damaged, mutilated, lost, stolen, or destroyed Bond, in replacement for such Bond in the manner hereinafter provided.

(b) Application for Replacement Bonds. Application for replacement of damaged, mutilated, lost, stolen, or destroyed Bonds shall be made by the registered owner thereof to the Paying Agent/Registrar. In every case of loss, theft, or destruction of a Bond, the registered owner applying for a replacement bond shall furnish to the Issuer and to the Paying Agent/Registrar such security or indemnity as may be required by them to save each of them harmless from any loss or damage with respect thereto. Also, in every case of loss, theft, or destruction of a Bond, the registered owner shall furnish to the Issuer and to the Paying Agent/Registrar evidence to their satisfaction of the loss, theft, or destruction of such Bond, as the case may be. In every case of damage or mutilation of a Bond, the registered owner shall surrender to the Paying Agent/Registrar for cancellation the Bond so damaged or mutilated.

(c) No Default Occurred. Notwithstanding the foregoing provisions of this Section, in the event any such Bond shall have matured, and no default has occurred which is then continuing in the payment of the principal of, redemption premium, if any, or interest on the Bond, the Issuer may authorize the payment of the same (without surrender thereof except in the case of a damaged or mutilated Bond) instead of issuing a replacement Bond, provided security or indemnity is furnished as above provided in this Section.

(d) Charge for Issuing Replacement Bonds. Prior to the issuance of any replacement bond, the Paying Agent/Registrar shall charge the registered owner of such Bond with all legal, printing, and other expenses in connection therewith. Every replacement bond issued pursuant to the provisions of this Section by virtue of the fact that any Bond is lost, stolen, or destroyed shall constitute a contractual obligation of the Issuer whether or not the lost, stolen, or destroyed Bond shall be found at any time, or be enforceable by anyone, and shall be entitled to all the benefits of this Resolution equally and proportionately with any and all other Bonds duly issued under this Resolution.

(e) Authority for Issuing Replacement Bonds. In accordance with Section 1201.067, Texas Government Code, this Section of this Resolution shall constitute authority for the issuance of any such replacement bond without necessity of further action by the governing body of the Issuer or any other body or person, and the duty of the replacement of such bonds is hereby authorized and imposed upon the Paying Agent/Registrar, and the Paying Agent/Registrar shall authenticate and deliver such Bonds in the form and manner and with the effect, as provided in Section 6(d) of this Resolution for Bonds issued in conversion and exchange for other Bonds.

COVENANTS REGARDING TAX-EXEMPTION. (a) Covenants. The Issuer covenants to refrain from any action which would adversely affect, or to take such action to assure, the treatment of the Bonds as obligations described in section 103 of the Code, the interest on which is not includable in the "gross income" of the holder for purposes of federal income taxation. In furtherance thereof, the Issuer covenants as follows:

- (1) to take any action to assure that no more than 10 percent of the proceeds of the Bonds or the projects financed therewith (less amounts deposited into a reserve fund, if any) are used for any "private business use," as defined in section 141(b)(6) of the Code, or if more than 10 percent of the proceeds or the projects financed therewith are so used, such amounts, whether or not received by the Issuer, with respect to such private business use, do not, under the terms of this Resolution or any underlying arrangement, directly or indirectly, secure or provide for the payment of more than 10 percent of the debt service on the Bonds, in contravention of section 141(b)(2) of the Code;
- (2) to take any action to assure that in the event that the "private business use" described in subsection (a) hereof exceeds five percent of the proceeds of the Bonds or the projects financed therewith (less amounts deposited into a reserve fund, if any) then the amount in excess of five percent is used for a "private business use" which is "related" and not "disproportionate," within the meaning of section 141(b)(3) of the Code, to the governmental use;
- (3) to take any action to assure that no amount which is greater than the lesser of \$5,000,000, or five percent of the proceeds of the Bonds (less amounts deposited into a reserve fund, if any) is, directly or indirectly, used to finance loans to persons, other than state or local governmental units, in contravention of section 141(c) of the Code;
- (4) to refrain from taking any action that would otherwise result in the Bonds being treated as "private activity bonds" within the meaning of section 141(b) of the Code;
- (5) to refrain from taking any action that would result in the Bonds being "federally guaranteed" within the meaning of section 149(b) of the Code;
- (6) to refrain from using any portion of the proceeds of the Bonds, directly or indirectly, to acquire or to replace funds which were used, directly or indirectly, to acquire investment property (as defined in section 148(b)(2) of the Code) which produces a materially higher yield over the term of the Bonds, other than investment property acquired with --
 - (A) proceeds of the Bonds invested for a reasonable temporary period of 3 years or less or, in the case of a refunding bond, for a period of 30 days or less until such proceeds are needed for the purpose for which the Bonds are issued,
 - (B) amounts invested in a bona fide debt service fund, within the meaning of section 1.148-1(b) of the Treasury Regulations, and
 - (C) amounts deposited in any reasonably required reserve or replacement fund to the extent such amounts do not exceed 10 percent of the stated principal amount (or, in the case of a discount, the issue price) of the Bonds;
- (7) to otherwise restrict the use of the proceeds of the Bonds or amounts treated as proceeds of the Bonds, as may be necessary, so that the Bonds do not otherwise contravene the requirements of section 148 of the Code (relating to arbitrage), section 149(g) of the Code (relating to hedge bonds), and, to the extent applicable, section 149(d) of the Code (relating to advance refundings); and
- (8) to pay to the United States of America at least once during each five-year period (beginning on the date of delivery of the Bonds) an amount that is at least equal to 90 percent of the "Excess Earnings," within the meaning of section 148(f) of the Code and to pay to the United States of America, not later than 60 days after the Bonds have been paid in full, 100 percent of the amount then required to be paid as a result of Excess Earnings under section 148(f) of the Code.

For purposes of the foregoing (a)(1) and (a)(2), the Issuer understands that the term "proceeds" includes "disposition proceeds" as defined in the Treasury Regulations and, in the case of refunding bonds, transferred proceeds (if any) and proceeds of the refunded bonds expended prior to the date of issuance of the Bonds.

(b) Compliance with Code. It is the understanding of the Issuer that the covenants contained herein are intended to assure compliance with the Code and any regulations or rulings promulgated by the U.S. Department of the Treasury pursuant thereto. In the event that regulations or rulings are hereafter promulgated which modify or expand provisions of the Code, as applicable to the Bonds, the Issuer will not be required to comply with any covenant contained herein to the extent that such failure to comply, in the opinion of nationally-recognized bond counsel, will not adversely affect the exemption from federal income taxation of interest on the Bonds under section 103 of the Code. In the event that regulations or rulings are hereafter promulgated which impose additional requirements which are applicable to the Bonds, the Issuer agrees to comply with the additional requirements to the extent necessary, in the opinion of nationally-recognized bond counsel, to preserve the exemption from federal income taxation of interest on the Bonds under section 103 of the Code. In furtherance of such intention, the Issuer hereby authorizes and directs its President or Executive Director to execute any documents, certificates or reports required by the

Code and to make such elections, on behalf of the Issuer, which may be permitted by the Code as are consistent with the purpose for the issuance of the Bonds. The Issuer covenants to comply with the covenants contained in this section after defeasance of the Bonds.

(c) Rebate Fund. In order to facilitate compliance with the above covenant (a)(8), a "Rebate Fund" is hereby established by the Issuer for the sole benefit of the United States of America, and such fund shall not be subject to the claim of any other person, including without limitation, the bondholders. The Rebate Fund is established for the additional purpose of compliance with section 148 of the Code.

(d) Written Procedures. Unless superseded by another action of the Issuer to ensure compliance with the covenants contained herein regarding private business use, remedial actions, arbitrage and rebate, the Issuer hereby adopts and establishes the instructions attached hereto as Exhibit A as their written procedures applicable to Bonds issued pursuant to the Contract.

ALLOCATION OF, AND LIMITATION ON, EXPENDITURES FOR THE PROJECT; DISPOSITION OF THE PROJECT. (a) The Issuer covenants to account for the expenditure of Bond proceeds and investment earnings to be used for the construction or acquisition of the property constituting the projects financed or refinanced with proceeds of the sale of the Bonds on its books and records by allocating proceeds to expenditures within 18 months of the later of the date that (1) the expenditure is made or (2) such construction or acquisition is completed. The foregoing notwithstanding, the Issuer shall not expend proceeds of the Bonds or investment earnings thereon more than 60 days after the earlier of (1) the fifth anniversary of the delivery of the Bonds or (2) the date the Bonds are retired, unless the Issuer obtains an opinion of nationally-recognized bond counsel that such expenditure will not adversely affect the tax-exempt status of the Bonds. For purposes hereof, the Issuer shall not be obligated to comply with this covenant if it obtains an opinion that such failure to comply will not adversely affect the excludability for federal income tax purposes from gross income of the interest on the Bonds.

(b) The Issuer covenants that the property constituting the projects financed or refinanced with proceeds of the Bonds will not be sold or otherwise disposed in a transaction resulting in the receipt by the Issuer of cash or other compensation, unless the Issuer obtains an opinion of nationally-recognized bond counsel that such sale or other disposition will not adversely affect the tax-exempt status of the Bonds. For purposes of the foregoing, the portion of the property comprising personal property and disposed in the ordinary course shall not be treated as a transaction resulting in the receipt of cash or other compensation. For purposes hereof, the Issuer shall not be obligated to comply with this covenant if it obtains an opinion that such failure to comply will not adversely affect the excludability for federal income tax purposes from gross income of the interest on the Bonds.

INTEREST EARNINGS ON BOND PROCEEDS. Interest earnings derived from the investment of proceeds from the sale of the Initial Bond, other than proceeds deposited in accordance with Section 16 hereof or deposited pursuant to the Escrow Agreement authorized by Section 33 hereof, shall be used along with other available proceeds for improving the District's Water System; provided that after such use, if any of such interest earnings remain on hand, such interest earnings on bond proceeds which are required to be rebated to the United States of America pursuant to Section 27 hereof in order to prevent the Bonds from being arbitrage bonds shall be so rebated and not considered as interest earnings for the purposes of this Section.

CONTINUING DISCLOSURE UNDERTAKING.

(a) Annual Reports.

The Issuer shall provide or cause to be provided annually to the MSRB, (1) within six months after the end of each fiscal year ending in or after 2016, financial information and operating data of the general type included in the final Official Statement authorized by Section 32 of the Resolution, (i) with respect to the Issuer, in tables numbered 1 through 5, and (ii) with respect to each Significant Obligated Person in Appendix C, and (2) when and if available, audited financial statements of the Issuer and each Significant Obligated Person. Any financial statements so to be provided shall be prepared in accordance with generally accepted accounting principles or such other accounting principles as the Issuer or any such Significant Obligated Person may be required to employ from time to time pursuant to state law or regulation. If the audit of such financial statements of the Issuer or a Significant Obligated Person is not complete within 12 months after the respective fiscal year end, then the Issuer shall provide or cause to be provided by each Significant Obligated Person unaudited financial statements within such 12-month period and audited financial statements when and if the audit report on such statements become available.

If the Issuer or any such Significant Obligated Person changes its fiscal year, the Issuer will notify or cause the Significant Obligated Person to notify the MSRB of the change (and of the date of the new fiscal year end) prior to the next date by which the Issuer or any such Significant Obligated Person otherwise would be required to provide financial information and operating data pursuant to this Section.

The financial information and operating data to be provided pursuant to this Section may be set forth in full in one or more documents or may be included by specific reference to any document (including an official statement or other offering document, if it is available from the MSRB) that theretofore has been provided to the MSRB or filed with the SEC

(b) Event Notices.

The Issuer shall notify the MSRB, in a timely manner, of any of the following events with respect to the Bonds, not in excess of ten Business Days after occurrence of the event:

1. Principal and interest payment delinquencies;
2. Non-payment related defaults, if material;
3. Unscheduled draws on debt service reserves reflecting financial difficulties;
4. Unscheduled draws on credit enhancements reflecting financial difficulties;
5. Substitution of credit or liquidity providers, or their failure to perform;
6. Adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the security, or other material events affecting the tax status of the security;
7. Modifications to the rights of security holders, if material;
8. Bond calls, if material, and tender offers;
9. Defeasances;
10. Release, substitution or sale of property securing repayment of the securities, if material;
11. Rating changes;
12. Bankruptcy, insolvency, receivership or similar event of the Issuer or a Significant Obligated Person;
13. The consummation of a merger, consolidation, or acquisition involving the Issuer or a Significant Obligated Person or the sale of all or substantially all of the assets of the Issuer or a Significant Obligated Person, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material; and
14. Appointment of a successor or additional trustee or the change of name of a trustee, if material.

The Issuer shall notify the MSRB, in a timely manner, of any failure by the Issuer to provide financial information or operating data in accordance with Section 36(c) of this Resolution by the time required by such Section. As used in clause 12 above, the phrase "bankruptcy, insolvency, receivership or similar event" means the appointment of a receiver, fiscal agent, or similar officer for the Issuer in a proceeding under the U.S. Bankruptcy Code or in any other proceeding under state or federal law in which a court or governmental authority has assumed jurisdiction over substantially all of the assets or business of the Issuer, or if jurisdiction has been assumed by leaving the Board of Directors and official or officers of the Issuer in possession but subject to the supervision and orders of a court or governmental authority, or the entry of an order confirming a plan of reorganization, arrangement or liquidation by a court or governmental authority having supervision or jurisdiction over substantially all of the assets or business of the Issuer.

(c) Limitations, Disclaimers, and Amendments.

The Issuer shall be obligated to observe and perform or cause a Significant Obligated Person to observe and perform the covenants specified in this Section for so long as, but only for so long as, such Significant Obligated persons remains a "Significant Obligated Person" with respect to the Bonds, except that the Issuer in any event will give notice of any deposit made in accordance with Section 21 hereof that causes Bonds no longer to be Outstanding.

The provisions of this Section are for the sole benefit of the Holders and beneficial owners of the Bonds, and nothing in this Section, express or implied, shall give any benefit or any legal or equitable right, remedy, or claim hereunder to any other person. The Issuer undertakes to provide or cause to be provided only the financial information, operating data, financial statements, and notices which it has expressly agreed to provide pursuant to this Section and does not hereby undertake to provide or cause to be provided any other information that may be relevant or material to a complete presentation of the Issuer's or any Significant Obligated Person's financial results, condition or prospects or hereby undertake to update any information provided in accordance with this Section or otherwise, except as expressly provided herein. The Issuer does not make any representation or warranty concerning such information or its usefulness to a decision to invest in or sell Bonds at any future date.

UNDER NO CIRCUMSTANCES SHALL THE ISSUER BE LIABLE TO THE HOLDER OR BENEFICIAL OWNER OF ANY BOND OR ANY OTHER PERSON, IN CONTRACT OR TORT, FOR DAMAGES RESULTING IN WHOLE OR IN PART FROM ANY BREACH BY THE ISSUER, WHETHER NEGLIGENT OR WITHOUT FAULT ON ITS PART, OF ANY COVENANT SPECIFIED IN THIS SECTION, BUT EVERY RIGHT AND REMEDY OF ANY SUCH PERSON, IN CONTRACT OR TORT, FOR OR ON ACCOUNT OF ANY SUCH BREACH SHALL BE LIMITED TO AN ACTION FOR MANDAMUS OR SPECIFIC PERFORMANCE.

No default by the Issuer in observing or performing its obligations under this Section shall comprise a breach of or default under this Resolution for purposes of any other provision of this Resolution.

Nothing in this Section is intended or shall act to disclaim, waive, or otherwise limit the duties of the Issuer under federal and state securities laws.

Should the Rule be amended to obligate the Issuer to make filings with or provide notices to entities other than the MSRB, the Issuer hereby agrees to undertake such obligation with respect to the Bonds in accordance with the Rule as amended. The provisions of this Section may be amended by the Issuer from time to time to adapt to changed circumstances that arise from a change in legal requirements, a change in law, or a change in the identify, nature, status, or type of operations of the Issuer or any Significant Obligated Person, but only if (1) the provisions of this Section, as so amended, would have permitted an underwriter to purchase or sell Bonds in the primary offering of the Bonds in compliance with the Rule, taking into account any amendments or interpretations of the Rule since such offering as well as such changed circumstances and (2) either (a) the Holders of a majority in aggregate principal amount (or any greater amount required by any other provision of this Resolution that authorizes such an amendment) of the outstanding Bonds consent to such amendment or (b) a Person that is unaffiliated with the Issuer (such as nationally recognized bond counsel) determined that such amendment will not materially impair the interest of the Holders and beneficial owners of the Bonds. If the Issuer so amends the provisions of this Section, it shall include with any amended financial information or operating data next provided in accordance with Subsection (a) hereof an explanation, in narrative form, of the reason for the amendment and of the impact of any change in the type of financial information or operating data so provided. The Issuer may also amend or repeal the provisions of this continuing disclosure agreement if the SEC amends or repeals the applicable provision of the Rule or a court of final jurisdiction enters judgment that such provisions of the Rule are invalid, but only if and to the extent that the provisions of this sentence would not prevent an underwriter from lawfully purchasing or selling Bonds in the primary offering of the Bonds.

(d) Definitions.

As used in this Section, the following terms have the meanings ascribed to such terms below:

"*MSRB*" means the Municipal Securities Rulemaking Board.

"*Rule*" means SEC Rule 15c2-12, as amended from time to time.

"*SEC*" means the United States Securities and Exchange Commission and any successor to its duties.

"*Significant Obligated Person*" means, at any point in time, any Member City or other party contracting with the Issuer, in either case whose payments to the Issuer for the use of or service from the System in the calendar year preceding any such determination exceeded 10% of the Gross Revenues of the System.

INVESTMENTS

The District invests its investable funds in investments authorized by Texas law in accordance with investment policies approved by the Board of Directors of the District. Both State law and the District's investment policies are subject to change.

LEGAL INVESTMENTS . . . Under Texas law, the District is authorized to invest in (1) obligations of the United States or its agencies and instrumentalities, including letters of credit; (2) direct obligations of the State of Texas or its agencies and instrumentalities; (3) collateralized mortgage obligations directly issued by a federal agency or instrumentality of the United States, the underlying security for which is guaranteed by an agency or instrumentality of the United States; (4) other obligations, the principal and interest of which is guaranteed or insured by or backed by the full faith and credit of, the State of Texas or the United States or their respective agencies and instrumentalities; (5) obligations of states, agencies, counties, cities, and other political subdivisions of any state rated as to investment quality by a nationally recognized investment rating firm not less than A or its equivalent; (6) bonds issued, assumed or guaranteed by the State of Israel; (7) certificates of deposit and share certificates meeting the requirements of the Public Funds Investment Act, Chapter 2256, Texas Government Code, as amended, (i) that are issued by an institution that has its main office or a branch office in the State of Texas and are guaranteed or insured by the Federal Deposit Insurance Corporation or the National Credit Union Share Insurance Fund, or are secured as to principal by obligations described in clauses (1) through (6) or in any other manner and amount provided by law for District deposits or (ii) where (a) the funds are invested by the District through a depository institution that has a main office or branch office in the State and that is selected by the District; (b) the depository institution selected by the District arranges for the deposit of funds in one or more federally insured depository institutions, wherever located, for the account of the District; (c) the full amount of the principal and accrued interest of each of the certificates of deposit is insured by the United States or an instrumentality of the United States; (d) the depository institution acts as a custodian for the District with respect to the certificates of deposit; and (e) at the same time that the certificates of deposit are issued, the depository institution selected by the District receives deposits from customers of other federally insured depository institutions, wherever located, that is equal to or greater than the funds invested by the District through the depository institution selected under clause (ii)(a) above (8) fully collateralized repurchase agreements that have a defined termination date, are fully secured by obligations described in clause (1), and are placed through a primary government securities dealer or a financial institution doing business in the State of Texas, (9) securities lending programs if (i) the securities loaned under the program are 100% collateralized, a loan made under the program allows for termination at any time and a loan made under the program is either secured by (a) obligations that are described in clauses (1) through (6) above, (b) irrevocable letters of credit issued by a state or national bank that is continuously rated by a nationally recognized investment rating firm at not less than A or its equivalent or (c) cash invested in obligations described in clauses (1) through (6) above, clauses (11) through (13) below, or an authorized investment pool; (ii) securities held as collateral under a loan are pledged to the District, held in the District's name and deposited at the time the investment is made with the District or a third party designated by the District; (iii) a loan made under the program is placed through either a primary government securities dealer or a financial institution doing business in the State of Texas; and (iv) the agreement to lend securities has a term of one year or less, (10) certain bankers' acceptances with the remaining term of 270 days or less, if the short-term obligations of the accepting bank or its parent are rated at least A-1 or P-1 or the equivalent by at least one nationally recognized credit rating agency, (11) commercial paper with a stated maturity of 270 days or less that is rated at least A-1 or P-1 or the equivalent by either (a) two nationally recognized credit rating agencies or (b) one nationally recognized credit rating agency if the paper is fully secured by an irrevocable letter of credit issued by a U.S. or state bank, (12) no-load money market mutual funds registered with and regulated by the Securities and Exchange Commission that have a dollar weighted average stated maturity of 90 days or less and include in their investment objectives the maintenance of a stable net asset value of \$1 for each share, and (13) no-load mutual funds registered with the Securities and Exchange Commission that have an average weighted maturity of less than two years, invest exclusively in obligations described in this paragraph, and are continuously rated as to investment quality by at least one nationally recognized investment rating firm of not less than AAA or its equivalent. In addition, bond proceeds may be invested in guaranteed investment contracts that have a defined termination date and are secured by obligations, including letters of credit, of the United States or its agencies and instrumentalities in an amount at least equal to the amount of bond proceeds invested under such contract, other than the prohibited obligations described in the next succeeding paragraph.

The District may invest in such obligations directly or through government investment pools that invest solely in such obligations provided that the pools are rated no lower than AAA or AAAM or an equivalent by at least one nationally recognized rating service. The District is specifically prohibited from investing in: (1) obligations whose payment represents the coupon payments on the outstanding principal balance of the underlying mortgage-backed security collateral and pays no principal; (2) obligations whose payment represents the principal stream of cash flow from the underlying mortgage-backed security and bears no interest; (3) collateralized mortgage obligations that have a stated final maturity of greater than 10 years; and (4) collateralized mortgage obligations the interest rate of which is determined by an index that adjusts opposite to the changes in a market index.

INVESTMENT POLICIES . . . Under Texas law, the District is required to invest its funds under written investment policies that primarily emphasize safety of principal and liquidity; that address investment diversification, yield, maturity, and the quality and capability of investment management; and that includes a list of authorized investments for District funds, maximum allowable stated maturity of any individual investment and the maximum average dollar-weighted maturity allowed for pooled fund groups. All District funds must be invested consistent with a formally adopted "Investment Strategy Statement" that specifically addresses each funds' investment. Each Investment Strategy Statement will describe its objectives concerning: (1) suitability of investment type, (2) preservation and safety of principal, (3) liquidity, (4) marketability of each investment, (5) diversification of the portfolio, and (6) yield.

Under Texas law, District investments must be made "with judgment and care, under prevailing circumstances, that a person of prudence, discretion, and intelligence would exercise in the management of the person's own affairs, not for speculation, but for investment, considering the probable safety of capital and the probable income to be derived." At least quarterly the investment officers of the District shall submit an investment report detailing: (1) the investment position of the District, (2) that all investment officers jointly prepared and signed the report, (3) the beginning market value, any additions and changes to market value and the ending value of each pooled fund group, (4) the book value and market value of each separately listed asset at the beginning and end of the reporting period, (5) the maturity date of each separately invested asset, (6) the account or fund or pooled fund group for which each individual investment was acquired, and (7) the compliance of the investment portfolio as it relates to: (a) adopted investment strategy statements and (b) state law. No person may invest District funds without express written authority from the Board of Directors.

ADDITIONAL PROVISIONS . . . Under State law, the District is additionally required to: (1) annually review its adopted policies and strategies; (2) adopt a rule, order, ordinance or Resolution stating that it has reviewed its investment policy and investment strategies and records any changes made to either its investment policy or investment strategy in the respective rule, order, ordinance or Resolution; (3) require any investment officers with personal business relationships or relatives with firms seeking to sell securities to the entity to disclose the relationship and file a statement with the Texas Ethics Commission and the District Board of Directors; (4) require the qualified representative of firms offering to engage in an investment transaction with the District to: (a) receive and review the District's investment policy, (b) acknowledge that reasonable controls and procedures have been implemented to preclude investment transactions conducted between the District and the business organization that are not authorized by the District's investment policy (except to the extent that this authorization is dependent on an analysis of the makeup of the District's entire portfolio or requires an interpretation of subjective investment standards), and (c) deliver a written statement in a form acceptable to the District and the business organization attesting to these requirements; (5) perform an annual audit of the management controls on investments and adherence to the District's investment policy; (6) provide specific investment training for the Treasurer, Chief Financial Officer and investment officers; (7) restrict reverse repurchase agreements to not more than 90 days and restrict the investment of reverse repurchase agreement funds to no greater than the term of the reverse purchase agreement; (8) restrict the investment in no-load mutual funds in the aggregate to no more than 15% of the District's monthly average fund balance, excluding bond proceeds and reserves and other funds held for debt service; (9) require local government investment pools to conform to the new disclosure, rating, net asset value, yield calculation, and advisory board requirements; and (10) at least annually review, revise, and adopt a list of qualified brokers that are authorized to engage in investment transactions with the District.

TABLE 5 - CURRENT INVESTMENTS

As of September 1, 2016, investable funds of the District's Water System were invested as follows:

<u>Description</u>	<u>Percent ⁽¹⁾</u>	<u>Book Value</u>	<u>Market Value</u>
FHLB Note	20.53%	\$ 79,177,243	\$ 79,205,314
FHLMC Note	10.92%	42,064,870	42,126,460
State Pools	42.88%	165,484,308	165,484,308
Treasury Notes	25.68%	98,990,785	99,078,740
	<u>100.00%</u>	<u>\$ 385,717,206</u>	<u>\$ 385,894,822</u>

(1) Based Upon Market Value.

TAX MATTERS

OPINION . . . On the date of initial delivery of the Bonds, McCall, Parkhurst & Horton L.L.P., Dallas, Texas, Bond Counsel, will render their opinion that, in accordance with statutes, regulations, published rulings and court decisions existing on the date thereof, ("Existing Law") (1) interest on the Bonds for federal income tax purposes will be excludable from the "gross income" of the holders thereof and (2) the Bonds will not be treated as "specified private activity bonds" the interest on which would be included as an alternative minimum tax preference item under section 57(a)(5) of the Internal Revenue Code of 1986 (the "Code"). Except as stated above, Bond Counsel will express no opinion as to any other federal, state or local tax consequences of the purchase, ownership or disposition of the Bonds. See APPENDIX D - Form of Bond Counsel's Opinion.

In rendering its opinion, Bond Counsel will rely upon (a) the District's federal tax certificate, (b) the Verification Report of Grant Thornton LLP, certified public accountants, and (c) covenants of the District with respect to arbitrage, the application of the proceeds to be received from the issuance and sale of the Bonds and certain other matters. Failure of the District to comply with these representations or covenants could cause the interest on the Bonds to become includable in gross income retroactively to the date of issuance of the Bonds.

The Code and the regulations promulgated thereunder contain a number of requirements that must be satisfied subsequent to the issuance of the Bonds in order for interest on the Bonds to be, and to remain, excludable from gross income for federal income tax purposes. Failure to comply with such requirements may cause interest on the Bonds to be included in gross income retroactively to the date of issuance of the Bonds. The opinion of Bond Counsel is conditioned on compliance by the District with such requirements, and Bond Counsel has not been retained to monitor compliance with these requirements subsequent to the issuance of the Bonds.

Bond Counsel's opinion represents its legal judgment based upon its review of Existing Law and the reliance on the aforementioned representations and covenants. Bond Counsel's opinion is not a guarantee of a result. The Existing Law is subject to change by the Congress and to subsequent judicial and administrative interpretation by the courts and the Department of the Treasury. There can be no assurance that such Existing Law or the interpretation thereof will not be changed in a manner which would adversely affect the tax treatment of the purchase, ownership or disposition of the Bonds. Further, no assurances can be given as to whether or not the Internal Revenue Service will commence an audit of the Bonds, or as to whether the Internal Revenue Service would agree with the opinion of Bond Counsel. If an audit is commenced, under current procedures the Internal Revenue Service is likely to treat the Issuer as the taxpayer and the Bondholders may have no right to participate in such procedure. No additional interest will be paid upon any determination of taxability.

FEDERAL INCOME TAX ACCOUNTING TREATMENT OF ORIGINAL ISSUE DISCOUNT . . . The initial public offering price to be paid for one or more maturities of the Bonds (the "Original Issue Discount Bonds") may be less than the principal amount thereof or one or more periods for the payment of interest on the bonds may not be equal to the accrual period or be in excess of one year. In such event, the difference between (i) the "stated redemption price at maturity" of each Original Issue Discount Bond, and (ii) the initial offering price to the public of such Original Issue Discount Bond would constitute original issue discount. The "stated redemption price at maturity" means the sum of all payments to be made on the bonds less the amount of all periodic interest payments. Periodic interest payments are payments which are made during equal accrual periods (or during any unequal period if it is the initial or final period) and which are made during accrual periods which do not exceed one year.

Under existing law, any owner who has purchased such Original Issue Discount Bond in the initial public offering is entitled to exclude from gross income (as defined in section 61 of the Code) an amount of income with respect to such Original Issue Discount Bond equal to that portion of the amount of such original issue discount allocable to the accrual period. For a discussion of certain collateral federal tax consequences, see discussion set forth below.

In the event of the redemption, sale or other taxable disposition of such Original Issue Discount Bond prior to stated maturity, however, the amount realized by such owner in excess of the basis of such Original Issue Discount Bond in the hands of such owner (adjusted upward by the portion of the original issue discount allocable to the period for which such Original Issue Discount Bond was held by such initial owner) is includable in gross income.

Under Existing Law, the original issue discount on each Original Issue Discount Bond is accrued daily to the stated maturity thereof (in amounts calculated as described below for each six-month period ending on the date before the semiannual anniversary dates of the date of the Bonds and ratably within each such six-month period) and the accrued amount is added to an initial owner's basis for such Original Issue Discount Bond for purposes of determining the amount of gain or loss recognized by such owner upon the redemption, sale or other disposition thereof. The amount to be added to basis for each accrual period is equal to (a) the sum of the issue price and the amount of original issue discount accrued in prior periods multiplied by the yield to stated maturity (determined on the basis of compounding at the close of each accrual period and properly adjusted for the length of the accrual period) less (b) the amounts payable as current interest during such accrual period on such Original Issue Discount Bond.

The federal income tax consequences of the purchase, ownership, redemption, sale or other disposition of Original Issue Discount Bonds which are not purchased in the initial offering at the initial offering price may be determined according to rules

which differ from those described above. All owners of Original Issue Discount Bonds should consult their own tax advisors with respect to the determination for federal, state and local income tax purposes of the treatment of interest accrued upon redemption, sale or other disposition of such Original Issue Discount Bonds and with respect to the federal, state, local and foreign tax consequences of the purchase, ownership, redemption, sale or other disposition of such Original Issue Discount Bonds.

COLLATERAL FEDERAL INCOME TAX CONSEQUENCES . . . The following discussion is a summary of certain collateral federal income tax consequences resulting from the purchase, ownership or disposition of the Bonds. This discussion is based on existing statutes, regulations, published rulings and court decisions, all of which are subject to change or modification, retroactively.

The discussion is applicable to investors, other than those who are subject to special provisions of the Code, such as financial institutions, property and casualty insurance companies, life insurance companies, owners of interest in a FASIT, individual recipients of Social Security or Railroad Retirement benefits, individuals allowed earned income credit, certain S corporations with Subchapter C earnings and profits, taxpayers qualifying for the health insurance premium assistance credit, and taxpayers who may be deemed to have incurred or continued indebtedness to purchase tax-exempt obligations.

THE DISCUSSION CONTAINED HEREIN MAY NOT BE EXHAUSTIVE. INVESTORS, INCLUDING THOSE WHO ARE SUBJECT TO SPECIAL PROVISIONS OF THE CODE, SHOULD CONSULT THEIR OWN TAX ADVISORS AS TO THE TAX TREATMENT WHICH MAY BE ANTICIPATED TO RESULT FROM THE PURCHASE, OWNERSHIP AND DISPOSITION OF TAX-EXEMPT OBLIGATIONS BEFORE DETERMINING WHETHER TO PURCHASE THE BONDS.

Interest on the Bonds will be includable as an adjustment for "adjusted current earnings" to calculate the alternative minimum tax imposed on corporations by section 55 of the Code.

Under section 6012 of the Code, holders of tax-exempt obligations, such as the Bonds, may be required to disclose interest received or accrued during each taxable year on their returns of federal income taxation.

Section 1276 of the Code provides for ordinary income tax treatment of gain recognized upon the disposition of a tax-exempt obligation, such as the Bonds, if such obligation was acquired at a "market discount" and if the fixed maturity of such obligation is equal to or exceeds, one year from the date of issue. Such treatment applies to "market discount bonds" to the extent such gain does not exceed the accrued market discount of such bonds, although for this purpose, a de minimis amount of market discount is ignored. A "market discount bond" is one which is acquired by the holder at a purchase price which is less than the stated redemption price at maturity or, in the case of a bond issued at an original issue discount, the "revised issue price" (i.e., the issue price plus accrued original issue discount). The "accrued market discount" is the amount which bears the same ratio to the market discount as the number of days during which the holder holds the obligation bears to the number of days between the acquisition date and the final maturity date.

STATE, LOCAL AND FOREIGN TAXES . . . Investors should consult their own tax advisors concerning the tax implications of the purchase, ownership or disposition of the Bonds under applicable state or local laws. Foreign investors should also consult their own tax advisors regarding the tax consequences unique to investors who are not United States persons.

INFORMATION REPORTING AND BACKUP WITHHOLDING . . . Subject to certain exceptions, information reports describing interest income, including original issue discount, with respect to the Bonds will be sent to each registered holder and to the IRS. Payments of interest and principal may be subject to backup withholding under section 3406 of the Code if a recipient of the payments fails to furnish to the payor such owner's social security number or other taxpayer identification number ("TIN"), furnishes an incorrect TIN, or otherwise fails to establish an exemption from the backup withholding tax. Any amounts so withheld would be allowed as a credit against the recipient's federal income tax. Special rules apply to partnerships, estates and trusts, and in certain circumstances, and in respect of Non-U.S. Holders, certifications as to foreign status and other matters may be required to be provided by partners and beneficiaries thereof.

OTHER INFORMATION

RATINGS

The Bonds and the Outstanding Bonds are "■" by Moody's Investors Service, Inc. ("Moody's") and "AAA" by S&P Global Ratings, a business unit of Standard & Poor's Financial Services LLC ("S&P"). An explanation of the significance of such ratings may be obtained from the company furnishing the rating. The ratings reflect only the respective views of such organizations and the District makes no representation as to the appropriateness of the ratings. There is no assurance that such ratings will continue for any given period of time or that they will not be revised downward or withdrawn entirely by either or both of such rating companies, if in the judgment of either or both companies, circumstances so warrant. Any such downward revision or withdrawal of such ratings, or either of them, may have an adverse effect on the market price of the Bonds.

LITIGATION

The District is not a party to any litigation or other proceeding pending, or to its knowledge threatened, in or before any court, agency or other administrative body (either state or federal) which, if decided adversely to the District, would have a material adverse effect on the financial statements or operations of the District.

At the time of the initial delivery of the Bonds, the District will provide the Initial Purchaser with a certificate to the effect that no litigation of any nature has been filed or is then pending challenging the issuance of the Bonds or that affects the payment and security of the Bonds or in any other manner questioning the issuance, sale or delivery of said Bonds.

REGISTRATION AND QUALIFICATION OF BONDS FOR SALE

The sale of the Bonds has not been registered under the Federal Securities Act of 1933, as amended, in reliance upon the exemption provided thereunder by Section 3(a)(2); and the Bonds have not been qualified under the Securities Act of Texas in reliance upon various exemptions contained therein; nor have the Bonds been qualified under the securities acts of any jurisdiction. The District assumes no responsibility for qualification of the Bonds under the securities laws of any jurisdiction in which the Bonds may be sold, assigned, pledged, hypothecated or otherwise transferred. This disclaimer of responsibility for qualification for sale or other disposition of the Bonds shall not be construed as an interpretation of any kind with regard to the availability of any exemption from securities registration provisions.

LEGAL INVESTMENTS AND ELIGIBILITY TO SECURE PUBLIC FUNDS IN TEXAS

Section 1201.041 Texas Government Code, provides that the Bonds are negotiable instruments governed by Chapter 8, Texas Business and Commerce Code, and are legal and authorized investments for insurance companies, fiduciaries, and trustees, and for the sinking funds of municipalities or other political subdivisions or public agencies of the State of Texas. With respect to investment in the Bonds by municipalities or other political subdivisions or public agencies of the State of Texas, the Public Funds Investment Act, Chapter 2256, Texas Government Code, requires that the Bonds be assigned a rating of "A" or its equivalent as to investment quality by a national rating agency. See "OTHER INFORMATION - Ratings" above. In addition, various provisions of the Texas Finance Code provide that, subject to a prudent investor standard, the Bonds are legal investments for state banks, savings banks, trust companies with a capital of one million dollars or more, and savings and loan associations. The Public Funds Collateral Act, Chapter 2257, Texas Government Code, provides that the Bonds are eligible to secure deposits of any public funds of the State, its agencies, and its political subdivisions, and are legal security for those deposits to the extent of their market value. No review by the District has been made of the laws in other states to determine whether the Bonds are legal investments for various institutions in those states.

LEGAL MATTERS

The District will furnish a complete transcript of proceedings had incident to the authorization and issuance of the Bonds, including the unqualified approving legal opinion of the Attorney General of Texas as to the Bonds to the effect that the Bonds are valid and legally binding obligations of the District, and based upon examination of such transcript of proceedings, the approving legal opinion of Bond Counsel, a copy of which opinion is attached to this Official Statement as Appendix C. The customary closing papers, including a certificate to the effect that no litigation of any nature has been filed or is then pending to restrain the issuance and delivery of the Bonds which would affect the provision made for their payment or security, or in any manner questioning the validity of said Bonds will also be furnished. Bond Counsel was not requested to participate, and did not take part, in the preparation of the Notice of Sale and Bidding Instructions, the Official Bid Form and the Official Statement, and such firm has not assumed any responsibility with respect thereto or undertaken independently to verify any of the information contained herein, except that, in its capacity as Bond Counsel, such firm has reviewed the information describing the Bonds in the Official Statement to verify that such description conforms to the provisions of the Bond Resolution. The legal fee to be paid Bond Counsel for services rendered in connection with the issuance of the Bonds is contingent upon the sale and delivery of the Bonds. The legal opinion will accompany the Bonds deposited with DTC or will be printed on the Bonds in the event of the discontinuance of the Book-Entry-Only System. In connection with the issuance of the Bonds, Bond Counsel has been engaged by, and only represents, the District.

AUTHENTICITY OF FINANCIAL DATA AND OTHER INFORMATION

The financial data and other information contained herein have been obtained from District and Member Cities' records, audited financial statements and other sources which are believed to be reliable. There is no guarantee that any of the assumptions or estimates contained herein will be realized. All of the summaries of the statutes, documents and resolutions contained in this Official Statement are made subject to all of the provisions of such statutes, documents and resolutions. These summaries do not purport to be complete statements of such provisions and reference is made to such documents for further information. Reference is made to original documents in all respects.

CONTINUING DISCLOSURE OF INFORMATION

In the Bond Resolution, the District has made the following agreements for the benefit of the holders and beneficial owners of the Bonds. Under the agreement the District has agreed to provide or cause to be provided with respect to itself and each Significant Obligated Person certain updated financial information and operating data annually and the District will be obligated to provide timely notice of specified events. For purposes of such agreement, the "Significant Obligated Person" means any Member City, or Additional Member City, or other party contracting with the District whose payments to the District for use of or service from the System in the calendar year preceding any such determination exceeded 10% of the Gross Revenues of the System. The District is required to observe the agreement for so long as it remains obligated to advance funds to pay the Bonds. Under the agreement, the District will be obligated to provide certain updated financial information and operating data annually, and timely notice of specified events, to the Municipal Securities Rulemaking Board (the "MSRB") through the Electronic Municipal Market Access ("EMMA") system.

ANNUAL REPORTS . . . The District will provide or cause each Significant Obligated Person to provide certain updated financial information and operating data annually to the MSRB. The information to be updated includes all quantitative financial information and operating data with respect to the District of the general type included in this Official Statement under tables numbered 1 through 5 and all quantitative financial information and operating data with respect to each Significant Obligated Person of the general type included in Appendix B to this Official Statement. The District will provide, or cause each Significant Obligation Person to provide, this information within 6 months after the end of each fiscal year ending in and after 2017. The District will additionally provide or cause to be provided audited financial statements for the District and each Significant Obligated Person when and if available. If the audit of such financial statements of the District or a Significant Obligated Person is not complete within 12 months after their respective fiscal year end, then the District shall provide or cause to provide by each Significant Obligated Person unaudited financial statements within said 12-month period and audited financial statements when and if the audit report on such statement becomes available. Any such financial statements will be prepared in accordance with general accepted accounting principles or such other accounting principles as the District or the Significant Obligated Persons may be required to employ from time to time pursuant to State law or regulation. The District or a Significant Obligated Person may provide updated information in full text or may incorporate by reference certain other publicly available documents, as permitted by Rule 15c2-12 (the "Rule") of the United States Securities and Exchange Commission (the "SEC").

The District's and each Significant Obligated Person's current fiscal year end is September 30. Accordingly, updated information included in the above-referenced tables and Appendix B must be provided by March 31 in each year, and audited financial statements for the preceding fiscal year must be provided by September 30 of each year, unless the District or a Significant Obligated Person changes its respective fiscal year. If the District or such Significant Obligated Person changes its fiscal year, the District will notify the MSRB of the change.

NOTICE OF CERTAIN EVENTS . . . The District will also provide timely notices of certain events to the MSRB. The District will provide notice (not in excess of ten (10) business days after the occurrence of the event) of any of the following events with respect to the Bonds, if such event is material to a decision to purchase or sell Bonds: (1) Principal and interest payment delinquencies; (2) Non-payment related defaults, if material; (3) Unscheduled draws on debt service reserves reflecting financial difficulties; (4) Unscheduled draws on credit enhancements reflecting financial difficulties; (5) Substitution of credit or liquidity providers, or their failure to perform; (6) Adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the security, or other material events affecting the tax status of the security; (7) Modifications to the rights of security holders, if material; (8) Bond calls, if material, and tender offers; (9) Defeasances; (10) Release, substitution or sale of property securing repayment of the securities, if material; (11) Rating changes; (12) Bankruptcy, insolvency, receivership or similar event of the District, or a Significant Obligated Person; (13) the consummation of a merger, consolidation, or acquisition involving the District, or a Significant Obligated Person, or the sale of all or substantially all of the assets of the District, or a Significant Obligated Person, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material; and (14) appointment of a successor or additional trustee or the change of name of a trustee, if material. Neither the Bonds nor the Bond Resolution make any provision for credit enhancement, or enhancement liquidity. In addition, the District will provide timely notice of any failure by the District to provide information, data, or financial statements in accordance with its agreement described above under "Annual Reports."

AVAILABILITY OF INFORMATION . . . The District and the Significant Obligated Persons have agreed to provide the foregoing information to the MSRB. Investors will be able to access continuing disclosure information filed with the MSRB at www.emma.msrb.org.

LIMITATIONS AND AMENDMENTS . . . The District has agreed to update, or cause each Significant Obligated Person to update, information and to provide or cause the Significant Obligated Person to provide notices of material events only as described above. The District has not agreed to provide other information that may be relevant or certain to a complete presentation of its or any Significant Obligated Person's financial results of operations, condition, or prospects or agreed to update any information that is provided, except as described above. The District makes no representation or warranty concerning such information or concerning its usefulness to a decision to invest in or sell Bonds at any future date. The District disclaims any contractual or tort liability for damages resulting in whole or in part from any breach of its continuing disclosure agreement or from any statement

made pursuant to its agreement, although holders of Bonds may seek a writ of mandamus to compel the District to comply with its agreement.

The District may amend its continuing disclosure agreement from time to time to adapt to changed circumstances that arise from a change in legal requirements, a change in law, or a change in the identity, nature, status, or type of operations of the respective Significant Obligated Person, if (i) the agreement, as amended, would have permitted an underwriter to purchase or sell Bonds in the offering described herein in compliance with the Rule, taking into account any amendments or interpretations of the Rule to the date of such amendment, as well as such changed circumstances, and (ii) either (a) the holders of a majority in aggregate principal amount of the Parity Bonds consent to the amendment or (b) any person unaffiliated with the District or the Significant Obligated Person (such as nationally recognized bond counsel) determines that the amendment will not materially impair the interests of the holders and beneficial owners of the Bonds. If the District so amends the agreement, the District has agreed to include or cause the Significant Obligated Person to include with the next financial information and operating data provided in accordance with its agreement described above under "Annual Reports" an explanation, in narrative form, of the reasons for the amendment and of the impact of any change in the type of financial information and operating data so provided.

COMPLIANCE WITH PRIOR UNDERTAKINGS . . . During the last five years, the District believes it has complied in all material respects with its previous continuing disclosure undertakings, entered into pursuant to the Rule, except as follows:

In fiscal year ending 2010, the City of Forney ("Forney") became, and in fiscal year ending 2011 the City continued to be, a Significant Obligated Person with respect to its Buffalo Creek Wastewater Interceptor System (the "Buffalo Creek System"), because Forney's payments to the District for use of, or service from, the Buffalo Creek System exceeded 10% of the Gross Revenues of the Buffalo Creek System. However, due to an administrative oversight, the required financial information and operating data for Forney was not timely filed at the State Information Depository ("SID") or the MSRB for fiscal years ending 2010 and 2011. All financial information has since been filed, including a notice of late filing. The District has implemented procedures to ensure timely filing of all future financial information.

The District became obligated to file annual reports with the nationally recognized municipal securities information repository ("NRMSR") and any SID in an offering for the Panther Creek Regional Wastewater System ("Panther Creek System") that took place in 2006. However, due to an administrative oversight that resulted from additional requirements relating to the Panther Creek System's 2009 bond issue, certain of the required information and operating data for the District was not timely filed at the SID or MSRB for fiscal years ending 2009 through 2011. The District has since filed the required information. The District has implemented procedures to ensure timely filing of all future financial information.

In its Water Transmission Facilities Contract Revenue Bonds (City of Terrell Project), Series 2005, the District agreed that it would provide or cause the Significant Obligated Person to provide certain updated financial information and operating data annually to each NRMSR and any SID, which information would include audited financial statements, provided an audit is commissioned and the audit is completed in time. The District further agreed that if audited financial statements were not available by the required time, the District would provide or cause to be provided unaudited financial statements within the required time, which is six months after the end of each fiscal year of the Significant Obligated Person (March 31 in each year) and would provide or cause to be provided audited financial statements when and if such audited financial statements became available. For fiscal years ending 2009-2013, the Significant Obligated Person, the City of Terrell, Texas ("Terrell"), filed its audited financial statements between 4 and 10 months after March 31 in each year. Terrell filed certain financial information and statements of the type included in Appendix A and C of the 2014 City of Terrell Project Official Statement through its other filings.

In its Water System Revenue Bonds Series 2010, the District agreed that it would provide or cause Significant Obligated Persons to provide certain updated financial information and operating data annually to the MSRB, which information would include audited financial statements, provided an audit is commissioned and the audit is completed in time. The District further agreed that if audited financial statements were not available by the required time, the District would provide or cause to be provided unaudited financial statements within the required time, which is six months after the end of each fiscal year of the Significant Obligated Person ending in or after 2010, and would provide or cause to be provided audited financial statements when and if such audited financial statements became available. In the fiscal years ending 2011 and 2012, a Significant Obligated Person, the City of Garland ("Garland"), filed its audited financial statements on April 17, 2012 and May 1, 2013, respectively. However, Garland did file certain unaudited financial statements, financial information and quantitative data in the form of certain tables identified for each of the respective debt issuances within six months after the end of its 2011 and 2012 fiscal years (March 31).

Due to an administrative oversight, the current investments table was not included in the 2012-2015 filings for the District's Water Transmission Facilities Contract Revenue Refunding Bonds (City of Plano Project), Series 2009. The investments table due in 2016 was timely filed, but the District believes it is neither reasonably feasible nor material to create such Tables for prior years. The District has implemented procedures to ensure timely filing of all future information.

Due to an administrative oversight, the ten largest wastewater customers was not included in the 2012-2013 filings for the District's City of Rockwall 2007 Sewage Treatment and Disposal Service Contract (Buffalo Creek Plant) Revenue Bonds, Series 2008 (the "2008 Bonds"). The City of Rockwall, through its disclosure filings, had filed this information and the information was publically available. This information is now linked to the 2008 Bonds 2012-2013 filings.

The ratings on municipal bond insurers have been downgraded with frequency at various times in recent years. Information about the downgrades of municipal bond insurers has been publicly reported. During the previous five years, the District and Significant Obligated Persons have filed notices of downgrades of municipal bond insurers that insured the District or Significant Obligated Person's outstanding obligations, but no assurances can be made that all the filings have been made or made in a timely manner.

On March 18, 2014, Standard and Poor's upgraded Assured Guaranty's rating from "AA-" to "AA", and the District did not timely file a material event notice related to the rating change, by virtue of the insurance policy provided by Assured Guaranty, for the District's Mustang Creek Wastewater Interceptor System Contract Revenue Bonds, Series 2012. The material event notice has now been filed, including a notice of late filing.

On August 4, 2015, Moody's downgraded from "Aa3" to "A1" the District's Water Facilities Installment Sale Contract Revenue Bonds (City of Rockwall Pump Station Project), Series 2006 and the District's City of Rockwall 2007 Sewage Treatment and Disposal Service Contract (Buffalo Creek Plant) Revenue Bonds, Series 2008, and a material event notice was not timely filed. The material event notice has now been filed, including a notice of late filing.

FINANCIAL ADVISOR

FirstSouthwest serves as Financial Advisor to the District in connection with the issuance of the Bonds. The Financial Advisor's fee for services rendered with respect to the sale of the Bonds is contingent upon the issuance and delivery of the Bonds. FirstSouthwest, in its capacity as Financial Advisor, has relied on the opinion of Bond Counsel and has not verified and does not assume any responsibility for the information, covenants and representations contained in any of the legal documents with respect to the federal income tax status of the Bonds, or the possible impact of any present, pending or future actions taken by any legislative or judicial bodies. In the normal course of business, the Financial Advisor may from time to time sell investment securities to the District for the investment of bond proceeds or other funds of the District upon the request of the District.

The Financial Advisor to the District has provided the following sentence for inclusion in this Official Statement. The Financial Advisor has reviewed the information in this Official Statement in accordance with, and as part of, its responsibility to the District and, as applicable, to investors under the federal securities laws as applied to the facts and circumstances of this transaction, but the Financial Advisor does not guarantee the accuracy or completeness of such information.

VERIFICATION OF ARITHMETICAL AND MATHEMATICAL COMPUTATIONS

The arithmetical accuracy of certain computations included in the schedules provided by FirstSouthwest on behalf of the District relating to (a) computation of the sufficiency of forecasted receipts of principal and interest on the Federal Securities held by the Escrow Agent to pay, when due, the forecasted payments of principal and interest on the Refunded Bonds and (b) computation of the yields of the Bonds and the Federal Securities will be verified by Grant Thornton LLP, certified public accountants. Such computations will be based solely on assumptions and information supplied by FirstSouthwest on behalf of the District. Grant Thornton LLP will restrict its procedures to verifying the arithmetical accuracy of certain computations and will not make any study or evaluation of the assumptions and information on which the computations are based and, accordingly, will not express an opinion on the data used, the reasonableness of the assumptions, or the achievability of the forecasted outcome. Such verification will be relied upon by Bond Counsel in rendering its opinions with respect to the exclusion from gross income of interest on the Bonds for federal income tax purposes and with respect to defeasance of the Refunded Bonds.

FORWARD LOOKING STATEMENTS DISCLAIMER

The statements contained in this Official Statement, and in any other information provided by the District, that are not purely historical, are forward-looking statements, including statements regarding the District's expectations, hopes, intentions, or strategies regarding the future. Readers should not place undue reliance on forward-looking statements. All forward-looking statements included in this Official Statement are based on information available to the District to the date hereof, and the District assumes no obligation to update any such forward-looking statements. The District's actual results could differ materially from those discussed in such forward-looking statements.

The forward-looking statements included herein are necessarily based on various assumptions and estimates and are inherently subject to various risks and uncertainties, including risks and uncertainties relating to the possible invalidity of the underlying assumptions and estimates and possible changes or developments in social, economic, business, industry, market, legal, and regulatory circumstances and conditions and actions taken or omitted to be taken by third parties, including customers, suppliers, business partners and competitors, and legislative, judicial, and other governmental authorities and officials. Assumptions related to the foregoing involve judgment with respect to, among other things, future economic, competitive, and market conditions and future business decisions, all of which are difficult or impossible to predict accurately and many of which are beyond the control of the District. Any of such assumptions could be inaccurate and, therefore, there can be no assurance that the forward-looking statements included in this Official Statement will prove to be accurate.

INITIAL PURCHASER

After requesting competitive bids for the Bonds, the District accepted the bid of _____ (the "Initial Purchaser") to purchase the Bonds at the interest rates shown on the cover page of this Official Statement at a price of ___ % of par plus a cash premium (if any) of \$ _____. The Initial Purchaser can give no assurance that any trading market will be developed for the Bonds after their sale by the District to the Initial Purchaser. The District has no control over the price at which the Bonds are subsequently sold and the initial yield at which the Bonds will be priced and reoffered will be established by and will be the responsibility of the Initial Purchaser.

MISCELLANEOUS

The financial data and other information contained herein have been obtained from the District's records, audited financial statements and other sources which are believed to be reliable. There is no guarantee that any of the assumptions or estimates contained herein will be realized. All of the summaries of the statutes, documents and resolutions contained in this Official Statement are made subject to all of the provisions of such statutes, documents and resolutions. These summaries do not purport to be complete statements of such provisions and reference is made to such documents for further information. Reference is made to original documents in all respects.

CERTIFICATION OF THE OFFICIAL STATEMENT

At the time of payment for and delivery of the Bonds, the Purchaser will be furnished a certificate, executed by proper officers, acting in their official capacity, to the effect that to the best of their knowledge and belief: (a) the descriptions and statements of or pertaining to the District contained in this Official Statement, and any addenda, supplement or amendment thereto, on the date of such Official Statement, on the date of sale of said Bonds and the acceptance of the best bid therefor, and on the date of the delivery, were and are true and correct in all material respects; (b) insofar as the District and its affairs, including its financial affairs, are concerned, such Official Statement did not and does not contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading; (c) insofar as the descriptions and statements, including financial data, of or pertaining to entities, other than the District, and their activities contained in such Official Statement are concerned, such statements and data have been obtained from sources which the District believes to be reliable and the District has no reason to believe that they are untrue in any material respect; and (d) there has been no material adverse change in the financial condition of the District since the date of the last audited financial statements of the District.

The Resolution authorizing the issuance of the Bonds will also approve the form and content of this Official Statement, and any addenda, supplement or amendment thereto, and authorize its further use in the reoffering of the Bonds by the Initial Purchasers.

NORTH TEXAS MUNICIPAL WATER DISTRICT

/s/ _____
THOMAS W. KULA
Executive Director/General Manager

SCHEDULE OF REFUNDED OBLIGATIONS*

Schedule I

Water System Revenue Bonds, Series 2008

<u>Original Dated Date</u>	<u>Original Maturity</u>	<u>Interest Rate</u>	<u>Principal Amount Outstanding</u>	<u>Principal Amount Refunded</u>
6/15/2008	9/1/2019	5.25%	\$ 2,695,000	\$ 2,695,000
	9/1/2020	5.25%	2,840,000	2,840,000
	9/1/2021	5.25%	2,985,000	2,985,000
	9/1/2022	5.25%	3,145,000	3,145,000
	9/1/2023	5.25%	3,310,000	3,310,000
	9/1/2024	5.25%	3,480,000	3,480,000
	9/1/2025	5.25%	3,665,000	3,665,000
	9/1/2026	5.25%	3,860,000	3,860,000
	9/1/2027	5.25%	4,060,000	4,060,000
	9/1/2028 ⁽¹⁾	5.00%	4,275,000	4,275,000
	9/1/2029 ⁽¹⁾	5.00%	4,500,000	4,500,000
	9/1/2030 ⁽¹⁾	5.00%	4,725,000	4,725,000
	9/1/2031 ⁽¹⁾	5.00%	4,960,000	4,960,000
	9/1/2032 ⁽¹⁾	5.00%	5,205,000	5,205,000
	9/1/2033 ⁽¹⁾	5.00%	5,465,000	5,465,000
	9/1/2034 ⁽²⁾	5.00%	5,740,000	5,740,000
	9/1/2035 ⁽²⁾	5.00%	6,040,000	6,040,000
	9/1/2036 ⁽²⁾	5.00%	6,360,000	6,360,000
	9/1/2037 ⁽²⁾	5.00%	6,695,000	6,695,000
	9/1/2038 ⁽²⁾	5.00%	7,045,000	7,045,000
			<u>\$ 91,050,000</u>	<u>\$ 91,050,000</u>

The Refunded Obligations will be redeemed prior to original maturity on September 1, 2018, at par.

(1) Represents a Term Bond with a final maturity of September 1, 2033.

(2) Represents a Term Bond with a final maturity of September 1, 2038.

* Preliminary, subject to change.

APPENDIX A

EXCERPTS FROM THE

NORTH TEXAS MUNICIPAL WATER DISTRICT

COMPREHENSIVE ANNUAL FINANCIAL REPORT

For the Year Ended September 30, 2015

The information contained in this Appendix consists of excerpts from the North Texas Municipal Water District Comprehensive Annual Financial Report for the Year Ended September 30, 2015, and is not intended to be a complete statement of the District's financial condition. Reference is made to the complete Report for further information.

APPENDIX B

NORTH TEXAS MUNICIPAL WATER DISTRICT

MISCELLANEOUS STATISTICAL DATA

FISCAL YEAR ENDED SEPTEMBER 30, 2015

MISCELLANEOUS STATISTICAL DATA

Authority created under Chapter 62, Acts of 1951, and 52nd Legislature.

Year of Creation	1951
Domicile	Wylie, Texas
District Population	1,600,000+
District Service Area	2,200 Square Miles
Water Treatment Plant	420 acres
Average Annual Rainfall	44.54 inches
Total Employees	670

REGIONAL WATER SYSTEM

Raw Water Supply: Safe Yield

Lake Lavon	102.6 MGD
Lake Texoma	82.8 MGD
Jim Chapman Lake	44.6 MGD
Lake Bonham	4.8 MGD
Lake Tawakoni	45.7 MGD
Wilson Creek Reuse	44.0 MGD
East Fork Raw Water Supply	27.0 MGD
Ray Hubbard Pass Through	<u>18.8 MGD</u>
Total	370.3 MGD

Water Treatment Plants: Capacity

Wylie - Plant I	70 MGD
Wylie - Plant II	280 MGD
Wylie - Plant III	280 MGD
Wylie - Plant IV	140 MGD
Bonham	6.6 MGD
Tawakoni	<u>30 MGD</u>
Total	806.6 MGD

Transmission Pipelines

12" to 24" Diameter	115.6 Miles
30" to 54" Diameter	171.0 Miles
60" to 96" Diameter	<u>286.0 Miles</u>
Total	572.6 Miles

RAW WATER PUMP STATIONS

Lavon - 3 sites	
Total raw water pumps	17
Total raw water pumping capacity	940 MGD
Texoma - 1 site	
Total raw water pumps	4
Total raw water pumping capacity	125 MGD
Jim Chapman - 1 site	
Total raw water pumps	3
Total raw water pumping capacity	165 MGD
East Fork Raw Water Supply - 2 sites	
Total raw water pumps	8
Total raw water pumping capacity	270 MGD
Lake Tawakoni - 2 sites	
Total raw water pumps	7
Total raw water pumping capacity	168 MGD
Wylie Water Plant - treated water pump stations	7
Wylie Water Plant - treated water pumping capacity	953.5 MGD
NTMWD treated water storage reservoirs	
Treatment plant storage	42.0 million gallons
Transmission system storage	<u>368.00 million gallons</u>
	410.00 million gallons
Total City delivery points	77

APPENDIX C

**NORTH TEXAS MUNICIPAL WATER DISTRICT
REGIONAL WATER SYSTEM**

**WATERWORKS AND SEWER SYSTEM FINANCIAL DATA ⁽¹⁾⁽²⁾
FOR CERTAIN MEMBER CITIES**

-
- (1) Financial data is being presented herein only for the Member Cities which meet the definition of a "Significant Obligated Person" for purposes of continuing disclosure as described herein under "Other Information – Continuing Disclosure of Information."
 - (2) The following condensed operating schedules in this Appendix C have been compiled using a presentation customarily employed in the determination of net revenues available for debt service, and in all instances exclude depreciation, transfers, debt service payments and expenditures identified as capital.

CITY OF GARLAND

COMBINED UTILITY SYSTEM STATEMENT OF REVENUES AND EXPENSES

	Fiscal Year Ended September 30,				
	2015	2014	2013	2012	2011
Operating Revenues					
Charges for Services	\$ 100,745,094	\$ 92,997,444	\$ 92,008,773	\$ 88,698,885	\$ 92,282,581
Other	401,540	1,156,736	625,773	360,087	540,520
	<u>\$ 101,146,634</u>	<u>\$ 94,154,180</u>	<u>\$ 92,634,546</u>	<u>\$ 89,058,972</u>	<u>\$ 92,823,101</u>
Expenditures ⁽¹⁾					
Salaries and Wages	\$ 11,721,234	\$ 11,662,024	\$ 11,349,335	\$ 11,013,271	\$ 11,239,054
Water Purchases	25,901,319	24,066,289	22,431,264	19,890,333	18,669,727
Maintenance, Repairs and Supplies	13,243,359	13,043,559	13,086,498	13,839,012	10,983,692
Insurance and Other Expenses	899,321	1,074,845	703,604	839,809	586,542
Insurance Claims Payable	196,563	77,960	288,573	-	165,414
General and Administrative	8,674,003	9,317,675	8,782,971	7,821,863	8,079,677
Capitalized General and Administrative	(664,159)	(692,849)	(842,340)	(903,851)	(568,140)
Total	<u>\$ 59,971,640</u>	<u>\$ 58,549,503</u>	<u>\$ 55,799,905</u>	<u>\$ 52,500,437</u>	<u>\$ 49,155,966</u>
Net Income	<u>\$ 41,174,994</u>	<u>\$ 35,604,677</u>	<u>\$ 36,834,641</u>	<u>\$ 36,558,535</u>	<u>\$ 43,667,135</u>
Water Customers	68,804	68,533	68,358	69,913	67,512
Sewer Customers	66,472	66,226	66,103	67,618	65,094

(1) Excludes depreciation and bonded debt amortization.

Water and Sewer Revenue Bonds Outstanding (as of 9-30-15)	\$ 197,290,000
Average Annual Principal and Interest Requirements, 2016-2034	\$ 13,663,766
Coverage of Average Annual Debt Service Requirements by 9-30-15 Net Income	3.01 times
Maximum Debt Service Requirements, 2017	\$ 21,279,600
Coverage of Maximum Debt Service Requirements by 9-30-15 Net Income	1.93 times
Reserve Fund (as of 3-15-16)	\$ 5,046,446 ⁽¹⁾

(1) The debt service reserve fund cash balance is to provide additional security for the System's Series 2009, Series 2010, Series 2011, Series 2011A, Series 2012 and Series 2013. All other Series' reserve funds are funded by surety policies.

WATER RATES

Residential volume charge:	\$ 4.11 per 1,000 gallons for first 3,000 gallons
	\$5.25 per 1,000 gallons for next 12,000 gallons
	\$8.42 per 1,000 gallons for over 15,000 gallons
Commercial and Industrial volume charge:	\$ 5.49 per 1,000 gallons
Monthly customer charge for residential,	5/8 inch meter \$16.30
commercial and industrial customers, based	3/4 inch meter \$21.20
on meter size:	1 inch meter \$22.45
	1 1/2 inch meter \$24.80
	2 inch meter \$32.85
	3 inch meter \$85.70
	4 inch meter \$105.80
	6 inch meter \$151.65
	8 inch meter \$204.60

SEWER RATES

Single-Family Residential User	
Customer Charge	\$6.20
Volume Charge	\$4.50 per 1,000 gallons

Duplex Dwelling Residential User	
Customer Charge	\$6.20
Volume Charge	\$4.50 per 1,000 gallons

Apartment Dwelling Residential User	
Customer Charge	\$6.20
Volume Charge	\$4.50 per 1,000 gallons

General Commercial-Industrial User	
Customer Charge	\$6.20
Volume Charge	\$4.66 per 1,000 gallons

ELECTRIC RATES

Residential Service Rate	
Customer Charge	\$5.34 per kWh
November/May	0.0528 per 0-600 kWh; .0370 All Over 600 kWh
June/October	0.0561 per kWh

General Service - Small (0-20 kW Demand)		
Customer Charge	\$ 11.55	0/2,000
All Months	\$ 0.0602 per kWh	\$ 0.0549 per kWh

General Service - Large 20 kW and Greater Demand					
Energy:		Demand: November/May		Demand: June/October	
0-60,000 kWh	\$ 0.0276 per kWh	First 200 kW	\$6.88 Per kW	First 200 kW	\$8.53 Per kW
All over 60,000	0.0235 per kWh	Over 200 kW	\$6.33 Per kW	Over 200 kW	\$7.98 Per kW

Public Institutional Electric Service Rate		High Tension Service Rate (5,000 kW and Greater Demand)	
Customer Charge	\$ 19.25	Energy:	
November/May	0.04133 per kWh	0-6,000,000	\$0.0056 per kWh
June/October	0.05200 per kWh	Over 6,000,000	0.0033 per kWh
		Demand Charge	8.2500 per kWh

CITY OF PLANO

WATERWORKS AND SEWER SYSTEM CONDENSED STATEMENT OF OPERATIONS

	Fiscal Year Ended September 30,				
	2015	2014	2013	2012	2011
Revenues	<u>\$ 132,436,606</u>	<u>\$ 114,879,264</u>	<u>\$ 121,261,370</u>	<u>\$ 114,880,685</u>	<u>\$ 127,990,851</u>
Expenditures ⁽¹⁾					
Water Purchased	\$ 50,579,800	\$ 46,060,145	\$ 43,476,849	\$ 37,660,182	\$ 35,437,094
Sewer Contract	24,639,784	23,934,521	22,729,196	22,155,664	21,704,872
Other	<u>29,136,782</u>	<u>28,661,726</u>	<u>28,412,199</u>	<u>35,394,587</u>	<u>31,059,102</u>
	<u>\$ 104,356,366</u>	<u>\$ 98,656,392</u>	<u>\$ 94,618,244</u>	<u>\$ 95,210,433</u>	<u>\$ 88,201,068</u>
Net Income	<u>\$ 28,080,240</u>	<u>\$ 16,222,872</u>	<u>\$ 26,643,126</u>	<u>\$ 19,670,252</u>	<u>\$ 39,789,783</u>
Water Customers	80,371	79,139	78,534	78,144	77,720
Sewer Customers	77,591	77,439	77,267	76,116	75,492

(1) Excludes depreciation and bonded debt amortization.

MONTHLY WATER RATES (Effective November 1, 2015)

All Residential Meter Charges				Residential Consumption Charges		
Meter Size	Rate	Meter Size	Rate	First		
up to 3/4"	\$ 20.48	1 1/2"	\$ 90.65	1,000 Gallons	Included in Minimum Meter Charge	
1"	20.48	2"	143.07	1,001 - 5,000 Gallons	\$0.60 per 1,000 Gallons	
				5,001 - 20,000 Gallons	\$3.10 per 1,000 Gallons	
				20,001 - 40,000 Gallons	\$6.19 per 1,000 Gallons	
				All over 40,000 Gallons	\$7.50 per 1,000 Gallons	
All Non-Residential and Separately Metered Irrigation Use Consumption Charges				All Non-Residential and Separately Metered Irrigation Use Consumption Charges		
Meter Size	Rate	Meter Size	Rate	First		
up to 3/4"	\$ 20.48	4"	\$ 440.18	1,000 Gallons	Included in Minimum Meter Charge	
1"	46.27	6"	877.09	1,001 - 5,000 Gallons	\$0.60 per 1,000 Gallons	
1 1/2"	90.65	8"	1,401.38	All over 5,000 Gallons	\$3.10 per 1,000 Gallons	
2"	143.07	10"	2,013.21	All over 20,001 Gallons*	\$6.19 per 1,000 Gallons	
3"	282.81					

* Rate applies only to separately metered irrigation use

SEWER RATES (Effective November 1, 2015)

All Residential Consumption Charges			
Minimum Meter Charge	\$12.55		
First 1,000 Gallons	Included in Minimum Meter Charge		
All over 1,000 Gallons	\$4.97 per 1,000 Gallons		
All Non-Residential Consumption Charges			
First 1,000 Gallons	Included in Minimum Meter Charge		
All over 1,000 Gallons	\$4.97 per 1,000 Gallons		
All Non-Residential Meter Charges			
Meter Size	Rate	Meter Size	Rate
up to 3/4"	\$ 12.55	4"	\$ 202.79
1"	24.48	6"	400.97
1 1/2"	44.27	8"	596.66
2"	68.08	10"	916.21
3"	131.49		

APPENDIX D

FORM OF BOND COUNSEL'S OPINION

This page is a placeholder for information submitted with the application that may contain confidential information. Please contact Cindy DePrato, Executive Assistant at (512) 463-8420 to request reviewing this information.

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Innovative approaches
Practical results
Outstanding service

Water Conservation Plan

Prepared for:

North Texas Municipal Water District

APRIL 2014



4/30/14

Thomas C. Gooch

FREESE AND NICHOLS, INC.
TEXAS REGISTERED
ENGINEERING FIRM
F-2144

Prepared by:

FREESE AND NICHOLS, INC.
4055 International Plaza, Suite 200
Fort Worth, Texas 76109
817-735-7300

NTD13507

FORWARD

This Water Conservation Plan was prepared by Freese and Nichols for the North Texas Municipal Water District (NTMWD), pursuant to Texas Commission on Environmental Quality rules. Some material is based on the existing water conservation plans listed in Appendix A.

Questions regarding this water conservation plan should be addressed to the following:

Tom Gooch, P.E.
Freese and Nichols, Inc.
(817) 735-7300
tcg@freese.com

Jeremy Rice
Freese and Nichols, Inc.
(817) 735-7300
jjr@freese.com

Denise Hickey
North Texas Municipal
Water District
(972) 442-5405
dhickey@ntmwd.com

This water conservation plan is based on the Texas Administrative Code in effect on June 25, 2013 and considers water conservation best management practices from Texas Water Development Board Report 362, *Water Conservation Best Management Practices Guide*. The Texas Commission on Environmental Quality (TCEQ), Texas Water Development Board (TWDB) and Water Conservation Advisory Council (WCAC) are currently reviewing additional regulations in compliance with the mandates of Senate Bill 181 enacted in 2011 by the 82nd Texas Legislature. In addition to these rules, the WCAC is reviewing additional Best Management Practices (BMPs) for Wholesale Suppliers. The draft regulations and BMPs have also been considered in the preparation of this plan. The following items that are not currently in the regulations are presented in the draft regulations or under consideration by the WCAC:

- Reporting requirement for TWDB and TCEQ.
- A standardized methodology for calculating per capita use.
- Calculating per capita use by sector (i.e. total, residential (single and multi-family), industrial, institutional and commercial).
- Additional BMPs for Wholesale Suppliers (Contract Requirements, Technical Assistance and Outreach, Collective Purchasing and Direct Distribution, Cost Sharing Programs).

None of the currently proposed adjustments will cause this plan to be obsolete. The most current annual report form should be obtained from TCEQ¹ when preparing the annual report (Appendix F) to submit to the TCEQ. A copy of the annual report should be sent to the Texas Water Development Board as well as to the TCEQ.

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APPENDIX C	Model Water Conservation Plan and Model Drought Water Resource and Emergency Management Plan
APPENDIX D	NTMWD Water Utility Profile Based on TCEQ Format
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1. INTRODUCTION AND OBJECTIVES

The North Texas Municipal Water District (“NTMWD” or the “District”) is a regional wholesale supplier of water for 13 Member Cities and 60 other water suppliers in Collin, Dallas, Denton, Fannin, Hopkins, Hunt, Grayson, Kaufman, Rains, Rockwall and Van Zandt Counties. NTMWD currently provides water for over 1.6 million people throughout North Central Texas. The District has developed this updated Water Conservation Plan as a replacement for previous District water conservation plans dated August 2004, April 2006 and March 2008.

Water supply has always been a key issue in the development of Texas. In recent years, the increasing population and economic development of North Central Texas have led to growing demands for water supplies. At the same time, local and less expensive sources of water supply are largely already developed. Additional supplies to meet future demands will be expensive and difficult to secure. Severe drought conditions in recent years have highlighted the importance of efficient use of our existing supplies to make them last as long as possible. Extending current supplies will delay the need for new supplies, minimize the environmental impacts associated with developing new supplies, and delay the high cost of additional water supply development.

Recognizing the need for efficient use of existing water supplies, the Texas Commission on Environmental Quality (“TCEQ”) has developed guidelines and requirements governing the development of water conservation and drought contingency plans for wholesale water suppliers². The TCEQ guidelines and requirements for wholesale suppliers are included in Appendix B. NTMWD has developed this water conservation plan in accordance with TCEQ guidelines and requirements.

NTMWD also recognizes that in order to achieve its goals of maximizing water conservation and efficiency, it is necessary to develop and implement a water conservation plan that goes beyond basic compliance with TCEQ guidelines and requirements. This plan reflects NTMWD’s commitment to enhanced water conservation and efficiency strategies – particularly those best management practices established by the Water Conservation Implementation Task Force,³ which were incorporated, where practicable, in the development of these water conservation measures. The Water Conservation Implementation Task Force developed the Texas Water Development Board Report 362 *Water Conservation Best Management Practices Guide* in partial fulfillment of the Texas Legislature’s charge to the TCEQ and Texas Water Development Board (“TWDB”) to develop recommendations for optimum levels of water use efficiency and conservation in the State.

NTMWD has, where practicable, implemented those best management practices that are appropriate for a wholesale water supplier of its type, reflecting the intent of the best management practices to provide flexibility to wholesalers in implementing those practices that are appropriate for their individual circumstances.

As a wholesale supplier of water to customers, NTMWD does not have any direct control over the end user of water, nor does it have the authority to create ordinances or enforce the measures laid out in this plan for end users. In order to work within the confines of its role as a wholesaler, NTMWD has developed Model Water Conservation Plans to be adopted by Member Cities and Customers, who then have the ability to enforce those measures through ordinances or regulations on end users (See Appendix C).

NTMWD has also made significant financial and other investments to promote water conservation and efficiency, including public education and awareness programs and other initiatives targeted toward reducing water use. Specifically, the District maintains active participation in the Water Conservation Advisory Council, the Alliance for Water Efficiency (on behalf of itself and its Member Cities), EPA Water Sense, the Texas Water Smart Coalition, and the Water Efficiency Network of North Texas, and it developed and financed the *Water IQ* Program, a highly successful public awareness campaign that is now being used statewide to promote water conservation.

NTMWD understands that achieving the highest practicable levels of water conservation and efficiency requires that it look beyond the TCEQ requirement to update its plan every five years. To that end, the District will continually reassess ways in which to improve upon its water conservation and efficiency, and is committed to updating this plan whenever new opportunities to improve upon water conservation and efficiency necessitate edits and revisions hereto.

The objectives of this Water Conservation Plan are as follows:

- To reduce water consumption from the levels that would prevail without conservation efforts.
- To reduce the loss and waste of water.
- To improve efficiency in the use of water.
- Encourage efficient outdoor water use.
- To document the level of recycling and reuse in the water supply.

- To extend the life of current water supplies by reducing the rate of growth in demand.

2. DEFINITIONS

1. **ATHLETIC FIELD** means a public sports competition field, the essential feature of which is turf grass, used primarily for organized sports practice, competition or exhibition events for schools, professional sports, or sanctioned league play.
2. **COOL SEASON GRASSES** are varieties of turf grass that grow best in cool climates primarily in northern and central regions of the U.S. Cool season grasses include perennial and annual rye grass, Kentucky blue grass and fescues.
3. **CUSTOMERS** include those entities to whom NTMWD provides water on a customer basis that are not members of NTMWD.
4. **EVAPOTRANSPIRATION** abbreviated as ET represents the amount of water lost from plant material to evaporation and transpiration. The amount of ET can be estimated based on the temperature, wind, and relative humidity.
5. **ET/SMART CONTROLLERS** are irrigation controllers that adjust their schedule and run times based on weather (ET) data. These controllers are designed to replace the amount of water lost to evapotranspiration.
6. **EXECUTIVE DIRECTOR** means the Executive Director of the North Texas Municipal Water District and includes a person the Director has designated to administer or perform any task, duty, function, role, or action related to this plan or on behalf of the Executive Director.
7. **INSTITUTIONAL USE** means the use of water by an establishment dedicated to public service, such as a school, university, church, hospital, nursing home, prison or government facility. All facilities dedicated to public service are considered institutional regardless of ownership.
8. **MEMBER CITIES** include the cities of Allen, Farmersville, Forney, Frisco, Garland, McKinney, Mesquite, Plano, Princeton, Richardson, Rockwall, Royse City, and Wylie, Texas.
9. **MULTI-FAMILY PROPERTY** means a property containing five or more dwelling units.
10. **MUNICIPAL USE** means the use of potable water provided by a public water supplier as well as the use of treated wastewater effluent for residential, commercial, industrial, agricultural, institutional, and wholesale uses.

11. RECLAIMED WATER means reclaimed municipal wastewater that has been treated to a quality that meets or exceeds the minimum standards of the 30 Texas Administrative Code, Chapter 210 and is used for lawn irrigation, industry, or other non-potable purposes.
12. REGULATED IRRIGATION PROPERTY means any property that uses 1 million gallons of water or more for irrigation purposes in a single calendar year or is greater than 1 acre in size.
13. RESIDENTIAL GALLONS PER CAPITA PER DAY (Residential GPCD) the total gallons sold for residential use by a public water supplier divided by the residential population served and then divided by the number of days in the year.
14. TOTAL GALLONS PER CAPITA PER DAY (Total GPCD) The total amount of water diverted and/or pumped for potable use divided by the total permanent population divided by the days of the year. Diversion volumes of reuse as defined in TAC 288.1 shall be credited against total diversion volumes for the purposes of calculating GPCD for targets and goals.
15. WATER CONSERVATION PLAN means this water conservation plan approved and adopted by the NTMWD Board of Directors on February 27, 2014.

3. REGULATORY BASIS FOR WATER CONSERVATION PLAN

3.1 TCEQ Rules Governing Conservation Plans

The TCEQ rules governing development of water conservation plans for wholesale water suppliers are contained in Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.5 of the Texas Administrative Code, which is included in Appendix B. For the purpose of these rules, a water conservation plan is defined as “a strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water. A water conservation plan may be a separate document identified as such or may be contained within another water management document(s).”² The elements in the TCEQ water conservation rules addressed in this Water Conservation Plan are listed below. In addition to being a wholesale provider under TCEQ rules, NTMWD also acts as a retail water provider, and thus the TCEQ water conservation rules for retail water providers are addressed in Section 9 of this Plan.

Minimum Conservation Plan Requirements for Wholesale Water Suppliers

NTMWD is a wholesale water supplier to Member Cities and Customers in North Central Texas (NTMWD’s Customers include cities, water supply corporations, and utility districts). The minimum requirements in the Texas Administrative Code for water conservation plans for wholesale water suppliers are covered in this Plan as follows:

- 288.5(1)(A) – Description of Service Area – Section 4 and Appendix D
- 288.5(1)(B) – Specification of Goals – Section 5
- 288.5(1)(C) – Specific, Quantified Goals – Section 5
- 288.5(1)(D) – Measure and Account for Water Diverted – Section 6.1.1
- 288.5(1)(E) – Monitoring and Record Management System – Section 6.1.2
- 288.5(1)(F) – Program of Metering and Leak Detection and Repair – Section 6.1.3
- 288.5(1)(G) – Requirement for Water Conservation Plans by Wholesale Customers – Section 6.2
- 288.5(1)(H) – Reservoir System Operation Plan – Section 6.3

- 288.5(1)(I) – Means of Implementation and Enforcement – Section 6.4
- 288.5(1)(J) – Documentation of Coordination with Regional Water Planning Group – Section 6.5
- 288.5(3) – Review and Update of Plan – Section 8

Texas Administrative Code 288.7(a) imposes additional requirements for Water Conservation Plans submitted with a water right application for new or additional state water, and those requirements are addressed in Appendix H.

Additional Conservation Strategies

The Texas Administrative Code lists additional water conservation strategies that can be adopted by a wholesale supplier but are not required. Additional strategies adopted by NTMWD include the following:

- 288.5(2)(C) – Program for Reuse and/or Recycling – Section 7.1
- 288.5(2)(D) – Other Measures
 - Section 7.2 (public education),
 - Section 7.5 (model water conservation plans),
 - Sections 7.5.1 and 7.5.2 (landscape water management measures),
 - Section 7.10 (zero discharge from water treatment plants); and
 - Section 7.11 (in-house conservation measures).

3.2 Guidance and Methodology for Reporting on Water Conservation and Water Use

In addition to TCEQ rules regarding water conservation, this plan also incorporates elements of the Guidance and Methodology for Reporting on Water Conservation and Water Use developed by TWDB and TCEQ, in consultation with the Water Conservation Advisory Council (the “Guidance”). The Guidance was developed in response to a charge by the 82nd Texas Legislature to develop water use and calculation methodology and guidance for preparation of water use reports and water conservation plans in accordance with TCEQ rules. While the Guidance is targeted toward retail water providers, the Guidance provides helpful resources for wholesalers such as NTMWD to determine water use and water loss for purposes of its water conservation

plan. NTMWD has considered elements of the Guidance in preparation of this Plan. NTMWD has also incorporated features of the Guidance into the Model Water Conservation and Model Water Resource and Emergency Management Plans that it develops for use by its Member Cities and Customers. Copies of the Model Water Conservation Plans and Model Water Resource and Emergency Management Plans are included herewith as Appendix C.

4. DESCRIPTION OF THE NTMWD SERVICE AREA

NTMWD provides treated potable water to 13 Member Cities and 60 other Customers (some direct and some indirect) in North Central Texas. Figure 4-1 shows a schematic diagram of NTMWD's system and its Member Cities and Customers. Figure 4-2¹ shows the NTMWD service area, which covers over 2,200 square miles in Collin, Dallas, Denton, Fannin, Grayson, Hopkins, Hunt, Kaufman, Rains, Rockwall and Van Zandt Counties.

NTMWD obtains its raw water supplies from Lavon Lake, Lake Texoma, Jim Chapman Lake, Lake Tawakoni, the Upper Sabine Basin, Lake Bonham and reuse of treated wastewater effluent from its Wilson Creek Regional Wastewater Treatment Plant, and the East Fork Raw Water Supply Project. In 2009, NTMWD ceased raw water pumping from Lake Texoma due to the presence of Zebra Mussels, reducing available water supplies by 28 percent. NTMWD is in the process of constructing a pipeline that will allow the District to resume pumping from Lake Texoma in 2014. The long-term supply available to NTMWD as of 2013 is 617,499 acre-feet per year. The reliable supply from existing sources is somewhat less than the permitted supply, and NTMWD is seeking additional supplies to meet its projected demands. NTMWD operates four water treatment plants in Wylie, Texas, near Lavon Lake, with a total treatment capacity of 770 MGD. NTMWD also operates the 30 MGD Tawakoni water treatment plant northeast of Terrell and the 6 MGD Bonham water treatment plant. Plate 1 in the envelope at the back of this Plan shows NTMWD's current water treatment and distribution system. In addition to the facilities shown on Plate 1, NTMWD owns and operates a 6 MGD water treatment plant in Bonham, Texas.

Appendix D to this Water Conservation Plan is a water utility profile for NTMWD, based on the format recommended by the TCEQ. Table 4-1 summarizes key facts from the Water Utility Profile.

¹ The NTMWD service area shown in Figure 4.2 includes the entire service area of all of the entities to which NTMWD provides water. Actual NTMWD facilities do not extend into Hopkins, Hunt, and Rains Counties. Some of NTMWD's customers have other sources of water supply in addition to NTMWD.



Figure 4-1 North Texas Municipal Water District System Schematic

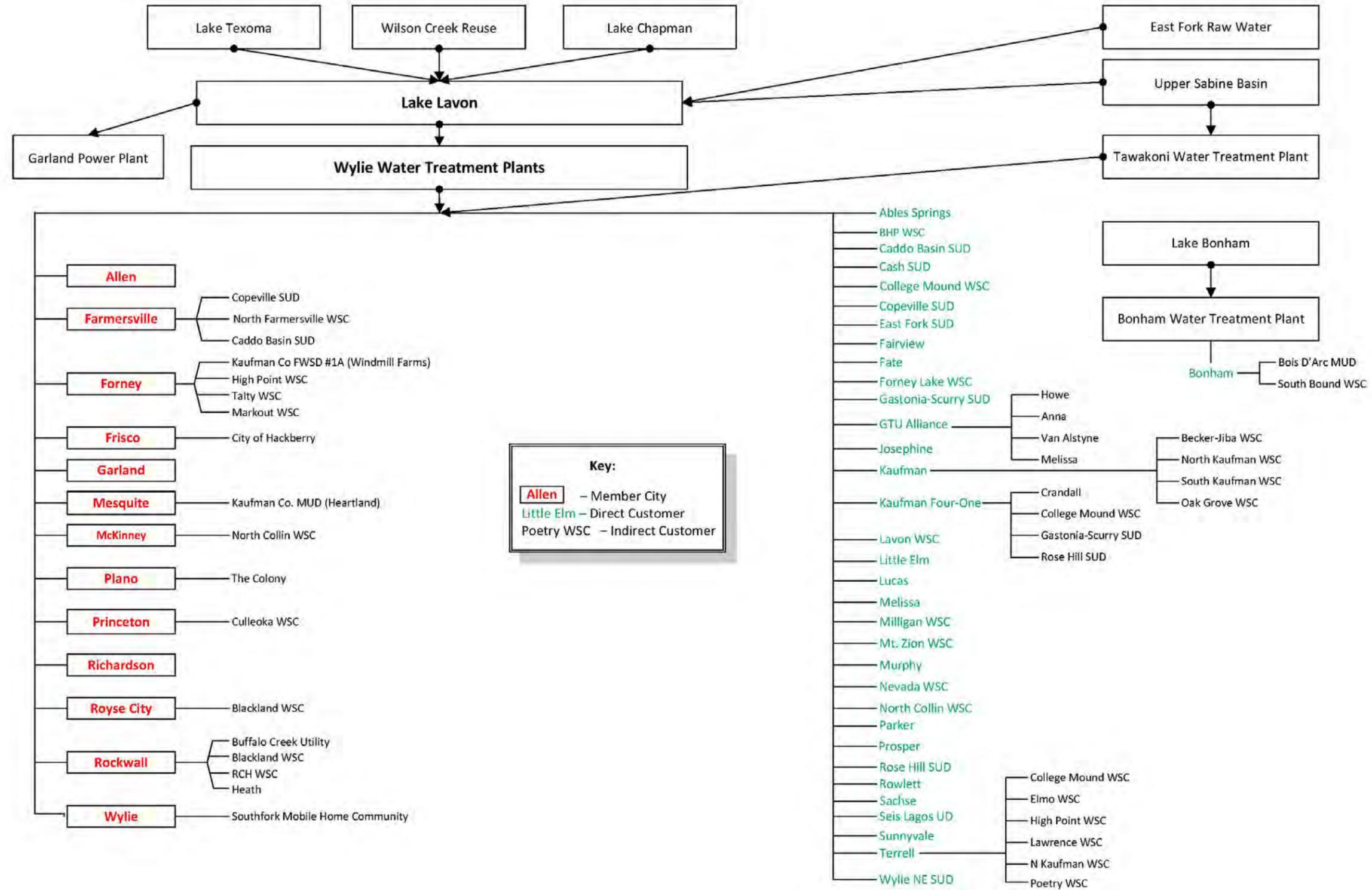


Figure 4-2 North Texas Municipal Water District Current Service Area Map

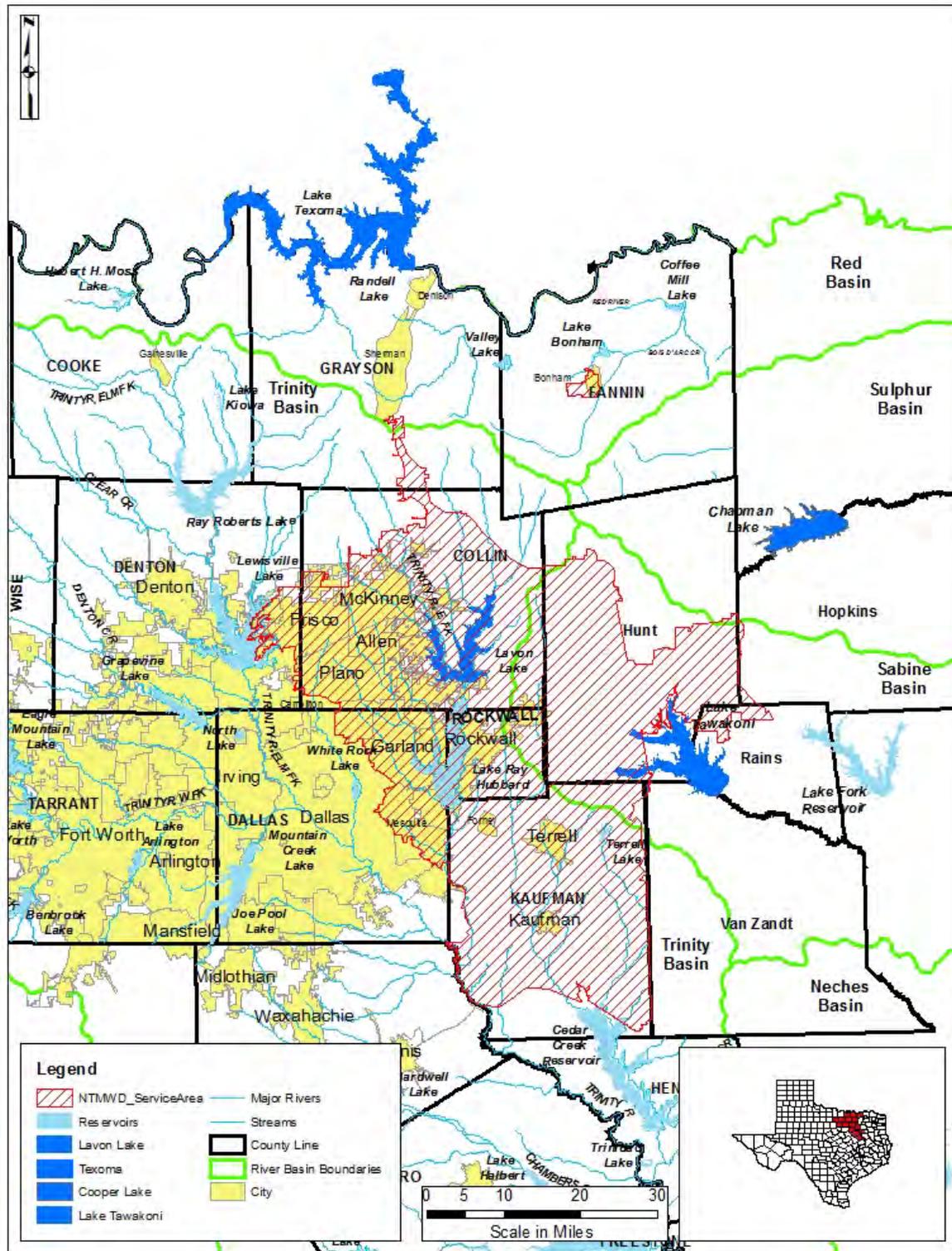


Table 4-1 Summary of Water Utility Profile for North Texas Municipal Water District

Water Service Area = 2,200 square miles

Miles Raw and Potable Water Transmission Distribution Pipeline = 518 miles

Population:

Current Population Served = 1.6 million in 2013 (estimated)

Projected 2070 Population = 3.8 million (current & projected Member Cities & Customers)

Connections:

Current Retail Connections = 41 in 2012

Information on Water Sales for the Last Five Years:

Year	Total Municipal Raw Water Diverted (Million Gallons)	Estimated Population*	Raw Water Total GPCD with Credit for Indirect Reuse (GPCD)	Ratio of Peak Day to Average Day
2008	96,441	1,413,059	165	2.04
2009	88,536	1,455,451	134	1.94
2010	101,478	1,464,391	156	1.97
2011	108,813	1,501,001	161	2.03
2012	100,933	1,596,304	140	2.01

* The estimated population served in 2012 is from the Appendix D submitted by NTMWD Customers.

Water Supply Sources (as of 2012) = Lavon Lake, Lake Texoma, Jim Chapman Lake, Lake Tawakoni, Lake Bonham, Reuse from Wilson Creek Regional Wastewater Treatment Plant, East Fork Raw Water Supply, and Upper Sabine Raw Water Supply.

Treatment and Distribution System:

Treatment Plant Capacity = 770 MGD in September 2012

Ground storage = 74 million gallons (35 MG at Plants, 39 MG remote)

Current Wastewater Flow = 42,683 million gallons in 2012

5. SPECIFICATION OF WATER CONSERVATION GOALS

As a wholesale water supplier, NTMWD does not control the water use of its Member Cities and Customers and does not have a direct relationship with the retail customers who are the ultimate consumers of the water. The Total GPCD for NTMWD’s system can be affected by changes in per capita use by its Member Cities and Customers, and can also be affected by how much water NTMWD is asked to supply to high per capita use customers or low per capita use customers. These factors are not controlled by NTMWD. In order to gain a more accurate understanding of water use within its service area and assist Member Cities and Customers in conservation efforts, NTMWD, where practicable, works with its Member Cities and Customers to utilize the Guidance and Methodology for Reporting on Water Conservation and Water Use for sector-based water use reporting. NTMWD also affords its Member Cities access to the Alliance for Water Efficiency’s Tracking Tools at the District’s expense, which enable the Member Cities to more adequately track water use by sector.

Figure 5-1 North Texas Municipal Water District Total GPCD Analysis

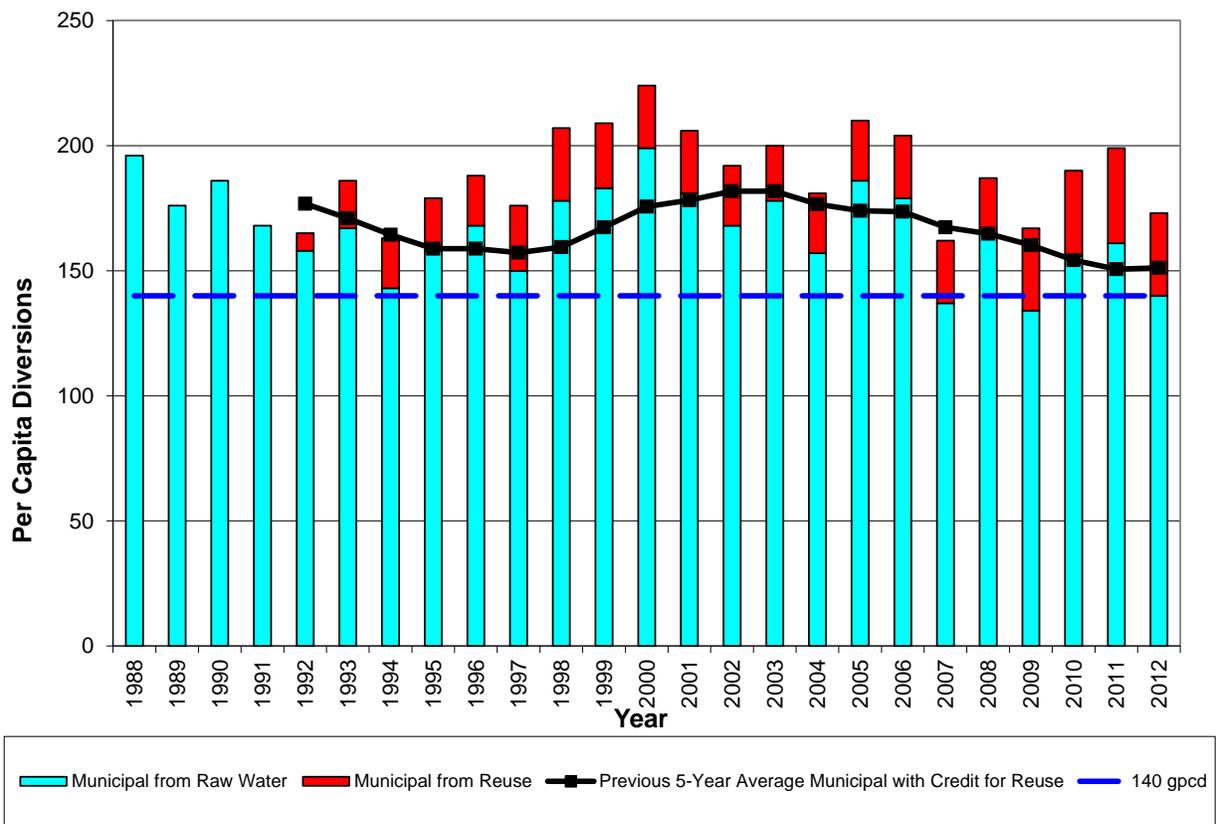


Figure 5-1 shows the historical total GPCD, with credit for indirect reuse, for the NTMWD from 1998-2012. The figure shows the amount of per capita from municipal use, industrial use and from municipal reuse. As is the case with most suppliers, there is great variability in per capita use due to weather and other factors. A 5 year average total GPCD with credit for indirect reuse is plotted to show long-term trends. Since the early 2000s, NTMWD has experienced a steady decline in their 5 year average, including dry years in 2006 and 2011. Currently, the 5-year average for total GPCD, with credit for indirect reuse, is approximately 150 GPCD, which is near the State goal for water use outlined in the Water Conservation Implementation Task Force Report 362, as well as the Region C 2011 Water Plan.²

NTMWD has control over the operation of its water supply, treatment, and delivery system and takes direct action to maximize the efficiency of that system. In areas under its direct control, NTMWD adopts the following goals for water conservation and efficiency:

- Keep the level of unaccounted water in the system below 5 percent in 2013 and subsequent years, as discussed in Section 6.1.
- Maintain universal metering of customers, meter calibration, and meter replacement and repair, as discussed in Section 6.1.
- Maintain a program of leak detection and repair, as discussed on Section 6.1.
- Continue to utilize wastewater reuse as a major source of water supply, as discussed in Section 7.1. Seek TCEQ authorization for additional reuse to increase the efficiency of the NTMWD water supply system.
- Raise public awareness of water conservation and encourage responsible public behavior by a public education program, as discussed in Section 7.2.
- Continue to recycle wash water from NTMWD water treatment plants, as discussed in Section 7.10.
- Continue to implement other in-house water conservation efforts, as discussed in Section 7.11.

As a wholesale provider, NTMWD will continue to assist its Member Cities and Customers in the development of water conservation programs. NTMWD has developed a Model Water Conservation

² Note that both Water Conservation Implementation Task Force Report 362 and the 2011 Region C Water Plan identify a goal of 140 GPCD incorporating a credit for both direct and indirect reuse. NTMWD has mirrored that approach in its calculation of Total GPCD with a credit for indirect reuse.

Plan for NTMWD Member Cities and Customers³ and a Model Water Resource and Emergency Management Plan that its Member Cities and Customers can use to develop their own water conservation and drought contingency plans. As part of the Model Water Conservation Plan, NTMWD requires Member Cities and Customers to provide annual water conservation reports. NTMWD reviews these reports and compiles the information as part of its own annual conservation report, which is used to manage NTMWD's water conservation program. Annual water conservation reports also provide for the reporting of annual sector-based water use information, where practicable.

Table 5-1 shows the projected Total GPCD, with credit for indirect reuse, for NTMWD. NTMWD has outlined its 5- and 10-year Total GPCD goals according to a credit for indirect reuse, as the GPCD goals recommended by the Region C Water Planning Group and approved by the TWDB incorporate a credit for indirect reuse. The projected per capita use approved by the TWDB includes the estimated effect of low-flow plumbing fixtures but does not include the effect of new water conservation measures that may be adopted by NTMWD Member Cities and Customers. Table 5-1 also shows NTMWD's targets for reduction in Total GPCD, with credit for indirect reuse, as a result of implementing this Water Conservation Plan and the plans to be developed by its Member Cities and Customers. The data shown on the table reflect the following:

- The five year moving average of the current Total GPCD, with credit for indirect reuse, is used based on the Water Conservation Implementation Task Force recommendation².
- The target for the five-year (2017) Total GPCD with credit for indirect reuse for all NTMWD Member Cities and Customers is 145 gallons per capita per day, based on a five-year moving average, as shown in Table 5-1 (5-year goal). This represents a reduction of 6 gallons per capita per day.
- The target for the ten-year (2022) Total GPCD with credit for indirect reuse for all NTMWD Member Cities and Customers is 140 gallons per capita per day based on a five year moving average, as shown in Table 5-1 (10-year goal). This represents a reduction of 11 gallons per capita per day.

The per capita use in recent years includes reductions due to drought measures that have been implemented in the past five years. In addition to these drought measures, NTMWD has continued to increase the percentage of its supply that comes from reuse, as shown in Table 5-1. The goal is for a 5-

year average and some years (dry years) will be higher. A series of dry years might lead to an average exceeding the goal.

Table 5-1 Five-Year and Ten-Year Total GPCD Goals*

Description	Current Average (GPCD)	5-Year Goal (2017) (GPCD)	10-Year Goal (2022) (GPCD)
Current 5-Year Average Per Capita Total Use	183		
Current 5-Year Average Per Capita Municipal Use from Reuse	32		
Current 5-Year Average Per Capita Municipal Use with Credit for Reuse	151		
Expected Reduction Due to Low-Flow Plumbing Fixtures		1	3
Projected Reduction Due to Elements in this Plan		5	8
Water Conservation Goals (Based on 5-Year Average with credit for reuse)		145	140

* Includes credit for indirect reuse.

6. BASIC WATER CONSERVATION STRATEGIES

6.1 Metering, Water Use Records, Control of Unaccounted Water, and Leak Detection and Repair

One of the key elements in water conservation is careful tracking of water use and control of losses. Accurate metering of water deliveries, detection and repair of leaks in the raw water delivery and potable water distribution systems and regular monitoring of unaccounted water are important elements of NTMWD's program to control losses. To that end, in 2012 the NTMWD Board of Directors authorized an expenditure of \$4.8 million in flow metering improvements, including new meters for several of its water treatment plants. These metering upgrades allow for more accurate metering and ultimately, more careful monitoring of water use and water loss control.

6.1.1 Practices to Measure and Account for the Amount of Water Diverted

NTMWD meters its raw water diversions by meters with accuracy of $\pm 2\%$. These meters are calibrated on an annual basis by NTMWD and are repaired and/or replaced as needed.

6.1.2 Monitoring and Record Management Program for Determining Deliveries, Sales, and Losses

As a wholesale water supplier, NTMWD has instituted a program of careful monitoring and record management to assure that its Member Cities and Customers are charged appropriately for their water use. The program includes the following elements:

- Deliveries to all Member Cities and Customers are metered by meters with accuracy of $\pm 2\%$, which are read monthly by NTMWD personnel. These readings are used to bill Member Cities and wholesale Customers.
- The meters used to measure deliveries to the Member Cities and wholesale Customers are calibrated quarterly and tested, as necessary.
- Potable drinking water leaving NTMWD's water treatment plants is metered by meters with accuracy of $\pm 2\%$.
- Plant potable water discharge meters are calibrated at least quarterly and more frequently if necessary.
- All meter readings are sent to Member Cities and Customers so that they can compare the readings against the operation of their systems.

- NTMWD monitors unaccounted water in its delivery system. (For NTMWD, unaccounted water is defined as raw water diverted from Lavon Lake less metered sales to Member Cities and Customers and line flushing use.) Historical records show that NTMWD's unaccounted water has been as high as 8.4 percent and as low as 0.9 percent of raw water diversions and averaged 2.9 percent over that period. This low level of unaccounted water is evidence of NTMWD's diligence in metering all uses and controlling losses in its system.
- Some NTMWD Member Cities and Customers have leak detection crews that are utilized and available for other Member Cities and Customers.

One of the goals of NTMWD's water conservation program is to maintain unaccounted water below 5 percent in every year.

6.1.3 Leak Detection and Repair

NTMWD's metering program for raw and potable water is described in Sections 6.1.1 and 6.1.2. As evidenced by the low level of unaccounted water described in Section 6.1.2, NTMWD has an effective program to control, detect, and repair leaks:

- All NTMWD water transmission pipelines are reinforced concrete cylinder pipe or steel cylinder pipe with an internal protective liner and an external protective coating. Because of the multiple layers of material, these pipelines have very long service lives and are not subject to frequent development of leaks.
- Most joints in NTMWD water transmission pipelines are designed with bell and spigot joint construction including a rubber gasket. Some joints are welded.
- All NTMWD water transmission pipelines are constructed in legally defined and identified rights-of-way, properly registered with authorities in each county.
- NTMWD personnel routinely inspect NTMWD facilities and water transmission pipelines for leaks or mechanical problems. Repairs are undertaken as soon as practicable in order to minimize waste.
- NTMWD operates a program for right-of-way identification for construction projects adjacent to NTMWD facilities and water transmission pipelines in order to minimize leaks caused by pipeline damage during construction.
- NTMWD's metering program allows comparison of measured flows in the system and metered deliveries to Member Cities and Customers, which can be used to identify leaks.

- NTMWD's regular monitoring of unaccounted water (on a monthly basis) provides a further check for problems in the distribution system.
- NTMWD personnel perform regular inspections of its system to detect unauthorized connections.

6.2 Requirement for Water Conservation Plans by Wholesale Customers

NTMWD has developed language for all contracts for the wholesale sale of water by NTMWD entered into, renewed, or extended after the adoption of this Plan that will require the wholesale customer and any wholesale customers of that wholesale customer to develop and implement a water conservation plan meeting the requirements of Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 of the Texas Administrative Code.

Further, all wholesale contracts with Customers entered into, renewed, or extended after the adoption of this plan will include the following language:

Customer agrees to adopt, implement, and enforce any and all ordinances and policies related to water conservation and drought management as required by the Texas Water Code, rules of the TCEQ and/or as may be adopted by the Board of Directors of NTMWD. NTMWD's obligations pursuant to this Contract shall be subject to the Customer preparing and implementing any water conservation plans and drought contingency plans adopted by NTMWD and required or approved by the TCEQ, the Board, or any federal, state, or local regulatory authority with power to require or approve water conservation and drought contingency plans. Upon execution of this Contract, Customer shall submit its water conservation plan or water conservation measures, and drought contingency plan, to NTMWD for review and approval, and Customer agrees to amend its water conservation plan or other water conservation measures, and drought contingency plan as requested by NTMWD in order to comply with the requirements of NTMWD's water conservation plan and drought contingency plan, program and/or rules. Customer shall also submit any changes or amendments to its water conservation plan or water conservation measures, and drought contingency plan, to NTMWD for review and approval.

6.3 Reservoir System Operation Plan

NTMWD currently has a long-term water supply of 617,499 acre-feet per year from the following permitted and contractual sources:

Lavon Lake water right	118,670 acre-feet per year
Lake Texoma†	197,000 acre-feet per year
Jim Chapman Lake	57,214 acre-feet per year
Lake Bonham	5,340 acre-feet per year
Reuse - Wilson Creek Reg. WWTP*	71,882 acre-feet per year
East Fork Raw Water Supply*	157,393 acre-feet per year
Upper Sabine Basin	10,000 acre-feet per year
TOTAL	617,499 acre-feet per year

* Availability from Wilson Creek WWTP and East Fork Raw Water Supply Project is limited to actual discharges and is currently less than amount authorized.

† Availability from Lake Texoma is limited due to issues with zebra mussels and salt levels.

In addition, NTMWD has entered into short-term interim contracts for 67,260 acre-feet per year from the City of Dallas (expiring in 2016), and for 40,000 acre-feet per year from the Sabine River Authority (decreasing incrementally over time and expiring in 2025).

The current reliable water supply (based on current return flows and supplies available in a drought of record) is about 295,000 acre-feet per year. Upon completion of the pipeline to deliver Lake Texoma water directly to the Wylie Water Treatment Plants is completed (scheduled for April 2014), the reliable water supply will increase to 379,000 acre-feet per year.

Water from Jim Chapman Lake is pumped by pipeline to the Lavon Lake watershed, where it flows into Lavon Lake. A pipeline from Lake Texoma is being constructed that will bring water from the lake directly to NTMWD's Water Treatment Plant in Wylie. Treated wastewater effluent from the Wilson Creek Regional Wastewater Treatment Plant is returned to the Lavon Lake watershed. Water from East Fork Raw Water Supply Project is pumped to Lavon Lake. Water from Lake Tawakoni (Upper Sabine Basin) is pumped to the Lake Tawakoni Water Treatment Plant and also delivered as raw water to Lavon Lake. Water from Lake Bonham is pumped to the NTMWD Bonham Water Treatment Plant. NTMWD has developed a reservoir system operation plan for its various sources of supply in order to maximize the efficiency of operation within existing water rights. The NTMWD reservoir system operation plan includes pumping from alternative sources before Lavon Lake reaches extremely low elevations to avoid water supply problems that would be caused by low water surface elevations. The plan minimizes pumping into the Lavon Lake during flood conditions. The plan also avoids unnecessary pumping from

alternative sources to minimize energy use and avoid causing low elevations in other sources. Overall, the operation of the reservoir system is intended to optimize the use of the District's sources (within the constraints of existing water rights) while minimizing energy use cost for pumping, maintaining water quality and minimizing potential impacts on recreational users of the reservoirs and fish and wildlife.

6.4 Water Conservation Implementation and Enforcement

The Executive Director of NTMWD is authorized to implement and enforce the Water Conservation Plan. Appendix F includes the TCEQ-required water conservation implementation report. NTMWD will submit this report to the TCEQ by the required date of May 1 of every year. This report lists the various water conservation strategies that have been implemented, including the date the strategy was implemented. The report also lists the five-year and ten-year per capita water use goals from the previous water conservation plan, and the amount of water saved. This report will be used to review the effectiveness of NTMWD's water conservation program, and results will be reported to the NTMWD Water Committee of the NTMWD Board and the Board of Directors.

As a wholesale provider of water, NTMWD has no direct enforcement authority over those conservation practices ultimately implemented and enforced by its Member Cities and Customers. However, as discussed herein, NTMWD makes best efforts to ensure implementation and enforcement of its water conservation plan via outreach, technical assistance, and the contractual requirements discussed in Section 6.2. Further, NTMWD's annual water conservation report provides a means by which NTMWD can measure its success and quantify water savings via conservation initiatives, thereby optimizing implementation of the plan over time.

6.5 Coordination with Regional Water Planning Groups

NTMWD's service area is located within two regional water planning areas, Region C and the North East Texas Region (Region D). Appendix G includes copies of those letters sent to the Chairs of the Region C and North East Texas Region water planning groups with a copy of this Water Conservation Plan.

As part of its coordination with the appropriate regional water planning groups to ensure consistency with the state and regional water plans, NTMWD has undertaken an evaluation of the feasibility of alternatives to proposed future water right applications by NTMWD pursuant to Title 30, Chapter 288, Section 288.7 of the Texas Administrative Code. This evaluation assessed waste prevention, recycling and reuse, water transfer and marketing, regionalization, and other water supplies identified in the

Region C and the North East Texas (Region D) Water Plans as possible alternatives to future appropriations. A synopsis of this assessment is included herewith as Appendix H.

7. ENHANCED WATER CONSERVATION STRATEGIES

NTMWD has implemented a number of enhanced water conservation measures which allow the District to serve as a regional leader and resource for water conservation efforts throughout its service area. These enhanced water conservation measures are outlined below.

7.1 Reuse and Recycling of Wastewater

NTMWD's Wilson Creek Regional Wastewater Treatment Plant discharges treated effluent into Wilson Creek upstream from Lavon Lake. NTMWD reused 41,327 acre-feet of treated wastewater from the Wilson Creek WWTP for municipal purposes in 2012. In addition, NTMWD has developed the East Fork Raw Water Supply Project, which diverted 43,735 acre-feet in 2012. These two projects represent the largest municipal water supply based on reuse in the State of Texas. When fully developed, the two projects will provide up to 44 percent of the NTMWD's currently permitted water supplies.

The 18 wastewater treatment plants that NTMWD owns and/or operates use treated effluent for all necessary wastewater plant washdowns and for wastewater plant site irrigation. NTMWD also makes treated wastewater from its plants available for direct reuse for landscape irrigation use. In 2012, approximately 378 million gallons of NTMWD's treated wastewater were used for off-site irrigation.

NTMWD has been recognized, both at the state and national level, for its reuse program:

- ACEC Engineering Excellence Award – 2012; in recognition of the East Fork Raw Water Supply Project.
- TCEQ Texas Environmental Excellence Awards – 2011; in recognition of the East Fork Raw Water Supply Project
- WEAT Sidney L. Allison Award – 2010; in recognition of the East Fork Raw Water Supply Project.
- Water Reuse Association Large Project of the Year -2008; in recognitions of the East Fork Raw Water Supply Project.
- North Central Texas Council of Governments CLIDE Award – 2013; in recognition of the East Fork Water Supply Project

7.2 Public Education Program

As a regional wholesale water supplier, NTMWD has few opportunities to directly interact with end users of water throughout its service area. However, NTMWD's public education program is intended to

educate water suppliers and end users in conservation efforts, and to assist and supplement the public education efforts of its Member Cities and Customers to reach end users and effect water savings. NTMWD's public education efforts include the following elements:

- Beginning in 2006 and continuing through 2013, NTMWD has invested \$11.2 million in the development and implementation of the "Water IQ: Know Your Water" campaign, including newspaper ads, radio spots, billboards, a web site, and other forms of communication all intended to educate the public regarding water use and water conservation . NTMWD has budgeted an additional \$1.1 million for the "Water IQ: Know Your Water" campaign for 2014. During the 2012 campaign, over a quarter of a million people were reached by the program through media relations, outreach and interactive media. The total audience reached through the campaign in 2012 was over 72 million impressions.
- NTMWD has prepared and presented programs to area cities, civic organizations and other groups concerning the need for water conservation and strategies that can be implemented on an individual and corporate level. Presentations have been made to Rotary Clubs, Lions Clubs, Chambers of Commerce, Leadership Training Classes, Boy Scouts, Girl Scouts, mayors, city councils, city staff, etc.
- NTMWD provided funding for the conversion of the Texas Smartscape CD-ROM into an interactive web site. Texas Smartscape is an educational tool designed to assist citizens with the design and development of landscaping using Texas native and drought tolerant plants. NTMWD promotes the use of the Texas Smartscape web site (www.txsmartscape.com).
- NTMWD provides conservation brochures and information to interested civic groups and schools. Information includes brochures on water-saving measures and xeriscape landscaping.
- NTMWD participates in special events to distribute water conservation information to the public.
- NTMWD participates in the Water Educators Network of North Texas to enhance regional programs and develop water efficiency brochures, videos, "Sprinkler Smarts" irrigation outreach, in addition to numerous other activities for regional cooperation and water awareness.

- NTMWD has partnered with Texas A&M AgriLife Extension Service to provide proven, scientific based best management practices to the region through public events, seminars, and brochures.
- NTMWD has partnered with Dallas Water Utilities and Tarrant Regional Water District to host an annual Water Conservation Symposium, a half day event where leading water conservation experts present best management practices.
- NTMWD is an EPA Water Sense Partner and participates in the EPA Water Sense sponsored “Fix a Leak Week.” NTMWD encourages all Member Cities and Customers to become EPA Water Sense Partners.
- NTMWD operates the East Fork Raw Water Supply project in cooperation with the John Bunker Sands Wetland Center, funding the operation and maintenance cost of the Center, as well as the personnel cost. As part of its mission, the Center provides education to the public, area school districts, wildlife and conservation organizations, and research institutions in the areas of water supply, water conservation and reuse.
- NTMWD acts as a supporting participant and member of the Texas Water Smart education campaign, and participates at Texas Water Smart meetings, conferences, media events designed to increase public awareness and education on water conservation.
- NTMWD has been recognized at the state and national level for its water conservation program with the following awards:
 - ADDY Award – 2012; in recognition of the 2011 Water IQ media campaign.
 - Water Conservation Advisory Council Large Supplier Water Conservation and Stewardship Award – 2011; in recognition of outstanding and innovative commitment to conservation of Texas’ water resources.
 - Texas AWWA Watermark Award – 2011; in recognition of the 2010 Water IQ media campaign.
 - TCEQ Texas Excellence Environmental Awards – 2011; in recognition of the NTMWD water conservation program.

7.3 Interactive Weather Stations / Water My Yard Program

NTMWD has developed the Water My Yard program to install weather stations throughout its service area to provide consumers with a weekly e-mail and information through the Water My Yard website in determining an adequate amount of supplemental water that is needed to maintain healthy grass in specific locations. This service represents the largest network of weather stations providing ET-based irrigation recommendations in the State of Texas, and provides the public advanced information regarding outdoor irrigation needs, thereby reducing water use. Through a series of selections on the type of irrigation system a consumer has, a weekly email is provided that will determine how long (in minutes) that an irrigation system needs to run based on the past seven days of weather. This recommendation provides the actual amount of supplemental water that is required for a healthy lawn based on research of the Texas A&M Agrilife Extension Service and proven technologies. This innovative program has been available to those within the NTMWD service area since May 2013.

7.4 Technical Assistance and Outreach

Beginning in 2003, NTMWD has held a series of water conservation workshops for staff of its Member Cities and Customers. These workshops have covered a number of conservation-related topics, including TCEQ requirements for water conservation and drought contingency plans, advanced water conservation strategies, current NTMWD water conservation efforts, water conservation programs of the cities, current drought status, progress on future water supplies, and related topics. These workshops also provide training and education regarding water use accounting, irrigation evaluations, industrial, commercial, and institutional (ICI) audits, and other procedures.

NTMWD encourages its Member Cities and Customers to develop and implement rebate and bulk purchasing programs, where such programs may benefit the Member Cities and Customers in achieving overall water savings. Further, NTMWD provides technical assistance to those Member Cities and Customers who wish to implement rebate and bulk purchasing programs.

In addition, NTMWD staff participates in the following technical assistance and outreach for Member Cities and Customers:

- Dedicated conservation coordinator on NTMWD staff to field conservation-related queries from Member Cities and Customers and coordinate with media regarding conservation issues.

- Provision of training for Member Cities and Customers regarding Industrial, Commercial, and Institutional retail customer audits.
- Provision of online portal on NTMWD website for Member Cities and Customers to communicate and share information on water conservation programs.
- Presenting at meetings and conferences to various commercial, institutional, and industry stakeholder groups: landscapers, irrigators, tree and nursery growers, pool and spa industries, school district facility managers, and hospitality industry groups.
- Holding monthly meeting with Member Cities and Customers for water supply updates, Water IQ campaign strategies, and legislative activities related to water and water conservation.
- Provision of web-based water conservation tips on the NTMWD website, Water IQ website, and Water My Yard website, in addition to links to other water related agencies for additional resources.
- Purchasing American Water Works Association Research Foundation publications for use by Member Cities and Customers to further enhance resources for water efficiency, water rate structures, etc.
- Member/partner of EPA Water Sense
- Member/partner of the Alliance for Water Efficiency (NTMWD membership, as well as membership paid for by NTMWD for Member Cities)
- Member/partner for the Texas Water Foundation
- Member of American Water Works Association and American Water Works Association Research Foundation
- Member of WENT (Water Efficiency Network of North Texas)

7.5 NTMWD Model Water Conservation Plan for NTMWD Member Cities and Customers

In order to assist its Member Cities and Customers in the development of their own water conservation plans, NTMWD has developed a Model Water Conservation Plan for NTMWD Member Cities and Customers⁴. The Model Water Conservation Plan addresses the TCEQ requirements for water conservation plans for municipal use by public water suppliers¹ and includes advanced water conservation strategies beyond TCEQ requirements that mirror the NTMWD plan. NTMWD continues to

assist Member Cities and Customers in the development of their water conservation plans using the Model Conservation Plan as a guide.

7.5.1 Compulsory Landscape and Water Management Measures

The following landscape water management measures are included in the NTMWD Model Water Conservation Plan to be utilized by Member Cities and Customers. These measures represent minimum measures to be implemented and enforced in order to irrigate the landscape appropriately, and are to remain in effect on a permanent basis unless water resource management stages are declared.

1. Landscape Water Management Measures

- Limit landscape watering with sprinklers or irrigation systems at each service address to no more than two days per week (April 1 – October 31), with education that less than twice per week is usually adequate. Additional watering of landscape may be provided by hand-held hose with shutoff nozzle, use of dedicated irrigation drip zones, and/or soaker hose provided no runoff occurs.
- Limit landscape watering with sprinklers or irrigation systems at each service address to no more than one day per week beginning November 1 and ending March 31 of each year, with education that less than once per week is usually adequate.
- Prohibit lawn irrigation watering from 10 AM to 6 PM (April 1 – October 31).
- Prohibit the use of irrigation systems that water impervious surfaces. (Wind driven water drift will be taken into consideration.)
- Prohibit outdoor watering during precipitation or freeze events.
- Prohibition of use of poorly maintained sprinkler systems that waste water.
- Prohibit excess water runoff or other obvious waste.
- Require rain and freeze sensors and/or ET or Smart controllers on all new irrigation systems. Rain and freeze sensors and/or ET or Smart controllers must be maintained to function properly.
- Prohibit overseeding, sodding, sprigging, broadcasting or plugging with cool season grasses or watering cool season grasses, except for golf courses and athletic fields.

- Require that irrigation systems be inspected at the same time as initial backflow preventer inspection.
- Requirement that all new irrigation systems be in compliance with state design and installation regulations (TAC Title 30, Part 1, Chapter 344).
- Require the owner of a regulated irrigation property to obtain an evaluation of any permanently installed irrigation system on an periodic basis. The irrigation evaluation shall be conducted by a licensed irrigator in the state of Texas and be submitted to your local water provider (i.e., city, water supply corporation).

2. Additional Water Management Measures

- Prohibit the use of potable water to fill or refill residential, amenity, and any other natural or manmade ponds. A pond is considered to be a still body of water with a surface area of 500 square feet or more.
- Non-commercial car washing can be done only when using a water hose with a shut-off nozzle.
- Hotels and motels shall offer a linen reuse water conservation option to customers.
- Restaurants, bars, and other commercial food or beverage establishments may not provide drinking water to customers unless a specific request is made by the customer for drinking water.

7.5.2 Additional Water Conservation Measures in the NTMWD Model Water Conservation Plan

NTMWD also urges its Member Cities and Customers to consider including the following additional water conservation measures from the NTMWD Model Water Conservation Plan in their plans:

1. Landscape Water Management Regulations

- Requirement that all existing irrigation systems be retrofitted with rain and freeze sensors and/or ET or Smart controllers capable of multiple programming. Rain and freeze sensors and/or ET or Smart controllers must be maintained to function properly.
- Requirement that all new athletic fields be irrigated by a separate irrigation system from surrounding areas.
- Implementation of other measures to encourage off-peak water use.

2. Landscape Ordinance

- Landscape ordinances are developed by cities to guide developers in landscaping requirements for the city. A model landscape ordinance is provided in as part of the model plan and is intended as a guideline for adopting a landscape ordinance to promote water efficient landscape design.
- Native, drought tolerant or adaptive plants should be encouraged.
- Drip irrigation systems should be promoted.
- ET/Smart controllers that only allow sprinkler systems to irrigate when necessary should be promoted.

3. Water Audits

- Water audits are useful in finding ways in which water can be used more efficiently at a specific location. NTMWD recommends that Member Cities and Customers offer water audits to customers.

Member Cities and Customers are required to develop regulations, ordinances, policies, or procedures for enforcement of water conservation guidelines.

4. Rebates

- In addition to the conservation measures described above, the NTMWD also recommends the following water conservation incentive programs for consideration by Member Cities and Customers:
 - Low-flow toilet replacement and rebate programs,
 - Rebates for rain/freeze sensors and/or ET or Smart controllers,
 - Low-flow showerhead and sink aerators replacement programs or rebates,
 - Water efficient clothes washer rebates,
 - Pressure reducing valve installation programs or rebates,
 - Rain barrel rebates,
 - Pool Covers,
 - On-demand hot water heater rebates, and/or
 - Other water conservation incentive programs.

7.6 Annual Reports

One element of NTMWD's Model Water Conservation Plan for NTMWD Member Cities and Customers is a requirement that Member Cities and customers complete annual conservation reports by March 31 of the following year and submit them to NTMWD. A copy of the annual report is included herewith as Appendix E. NTMWD compiles these reports and uses them to help generate its own annual water conservation report

. NTMWD's annual water conservation report is used to review the effectiveness of its water conservation program and results will be reported to the NTMWD Water Committee of the NTMWD Board and the Board of Directors.. As part of the development of Appendix E, Member Cities and Customers will complete the Alliance for Water Efficiency (AWE) tracking tool by March 31 each year for the previous year and submit those results to NTWMD. The completion of this annual water conservation report allows NTMWD to track the effectiveness of its water conservation programs over time and reassess those programs that are not providing water savings, ensuring maximum water use efficiency and greater levels of conservation.

7.7 Water Conservation Symposium

NTMWD has partnered with Dallas Water Utilities and Tarrant Regional Water District to host the annual North Texas Regional Water Conservation Symposium. The Symposium is a half-day event bringing together leading water conservation experts from around the country to present water conservation best management practices to a wide audience of water utility staff. NTMWD's (and others') sponsorship allows the Symposium to be offered for free to all attendees. In 2013, the 7th annual North Texas Regional Water Conservation Symposium was attended by over 130 professionals.

7.8 Industrial Pretreatment

As part of its wastewater system, NTMWD has developed industrial pretreatment programs for the cities of Allen, Forney, Frisco, McKinney, Mesquite, Murphy, Plano, Richardson, Rockwall, Terrell, and Wylie. The pretreatment programs developed by NTMWD are adopted and implemented by the cities, which are also responsible for enforcement of the programs. By reducing allowable volumes of specific pollutants and encouraging pretreatment of industrial wastes, this joint effort by NTMWD and the cities has improved water quality in the region's streams and reservoirs. NTMWD industrial pretreatment personnel are also available to assist cities on request in the review or design of systems to allow

industrial recycling and reuse of wastewater. Such systems have reduced water use by some industries, while also reducing wastewater volumes and saving money for the industries.

7.9 Watershed Protection

The NTMWD monitors and samples about fifteen sites monthly on Lavon Lake to evaluate the water quality of the reservoir. Additionally, the hydraulic inputs into Lake Lavon are monitored to evaluate the nutrient and pollutant loading. Studies are performed to evaluate and model hydraulics, nutrient loading and pollutant loading of the reservoir.

The District monitors and performs monthly sampling of the tributaries that will be contributing water to the future Bois d'arc Creek Reservoir. The information is used to evaluate nutrient loading and pollutant loading of the future reservoir.

The NTMWD regularly monitors and samples the East Fork of the Trinity River to evaluate the impact of the constructed wetland on the river. The monitoring includes habitat assessments and biological assessments.

The District also monitors and samples the receiving streams of each of the NTMWD-operated wastewater treatment plants. That information is used to evaluate hydraulics, nutrient, and pollutant loading of the stream.

7.10 Zero Discharge from Water Treatment Plants

Since 1975, NTMWD's water treatment plants have operated under zero discharge permits. Wash water from filter washing and sludge from the water treatment process are pumped to lagoons for solar drying. After settling of solids, suitable water is decanted from the lagoons and recycled to the head of the water treatment plant for treatment. This approach saves water and contributes to NTMWD's excellent control of unaccounted water in treatment and distribution.

7.11 In-House Water Conservation Efforts

NTMWD has implemented an in-house water conservation program, including the following elements:

- Wherever possible, landscapes will use native or adapted drought tolerant plants, trees, and shrubs.

- Irrigation at NTMWD facilities will occur between 11 p.m. and 5 a.m. in the peak consumption summer months (April 1 and ending October 31) in order to lower evaporation losses.
- Irrigation will be limited to the amount needed to promote survival and health of plants and lawns.
- Irrigation will be avoided on Saturday and Sunday if possible, since these are periods of high water use by the public.
- Irrigation will be done with treated wastewater effluent wherever feasible and reasonable.

8. ADOPTION OF WATER CONSERVATION PLAN; PERIODIC REVIEW AND UPDATE OF PLAN

Appendix I contains a copy of the minutes of the NTMWD Board of Directors meeting at which this water conservation plan was adopted.

TCEQ requires that water conservation plans be reviewed and, if necessary, updated every five years to coincide with the regional water planning process. This Water Conservation Plan will be updated as required by TCEQ, and in addition, will be continually reassessed for opportunities to improve water efficiency and conservation based on new or updated information.

9. CONSERVATION PLAN REQUIREMENTS FOR A PUBLIC WATER SUPPLIER

9.1 Introduction

In addition to serving as a wholesale water supplier, NTMWD is also a public water supplier of potable water, providing direct retail service to 41 customers who do not have access to retail service from other sources. The TCEQ has established rules for the development of water conservation plans for public water suppliers that provide retail service. The rules for water conservation plans for public water suppliers are contained in Title 30, Part 1, Chapter 288, Subchapter B, Rule 288.2 of the Texas Administrative Code. These rules are included in Appendix B.

An additional requirement for public water suppliers is that they report 5 and 10 year goals for residential per capita water use. Table 9-1 shows the residential per capita goals for the 41 direct retail service customers.

Table 9-1 Five-Year and Ten-Year Residential GPCD Goals

Description	Assumed Average (GPCD)	5-Year Goal (2017) (GPCD)	10-Year Goal (2022) (GPCD)
Assumed Current 5-Year Average Per Capita Residential Use	100		
Expected Reduction Due to Low-Flow Plumbing Fixtures		1	3
Projected Reduction Due to Elements in this Plan		2	4
Water Conservation Goals (Based on 5-Year Average)		97	93

NTMWD’s Water Conservation Plan, specifically Sections 1-8 of the Plan, address the majority of requirements in the TCEQ rules pertaining to water conservation plans for public water suppliers. This section summarizes the TCEQ requirements for public water suppliers, indicates where they are met in the Plan, and covers any additional information needed to meet public water supplier requirements.

9.2 State Requirements for Water Conservation Plans for Public Water Suppliers

Title 30, Part 1, Chapter 288, Subchapter B, Rule 288.2 of the Texas Administrative Code contains the requirements for water conservation plans for public water suppliers. This rule is included in Appendix B.

Minimum Requirements

TCEQ's minimum requirements for water conservation plans for public water suppliers are addressed below:

- 288.2(a)(1)(A) – Utility Profile – Included in Appendix D.
- 288.2(a)(1)(B) – Specification of Conservation Goals – Addressed in Section 5 and Section 9.
- 288.2(a)(1)(C) – Specific, Quantifiable Goals – Addressed in Section 5 and Section 9.
- 288.2(a)(1)(D) – Metering of Diversions – Addressed in Section 6.1.1.
- 288.2(a)(1)(E) – Universal Metering – Addressed in Section 6.1. Deliveries to all of NTMWD's retail customers (like those to all of its wholesale customers) are metered. NTMWD tracks use for its retail customers to ensure that the meters remain in good working order.
- NTMWD has implemented a meter replacement program, in accordance with AWWA standards. At a minimum, all customer meters will be replaced every 15 years.
- 288.2(a)(1)(F) – Measures to Determine and Control Unaccounted Water – Addressed in Section 6.1.
- 288.2(a)(1)(G) – Program of Continuing Public Education and Information – Addressed in Section 7.2. NTMWD also will also communicate directly with its retail customers by including brochures and other material on water conservation in monthly invoicing.
- 288.2(a)(1)(H) – Non-Promotional Rate Structure – The NTMWD has a three-tiered rate structure for its residential customers as follows:
 - Monthly minimum charge of \$15.00 with up to 2,000 gallons
 - Base rate of \$3.50 per 1,000 gallons for water use of 2,000 to 10,000 gallons
 - 2nd tier rate of \$5.38 per 1,000 gallons from 10,000 to 20,000 gallons
 - 3rd tier rate of \$6.72 per 1,000 gallons for water use above 20,000 gallons
- 288.2(a)(1)(I) – Reservoir System Operation Plan – Addressed in Section 6.3.

- 288.2(a)(1)(J) – Means of Implementation and Enforcement – Addressed in Section 6.4.
- 288.2(a)(1)(K) – Documentation of Coordination with Regional Water Planning Groups – Addressed in Section 6.5.
- 288.2(c) – Review and Update of Plan – Section 8.

Additional Requirements for Users Serving a Current Population of 5,000 or More

TCEQ has additional requirements for water conservation plans for public water suppliers serving more than 5,000 people. Including its wholesale customers, NTMWD serves more than 5,000 people. Those additional TCEQ requirements are addressed below:

- 288.2(a)(2)(A) – Program of Leak Detection, Repair, and Water Loss Accounting – Addressed in Section 6.1.3.
- 288.2(a)(2)(B) – Record Management System – NTMWD’s retail customers include 34 residential accounts, 3 commercial accounts, and 4 public accounts. NTMWD has no retail industrial customers. The vast majority of NTMWD’s sales are to wholesale suppliers. NTMWD makes records available for residential use by retail customers, commercial use by retail customers, public use by retail customers, and wholesale sales.
- 222.8(a)(2)(C) – Requirement for Conservation Plans for Wholesale Customers – Addressed in Section 6.2.

Additional Conservation Strategies

TCEQ also lists additional water conservation strategies which may be implemented by a public water supplier but are not required. This water conservation plan includes several of those strategies:

- NTMWD’s program for reuse and recycling of wastewater is described in Section 7.1.
- Sections 7.3, 7.4, and 7.5 describe additional measures NTMWD has adopted to encourage water conservation by its Member Cities and Customers.
- Section 8.4 describes NTMWD’s plans to monitor the effectiveness of the water conservation program.
- Section 7.2 describes NTMWD’s public education program.
- Section 7.10 describes NTMWD’s program to maintain zero discharge from its water treatment plants.
- Section 7.11 describes NTMWD’s in-house water conservation efforts.

APPENDIX A
LIST OF REFERENCES

APPENDIX A

LIST OF REFERENCES

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http://www.tceq.texas.gov/permitting/water_rights/conserv.html#imple
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June 2013.
3. Water Conservation Implementation Task Force: “Texas Water Development Board Report 362, Water Conservation Best Management Practices Guide,” prepared for the Texas Water Development Board, Austin, November 2004.
4. Water Conservation Advisory Council: Guidance and Methodology for Reporting on Water Conservation and Water Use, December 2012
5. Freese and Nichols, Inc.: Model Water Conservation Plan for NTMWD Members Cities and Customers, prepared for the North Texas Municipal Water District, Fort Worth, March 2008.
6. Freese and Nichols, Inc.: Model Drought Contingency and Water Emergency Response Plan for NTMWD Members Cities and Customers, prepared for the North Texas Municipal Water District, Fort Worth, March 2008.
7. Definitions from City of Austin Water Conservation and Drought Contingency Ordinance adopted August 16, 2012.
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8. Definition from City of San Antonio Water Conservation Ordinance adopted 2005.
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9. Definition developed by Freese and Nichols Inc.

10. Texas Water Development Board, Texas Commission on Environmental Quality, Water Conservation Advisory Council. "DRAFT Guidance and Methodology for Water Conservation Reporting."
11. Freese and Nichols Inc, Alan Plummer Associates, Inc., CP & Y Inc., Cooksey Communications. "2011 Region C Water Plan"

APPENDIX B

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

RULES ON MUNICIPAL WATER CONSERVATION AND DROUGHT

CONTINGENCY PLANS FOR WHOLESALE WATER SUPPLIERS

APPENDIX B

TEXAS COMMISSION OF ENVIRONMENTAL QUALITY RULES ON MUNICIPAL WATER CONSERVATION AND DROUGHT CONTINGENCY PLANS FOR WHOLESALE WATER SUPPLIERS

<u>TITLE 30</u>	ENVIRONMENTAL QUALITY
<u>PART 1</u>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<u>CHAPTER 288</u>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<u>SUBCHAPTER A</u>	WATER CONSERVATION PLANS
<u>RULE §288.1</u>	Definitions

The following words and terms, when used in this chapter, shall have the following meanings, unless the context clearly indicates otherwise.

(1) Agricultural or Agriculture--Any of the following activities:

(A) cultivating the soil to produce crops for human food, animal feed, or planting seed or for the production of fibers;

(B) the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or non-soil media by a nursery grower;

(C) raising, feeding, or keeping animals for breeding purposes or for the production of food or fiber, leather, pelts, or other tangible products having a commercial value;

(D) raising or keeping equine animals;

(E) wildlife management; and

(F) planting cover crops, including cover crops cultivated for transplantation, or leaving land idle for the purpose of participating in any governmental program or normal crop or livestock rotation procedure.

- (2) Agricultural use--Any use or activity involving agriculture, including irrigation.
- (3) Best management practices--Voluntary efficiency measures that save a quantifiable amount of water, either directly or indirectly, and that can be implemented within a specific time frame.
- (4) Conservation--Those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses.
- (5) Commercial use--The use of water by a place of business, such as a hotel, restaurant, or office building. This does not include multi-family residences or agricultural, industrial, or institutional users.
- (6) Drought contingency plan--A strategy or combination of strategies for temporary supply and demand management responses to temporary and potentially recurring water supply shortages and other water supply emergencies. A drought contingency plan may be a separate document identified as such or may be contained within another water management document(s).
- (7) Industrial use--The use of water in processes designed to convert materials of a lower order of value into forms having greater usability and commercial value, and the development of power by means other than hydroelectric, but does not include agricultural use.
- (8) Institutional use--The use of water by an establishment dedicated to public service, such as a school, university, church, hospital, nursing home, prison or government facility. All facilities dedicated to public service are considered institutional regardless of ownership.
- (9) Irrigation--The agricultural use of water for the irrigation of crops, trees, and pastureland, including, but not limited to, golf courses and parks which do not receive water from a public water supplier.
- (10) Irrigation water use efficiency--The percentage of that amount of irrigation water which is beneficially used by agriculture crops or other vegetation relative to the amount of water diverted from the source(s) of supply. Beneficial uses of water for irrigation purposes include, but are not limited to, evapotranspiration needs for vegetative maintenance and growth, salinity management, and leaching requirements associated with irrigation.
- (11) Mining use--The use of water for mining processes including hydraulic use, drilling, washing sand and gravel, and oil field re-pressuring.

(12) Municipal use--The use of potable water provided by a public water supplier as well as the use of sewage effluent for residential, commercial, industrial, agricultural, institutional, and wholesale uses.

(13) Nursery grower--A person engaged in the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or nonsoil media, who grows more than 50% of the products that the person either sells or leases, regardless of the variety sold, leased, or grown. For the purpose of this definition, grow means the actual cultivation or propagation of the product beyond the mere holding or maintaining of the item prior to sale or lease, and typically includes activities associated with the production or multiplying of stock such as the development of new plants from cuttings, grafts, plugs, or seedlings.

(14) Pollution--The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property, or to the public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

(15) Public water supplier--An individual or entity that supplies water to the public for human consumption.

(16) Residential use--The use of water that is billed to single and multi-family residences, which applies to indoor and outdoor uses.

(17) Residential gallons per capita per day--The total gallons sold for residential use by a public water supplier divided by the residential population served and then divided by the number of days in the year.

(18) Regional water planning group--A group established by the Texas Water Development Board to prepare a regional water plan under Texas Water Code, §16.053.

(19) Retail public water supplier--An individual or entity that for compensation supplies water to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants when that water is not resold to or used by others.

(20) Reuse--The authorized use for one or more beneficial purposes of use of water that remains unconsumed after the water is used for the original purpose of use and before that water is either disposed of or discharged or otherwise allowed to flow into a watercourse, lake, or other body of state-

owned water.

(21) Total use--The volume of raw or potable water provided by a public water supplier to billed customer sectors or nonrevenue uses and the volume lost during conveyance, treatment, or transmission of that water.

(22) Total gallons per capita per day (GPCD)--The total amount of water diverted and/or pumped for potable use divided by the total permanent population divided by the days of the year. Diversion volumes of reuse as defined in this chapter shall be credited against total diversion volumes for the purposes of calculating GPCD for targets and goals.

(23) Water conservation plan--A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water. A water conservation plan may be a separate document identified as such or may be contained within another water management document(s).

(24) Wholesale public water supplier--An individual or entity that for compensation supplies water to another for resale to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants as an incident of that employee service or tenancy when that water is not resold to or used by others, or an individual or entity that conveys water to another individual or entity, but does not own the right to the water which is conveyed, whether or not for a delivery fee.

(25) Wholesale use--Water sold from one entity or public water supplier to other retail water purveyors for resale to individual customers.

Source Note: The provisions of this §288.1 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective August 15, 2002, 27 TexReg 7146; amended to be effective October 7, 2004, 29 TexReg 9384; amended to be effective January 10, 2008, 33 TexReg 193; amended to be effective December 6, 2012, 37 TexReg 9515

<u>TITLE 30</u>	ENVIRONMENTAL QUALITY
<u>PART 1</u>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<u>CHAPTER 288</u>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<u>SUBCHAPTER A</u>	WATER CONSERVATION PLANS
RULE §288.2	Water Conservation Plans for Municipal Uses by Public Water Suppliers

(a) A water conservation plan for municipal water use by public water suppliers must provide information in response to the following. If the plan does not provide information for each requirement, the public water supplier shall include in the plan an explanation of why the requirement is not applicable.

(1) Minimum requirements. All water conservation plans for municipal uses by public water suppliers must include the following elements:

(A) a utility profile in accordance with the Texas Water Use Methodology, including, but not limited to, information regarding population and customer data, water use data (including total gallons per capita per day (GPCD) and residential GPCD), water supply system data, and wastewater system data;

(B) a record management system which allows for the classification of water sales and uses into the most detailed level of water use data currently available to it, including, if possible, the sectors listed in clauses (i) - (vi) of this subparagraph. Any new billing system purchased by a public water supplier must be capable of reporting detailed water use data as described in clauses (i) - (vi) of this subparagraph:

- (i) residential;
 - (I) single family;
 - (II) multi-family;
- (ii) commercial;
- (iii) institutional;

- (iv) industrial;
- (v) agricultural; and,
- (vi) wholesale.

(C) specific, quantified five-year and ten-year targets for water savings to include goals for water loss programs and goals for municipal use in total GPCD and residential GPCD. The goals established by a public water supplier under this subparagraph are not enforceable;

(D) metering device(s), within an accuracy of plus or minus 5.0% in order to measure and account for the amount of water diverted from the source of supply;

(E) a program for universal metering of both customer and public uses of water, for meter testing and repair, and for periodic meter replacement;

(F) measures to determine and control water loss (for example, periodic visual inspections along distribution lines; annual or monthly audit of the water system to determine illegal connections; abandoned services; etc.);

(G) a program of continuing public education and information regarding water conservation;

(H) a water rate structure which is not "promotional," i.e., a rate structure which is cost-based and which does not encourage the excessive use of water;

(I) a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin in order to optimize available water supplies; and

(J) a means of implementation and enforcement which shall be evidenced by:

(i) a copy of the ordinance, resolution, or tariff indicating official adoption of the water conservation plan by the water supplier; and

(ii) a description of the authority by which the water supplier will implement and enforce the conservation plan; and

(K) documentation of coordination with the regional water planning groups for the service area of the public water supplier in order to ensure consistency with the appropriate approved regional water plans.

(2) Additional content requirements. Water conservation plans for municipal uses by public drinking water suppliers serving a current population of 5,000 or more and/or a projected

population of 5,000 or more within the next ten years subsequent to the effective date of the plan must include the following elements:

(A) a program of leak detection, repair, and water loss accounting for the water transmission, delivery, and distribution system;

(B) a requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements in this chapter. If the customer intends to resell the water, the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with the provisions of this chapter.

(3) Additional conservation strategies. Any combination of the following strategies shall be selected by the water supplier, in addition to the minimum requirements in paragraphs (1) and (2) of this subsection, if they are necessary to achieve the stated water conservation goals of the plan. The commission may require that any of the following strategies be implemented by the water supplier if the commission determines that the strategy is necessary to achieve the goals of the water conservation plan:

(A) conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates;

(B) adoption of ordinances, plumbing codes, and/or rules requiring water-conserving plumbing fixtures to be installed in new structures and existing structures undergoing substantial modification or addition;

(C) a program for the replacement or retrofit of water-conserving plumbing fixtures in existing structures;

(D) reuse and/or recycling of wastewater and/or graywater;

(E) a program for pressure control and/or reduction in the distribution system and/or for customer connections;

(F) a program and/or ordinance(s) for landscape water management;

(G) a method for monitoring the effectiveness and efficiency of the water conservation plan;

and

(H) any other water conservation practice, method, or technique which the water supplier shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

(b) A water conservation plan prepared in accordance with 31 TAC §363.15 (relating to Required Water Conservation Plan) of the Texas Water Development Board and substantially meeting the requirements of this section and other applicable commission rules may be submitted to meet application requirements in accordance with a memorandum of understanding between the commission and the Texas Water Development Board.

(c) A public water supplier for municipal use shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. The public water supplier for municipal use shall review and update the next revision of its water conservation plan every five years to coincide with the regional water planning group.

Source Note: The provisions of this §288.2 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384; amended to be effective December 6, 2012, 37 TexReg 9515

<u>TITLE 30</u>	ENVIRONMENTAL QUALITY
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<u>CHAPTER 288</u>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<u>SUBCHAPTER A</u>	WATER CONSERVATION PLANS
RULE §288.5	Water Conservation Plans for Wholesale Water Suppliers

A water conservation plan for a wholesale water supplier must provide information in response to each of the following paragraphs. If the plan does not provide information for each requirement, the wholesale water supplier shall include in the plan an explanation of why the requirement is not applicable.

(1) Minimum requirements. All water conservation plans for wholesale water suppliers must include the following elements:

(A) a description of the wholesaler's service area, including population and customer data, water use data, water supply system data, and wastewater data;

(B) specific, quantified five-year and ten-year targets for water savings including, where appropriate, target goals for municipal use in gallons per capita per day for the wholesaler's service area, maximum acceptable water loss, and the basis for the development of these goals. The goals established by wholesale water suppliers under this subparagraph are not enforceable;

(C) a description as to which practice(s) and/or device(s) will be utilized to measure and account for the amount of water diverted from the source(s) of supply;

(D) a monitoring and record management program for determining water deliveries, sales, and losses;

(E) a program of metering and leak detection and repair for the wholesaler's water storage, delivery, and distribution system;

(F) a requirement in every water supply contract entered into or renewed after official adoption of the

water conservation plan, and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements of this chapter. If the customer intends to resell the water, then the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of this chapter;

(G) a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin. The reservoir systems operations plans shall include optimization of water supplies as one of the significant goals of the plan;

(H) a means for implementation and enforcement, which shall be evidenced by a copy of the ordinance, rule, resolution, or tariff, indicating official adoption of the water conservation plan by the water supplier; and a description of the authority by which the water supplier will implement and enforce the conservation plan; and

(I) documentation of coordination with the regional water planning groups for the service area of the wholesale water supplier in order to ensure consistency with the appropriate approved regional water plans.

(2) Additional conservation strategies. Any combination of the following strategies shall be selected by the water wholesaler, in addition to the minimum requirements of paragraph (1) of this section, if they are necessary in order to achieve the stated water conservation goals of the plan. The commission may require by commission order that any of the following strategies be implemented by the water supplier if the commission determines that the strategies are necessary in order for the conservation plan to be achieved:

(A) conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates;

(B) a program to assist agricultural customers in the development of conservation pollution prevention and abatement plans;

(C) a program for reuse and/or recycling of wastewater and/or graywater; and

(D) any other water conservation practice, method, or technique which the wholesaler shows to be

appropriate for achieving the stated goal or goals of the water conservation plan.

(3) Review and update requirements. The wholesale water supplier shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. A wholesale water supplier shall review and update the next revision of its water conservation plan every five years to coincide with the regional water planning group.

Source Note: The provisions of this §288.5 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384; amended to be effective December 6, 2012, 37 TexReg 9515

APPENDIX C
MODEL WATER CONSERVATION PLAN AND MODEL DROUGHT
CONTINGENCY PLAN

MODEL WATER CONSERVATION PLAN FOR NORTH TEXAS MUNICIPAL WATER DISTRICT MEMBER CITIES AND CUSTOMERS

APRIL 2014

Prepared by:

FRESE AND NICHOLS, INC.
4055 International Plaza, Suite 200
Fort Worth, Texas 76109
817-735-7300

FORWARD

This Model Water Conservation plan was prepared by Freese and Nichols for the North Texas Municipal Water District (NTMWD). It is intended to be used as a guide by NTMWD Member Cities and Customers as they develop their own water conservation plans. The model plan was prepared pursuant to Texas Commission on Environmental Quality rules. Some material is based on the existing water conservation plans listed in Appendix A.

Questions regarding this Model Water Conservation plan should be addressed to the following:

Tom Gooch, P.E.
Freese and Nichols, Inc.
(817) 735-7300
tcg@freese.com

Jeremy Rice
Freese and Nichols, Inc.
(817) 735-7300
jjr@freese.com

Denise Hickey
North Texas Municipal
Water District
(972) 442-5405
dhickey@ntmwd.com

This Water Conservation plan is based on the Texas Administrative Code in effect on June 25, 2013, and considers water conservation best management practices from Texas Water Development Board Report 362, *Water Conservation Best Management Practices Guide*. The Texas Commission on Environmental Quality (TCEQ), Texas Water Development Board (TWDB) and Water Conservation Advisory Council (WCAC) are currently reviewing additional regulations in compliance with the mandates of Senate Bill 181 enacted in 2011 by the 82nd Texas Legislature. In addition to these rules, the WCAC is reviewing additional Best Management Practices (BMPs) for Wholesale Suppliers. The draft regulations and BMPs have also been considered in the preparation of this plan. The following items that are not currently in the regulations are presented in the draft regulations or under consideration by the WCAC:

- Reporting requirement for TWDB and TCEQ.
- A standardized methodology for calculating per capita use.
- Calculating per capita use by sector (i.e. total, residential, industrial and commercial).
- Additional BMPs for Wholesale Suppliers (Contract Requirements, Technical Assistance and Outreach, Collective Purchasing and Direct Distribution, Cost Sharing Programs).

None of the currently proposed adjustments will cause this plan to be obsolete. The most current annual report form should be obtained from TCEQ¹ when preparing the annual report (Appendix J) to submit to the TCEQ. A copy of the annual report should be sent to the Texas Water Development Board as well as to the TCEQ.



WATER CONSERVATION PLAN
INSERT ENTITY NAME

APRIL 2014

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- Texas Administrative Code Title 30, Part 1, Chapter 288, Subchapter A, Rule §288.1 – Definitions (Page B-1)
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1. INTRODUCTION AND OBJECTIVES

Water supply has always been a key issue in the development of Texas. In recent years, the increasing population and economic development of North Central Texas have led to growing demands for water supplies. At the same time, local and less expensive sources of water supply are largely already developed. Additional supplies to meet future demands will be expensive and difficult to secure. Severe drought conditions in recent years have highlighted the importance of efficient use of our existing supplies to make them last as long as possible. This will delay the need for new supplies, minimize the environmental impacts associated with developing new supplies, and delay the high cost of additional water supply development.

Recognizing the need for efficient use of existing water supplies, the Texas Commission on Environmental Quality (TCEQ) has developed guidelines and requirements governing the development of water conservation and drought contingency plans for wholesale water suppliers². The TCEQ guidelines and requirements for wholesale suppliers are included in Appendix B. The North Texas Municipal Water District (NTMWD) has developed this model water conservation plan pursuant to TCEQ guidelines and requirements. The best management practices established by the Water Conservation Implementation Task Force³ were also considered in the development of the water conservation measures.

This model water conservation plan includes measures that are intended to result in ongoing, long-term water savings. This plan replaces the previous plans dated August 2004, April 2006 and March 2008⁴.

The objectives of this water conservation plan are as follows:

- To reduce water consumption from the levels that would prevail without conservation efforts.
- To reduce the loss and waste of water.
- To improve efficiency in the use of water.
- Encourage efficient outdoor water use.
- To document the level of recycling and reuse in the water supply.

- To extend the life of current water supplies by reducing the rate of growth in demand.

The water conservation plan presented in this document is a model water conservation plan intended for adoption by the NTMWD Member Cities and Customers. In order to adopt this plan, each Member City and Customer will need to do the following:

- Complete the water utility profile (provided in Appendix C).
- Complete the annual water conservation implementation report (in Appendix J).
- Set five-year and ten-year goals for per capita water use.
- Adopt ordinance(s) or regulation(s) approving the model plan.

The water utility profile, goals, and ordinance(s) or regulations should be provided to NTMWD in draft form for review and comments. Final adopted versions should also be provided to NTMWD, as well as TCEQ. This model plan includes all of the elements required by TCEQ. Some elements of this model plan go beyond TCEQ requirements. Any water supplier wishing to adjust elements of the plan should coordinate with NTMWD.

¹ Superscripted numbers match references listed in Appendix A.

2. DEFINITIONS

1. **ATHLETIC FIELD** means a public sports competition field, the essential feature of which is turf grass, used primarily for organized sports practice, competition or exhibition events for schools, professional sports, or sanctioned league play.
2. **COOL SEASON GRASSES** are varieties of turf grass that grow best in cool climates primarily in northern and central regions of the U.S. Cool season grasses include perennial and annual rye grass, Kentucky blue grass and fescues.
3. **CUSTOMERS** include those entities to whom NTMWD provides water on a customer basis that are not members of NTMWD.
4. **EVAPOTRANSPIRATION** abbreviated as ET represents the amount of water lost from plant material to evaporation and transpiration. The amount of ET can be estimated based on the temperature, wind, and relative humidity.
5. **ET/SMART CONTROLLERS** are irrigation controllers that adjust their schedule and run times based on weather (ET) data. These controllers are designed to replace the amount of water lost to evapotranspiration.
6. **EXECUTIVE DIRECTOR** means the Executive Director of the North Texas Municipal Water District and includes a person the Director has designated to administer or perform any task, duty, function, role, or action related to this plan or on behalf of the Executive Director.
7. **INSTITUTIONAL USE** means the use of water by an establishment dedicated to public service, such as a school, university, church, hospital, nursing home, prison or government facility. All facilities dedicated to public service are considered institutional regardless of ownership.
8. **MEMBER CITIES** include the cities of Allen, Farmersville, Forney, Frisco, Garland, McKinney, Mesquite, Plano, Princeton, Richardson, Rockwall, Royse City, and Wylie, Texas.
9. **MULTI-FAMILY PROPERTY** means a property containing five or more dwelling units.

10. MUNICIPAL USE means the use of potable water provided by a public water supplier as well as the use of treated wastewater effluent for residential, commercial, industrial, agricultural, institutional, and wholesale uses.
11. RECLAIMED WATER means reclaimed municipal wastewater that has been treated to a quality that meets or exceeds the minimum standards of the 30 Texas Administrative Code, Chapter 210 and is used for lawn irrigation, industry, or other non-potable purposes.
12. REGULATED IRRIGATION PROPERTY means any property that uses 1 million gallons of water or more for irrigation purposes in a single calendar year or is greater than 1 acre in size.
13. RESIDENTIAL GALLONS PER CAPITA PER DAY (Residential GPCD) the total gallons sold for residential use by a public water supplier divided by the residential population served and then divided by the number of days in the year.
14. TOTAL GALLONS PER CAPITA PER DAY (Total GPCD) The total amount of water diverted and/or pumped for potable use divided by the total permanent population divided by the days of the year. Diversion volumes of reuse as defined in TAC 288.1 shall be credited against total diversion volumes for the purposes of calculating GPCD for targets and goals.
15. WATER CONSERVATION PLAN means this water conservation plan approved and adopted by the NTMWD Board of Directors on February 27, 2014.

3. REGULATORY BASIS FOR WATER CONSERVATION PLAN

3.1 TCEQ Rules Governing Conservation Plans

The TCEQ rules governing development of water conservation plans for public water suppliers are contained in Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 of the Texas Administrative Code, which is included in Appendix B. For the purpose of these rules, a water conservation plan is defined as “A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water².” The elements in the TCEQ water conservation rules covered in this conservation plan are listed below.

Minimum Conservation Plan Requirements

The minimum requirements in the Texas Administrative Code for Water Conservation Plans for Public Water Suppliers are covered in this report as follows:

- 288.2(a)(1)(A) – Utility Profile – Section 4 and Appendix C
- 288.2(a)(1)(B) – Specification of Goals – Section 5
- 288.2(a)(1)(C) – Specific, Quantified Goals – Section 5
- 288.2(a)(1)(D) – Accurate Metering – Section 6.1.1
- 288.2(a)(1)(E) – Universal Metering – Section 6.1.2
- 288.2(a)(1)(F) – Determination and Control of Water Loss – Section 6.1.3
- 288.2(a)(1)(G) – Public Education and Information Program – Section 6.2
- 288.2(a)(1)(H) – Non-Promotional Water Rate Structure – Section 7.1
- 288.2(a)(1)(I) – Reservoir System Operation Plan – Section 6.3
- 288.2(a)(1)(J) – Means of Implementation and Enforcement – Section 8
- 288.2(a)(1)(K) – Coordination with Regional Water Planning Group – Section 6.4 and Appendix F
- 288.2(c) – Review and Update of Plan – Section 9

Conservation Additional Requirements (Population over 5,000)

- The Texas Administrative Code includes additional requirements for water conservation plans for drinking water supplies serving a population over 5,000
- 288.2(a)(2)(A) – Leak Detection, Repair, and Water Loss Accounting – Sections 6.1.4
- 288.2(a)(2)(B) – Record Management System – Section 6.1.5
- 288.2(a)(2)(C) – Requirement for Water Conservation Plans by Wholesale Customers – Section 6.6

Additional Conservation Strategies

The TCEQ requires that a water conservation implementation report be completed and submitted on an annual basis. The template for this report is included in Appendix J.

In addition to the TCEQ required water conservation strategies, the NTMWD also requires the following strategy to be included in the Member City and Customer plans:

- 288.2(a)(3)(F) – Considerations for Landscape Water Management Regulations – Section 7.5 and Appendix E

TCEQ rules also include optional, but not required, conservation may be adopted by suppliers. The NTMWD recommends that the following strategies be included in the Member City and Customer water conservation plans:

- 288.2(a)(3)(A) – Conservation Oriented Water Rates – Section 7.1
- 288.2(a)(3)(B) – Ordinances, Plumbing Codes or Rules on Water-Conserving Fixtures – Section 7.2
- 288.2(a)(3)(C) – Replacement or Retrofit of Water-Conserving Plumbing Fixtures – Section 7.6
- 288.2(a)(3)(D) – Reuse and Recycling of Wastewater – Section 7.3
- 288.2(a)(3)(F) – Considerations for Landscape Water Management Regulations – Section 7.4, 7.5 and Appendix E
- 288.2(a)(3)(G) – Monitoring Method – Section 7.7
- 288.2(a)(3)(H) – Additional Conservation Ordinance Provisions – Section 7.6

3.2 Guidance and Methodology for Reporting on Water Conservation and Water Use

In addition to TCEQ rules regarding water conservation, this plan also incorporates elements of the Guidance and Methodology for Reporting on Water Conservation and Water Use developed by TWDB and TCEQ, in consultation with the Water Conservation Advisory Council (the “Guidance”). The Guidance was developed in response to a charge by the 82nd Texas Legislature to develop water use and calculation methodology and guidance for preparation of water use reports and water conservation plans in accordance with TCEQ rules.

4. WATER UTILITY PROFILE

Appendix C to this model water conservation plan is a template water utility profile based on the format recommended by the TCEQ. In adopting this model water conservation plan, each Member City and Customer will provide a draft water utility profile to NTMWD for review and comment. A final water utility profile will be provided to NTMWD.

5. SPECIFICATION OF WATER CONSERVATION GOALS

TCEQ rules require the adoption of specific water conservation goals for a water conservation plan. As part of plan adoption, each Member City and Customer must develop 5-year and 10-year goals for per capita municipal use. These goals should be submitted to NTMWD in draft form for review. The goals for this water conservation plan include the following:

- Maintain the total and residential per capita water use below the specified amount in gallons per capita per day in a dry year, as shown in the completed Table 5-1.
- Maintain the water loss percentage in the system below 12 percent annually in 2013 and subsequent years, as discussed in Section 6.1.3. (The 12 percent goal for water loss is recommended but is not required. Systems with long distances between customers may adopt a higher percent water loss goal.)
- Implement and maintain a program of universal metering and meter replacement and repair, as discussed in Section 6.1.2.
- Increase efficient water usage through a water conservation ordinance, order or resolution as discussed in Section 7.5 and Appendix E. (This ordinance is required by the NTMWD.)
- Decrease waste in lawn irrigation by implementation and enforcement of landscape water management regulations, as discussed in Section 7.6. (These landscape water management regulations are recommended but are not required.)
- Raise public awareness of water conservation and encourage responsible public behavior by a public education and information program, as discussed in Section 6.2.
- Develop a system specific strategy to conserve water during peak demands, thereby reducing the peak use.

Table 5-1 Five-Year and Ten-Year Per Capita Water Use Goals (gpcd)

Description	Current Average (gpcd)	5-Year Goal (gpcd)	10-Year Goal (gpcd)
Current 5-Year Average Total Per Capita Use with Credit for Reuse			
Current 5-Year Average Residential Per Capita Use			
Water Loss (GPCD) ¹			
Water Loss (Percentage) ²			
Expected Reduction due to Low-Flow Plumbing Fixtures			
Projected Reduction Due to Elements in this Plan			
Water Conservation Goals (with credit for reuse)			

1. Water Loss GPCD = (Total Water Loss ÷ Permanent Population) ÷ 365

2. Water Loss Percentage = (Total Water Loss ÷ Total Gallons in System) x 100; or (Water Loss GPCD ÷ Total GPCD) x 100

6. BASIC WATER CONSERVATION STRATEGIES

6.1 Metering, Water Use Records, Control of Water Loss, and Leak Detection and Repair

One of the key elements of water conservation is tracking water use and controlling losses through illegal diversions and leaks. It is important to carefully meter water use, detect and repair leaks in the distribution system and provide regular monitoring of real losses.

6.1.1 Accurate Metering of Treated Water Deliveries from NTMWD

Water deliveries from NTMWD are metered by NTMWD using meters with accuracy of $\pm 2\%$. These meters are calibrated on an annual basis by NTMWD to maintain the required accuracy.

6.1.2 Metering of Customer and Public Uses and Meter Testing, Repair, and Replacement

The provision of water to all customers, including public and governmental users, should be metered. In many cases, Member Cities and Customers already meter retail and wholesale water users. For those Member Cities and Customers who do not currently meter all internal water uses, as well as all subsequent users, these entities should implement a program to meter all water uses within the next three years.

Most Member Cities and Customers test and replace their customer meters on a regular basis. All customer meters should be replaced on a minimum of a 15-year cycle. Those who do not currently have a meter testing and replacement program should implement such a program over the next three years.

6.1.3 Determination and Control of Water Loss

Total water loss is the difference between water delivered to Member Cities and Customers from NTMWD (and other supplies, if applicable) and metered water sales to customers plus authorized for use but not sold. (Authorized for use but not sold would include use for fire fighting, releases for flushing of lines, uses associated with new construction, etc.) Total water loss includes three categories:

- Apparent Losses – including inaccuracies in customer meters. (Customer meters tend to run more slowly as they age and under-report actual use.) Losses due to

illegal connections and theft. (Included in Appendix H.) Accounts which are being used but have not yet been added to the billing system.

- Real Losses – includes physical losses from the system or mains, reported breaks and leaks, storage overflow.
- Unidentified Water Losses – (System Input - Total Authorized - Apparent Losses - Real Losses)

Measures to control water loss should be part of the routine operations of Member Cities and Customers. Maintenance crews and personnel should look for and report evidence of leaks in the water distribution system. A leak detection and repair program is described in Section 6.1.4 below. Meter readers should watch for and report signs of illegal connections, so they can be quickly addressed.

Total water loss should be calculated in accordance with the provisions of Appendix J. With the measures described in this plan, Member Cities and Customers should maintain water loss percentage below 12 percent in 2013 and subsequent years. If total water loss exceeds this goal, the Member City or Customer should implement a more intensive audit to determine the source(s) of and reduce the water loss. The annual conservation report described below is the primary tool that should be used to monitor water loss.

6.1.4 Leak Detection and Repair

As described above, city crews and personnel should look for and report evidence of leaks in the water distribution system. Areas of the water distribution system in which numerous leaks and line breaks occur should be targeted for replacement as funds are available.

6.1.5 Record Management System

As required by TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2(a)(2)(B), a record management system should allow for the separation of water sales and uses into residential, commercial, public/institutional, and industrial categories. This information should be included in an annual water conservation report, as described in Section 7.7 below. Those entities whose record management systems do not currently comply with this requirement should move to implement such a system within the next five years.

6.2 Continuing Public Education and Information Campaign

The continuing public education and information campaign on water conservation includes the following elements:

- Utilize the “Water IQ: Know Your Water” and other public education materials produced by the NTMWD.
- Insert water conservation information with water bills. Inserts will include material developed by Member Cities’ and Customers’ staff and material obtained from the TWDB, the TCEQ, and other sources.
- Encourage local media coverage of water conservation issues and the importance of water conservation.
- Notify local organizations, schools, and civic groups that Member City or Customer staff and staff of the NTMWD are available to make presentations on the importance of water conservation and ways to save water.
- Promote the *Texas Smartscape* web site (www.txsmartscape.com) and provide water conservation brochures and other water conservation materials available to the public at City Hall and other public places.
- Make information on water conservation available on its website (if applicable) and include links to the “Water IQ: Know Your Water” website, *Texas Smartscape* website and to information on water conservation on the TWDB and TCEQ web sites and other resources.
- NTMWD is an EPA Water Sense Partner and participates in the EPA Water Sense sponsored “Fix a Leak Week.” NTMWD encourages all member cities and customers to become EPA Water Sense Partners.
- Utilize the Water My Yard website and encourage customers to sign-up to receive weekly watering advice.

6.3 NTMWD System Operation Plan

Member Cities and Customers of NTMWD purchase treated water from NTMWD and do not have surface water supplies for which to implement a system operation plan. NTMWD operates multiple sources of water supply as a system. The operation of the reservoir system is intended

to optimize the use of the District's sources (within the constraints of existing water rights) while minimizing energy use cost for pumping, maintaining water quality, minimizing potential impacts on recreational users of the reservoirs and fish and wildlife.

6.4 Coordination with Regional Water Planning Group and NTMWD

Appendix F includes a letter sent to the Chair of the Region C and Region D water planning group with this model water conservation plan. Each Member City and Customer will send a copy of their draft ordinance(s) or regulation(s) implementing the plan and their water utility profile to NTMWD for review and comment. The adopted ordinance(s) or regulation(s) and the adopted water utility profile will be sent to the Chair of the appropriate Water Planning Group and to NTMWD.

6.5 Requirement for Water Conservation Plans by Wholesale Customers

Every contract for the wholesale sale of water by Member Cities and/or Customers that is entered into, renewed, or extended after the adoption of this water conservation plan will include a requirement that the wholesale customer and any wholesale customers of that wholesale customer develop and implement a water conservation plan meeting the requirements of Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 of the Texas Administrative Code. The requirement will also extend to each successive wholesale customer in the resale of the water.

7. ENHANCED WATER CONSERVATION STRATEGIES

7.1 Water Rate Structure

Member Cities and Customers should adopt, if they have not already done so, an increasing block rate water structure that is intended to encourage water conservation and discourage excessive use and waste of water upon completion of their next rate study or within five years. An example water rate structure is as follows:

Residential Rates

1. Monthly minimum charge. This can (but does not have to) include up to 2,000 gallons water use with no additional charge.
2. Base charge per 1,000 gallons up to the approximate average residential use.
3. 2nd tier (from the average to 2 times the approximate average) at 1.25 to 2.0 times the base charge.
4. 3rd tier (above 2 times the approximate average) at 1.25 to 2.0 times the 2nd tier.
5. Additional tiers with further increases if desired.
6. The residential rate can also include a lower tier for basic household use up to 4,000 gallons per month or a determined basic use.

Commercial/Industrial Rates

Commercial/industrial rates should include at least 2 tiers, with rates for the 2nd tier at 1.25 to 2.0 times the first tier. Higher water rates for commercial irrigation use are encouraged, but not required.

7.2 Ordinances, Plumbing Codes, or Rules on Water-Conserving Fixtures

The state has required water-conserving fixtures in new construction and renovations since 1992. The state standards call for flows of no more than 2.5 gallons per minute (gpm) for faucets, 2.5 gpm for showerheads, and 1.6 gallons per flush for toilets. Similar standards are now required nationally under federal law. These state and federal standards assure that all new construction and renovations will use water-conserving fixtures. Rebate programs to encourage replacement of older fixtures with water conservation programs are discussed in Section 7.6.

7.3 Reuse and Recycling of Wastewater

Most Member Cities and Customers do not own and operate their own wastewater treatment plants. Their wastewater is treated by NTMWD. NTMWD currently has the largest wastewater reuse program in the state. NTMWD has water rights allowing reuse of up to 71,882 acre-feet per year of this treated wastewater through Lavon Lake for municipal purposes. In addition, NTMWD has also developed the East Fork Raw Water Supply Project which can divert up to 157,393 acre-feet per year based on treated wastewater discharges by the NTMWD. When fully developed, these two reuse projects will provide up to 44 percent of the NTMWD's currently permitted water supplies. NTMWD also provides treated effluent from its wastewater treatment plants available for direct reuse for landscape irrigation and industrial use.

Those Member Cities and Customers who own and operate their own wastewater treatment plants should move toward reusing treated effluent for irrigation purposes at their plant site over the next three years. These entities should also seek other alternatives for reuse of recycled wastewater effluent.

7.4 Interactive Weather Stations / Water My Yard Program

NTMWD has developed the Water My Yard program to install weather stations throughout its service area to provide consumers with a weekly e-mail and information through the Water My Yard website in determining an adequate amount of supplemental water that is needed to maintain healthy grass in specific locations. This service represents the largest network of weather stations providing ET-based irrigation recommendations in the State of Texas, and provides the public advanced information regarding outdoor irrigation needs, thereby reducing

water use. Through a series of selections on the type of irrigation system a consumer has, a weekly email is provided that will determine how long (in minutes) that an irrigation system needs to run based on the past seven days of weather. This recommendation provides the actual amount of supplemental water that is required for a healthy lawn based on research of the Texas A&M Agrilife Extension Service and proven technologies. This innovative program has been available to those within the NTMWD service area since May 2013.

7.5 Compulsory Landscape and Water Management Measures

The following landscape water management measures are required by the NTMWD for this plan. These measures represent minimum measures to be implemented and enforced in order to irrigate the landscape appropriately, and are to remain in effect on a permanent basis unless water resource management stages are declared.

1. Landscape Water Management Measures

- Limit landscape watering with sprinklers or irrigation systems at each service address to no more than two days per week (April 1 – October 31), with education that less than twice per week is usually adequate. Additional watering of landscape may be provided by hand-held hose with shutoff nozzle, use of dedicated irrigation drip zones, and/or soaker hose provided no runoff occurs.
- Limit landscape watering with sprinklers or irrigation systems at each service address to no more than one day per week beginning November 1 and ending March 31 of each year, with education that less than once per week is usually adequate.
- Prohibit lawn irrigation watering from 10 AM to 6 PM (April 1 – October 31).
- Prohibit the use of irrigation systems that water impervious surfaces. (Wind driven water drift will be taken into consideration.)
- Prohibit outdoor watering during precipitation or freeze events.
- Prohibition of use of poorly maintained sprinkler systems that waste water.
- Prohibit excess water runoff or other obvious waste.

- Require rain and freeze sensors and/or ET or Smart controllers on all new irrigation systems. Rain and freeze sensors and/or ET or Smart controllers must be maintained to function properly.
- Prohibit overseeding, sodding, sprigging, broadcasting or plugging with cool season grasses or watering cool season grasses, except for golf courses and athletic fields.
- Require that irrigation systems be inspected at the same time as initial backflow preventer inspection.
- Requirement that all new irrigation systems be in compliance with state design and installation regulations (TAC Title 30, Part 1, Chapter 344).
- Require the owner of a regulated irrigation property to obtain an evaluation of any permanently installed irrigation system on a periodic basis. The irrigation evaluation shall be conducted by an licensed irrigator in the state of Texas and be submitted to your local water provider (i.e., city, water supply corporation).

2. Additional Water Management Measures

- Prohibit the use of potable water to fill or refill residential, amenity, and any other natural or manmade ponds. A pond is considered to be a still body of water with a surface area of 500 square feet or more.
- Non –commercial car washing can be done only when using a water hose with a shut-off nozzle.
- Hotels and motels shall offer a linen reuse water conservation option to customers.
- Restaurants, bars, and other commercial food or beverage establishments may not provide drinking water to customers unless a specific request is made by the customer for drinking water.

Member Cities and Customers are responsible for developing regulations, ordinances, policies, or procedures for enforcement of water conservation guidelines.

Appendix E is a summary of considerations for landscape water management regulations adopted as part of the development of this water conservation plan. These regulations are intended to minimize waste in landscape irrigation. Appendix E includes the required landscape water measures in this section.

7.6 Additional Water Conservation Measures (Not Required)

NTMWD also urges its Member Cities and Customers to consider including the following additional water conservation measures from the NTMWD Model Water Conservation Plan in their plans: Member Cities and Customers are responsible for developing regulations, ordinances, policies, or procedures for enforcement of water conservation guidelines.

1. Landscape Water Management Regulations

- Requirement that all existing irrigation systems be retrofitted with rain and freeze sensors and/or ET or Smart controllers capable of multiple programming. Rain and freeze sensors and/or ET or Smart controllers must be maintained to function properly.
- Requirement that all new athletic fields be irrigated by a separate irrigation system from surrounding areas.
- Implementation of other measures to encourage off-peak water use.

2. Landscape Ordinance

- Landscape ordinances are developed by cities to guide developers in landscaping requirements for the city. A sample landscape ordinance is provided in Appendix I and is intended as a guideline for adopting a landscape ordinance to promote water efficient landscape design.
- Native, drought tolerant or adaptive plants should be encouraged.
- Drip irrigation systems should be promoted.
- ET/Smart controllers that only allow sprinkler systems to irrigate when necessary should be promoted.

3. Water Audits

- Water audits are useful in finding ways in which water can be used more efficiently at a specific location. NTMWD recommends that Member Cities and Customers offer water audits to customers.

4. Rebates

- In addition to the conservation measures described above, the NTMWD also recommends the following water conservation incentive programs for consideration by Member Cities and Customers:
 - Low-flow toilet replacement and rebate programs,
 - Rebates for rain/freeze sensors and/or ET or Smart controllers,
 - Low-flow showerhead and sink aerators replacement programs or rebates,
 - Water efficient clothes washer rebates,
 - Pressure reducing valve installation programs or rebates,
 - Rain barrel rebates,
 - Pool covers,
 - On-demand hot water heater rebates, and/or
 - Other water conservation incentive programs.

7.7 Monitoring of Effectiveness and Efficiency - Annual Water Conservation Report

Appendix D is a form that should be used in the development of an annual water conservation report by Member Cities and Customers. This form should be completed by March 31 of the following year and used to monitor the effectiveness and efficiency of the water conservation program and to plan conservation-related activities for the next year. The form records the water use by category, per capita municipal use, and total water loss for the current year and compares them to historical values. As part of the development of Appendix D, Member Cities and Customers will complete the tracking tool by March 31 of the following year and submit them to NTMWD. The annual water conservation report should be sent to NTMWD, which will monitor NTMWD Member Cities' and Customers' water conservation trends.

7.8 Water Conservation Implementation Report

Appendix J includes the TCEQ-required water conservation implementation report. The report is due to the TCEQ by May 1 of every year. This report lists the various water conservation strategies that have been implemented, including the date the strategy was implemented. The report also calls for the five-year and ten-year per capita water use goals from the previous

water conservation plan. The reporting entity must answer whether or not these goals have been met and if not, why not. The amount of water saved is also requested.

8. IMPLEMENTATION AND ENFORCEMENT OF THE WATER CONSERVATION PLAN

Appendix G contains a draft ordinance, order, or resolution which may be tailored to meet Member or Customer City needs and be adopted by the City Council or governing board regarding the model water conservation plan. The ordinance, order, or resolution designates responsible officials to implement and enforce the water conservation plan. Appendix E, the considerations for landscape water management regulations, also includes information about enforcement. Appendix H includes a copy of an ordinance, order, or resolution that may be adopted related to illegal connections and water theft.

9. REVIEW AND UPDATE OF WATER CONSERVATION PLAN

TCEQ requires that the water conservation plans be updated prior to May 1, 2014. The plans are required to be updated every five years thereafter. The plan will be updated as required and as appropriate based on new or updated information.

**MODEL WATER RESOURCE AND EMERGENCY
MANAGEMENT PLAN
NORTH TEXAS MUNICIPAL WATER DISTRICT
MEMBER CITIES AND CUSTOMERS**

APRIL 2014

Prepared by:

FRESE AND NICHOLS, INC.
4055 International Plaza, Suite 200
Fort Worth, Texas 76109
817-735-7300



FORWARD

This Model Water Resource and Emergency Management Plan (which is an update to the previous Drought Contingency and Water Emergency Response Plan) was prepared by Freese and Nichols for the North Texas Municipal Water District (NTMWD). It is intended to be used by NTMWD Member Cities and Customers as a guide as they develop their own Water Resource and Emergency Management Plans. This plan was prepared pursuant to Texas Commission on Environmental Quality rules. Some material is based on the existing drought contingency plans listed in Appendix A.

Questions regarding this Water Resource and Emergency Management plan should be addressed to the following:

Tom Gooch, P.E.
Freese and Nichols, Inc.
(817) 735-7300
tcg@freese.com

Jeremy Rice
Freese and Nichols, Inc.
(817) 735-7300
jjr@freese.com

Denise Hickey
North Texas Municipal
Water District
(972) 442-5405
dhickey@ntmwd.com

This Water Resource and Emergency Management plan is based on the Texas Administrative Code in effect on June 25, 2013.

**WATER RESOURCE AND EMERGENCY
MANAGEMENT PLAN
INSERT ENTITY NAME**

APRIL 2014



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APPENDIX A **List of References**

APPENDIX B **Texas Commission on Environmental Quality Rules on Drought Contingency Plans**

- Texas Administrative Code Title 30, Part 1, Chapter 288, Subchapter B, Rule §288.20 – Drought Contingency Plans for Municipal Uses by Public Water Suppliers

APPENDIX C **Letters to Region C and Region D Water Planning Groups**

APPENDIX D **Adoption of Water Resource and Emergency Management Plan**

- Municipal Ordinance Adopting Water Resource and Emergency Management Plan
- Municipal Utility District Order Adopting Water Resource and Emergency Management Plan
- Special Utility District Order Adopting Water Resource and Emergency Management Plan
- Water Supply Corporation Resolution Adopting Water Resource and Emergency Management Plan

1. INTRODUCTION AND OBJECTIVES

This document has been prepared as a Model Water Resource and Emergency Management Plan, intended to be available for use by North Texas Municipal Water District (NTMWD) Member Cities and Customers as they develop their own plans. This model plan addresses all of the current TCEQ requirements for a drought contingency plan¹. This model plan will replace the plans dated August 2004, April 2006 and March 2008. The March 2008 model plan shall continue to apply until such time that the drought contingency or water emergency response stage currently in effect under the March 2008 model plan terminates and a less restrictive stage is applicable. At such time, this model plan shall take effect, replacing the March 2008 model plan, and the appropriate water resource management stage as provided in this model plan shall be initiated.

The measures included in this Model Water Resource and Emergency Management Plan are intended to provide short-term water savings during drought or emergency conditions. Water savings associated with ongoing, long-term strategies are discussed in the *Model Water Conservation Plan for North Texas Municipal Water District Member Cities and Customers*.²

The purpose of this model Water Resource and Emergency Management plan is as follows:

- To conserve the available water supply in times of drought and emergency
- To maintain supplies for domestic water use, sanitation, and fire protection
- To protect and preserve public health, welfare, and safety
- To minimize the adverse impacts of water supply shortages
- To minimize the adverse impacts of emergency water supply conditions.

The NTMWD supplies treated potable water to its Member Cities and Customers. This model plan was developed by NTMWD in consultation with its Member Cities and Customers. In order to adopt this model plan, each NTMWD Member City and Customer will need to adopt ordinance(s) or regulation(s) implementing the plan, including the determination of fines and enforcement procedures. The model plan calls for Member Cities and Customers to adopt water resource management stages initiated by NTMWD during a drought or water supply emergency. Member Cities and Customers may also adopt more stringent water resource management stages than NTMWD if conditions warrant.

In the absence of drought response measures, water demands tend to increase during a drought due to increased outdoor irrigation. The severity of a drought depends on the degree of depletion of supplies and on the relationship of demand to available supplies. The NTMWD considers a drought to end when all of its supply reservoirs refill to the conservation storage pool.

¹ Superscripted numbers match references listed in Appendix A.

2. DEFINITIONS

1. AQUATIC LIFE means a vertebrate organism dependent upon an aquatic environment to sustain its lifeⁱ.
2. ATHLETIC FIELD means a public sports competition field, the essential feature of which is turf grass, used primarily for organized sports practice, competition or exhibition events for schools, professional sports, or sanctioned league playⁱⁱ.
3. COMMERCIAL FACILITY business or industrial buildings and the associated landscaping, but does not include the fairways, greens, or tees of a golf courseⁱ.
4. COMMERCIAL VEHICLE WASH FACILITY means a permanently-located business that washes vehicles or other mobile equipment with water or water-based products, including but not limited to self-service car washes, full service car washes, roll-over/in-bay style car washes, and facilities managing vehicle fleets or vehicle inventoryⁱ.
5. COOL SEASON GRASSES are varieties of turf grass that grow best in cool climates primarily in northern and central regions of the U.S. Cool season grasses include perennial and annual rye grass, Kentucky blue grass and fescuesⁱⁱⁱ.
6. CUSTOMERS include those entities to whom NTMWD provides water on a customer basis that are not members of NTMWD.
7. DESIGNATED OUTDOOR WATER USE DAY means a day prescribed by rule on which a person is permitted to irrigate outdoorsⁱ.

ⁱ Definitions from City of Austin Water Conservation and Drought Contingency Ordinance adopted August 16, 2012.
http://www.austintexas.gov/sites/default/files/files/Water/Conservation/Planning_and_Policy/ProposedCodeRevision_DRAFT_with_watering_schedule-8-15-2012.pdf

ⁱⁱ Definition from City of San Antonio Water Conservation Ordinance adopted 2005.
http://saws.org/conservation/ordinance/docs/Ch34_Ordinance_2009.pdf

ⁱⁱⁱ Definition developed by Freese and Nichols, Inc.

8. DRIP IRRIGATION is a type of micro-irrigation system that operates at low pressure and delivers water in slow, small drips to individual plants or groups of plants through a network of plastic conduits and emitters; also called trickle irrigation. ^{iv}.
9. DROUGHT, for the purposes of this report, means an extended period of time when an area receives insufficient amounts of rainfall to replenish the water supply, causing water supply sources (in this case reservoirs) to be depleted^v.
10. EVAPOTRANSPIRATION abbreviated as ET represents the amount of water lost from plant material to evaporation and transpiration. The amount of ET can be estimated based on the temperature, wind, and relative humidityⁱⁱⁱ.
11. ET/SMART CONTROLLERS are irrigation controllers that adjust their schedule and run times based on weather (ET) data. These controllers are designed to replace the amount of water lost to evapotranspirationⁱⁱⁱ.
12. EXECUTIVE DIRECTOR means the Executive Director of the North Texas Municipal Water District and includes a person the Director has designated to administer or perform any task, duty, function, role, or action related to this plan or on behalf of the Executive Directorⁱⁱⁱ.
13. FOUNDATION WATERING means an application of water to the soils directly abutting the foundation of a building structureⁱ.
14. MEMBER CITIES include the cities of Allen, Farmersville, Forney, Frisco, Garland, McKinney, Mesquite, Plano, Princeton, Richardson, Rockwall, Royse City, and Wylie, Texas.
15. NEW LANDSCAPE means vegetation: installed at the time of the construction of a residential or commercial facility; installed as part of a governmental entity's capital improvement project; installed to stabilize an area disturbed by constructionⁱ.

^{iv} Amy Vickers: Handbook of Water Use and Conservation, Amherst Massachusetts, June 2002

^v Freese and Nichols, Inc.: Water Conservation and Drought Contingency and Water Emergency Response Plan, prepared for North Texas Municipal Water District, Fort Worth, March 2008.

16. ORNAMENTAL FOUNTAIN means an artificially created structure (up to six feet in diameter) from which a jet, stream, valves and emission devices or flow of water emanates and is not typically utilized for the preservation of aquatic lifeⁱ.
17. PERMANANTLY INSTALLED IRRIGATION SYSTEM means a custom-made, site-specific system of delivering water generally for landscape irrigation via a system of pipes or other conduits installed below groundⁱ.
18. RAIN/FREEZE SENSOR means a device designed to stop the flow of water to an automatic irrigation system when rainfall or freeze event has been detectedⁱⁱ.
19. RECLAIMED WATER means reclaimed municipal wastewater that has been treated to a quality that meets or exceeds the minimum standards of the 30 Texas Administrative Code, Chapter 210 and is used for lawn irrigation, industry, or other non-potable purposesⁱ.
20. SOAKER HOSE means a perforated or permeable garden-type hose or pipe that is laid above ground that provides irrigation at a slow and constant rateⁱ.
21. SPRINKLER means an above-ground water distribution device that may be attached to a garden hoseⁱ.
22. SWIMMING POOL means any structure, basin, chamber, or tank including hot tubs, containing an artificial body of water for swimming, diving, or recreational bathing, and having a depth of two (2) feet or more at any pointⁱⁱ.
23. WATER RESOURCE MANAGEMENT PLAN means a strategy or combination of strategies for temporary supply management and demand management responses to temporary and potentially recurring water supply shortages and other water supply emergencies required by Texas Administrative Code Title 30, Chapter 288, Subchapter B. This is sometimes called a drought contingency planⁱ

3. TEXAS COMMISSION ON ENVIRONMENTAL QUALITY RULES

The TCEQ rules governing development of drought contingency plans for public water suppliers are contained in Title 30, Part 1, Chapter 288, Subchapter B, Rule 288.20 of the Texas Administrative Code, a current copy of which is included in Appendix B. For the purpose of these rules, a drought contingency plan is defined as “a strategy or combination of strategies for temporary supply and demand management responses to temporary and potentially recurring water supply shortages and other water supply emergencies.”¹

Minimum Requirements

TCEQ’s minimum requirements for drought contingency plans are addressed in the following subsections of this report:

- 288.20(a)(1)(A) – Provisions to Inform the Public and Provide Opportunity for Public Input – Section 4.1
- 288.20(a)(1)(B) – Provisions for Continuing Public Education and Information – Section 4.2
- 288.20(a)(1)(C) – Coordination with the Regional Water Planning Group – Section 4.6
- 288.20(a)(1)(D) – Criteria for Initiation and Termination of Water Resource Management Stages – Section 4.3
- 288.20(a)(1)(E) – Water Resource Management Stages – Section 4.3
- 288.20(a)(1)(F) – Specific, Quantified Targets for Water Use Reductions – Section 4.3
- 288.20(a)(1)(G) – Water Supply and Demand Management Measures for Each Stage – Section 4.3
- 288.20(a)(1)(H) – Procedures for Initiation and Termination of Water Resource Management Stages – Section 4.3
- 288.20(a)(1)(I) - Procedures for Granting Variances – Section 4.4
- 288.20(a)(1)(J) - Procedures for Enforcement of Mandatory Restrictions – Section 4.5
- 288.20(a)(3) – Consultation with Wholesale Supplier – Sections 1, 4.2, and 4.3
- 288.20(b) – Notification of Implementation of Mandatory Measures – Section 4.3

- 288.20(c) – Review and Update of Plan – Section 4.7

4. WATER RESOURCE AND EMERGENCY MANAGEMENT PLAN

4.1 PROVISIONS TO INFORM THE PUBLIC AND OPPORTUNITY FOR PUBLIC INPUT

Member Cities and Customers will provide opportunity for public input in the development of this Water Resource and Emergency Management Plan by the following means:

- Providing written notice of the proposed plan and the opportunity to comment on the plan by newspaper, posted notice, and notice on the supplier's web site (if available).
- Making the draft plan available on the supplier's web site (if available).
- Providing the draft plan to anyone requesting a copy.
- Holding a public meeting.

4.2 PROVISIONS FOR CONTINUING PUBLIC EDUCATION AND INFORMATION

Member Cities and Customers will inform and educate the public about the Water Resource and Emergency Management Plan by the following means:

- Preparing a bulletin describing the plan and making it available at city hall and other appropriate locations.
- Making the plan available to the public through the supplier's web site (if available).
- Including information about the Water Resource and Emergency Management Plan on the supplier's web site (if available).
- Notifying local organizations, schools, and civic groups that staff are available to make presentations on the Water Resource and Emergency Management Plan (usually in conjunction with presentations on water conservation programs).
- At any time that the Water Resource and Emergency Management Plan is activated or the Water Resource and Emergency Management Plan changes, Member Cities and Customers will notify local media of the issues, the water resource management stage (if applicable), and the specific actions required of the public. The information will also be publicized on the supplier's web site (if available). Billing inserts will also be used as appropriate.

4.3 INITIATION AND TERMINATION OF WATER RESOURCE AND EMERGENCY MANAGEMENT STAGES

Initiation of a Water Resource Management Stage

The City Manager, General Manager, Mayor, Chief Executive, or official designee may order the implementation of a water resource management stage when one or more of the trigger conditions for that stage is met. The following actions will be taken when a water resource management stage is initiated:

- The public will be notified through local media and the supplier's web site (if available) as described in Section 4.2.
- Wholesale customers (if any) and the NTMWD will be notified by e-mail with a follow-up letter or fax that provides details of the reasons for initiation of the water resource management stage.
- If any mandatory provisions of the Water Resource and Emergency Management Plan are activated, Member Cities and Customers will notify the Executive Director of the TCEQ and the Executive Director of the NTMWD within 5 business days.
- Water Resource and Emergency Management Plan stages imposed by NTMWD action must be initiated by Member Cities and Customers.
- For other trigger conditions internal to a city or water supply entity, the City Manager, General Manager, Mayor, Chief Executive, or official designee may decide not to order the implementation of a water resource management stage or water emergency even though one or more of the trigger criteria for the stage are met. Factors which could influence such a decision include, but are not limited to, the time of the year, weather conditions, the anticipation of replenished water supplies, or the anticipation that additional facilities will become available to meet needs. The reason for this decision should be documented.

Termination of a Water Resource Management Stage

The City Manager, General Manager, Mayor, Chief Executive, or official designee may order the termination of a water resource management stage when the conditions for termination are met or at

their discretion. The following actions will be taken when a water resource management stage is terminated:

- The public will be notified through local media and the supplier's web site (if available) as described in Section 4.2.
- Wholesale customers (if any) and the NTMWD will be notified by e-mail with a follow-up letter or fax.
- If any mandatory provisions of the Water Resource and Emergency Management plan that have been activated are terminated, Member Cities and Customers will notify the Executive Director of the TCEQ and the Executive Director of the NTMWD within 5 business days.

The City Manager, General Manager, Mayor, Chief Executive, or official designee may decide not to order the termination of a water resource management stage even though the conditions for termination of the stage are met. Factors which could influence such a decision include, but are not limited to, the time of the year, weather conditions, or the anticipation of potential changed conditions that warrant the continuation of the water resource management stage. The reason for this decision should be documented.

Water Resource and Emergency Management Plan Stages and Measures

Stage 1

Initiation and Termination Conditions for Stage 1

- The NTMWD has initiated Stage 1, which may be initiated due to one or more of the following:
 - The NTMWD Executive Director, with the concurrence of the NTMWD Board of Directors, finds that conditions warrant the declaration of Stage 1.
 - Water demand is projected to approach the limit of the permitted supply.
 - The storage in Lavon Lake is less than 55 percent of the total conservation pool capacity.
 - NTMWD's storage in Jim Chapman Lake is less than 55 percent of NTMWD's total conservation pool capacity.
 - The Sabine River Authority has indicated that its Upper Basin water supplies used by NTMWD (Lake Tawakoni and/or Lake Fork) are in a Mild drought.
 - NTMWD has concern that Lake Texoma, the East Fork Raw Water Supply Project, or some other NTMWD source may be limited in availability in the next 6 months.
 - NTMWD water demand exceeds 95 percent of the amount that can be delivered to customers for three consecutive days.
 - NTMWD water demand for all or part of the delivery system equals delivery capacity because delivery capacity is inadequate.
 - NTMWD's supply source becomes contaminated.
 - Supply source is interrupted or unavailable due to invasive species.
 - NTMWD's water supply system is unable to deliver water due to the failure or damage of major water system components.
- Supplier's water demand exceeds 95 percent of the amount that can be delivered to customers for three consecutive days.
- Supplier's water demand for all or part of the delivery system equals delivery capacity because delivery capacity is inadequate.

- Supply source becomes contaminated.
- Supplier's water supply system is unable to deliver water due to the failure or damage of major water system components.
- Supplier's individual plan may be implemented if other criteria dictate.

Stage 1 may terminate when NTMWD terminates its Stage 1 condition or when the circumstances that caused the initiation of Stage 1 no longer prevail.

Goal for Use Reduction and Actions Available under Stage 1

The goal for water use reduction under Stage 1 is a five percent (5%) reduction in the amount of water produced by NTMWD from the previous annual payment period prior to drought restrictions. **If circumstances warrant or if required by NTMWD, the City Manager, General Manager, Mayor, Chief Executive, or official designee can set a goal for greater or lesser water use reduction.** The City Manager, General Manager, Mayor, Chief Executive, or official designee may order the implementation of any or all of the actions listed below, as deemed necessary to achieve a five percent reduction. Measures described as "requires notification to TCEQ" impose mandatory requirements on customers. The supplier must notify TCEQ and NTMWD within five business days if these measures are implemented:

- Continue actions in the water conservation plan.
- Notify wholesale customers of actions being taken and request them to implement similar procedures.
- Initiate engineering studies to evaluate alternatives should conditions worsen.
- Further accelerate public education efforts on ways to reduce water use.
- Halt non-essential city government water use. (Examples include street cleaning, vehicle washing, operation of ornamental fountains, etc.)
- Encourage the public to wait until the current drought or emergency situation has passed before establishing new landscaping.
- All users are encouraged to reduce the frequency of draining and refilling swimming pools.

- **Requires Notification to TCEQ** – Limit landscape watering with sprinklers or irrigation systems at each service address to no more than two days per week on designated days between April 1 – October 31. Limit landscape watering with sprinklers or irrigation systems at each service address to once every week on designated days between November 1 – March 31. Exceptions are as follows:
 - An exception is allowed for landscape associated with new construction that may be watered as necessary for 30 days from the installation of new landscape features.
 - An exemption is also allowed for registered and properly functioning ET/Smart irrigation systems and drip irrigation systems from the designated outdoor water use days limited to no more than two days per week. ET/Smart irrigation and drip irrigation systems are however subject to all other restrictions applicable under this stage.
 - An exception for additional watering of landscape may be provided by hand held hose with shutoff nozzle, use of dedicated irrigation drip zones, and/or soaker hose provided no runoff occurs.
 - Foundations, new landscaping, new plantings (first year) of shrubs, and trees (within a ten foot radius of its trunk) may be watered by a hand-held hose, a soaker hose, or a dedicated zone using a drip irrigation system provided no runoff occurs.
- **Requires Notification to TCEQ** - Initiate a rate surcharge for all water use over a certain level.
- **Requires Notification to TCEQ** – Landscape watering of parks, golf courses and athletic fields using potable water are required to meet the same reduction goals and measures outlined in this stage. Exception for golf course greens and tee boxes which may be hand watered as needed.

Stage 2

Initiation and Termination Conditions for Stage 2

- The NTMWD has initiated Stage 2, which may be initiated due to one or more of the following:
 - The NTMWD Executive Director, with the concurrence of the NTMWD Board of Directors, finds that conditions warrant the declaration of Stage 2.
 - Water demand is projected to approach or exceed the limit of the permitted supply.
 - The storage in Lavon Lake is less than 45 percent of the total conservation pool capacity.
 - NTMWD's storage in Jim Chapman Lake is less than 45 percent of NTMWD's total conservation pool capacity.
 - The Sabine River Authority has indicated that its Upper Basin water supplies used by NTMWD (Lake Tawakoni and/or Lake Fork) are in a Moderate drought. (Measures required by SRA under a Moderate drought designation are similar to those under NTMWD's Stage 2.)
 - The supply from Lake Texoma, the East Fork Raw Water Supply Project, or some other NTMWD source has become limited in availability within the next 3 months.
 - NTMWD water demand exceeds 98 percent of the amount that can be delivered to customers for three consecutive days.
 - NTMWD water demand for all or part of the delivery system exceeds delivery capacity because delivery capacity is inadequate.
 - NTMWD's supply source becomes contaminated.
 - NTMWD's water supply system is unable to deliver water due to the failure or damage of major water system components.
- Supplier's water demand exceeds 98 percent of the amount that can be delivered to customers for three consecutive days.
- Supplier's water demand for all or part of the delivery system exceeds delivery capacity because delivery capacity is inadequate.

- Supply source becomes contaminated.
- Supply source is interrupted or unavailable due to invasive species.
- Supplier's water supply system is unable to deliver water due to the failure or damage of major water system components.
- Supplier's individual plan may be implemented if other criteria dictate.
- Stage 2 may terminate when NTMWD terminates its Stage 2 condition or when the circumstances that caused the initiation of Stage 2 no longer prevail.

Goals for Use Reduction and Actions Available under Stage 2

The goal for water use reduction under Stage 2 is a reduction of ten percent (10%) in the amount of water obtained from NTMWD from the previous annual payment period prior to drought restrictions. **If circumstances warrant or if required by NTMWD, the City Manager, General Manager, Mayor, Chief Executive, or official designee can set a goal for greater or lesser water use reduction.** The City Manager, General Manager, Mayor, Chief Executive, or official designee may order the implementation of any or all of the actions listed below, as deemed necessary to achieve a ten percent reduction. Measures described as "requires notification to TCEQ" impose mandatory requirements on customers. The supplier must notify TCEQ and NTMWD within five business days if these measures are implemented:

- Continue or initiate any actions available under Stage 1.
- Notify wholesale customers of actions being taken and request them to implement similar procedures.
- Implement viable alternative water supply strategies.
- All users are encouraged to reduce the frequency of draining and refilling swimming pools.
- **Requires Notification to TCEQ** – Limit landscape watering with sprinklers or irrigation systems at each service address to once per week on designated days between April 1 – October 31. Limit landscape watering with sprinklers or irrigation systems at each service address to once every other week on designated days between November 1 – March 31. Exceptions are as follows:

- New construction may be watered as necessary for 30 days from the date of the installation of new landscape features. .
- Foundations, new plantings (first year) of shrubs, and trees (within a ten foot radius of its trunk) may be watered for up to two hours on any day by a hand-held hose, a dedicated zone using a drip irrigation system and/or soaker hose provided no runoff occurs.
- Public athletic fields used for competition may be watered twice per week.
- Locations using alternative sources of water supply only for irrigation may irrigate without day of the week restrictions provided proper signage is employed. However, irrigation using alternative sources of supply is subject all other restrictions applicable to this stage. If the alternative supply source is a well, proper proof of well registration with the North Texas Groundwater Conservation District or Red River Ground Water Conservation District is required. Other sources of water supply may not include imported treated water.
- An exemption is allowed for registered and properly functioning ET/Smart irrigation systems and drip irrigation systems from the designated outdoor water use day limited to no more than one day per week. ET/Smart irrigation and drip irrigation systems are however subject to all other restrictions applicable under this stage.
- Hand watering with shutoff nozzle, drip lines, and soaker hoses is allowed before 10 am and after 6 pm provided no runoff occurs.
- **Requires Notification to TCEQ** – Prohibit hydro seeding, hydro mulching, and sprigging.
- **Requires Notification to TCEQ** - Initiate a rate surcharge as requested by NTMWD.
- **Requires Notification to TCEQ** - Initiate a rate surcharge for all water use over a certain level.
- **Requires Notification to TCEQ** – If NTMWD has imposed a reduction in water available to Member Cities and Customers, impose the same percent reduction on wholesale customers.
- **Requires Notification to TCEQ** – Landscape watering of parks and golf courses using potable water are required to meet the same reduction goals and measures outlined in this stage. Exception for golf course greens and tee boxes which may be hand watered as needed.

Stage 3

Initiation and Termination Conditions for Stage 3

- The NTMWD has initiated Stage 3, which may be initiated due to one or more of the following:
 - The NTMWD Executive Director, with the concurrence of the NTMWD Board of Directors, finds that conditions warrant the declaration of Stage 3.
 - Water demand is projected to approach or exceed the limit of the permitted supply.
 - The storage in Lavon Lake is less than 35 percent of the total conservation pool capacity.
 - NTMWD's storage in Jim Chapman Lake is less than 35 percent of NTMWD's total conservation pool capacity.
 - The Sabine River Authority has indicated that its Upper Basin water supplies used by NTMWD (Lake Tawakoni and/or Lake Fork) are in a Severe drought or Emergency.
 - The supply from Lake Texoma, the East Fork Raw Water Supply Project, or some other NTMWD source has become severely limited in availability.
 - NTMWD water demand exceeds the amount that can be delivered to customers.
 - NTMWD water demand for all or part of the delivery system seriously exceeds delivery capacity because the delivery capacity is inadequate.
 - NTMWD's supply source becomes contaminated.
 - NTMWD's water supply system is unable to deliver water due to the failure or damage of major water system components.
- Supplier's water demand exceeds the amount that can be delivered to customers.
- Supplier's water demand for all or part of the delivery system seriously exceeds delivery capacity because the delivery capacity is inadequate.
- Supply source becomes contaminated.
- Supplier's water supply system is unable to deliver water due to the failure or damage of major water system components.
- Supplier's individual plan may be implemented if other criteria dictate.

- Stage 3 may terminate when NTMWD terminates its Stage 3 condition or when the circumstances that caused the initiation of Stage 3 no longer prevail.

Goals for Use Reduction and Actions Available under Stage 3

The goal for water use reduction under Stage 3 is a reduction of whatever amount is necessary in the amount of water obtained from NTMWD from the previous annual payment period prior to drought restrictions. **If circumstances warrant or if required by NTMWD, the City Manager, General Manager, Mayor, Chief Executive, or official designee can set a goal for greater or lesser water use reduction.**

The City Manager, General Manager, Mayor, Chief Executive, or official designee may order the implementation of any or all of the actions listed below, as deemed necessary. Measures described as “requires notification to TCEQ” impose mandatory requirements on member cities and customers. The supplier must notify TCEQ and NTMWD within five business days if these measures are implemented.

- Continue or initiate any actions available under Stages 1, and 2.
- Notify wholesale customers of actions being taken and request them to implement similar procedures.
- Implement viable alternative water supply strategies.
- **Requires Notification to TCEQ** – Initiate mandatory water use restrictions as follows:
 - Hosing and washing of paved areas, buildings, structures, windows or other surfaces is prohibited except by variance and performed by a professional service using high efficiency equipment.
 - Prohibit operation of ornamental fountains or ponds that use potable water except where supporting aquatic life or water quality.
- **Requires Notification to TCEQ** – Prohibit new sod, hydro seeding, hydro mulching, and sprigging.
- **Requires Notification to TCEQ** – Prohibit the use of potable water for the irrigation of new landscaping.
- **Requires Notification to TCEQ** – Prohibit all commercial and residential landscape watering, except that foundations and trees (within a ten foot radius of its trunk) may be watered for

two hours one day per week with a hand-held hose, a dedicated zone using a drip irrigation system and/or soaker hose provided no runoff occurs. ET/Smart irrigation systems and drip irrigation systems are not exempt from this requirement.

- **Requires Notification to TCEQ** – Prohibit washing of vehicles except at commercial vehicle wash facilities.
- **Requires Notification to TCEQ** – Landscape watering of parks, golf courses, and athletic fields with potable water is prohibited. Exception for golf course greens and tee boxes which may be hand watered as needed. Variances may be granted by the water provider under special circumstances.
- **Requires Notification to TCEQ** – Prohibit the filling, draining and refilling of existing swimming pools, wading pools, Jacuzzi and hot tubs except to maintain structural integrity, proper operation and maintenance or to alleviate a public safety risk. Existing pools may add water to replace losses from normal use and evaporation. Permitting of new swimming pools, wading pools, Jacuzzi and hot tubs is prohibited.
- **Requires Notification to TCEQ** – Prohibit the operation of interactive water features such as water sprays, dancing water jets, waterfalls, dumping buckets, shooting water cannons, or splash pads that are maintained for public recreation.
- **Requires Notification to TCEQ** – Require all commercial water users to reduce water use by a percentage established by the City Manager, General Manager, Mayor, Chief Executive, or official designee.
- **Requires Notification to TCEQ** – If NTMWD has imposed a reduction in water available to Member Cities and Customers, impose the same percent reduction on wholesale customers.
- **Requires Notification to TCEQ** - Initiate a rate surcharge for all water use over normal rates for all water use.

4.4 PROCEDURES FOR GRANTING VARIANCES TO THE PLAN

The City Manager, General Manager, Mayor, Chief Executive, or official designee may grant temporary variances for existing water uses otherwise prohibited under this Water Resource and Emergency Management Plan if one or more of the following conditions are met:

- Failure to grant such a variance would cause an emergency condition adversely affecting health, sanitation, or fire safety for the public or the person or entity requesting the variance.
- Compliance with this plan cannot be accomplished due to technical or other limitations.
- Alternative methods that achieve the same level of reduction in water use can be implemented.
- Variances shall be granted or denied at the discretion of the City Manager, General Manager, Mayor, Chief Executive, or official designee. All petitions for variances should be in writing and should include the following information:
 - Name and address of the petitioners
 - Purpose of water use
 - Specific provisions from which relief is requested
 - Detailed statement of the adverse effect of the provision from which relief is requested
 - Description of the relief requested
 - Period of time for which the variance is sought
 - Alternative measures that will be taken to reduce water use
 - Other pertinent information.

4.5 PROCEDURES FOR ENFORCING MANDATORY WATER USE RESTRICTIONS

Mandatory water use restrictions may be imposed in Stage 1, Stage 2 and Stage 3 Water Resource and Emergency Management Plan stages. The penalties associated with the mandatory water use restrictions will be determined by each entity.

Appendix D contains potential ordinances, resolutions, and orders that may be adopted by the city council, board, or governing body approving the Water Resource and Emergency Management plan and water response plan, including enforcement of same.

4.6 COORDINATION WITH THE REGIONAL WATER PLANNING GROUP AND NTMWD

Appendix C includes a copy of a letter sent to the Chairs of the Region C Water Planning Group and the North East Texas Water Planning Group with this model Water Resource and Emergency Management plan.

The suppliers will send a draft of its ordinance(s) or other regulation(s) implementing this plan to NTMWD for their review and comment. The supplier will also send the final ordinance(s) or other regulation(s) to NTMWD.

4.7 REVIEW AND UPDATE OF WATER RESOURCE AND EMERGENCY MANAGEMENT PLAN

As required by TCEQ rules, Member Cities and Customers must review the Water Resource and Emergency Management plan every five years. The plan will be updated as appropriate based on new or updated information.

APPENDIX D

NORTH TEXAS MUNICIPAL WATER DISTRICT

WATER UTILITY PROFILE BASED ON TCEQ FORMAT

APPENDIX D

North Texas Municipal Water District Water Utility Profile Based on TCEQ Format

Name of Utility: North Texas Municipal Water District
Address & Zip: P.O. Box 2408, Wylie, TX 75098
Telephone Number: (972) 442-5405
Fax Number: (972) 295-6440
Form Completed by: Denise Hickey
Title: Public Relations Coordinator
Signature: _____
Date: _____

Name and phone number of person responsible for implementing a water conservation program:

Name: Jim Parks
Phone Number: (972) 442-5405

I. CUSTOMER DATA

A. Population and Service Area Data

Service area map is included as Figure 3.2.

1. Service area size (square miles): 2,200 (Estimated 2012 total population of member cities and customers)
2. Current population of service area: 1,596,304
3. Current (2012) population served by utility:
water: 1,596,304
wastewater: 1,372,822
4. Population served by utility for the previous five years:

Year	Estimated Population
2008	1,413,059
2009	1,455,451
2010	1,464,391
2011	1,501,001
2012	1,596,304

Populations are based on estimates generated by NTWMD each year in preparing yearly Water Conservation Reports (Appendix D)

5. Projected population for service area in the following decades:

Year	Estimated Population
2020	1,797,279
2030	2,093,105
2040	2,454,133
2050	2,889,282
2060	3,333,931
2070	3,814,388

Projected 2020-2070 population for current and potential Member Cities and Customers from Region C projections for the 2016 regional water plan (as approved by TWDB)

6. List source(s)/method(s) for the calculation of current and projected population:

As described above, the estimates are total populations of current Member Cities and Customers, based on yearly estimates generated by NTWMD and projections made for the *2011 Region C Water Plan* and approved by the TWDB.

B. Customers Data

List the names of all wholesale customers, amount of annual contract, and amount of the annual use for each for the previous year:

Note: NTMWD is primarily a wholesale water provider. However, NTMWD does provide retail service to 41 customers.

Customer	Contracted Amount (Acre-Feet)	Year 2012 Water Delivered (Acre-Feet)
<u>Member Cities</u>		
Allen	Demand Based Contract with Minimum Take or Pay	16,842
Farmersville		677
Forney		4,385
Frisco		31,276
Garland		35,830
McKinney		29,303
Mesquite		18,644
Plano		65,287
Princeton		1,382
Richardson		26,379
Rockwall		8,994
Royse City		1,404
Wylie		5
Subtotal Members		
<u>Customers</u>		
Bonham		1,518
Caddo Basin SUD		927
Cash SUD		778
College Mound WSC		236
Copeville SUD		243
Crandall		508
East Fork SUD		1,041

Fairview		2,533	
Fate		1,036	
Forney Lake WSC		439	
Gastonia-Scurry SUD		749	
GTUA		213	
Josephine		1,549	
Kaufman		1,345	
Lavon WSC	Demand Based Contract with Minimum Take or Pay	792	
Little Elm		3,451	
Lucas		1,679	
Melissa		712	
Milligan WSC		363	
Mt. Zion WSC		328	
Murphy		3,701	
Nevada WSC		224	
N. Collin WSC		1,039	
Parker		1,354	
Prosper		2,731	
Rose Hill SUD		316	
Rowlett		7,857	
Sachse		3,304	
Seis Lagos MUD		308	
Sunnyvale		1,589	
Terrell		3,862	
Wylie NE SUD		499	
Subtotal Customers			47,224
<u>Retail Customers</u>			
Subtotal		12	
Total		287,644	

II. WATER USE DATA FOR SERVICE AREA

A. Water Delivery

Indicate if the water provided under wholesale contracts is treated or raw water and the annual amount for each for previous year.

Total amount sold for Year 2012 (acre-feet)

Treated	287,644
Raw	0

B. Water Accounting Data

- Total amount of water diverted at point of diversion(s) for previous five years (in acre-feet) for all water uses:

Diversions from Lavon Lake (and Lake Tawakoni) (acre-feet)

Year	2008	2009	2010	2011	2012
January	17,737	17,470	16,171	16,302	15,916
February	15,576	16,428	13,531	15,910	14,264
March	16,614	19,850	16,173	22,522	16,710
April	18,374	20,496	21,494	23,168	19,813
May	23,283	20,225	27,794	23,527	27,463
June	29,607	30,518	37,935	37,491	29,289
July	41,463	36,195	34,668	48,310	37,816
August	37,565	34,099	46,639	49,224	39,014
September	30,221	24,341	29,351	38,325	35,314
October	27,574	18,346	28,827	26,881	28,358
November	21,798	18,623	20,235	18,009	24,859
December	17,979	16,694	20,145	16,160	20,723
Total	297,791	273,282	312,962	335,828	309,540

- Wholesale population served and total amount of water diverted for **municipal** use for previous five years:

Year	Total Population Served	Total Annual Water Diverted for Municipal Use (Acre-Feet)
2008	1,413,059	296,145
2009	1,455,451	271,707
2010	1,464,391	311,318
2011	1,501,001	332,861
2012	1,596,304	303,446

C. Projected Water Demands

If applicable, project and attach water supply demands for the next ten years using information such as population trends, historical water use, and economic growth in the service area over the next ten years and any additional water supply requirement from such growth.

Year	Projected Demand (AF/Y) (with Plumbing Code Reductions)	Source of data
2020	371,743	2016 Region C Plan
2021	377,603	Interpolated
2022	383,462	Interpolated
2023	389,322	Interpolated
2024	395,181	Interpolated
2025	401,041	Interpolated
2026	406,900	Interpolated
2027	412,760	Interpolated
2028	418,619	Interpolated
2029	424,479	Interpolated
2030	430,338	2016 Region C Plan
2040	504,964	2016 Region C Plan
2050	582,350	2016 Region C Plan
2060	646,378	2016 Region C Plan
2070	710,535	2016 Region C Plan

Note: Projections are for current and potential customers. Projections include TWDB estimated reductions for plumbing fixtures. Projections are from Region C Water Planning Group information for the 2016 Plan, as approved by TWDB.

III. WATER SUPPLY SYSTEM DATA

A. Water Supply Sources

List all current water supply sources and the amounts available with each:

Type^a	Source	Amount Authorized (AF/Y)
Surface Water	Lavon Lake - municipal right	114,670
Surface Water	Lavon Lake - industrial or municipal	4,000
Surface Water	Lake Bonham	5,340
Surface Water	Lake Texoma ^b	197,000
Surface Water	Jim Chapman Lake	57,214
Surface Water	Upper Sabine Basin (contracted)	10,000
Indirect Reuse	Wilson Creek WWTP ^c	71,882
Indirect Reuse	East Fork Raw Water Supply ^c	157,393
Total		617,499

Notes: a. NTMWD does not have any groundwater supplies.

b. Availability from Lake Texoma is limited due to issues with zebra mussels and salt levels.

c. Availability from Wilson Creek WWTP and East Fork Raw Water Supply Project is limited to actual discharges and is currently less than amount authorized.

B. Treatment and Distribution System

1. Design daily capacity of system:

Plant 1	70 MGD
Plant 2	280 MGD
Plant 3	280 MGD
Plant 4	140 MGD
Lake Tawakoni	30 MGD
Lake Bonham	6 MGD
<hr/> Total	806 MGD

2. Storage capacity:

Elevated	<u>0</u>	MG
Ground	<u>74</u>	MG

3. If surface water, do you recycle filter backwash to the head of the plant?

Yes X No . Approximately 5 MGD.

4. Please describe the water system and attach. Include the number of treatment plants, wells,

and storage tanks. If possible, attach a sketch of the system layout.

Plate 1 at the back of the report is a map of the NTMWD water system. Raw water is diverted from Lavon Lake. (Raw water from Lake Texoma, Jim Chapman Lake, the East Fork Raw Water Supply Project, and the Upper Sabine Basin is pumped to the Lavon Lake watershed through pipelines and delivered by bed and banks of streams. Treated effluent from Wilson Creek WWTP is released into Wilson Creek and delivered to Lavon Lake by the bed and banks.) The raw water is treated at four water treatment plants with a total treatment capacity of 770 mgd, all located near Lavon Lake in Wylie. The treated water is delivered to NTMWD Member Cities and Customers through the system of pump stations and pipelines shown on Plate 1. Treated water is delivered to member cities and customers through air gaps into ground storage facilities owned by the member cities and customers.

IV. WASTEWATER SYSTEM DATA

A. Wastewater System Data (if applicable)

1. Design capacity of wastewater treatment plant(s): 126.755 MGD

2. Briefly describe NTMWD's wastewater systems. Identify treatment plants with the TCEQ name and number, the operator, owner, and, if wastewater is discharged, the receiving stream. Please provide a location map showing the plants. Plants are described below. Locations are shown on Plate 1:

Treatment Plant Name	TCEQ Number	Permitted Discharge (MGD)	Operator	Owner	Receiving Stream
Bear Creek	14577-001	0.250	NTMWD	World Land Developers	Bear Creek to Lake Ray Hubbard
Buffalo Creek	12047-001	2.250	NTMWD	NTMWD	Buffalo Creek thence East
Cottonwood Creek	10172-002	0.300	NTMWD	NTMWD	Cottonwood Branch to Lake
Farmersville #1	10442-001	0.225	NTMWD	NTMWD	Unnamed tributary of Elm
Farmersville #2	10442-002	0.530	NTMWD	NTMWD	Unnamed tributary of Elm
Floyd Branch	10257-001	4.750	NTMWD	NTMWD	Floyd Branch to Cottonwood
Muddy Creek	14216-001	5.000	NTMWD	NTMWD	Muddy Creek to Lake Ray
Panther Creek	14245-001	5.000	NTMWD	NTMWD	Unnamed tributary of
Rowlett Creek	10363-001	24.000	NTMWD	NTMWD	Rowlett Creek
Sabine Creek	14469-001	3.000	NTMWD	NTMWD	Parker Creek
Seis Lagos	11451-001	0.250	NTMWD	NTMWD	Unnamed tributary of Lavon
South Mesquite	10221-001	25.000	NTMWD	NTMWD	South Mesquite Creek
Squabble Creek	10262-001	1.200	NTMWD	NTMWD	Squabble Creek
Stewart Creek West	14008-001	5.000	NTMWD	NTMWD	Stewart Creek
Wilson Creek	12446-001	48.000	NTMWD	NTMWD	Lake Lavon Seg.# 0821
Wylie WWTP	10384-001	2.000	NTMWD	NTMWD	Muddy Creek

B. Wastewater Data for Service Area (if applicable)

1. Percent of water service area served by wastewater system: 62%
2. Monthly volume treated for previous three years (in 1,000 gallons):

Year	2010	2011	2012
January	1,410,476	1,227,707	1,413,885
February	1,579,695	1,150,275	1,139,140
March	1,558,821	1,116,601	1,432,752
April	1,151,705	1,159,584	1,097,959
May	1,095,664	1,367,492	1,101,447
June	1,036,124	1,070,548	1,176,674
July	1,142,571	983,061	1,031,512
August	1,085,631	959,558	1,107,059
September	1,290,595	943,647	1,060,828
October	1,097,052	1,078,004	1,108,391
November	1,195,716	969,354	1,026,706
December	1,114,127	1,253,781	1,107,901
Total	14,758,177	13,279,612	13,804,254

APPENDIX D1
Summary of NTMWD Water Use
Additional Information Not Required by TCEQ Water Utility Profile

Entity Reporting: NTMWD Summary
Filled Out By: Amy Kaarlela, Freese and Nichols, Inc.
Date Completed: 9/13/2012
Year Covered: 2012

NTMWD System Summary

Month	Municipal Raw Water Diversion (MG)	Amount of Reuse (MG)	Total Municipal Diversion (MG)	Industrial Raw Water Diversion (MG)	Percent of Municipal Supply from Reuse	Municipal Sales (MG)
January	1,368.222	3,603.604	4,971.826	0.000	72.48%	4,317.307
February	2,737.422	1,695.200	4,432.622	0.326	38.24%	4,221.266
March	2,556.166	2,653.314	5,209.480	2.282	50.93%	4,482.673
April	5,207.524	995.930	6,203.454	3.912	16.05%	6,085.772
May	7,461.814	1,147.520	8,609.334	5.868	13.33%	8,126.848
June	6,982.920	2,202.782	9,185.702	6.194	23.98%	8,857.113
July	10,038.518	2,139.538	12,178.056	7.824	17.57%	10,548.510
August	11,020.430	1,707.914	12,728.344	14.344	13.42%	10,982.036
September	9,731.100	1,771.158	11,502.258	4.564	15.40%	10,691.567
October	6,849.912	2,394.796	9,244.708	0.000	25.90%	8,010.067
November	6,123.910	1,980.124	8,104.034	0.000	24.43%	7,547.282
December	3,944.274	2,609.304	6,553.578	0.000	39.81%	5,468.538
TOTAL	74,022.212	24,901.184	98,923.396	45.314	25.17%	89,338.979

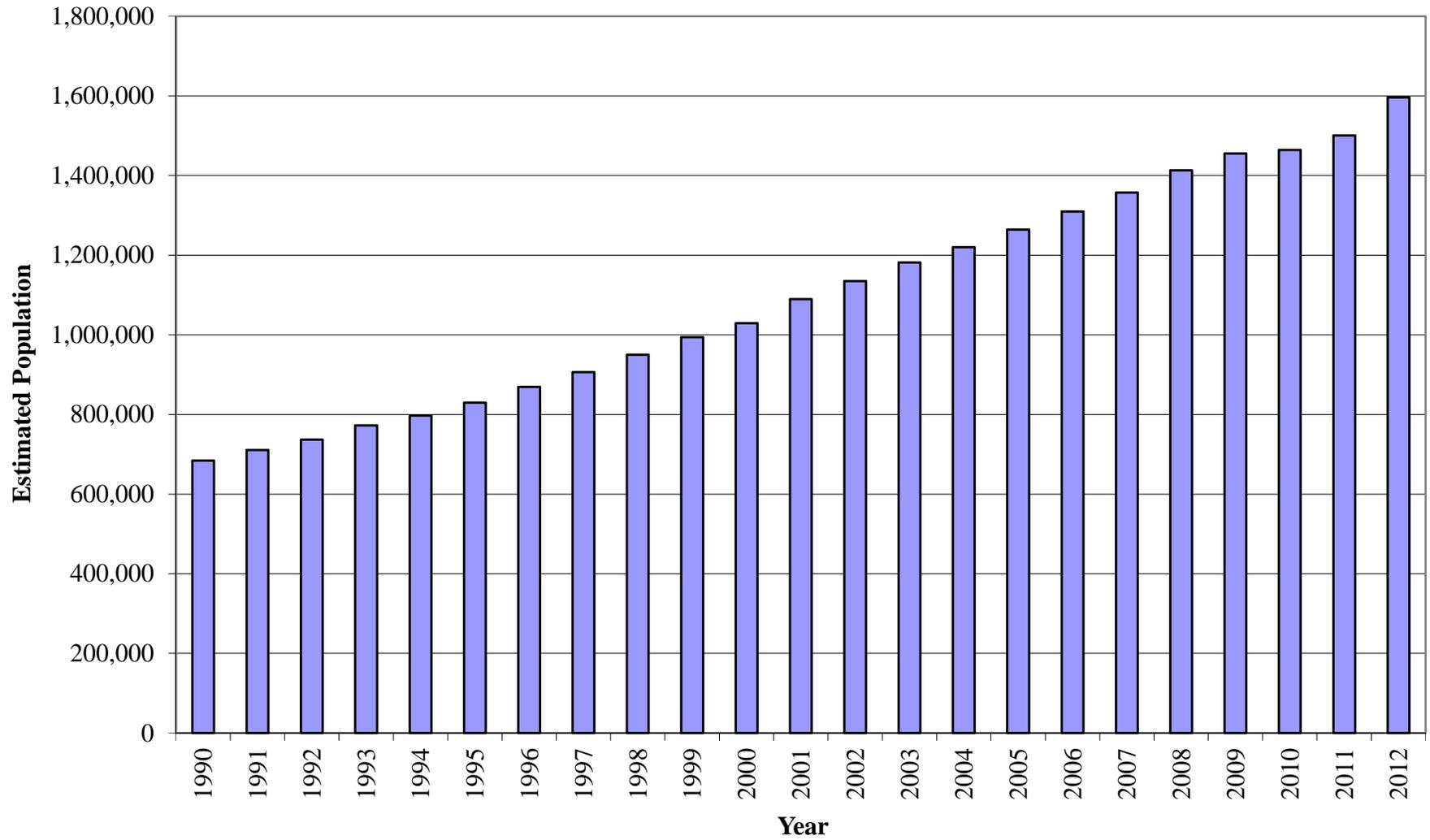
Historical Water Use Data for NTMWD

Year	Estimated Population	Raw Water & Reuse Diversions (MG)		Total Raw Water & Reuse Diversions (MG)	Reuse (MG)	Sales by Category (MG)		
		Municipal	Industrial			Municipal	Industrial Raw Water	Total
1990	684,435	46,544.324	280.686	46,825.010	0.000	46,483.362	280.686	46,764.048
1991	710,591	43,687.586	335.454	44,023.040	0.000	43,663.788	335.454	43,999.242
1992	736,859	44,488.242	367.076	44,855.318	2,004.574	43,426.134	367.076	43,793.210
1993	772,203	52,529.358	440.100	52,969.458	6,068.490	49,582.318	440.100	50,022.418
1994	797,386	47,542.536	478.894	48,021.430	6,976.400	47,091.026	478.894	47,569.920
1995	829,707	54,118.282	508.234	54,626.516	7,069.310	52,916.320	508.234	53,424.554
1996	869,142	59,779.924	429.668	60,209.592	7,418.456	55,655.046	429.668	56,084.714
1997	906,187	58,322.704	349.472	58,672.176	10,666.720	54,865.148	349.472	55,214.620
1998	949,808	71,851.378	444.664	72,296.042	12,218.806	69,444.846	444.664	69,889.510
1999	993,865	75,908.122	369.684	76,277.806	11,384.572	72,337.118	369.684	72,706.802
2000	1,028,985	84,090.070	402.936	84,493.006	10,672.914	81,991.608	402.936	82,394.544
2001	1,089,788	81,987.696	305.788	82,293.484	11,510.408	78,537.638	305.788	78,843.426
2002	1,135,190	79,444.896	277.426	79,722.322	11,426.626	77,732.092	277.426	78,009.518
2003	1,182,007	86,266.120	230.482	86,496.602	10,936.322	84,503.764	230.482	84,734.246
2004	1,220,396	80,629.906	237.328	80,867.234	12,930.790	78,797.460	237.328	79,034.788
2005	1,264,402	96,916.214	202.446	97,118.660	12,461.024	95,572.116	202.446	95,774.562
2006	1,309,994	97,888.346	188.754	98,077.100	13,735.684	93,524.510	188.754	93,713.264
2007	1,357,230	80,977.748	170.172	81,147.920	15,664.775	77,562.920	170.172	77,733.092
2008	1,413,059	96,543.270	48.248	97,050.873	13,384.982	89,584.077	48.248	89,632.325
2009	1,455,451	88,576.482	5.216	89,063.410	23,481.149	81,940.212	5.216	81,945.428
2010	1,464,391	101,489.668	43.032	101,995.312	23,302.908	91,600.759	43.032	91,643.791
2011	1,501,001	108,512.686	43.032	101,995.312	27,890.988	97,850.096	43.032	97,893.128
2012	1,596,304	98,923.396	45.314	109,447.284	26,163.631	89,338.979	45.314	89,384.293

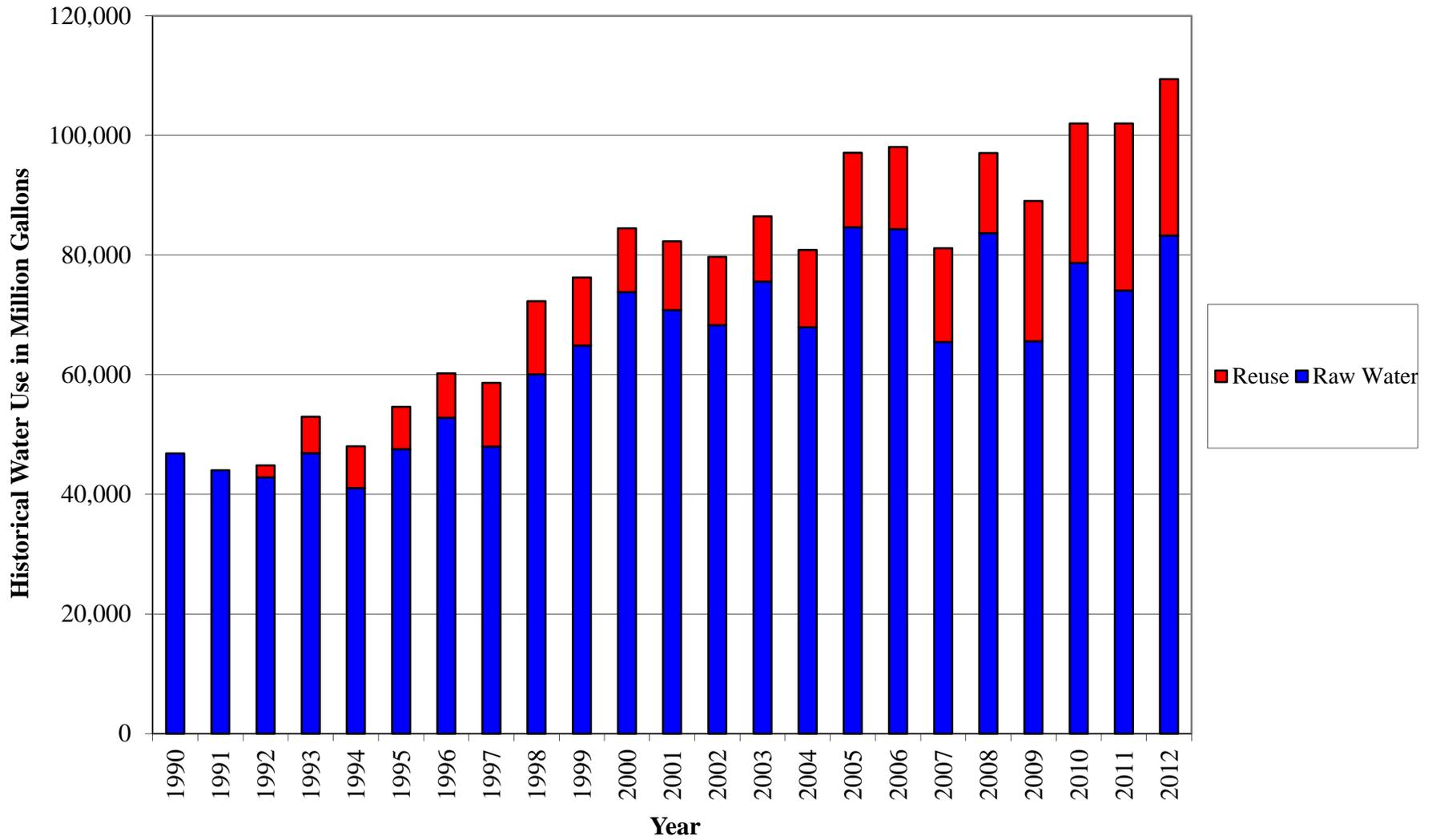
Historical Per Capita Use Data and Unaccounted Water for NTMWD

Year	Estimated Population	Municipal Raw Water & Reuse Diversions (MG)	Reuse (MG)	Industrial Sales by Customers (MG)	Municipal Treated Water Sales (MGD)	Unaccounted Water (MG)	% Unaccounted	% Reuse	Raw Water GPCD			Treated Water GPCD		
									Total gpcd	With Credit for Industrial Use	With Credit for Industrial Use and Reuse	Total gpcd	With Credit for Industrial Use	With Credit for Industrial Use and Reuse
1990	684,435	46,544.324	0.000	2,103.678	46,483.362	60.962	0.13%	0.00%	186	178	186	186	178	178
1991	710,591	43,687.586	0.000	1,585.990	43,663.788	23.798	0.05%	0.00%	168	162	168	168	162	162
1992	736,859	44,488.242	2,004.574	1,673.684	43,426.134	1,062.108	2.39%	4.51%	165	159	158	161	155	148
1993	772,203	52,529.358	6,068.490	1,768.550	49,582.318	2,947.040	5.61%	11.55%	186	180	167	176	170	148
1994	797,386	47,542.536	6,976.400	1,775.070	47,091.026	451.510	0.95%	14.67%	163	157	143	162	156	132
1995	829,707	54,118.282	7,069.310	1,804.084	52,916.320	1,201.962	2.22%	13.06%	179	173	158	175	169	146
1996	869,142	59,779.924	7,418.456	1,913.294	55,655.046	4,124.878	6.90%	12.41%	188	182	167	175	169	146
1997	906,187	58,322.704	10,666.720	2,126.172	54,865.148	3,457.556	5.93%	18.29%	176	170	150	166	159	127
1998	949,808	71,851.378	12,218.806	1,805.388	69,444.846	2,406.532	3.35%	17.01%	207	202	178	200	195	160
1999	993,865	75,908.122	11,384.572	2,072.708	72,337.118	3,571.004	4.70%	15.00%	209	204	182	199	194	162
2000	1,028,985	84,090.070	10,672.914	2,028.372	81,991.608	2,098.462	2.50%	12.69%	224	218	199	218	213	185
2001	1,089,788	81,987.696	11,510.408	2,030.980	78,537.638	3,450.058	4.21%	14.04%	206	201	181	197	192	164
2002	1,135,190	79,444.896	11,426.626	1,848.420	77,732.092	1,712.804	2.16%	14.38%	192	187	168	188	183	156
2003	1,182,007	86,266.120	10,936.322	1,434.400	84,503.764	1,762.356	2.04%	12.68%	200	197	177	196	193	167
2004	1,220,396	80,629.906	12,930.790	1,225.760	78,797.460	1,832.446	2.27%	16.04%	181	178	156	177	174	145
2005	1,264,402	96,916.214	12,461.024	1,215.980	95,572.116	1,344.098	1.39%	12.86%	210	207	186	207	204	177
2006	1,309,994	97,888.346	13,735.684	1,408.320	93,524.510	4,363.836	4.46%	14.03%	205	202	180	196	193	164
2007	1,357,230	80,977.748	15,664.775	1,285.913	77,562.920	3,414.828	4.22%	19.34%	163	161	138	157	154	122
2008	1,413,059	96,440.769	13,384.982	1,208.907	93,296.355	3,144.414	3.26%	13.88%	187	185	164	181	179	153
2009	1,455,451	88,535.998	23,481.149	1,205.649	86,756.525	1,779.472	2.01%	26.52%	167	164	134	163	161	117
2010	1,464,391	101,477.985	23,302.908	1,294.173	97,162.548	4,315.437	4.25%	22.96%	190	187	156	182	179	136
2011	1,501,001	108,812.975	27,890.988	1,737.330	104,429.475	4,383.501	4.03%	25.63%	199	195	160	191	187	137
2012	1,596,304	100,863.919	26,163.631	1,577.100	95,304.249	5,559.670	5.51%	25.94%	173	170	139	164	161	116

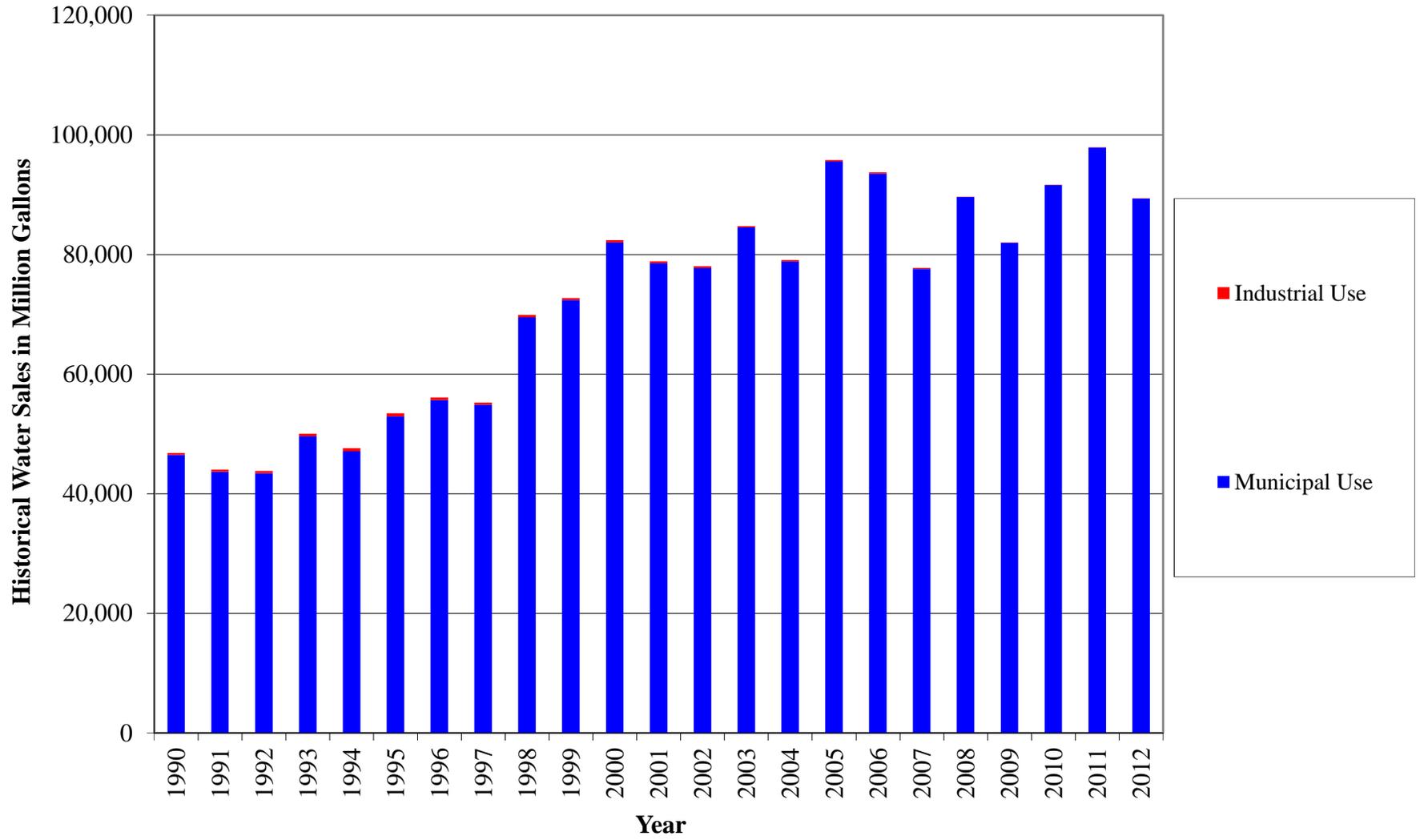
Estimated Historical NTMWD Service Area Population



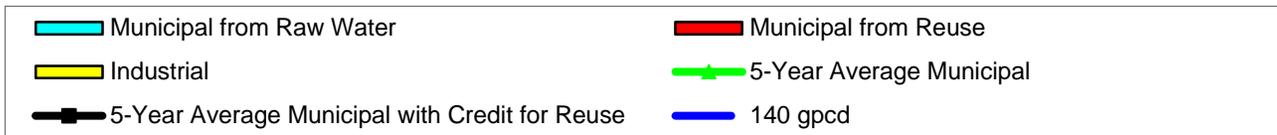
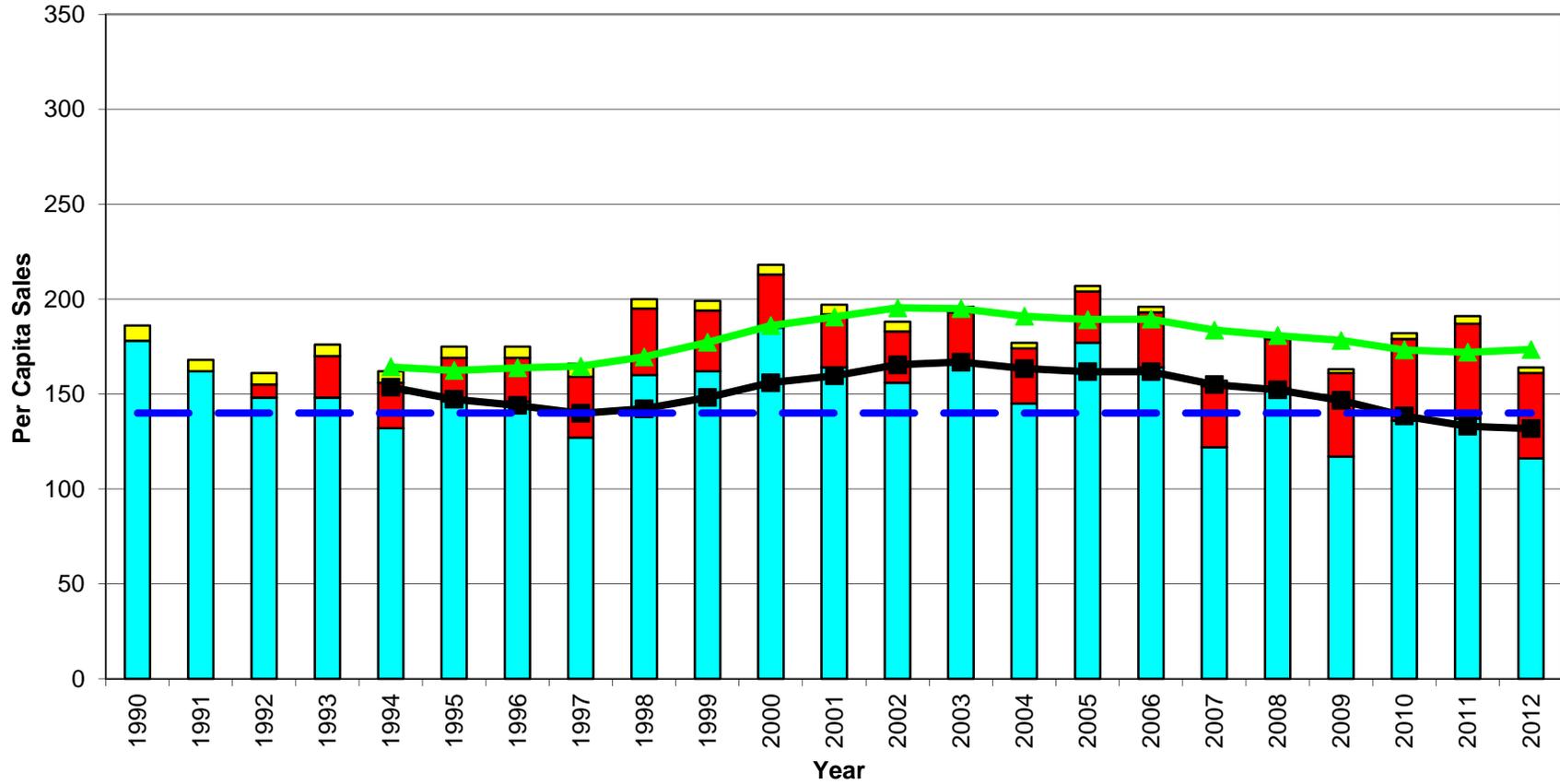
Historical NTMWD Raw Water & Reuse Diversions



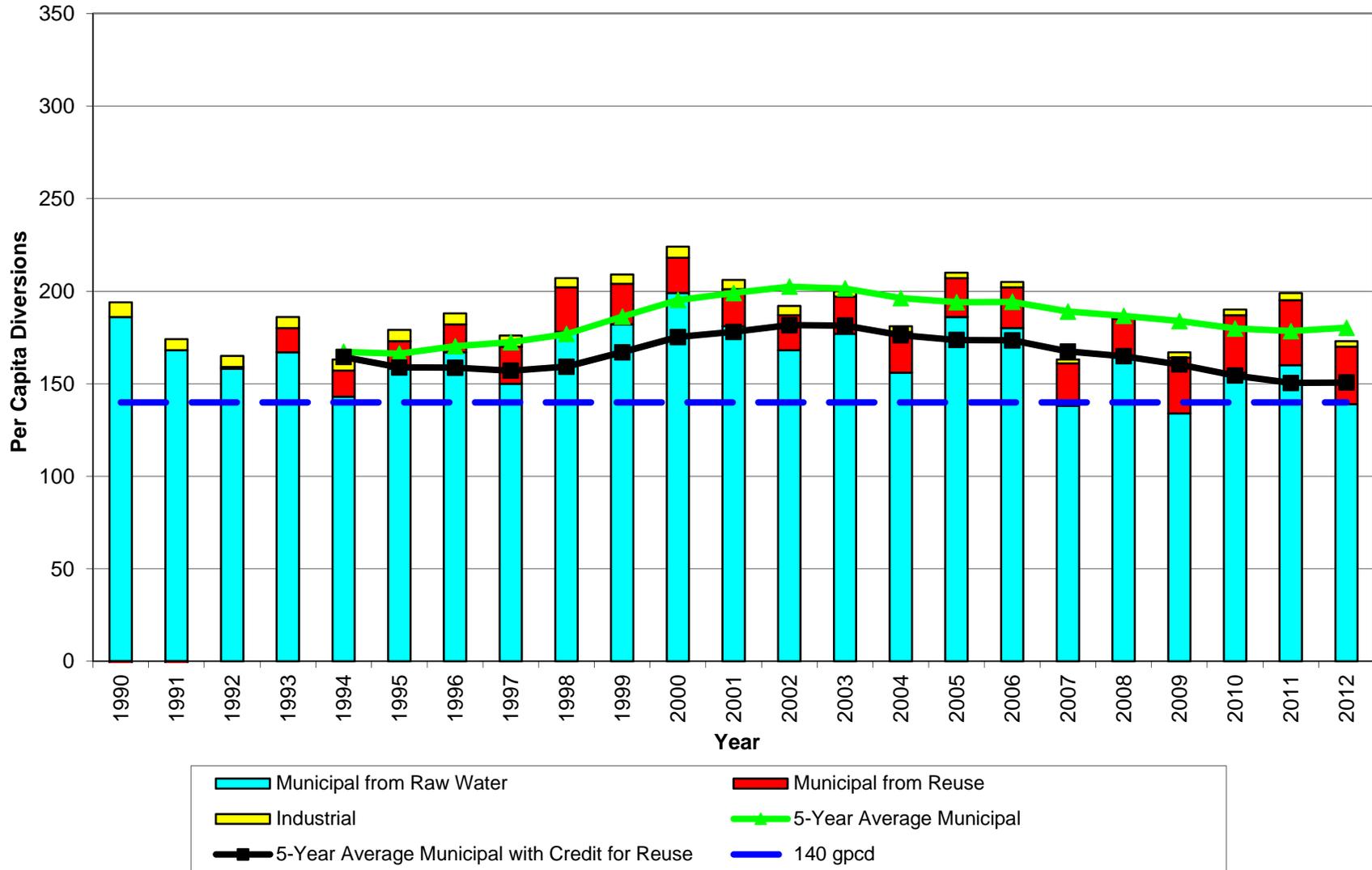
NTMWD Historical Water Sales by Classification



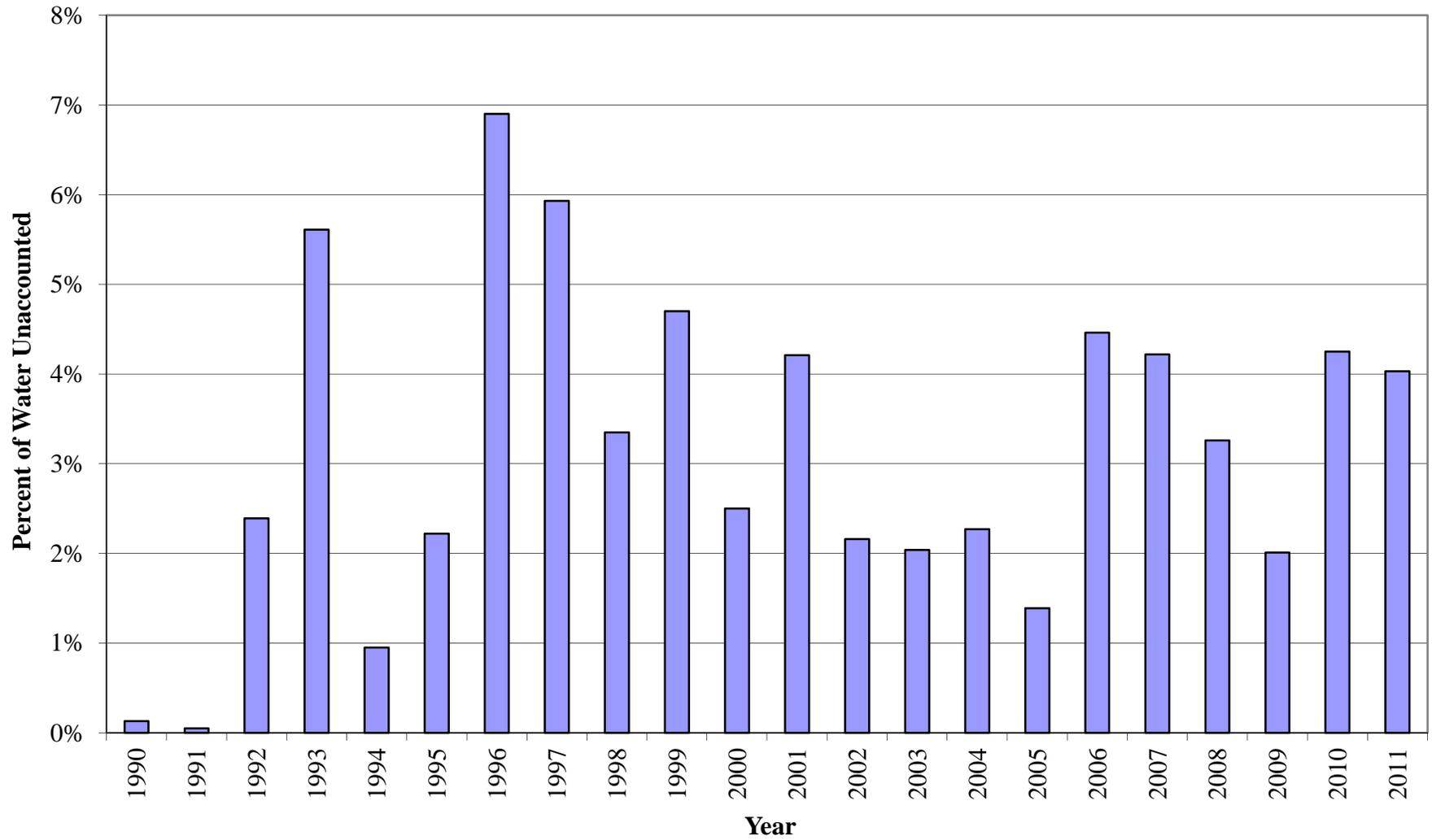
NTMWD Per Capita Treated Water Sales



NTMWD Per Capita Raw Water Diversions



NTMWD Historical Percent Unaccounted Water



APPENDIX E
NTMWD MEMBER CITY AND CUSTOMER ANNUAL WATER CONSERVATION
REPORT

APPENDIX E
NTMWD MEMBER CITY AND CUSTOMER WATER CONSERVATION REPORT

Due: March 31 of every year

Entity Reporting:
 Filled Out By:
 Date Completed:
 Year Covered: 2013
 # of Connections

Recorded Deliveries and Sales by Month (in Million Gallons):

Month	Deliveries from NTMWD	Other Supplies	Sales by Category						Total
			Residential	Commercial	Public/ Institutional	Industrial	Wholesale	Other	
January									0.000
February									0.000
March									0.000
April									0.000
May									0.000
June									0.000
July									0.000
August									0.000
September									0.000
October									0.000
November									0.000
December									0.000
TOTAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Peak Day Usage

Peak Day (MG) Total peak day use (Peak day delivery from NTMWD + other supplies)
 Average Day (MG) 0.000 Average day use (Annual deliveries from NTMWD + other supplies / 365 days)
 Peak/Average Day Ratio #DIV/0! Total peak day use/average day use

Unaccounted Water (Million Gallons):

NTMWD Deliveries	0.000	from Table above
Other Supplies	0.000	from Table above
Total Supplies	0.000	from Table above
Total Sales	0.000	from Table above
Estimated Fire Use		estimated from best available data
Estimated Line Flushing Use		estimated from best available data
Unaccounted Water	0.000	
% Unaccounted	#DIV/0!	
Goal for % Unaccounted		

Per Capita Use (Gallons per person per day)

Total Use (MG)	0.000	from Table above (NTMWD deliveries+ other supplies - wholesale)
Municipal Use (MG)	0.000	from Table above (NTMWD deliveries+ other supplies - industrial sales - municipal sales - wholesale - other sales)
Residential Use (MG)	0.000	from Table above (NTMWD deliveries+ other supplies - commercial sales - public/institutional sales - i
Estimated Population		Source:
Total Per Capita Use (gpcd)	#DIV/0!	
Municipal Per Capita Use (gpcd)	#DIV/0!	
Residential Per Capita Use (gpcd)	#DIV/0!	
5-year Per Capita Goal (___)		
10-year Per Capita Goal (___)		

Recorded Wholesale Sales by Month (in Million Gallons):

Month	Sales to _____	Total Wholesale Sales							
January									0.000
February									0.000
March									0.000
April									0.000
May									0.000
June									0.000
July									0.000
August									0.000
September									0.000
October									0.000
November									0.000
December									0.000
TOTAL	0.000								

Information on Wholesale Customers:

Customer	Estimated Population
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Unusual Circumstances (use additional sheets if necessary):

--

Progress in Implementation of Conservation Plan (use additional sheets if necessary):

--

Conservation measures planned for next year (use additional sheets if necessary):

A large, empty rectangular box with a thin black border, intended for listing conservation measures planned for the next year.

Assistance requested from North Texas Municipal Water District (use additional sheets if necessary):

A large, empty rectangular box with a thin black border, intended for listing assistance requested from the North Texas Municipal Water District.

Other (use additional sheets if necessary):

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Historical Water Use Data for

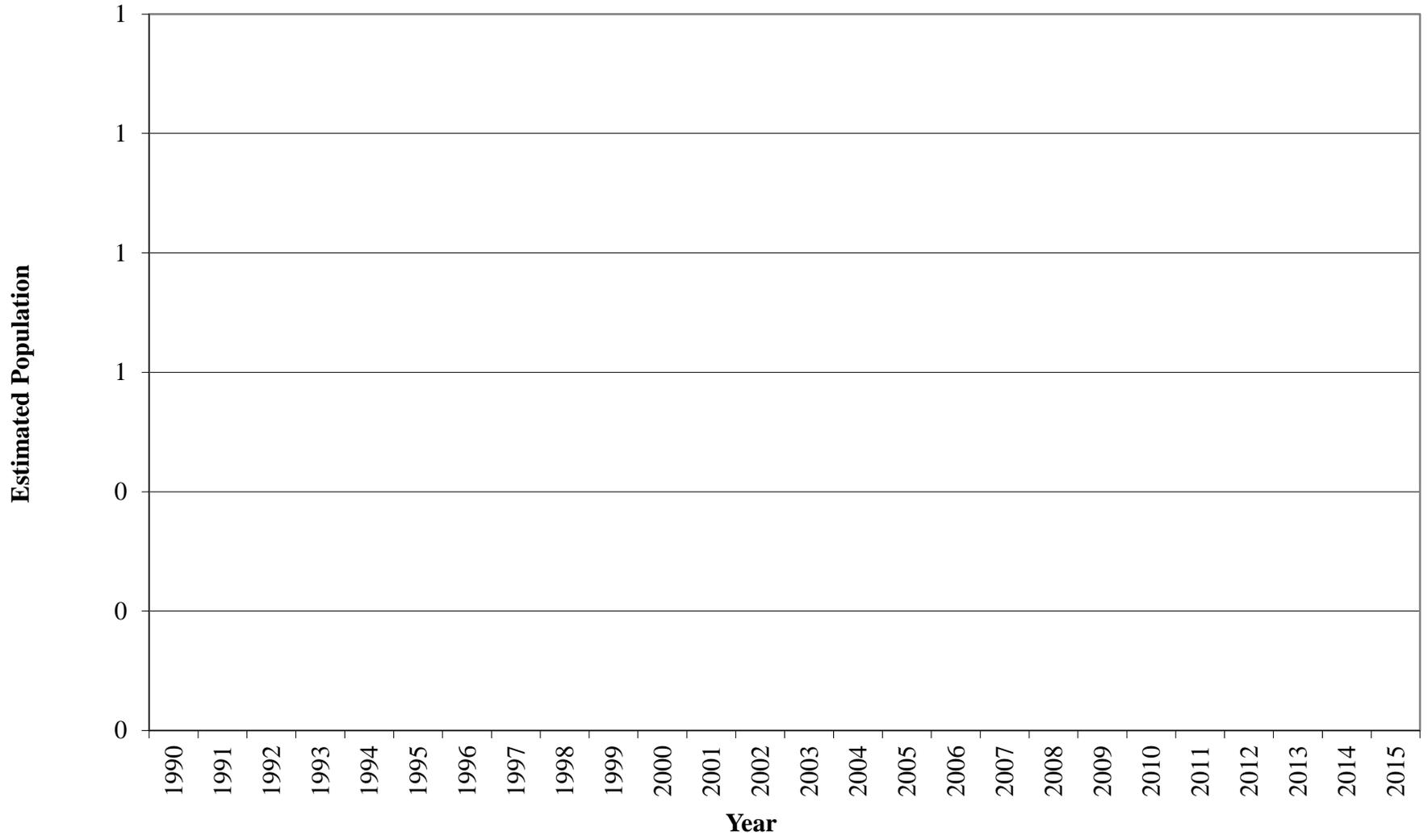
Year	Connections	Estimated Population	Deliveries from NTMWD (MG)	Other Supplies (MG)	Metered Sales by Category (Million Gallons)					Total
					Residential	Commercial	Public/ Institutional	Industrial	Other	
1990										0.000
1991										0.000
1992										0.000
1993										0.000
1994										0.000
1995										0.000
1996										0.000
1997										0.000
1998										0.000
1999										0.000
2000										0.000
2001										0.000
2002										0.000
2003										0.000
2004										0.000
2005										0.000
2006										0.000
2007										0.000
2008										0.000
2009										0.000
2010										0.000
2011										0.000
2012										0.000
2013										0.000
2014										0.000
2015										0.000

Historical Per Capita Use Data and Unaccounted Water for

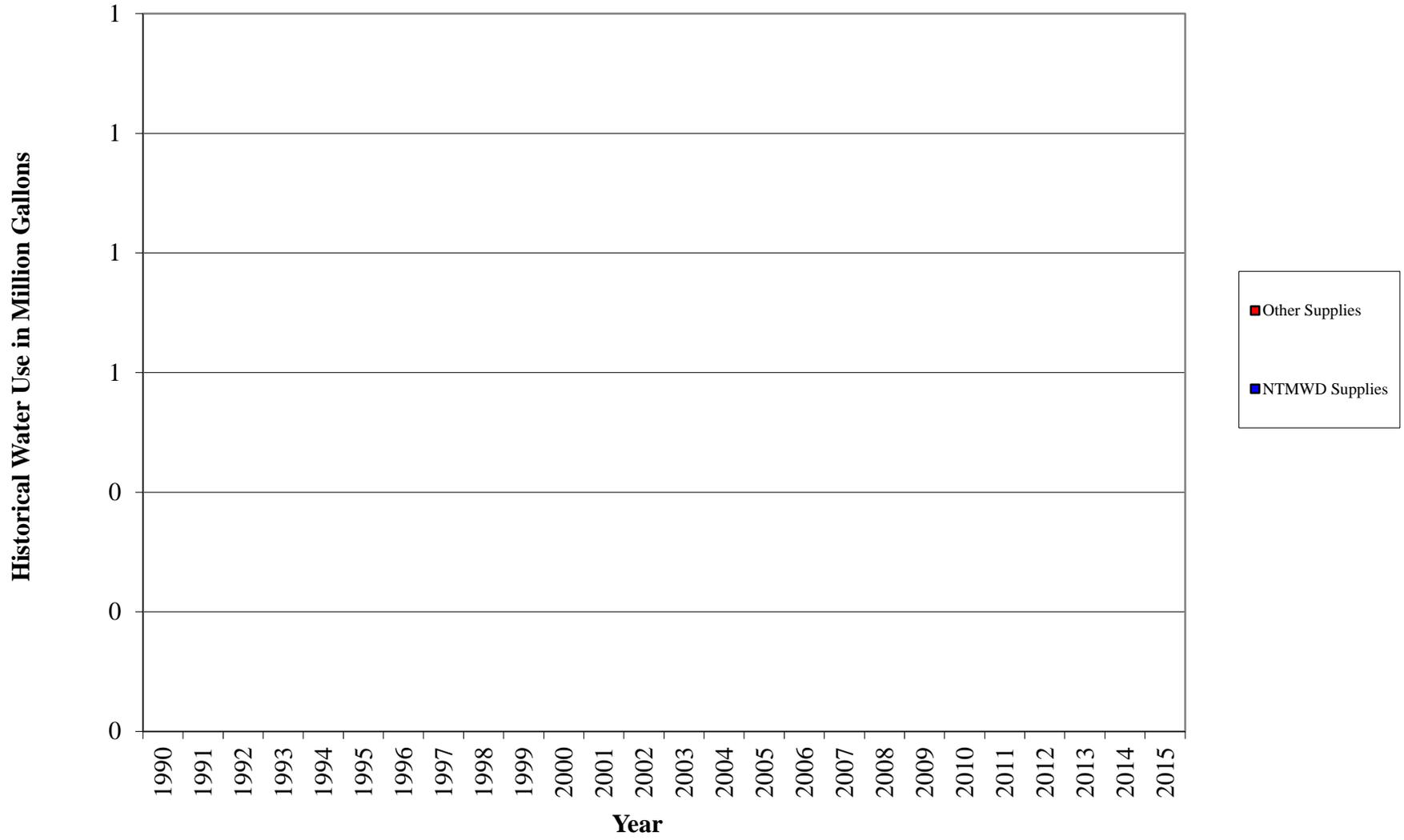
Year	Estimated Population	In-City Municipal Use (MG)	Per Capita Municipal Use (gpcd)	Deliveries from NTMWD (MG)	Other Supplies (MG)	Total Metered Sales (MG)	Estimated Fire Use (MG)	Estimated Line Flushing (MG)	Unaccounted Water (MG)	% Unaccounted
1995										#DIV/0!
1996										#DIV/0!
1997										#DIV/0!
1998										#DIV/0!
1999										#DIV/0!
2000										#DIV/0!
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2009										#DIV/0!
2010										#DIV/0!
2011										#DIV/0!
2012	0	0.000	#DIV/0!	0.000	0.000	0.000			0.000	#DIV/0!
2013	0	0.000	#DIV/0!	0.000	0	0			0	#DIV/0!
2014	0	0.000	#DIV/0!	0.000	0	0			0	#DIV/0!
2015	0	0.000	#DIV/0!	0.000	0	0			0	#DIV/0!

Note: In-city municipal use = total water supplied less sales to industry, wholesale sales and other sales.

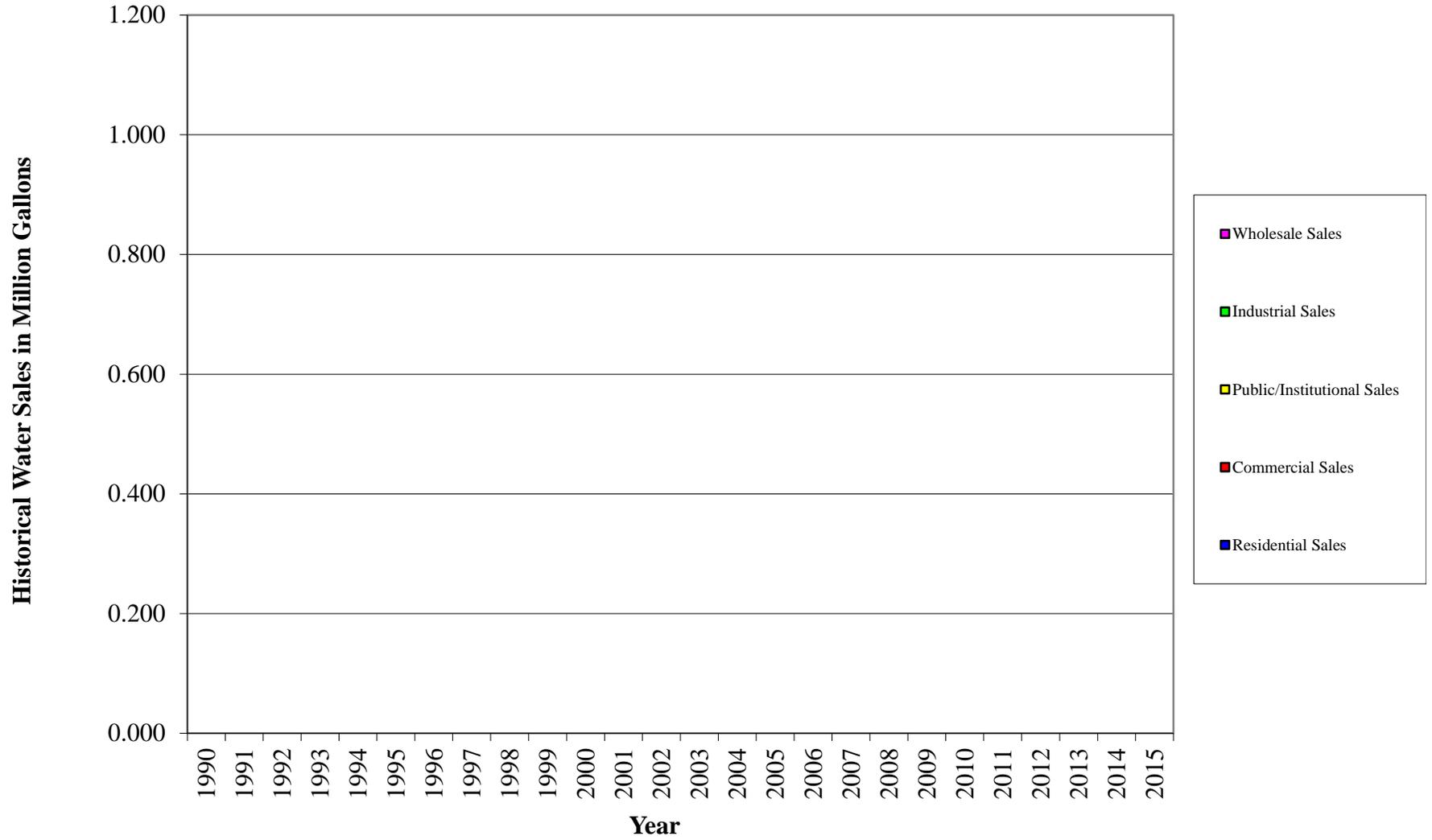
Estimated Historical Population



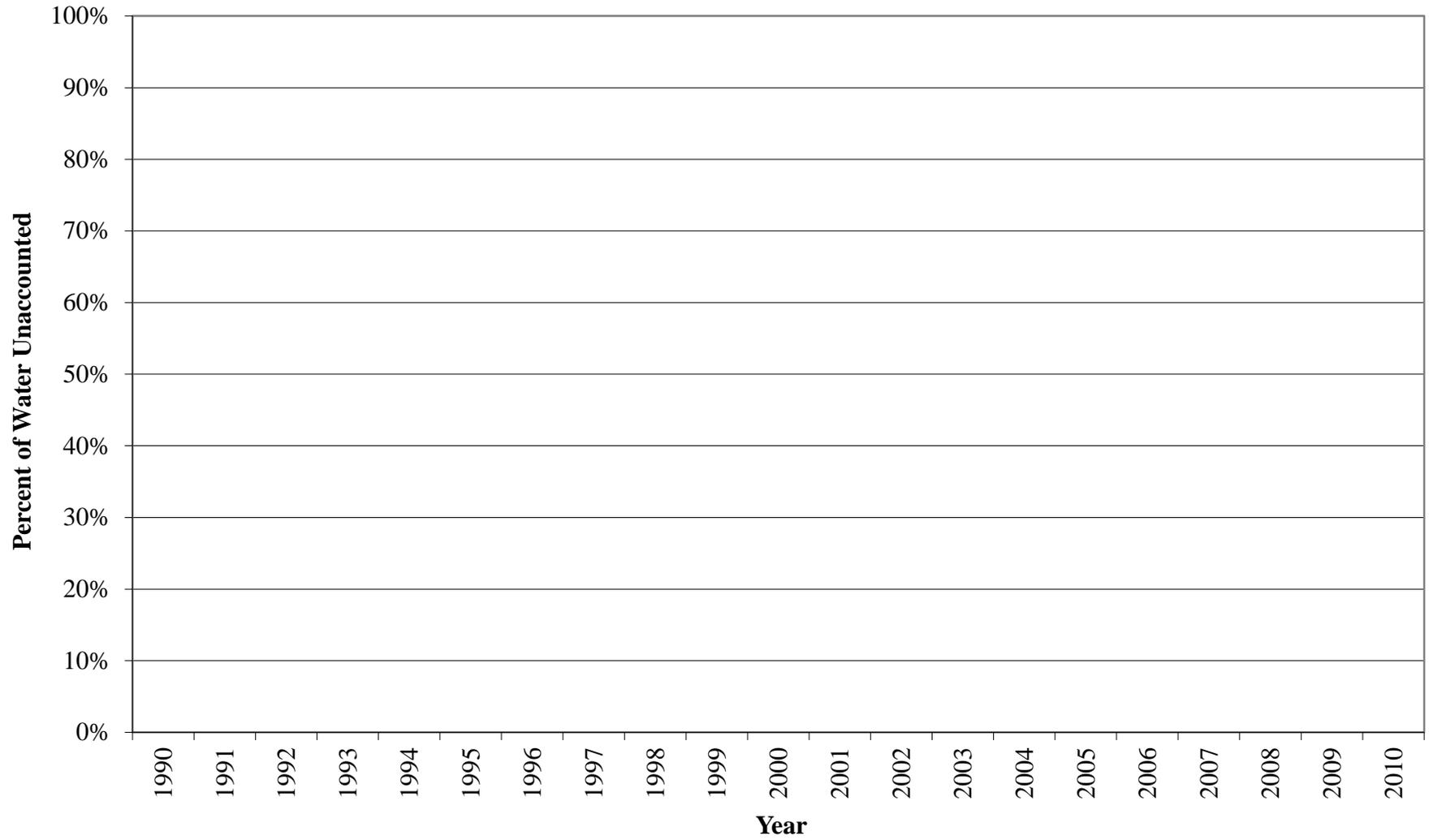
Historical Water Use



Historical Water Sales by Classification



Historical Percent Unaccounted Water



APPENDIX F
TCEQ WATER CONSERVATION
IMPLEMENTATION REPORT

APPENDIX G
LETTERS TO REGION C AND REGION D
WATER PLANNING GROUPS

APPENDIX G

LETTERS TO REGION C AND REGION D WATER PLANNING GROUPS

Date

Region C Water Planning Group
c/o North Texas Municipal Water District
P.O. Box 2408
Wylie, TX 75098

Dear Sir:

Enclosed please find a copy of the following documents:

- Model Water Conservation Plan for the Member Cities and Customers of the North Texas Municipal Water District
- Water Conservation Plan for the North Texas Municipal Water District

We are submitting a copy of these plans to the Region C Water Planning Group in accordance with the Texas Water Development Board and Texas Commission on Environmental Quality rules. The Board of the North Texas Municipal Water District adopted the attached plans on February 27, 2014.

Sincerely,

Jim Parks
North Texas Municipal Water District

Date

Mr. Brett McCoy
Chair, Region D Water Planning Group
700 CR3347
Omaha, TX 75571

Dear Mr. McCoy:

Enclosed please find a copy of the following documents:

- Model Water Conservation Plan for the Member Cities and Customers of the North Texas Municipal Water District
- Water Conservation Plan for the North Texas Municipal Water District

We are submitting a copy of these plans to the Region D Water Planning Group in accordance with the Texas Water Development Board and Texas Commission on Environmental Quality rules. The Board of the North Texas Municipal Water District adopted the attached plans on February 27, 2014.

Sincerely,

Jim Parks
Executive Director
North Texas Municipal Water District

APPENDIX H

**DATA REQUIRMENTS FOR WATER RIGHT APPLICATION FOR NEW OR
ADDITIONAL STATE WATER**

APPENDIX H

DATA REQUIREMENTS FOR WATER RIGHT APPLICATION FOR NEW OR ADDITIONAL STATE WATER

Texas Administrative Code (TAC) Title 30, Part 1, Rule 288.7(a) addresses water conservation plans that accompany an application for a water right:

§288.7. Plans Submitted With a Water Right Application for New or Additional State Water.

(a) A water conservation plan submitted with an application for a new or additional appropriation of water must include data and information which:

- (1) supports the applicant's proposed use of water with consideration of the water conservation goals of the water conservation plan;
- (2) evaluates conservation as an alternative to the proposed appropriation; and
- (3) evaluates any other feasible alternative to new water development including, but not limited to, waste prevention, recycling and reuse, water transfer and marketing, regionalization, and optimum water management practices and procedures.

H.1 Consideration of Water Conservation Goals - 288.7(a)(1)

The NTMWD provides wholesale treated water to customers within a nine-county area in North-Central Texas. The area served by the NTMWD is one of the fastest growing regions in the country. Population served by NTMWD has increased from 32,000 when the District was formed in 1951 to about 1.6 million today, and this growth is expected to continue. Using data from the *2011 Region C Water Plan*¹ (which was used to develop the *2012 State Water Plan*), NTMWD is expected to serve 3.1 million people by 2060. To meet the anticipated growth and increased water demands, the NTMWD is actively promoting water conservation measures with its Member Cities and Customers, and the NTMWD is currently implementing the largest wastewater reuse program in the State, and potentially the largest in the U.S. This section describes the NTMWD's conservation activities and water savings over the past eight years.

Highest Practicable Levels of Conservation and Efficiency

TAC Section 298.18(d)(2) addresses water right applications for interbasin transfers:

“the applicant for the interbasin transfer has prepared drought contingency and water conservation plans meeting the requirements of Chapter 288 of this title (relating to Water Conservation Plans, Drought Contingency Plans, Guidelines and Requirements) and has implemented a water conservation plan that will result in the highest practicable levels of water conservation and efficiency achievable within the jurisdiction of the applicant.”

The legislature directed the TWDB and the TCEQ to jointly develop model water conservation programs for different types of water suppliers that suggest best management practices for achieving “the highest practicable levels of water conservation and efficiency” in Texas Water Code Section 11.1271. Subsequent to this directive,

¹ 2011 Region C Water Plan, Freese and Nichols, Inc. et al., October 2010.

the TWDB and TCEQ adopted a *Water Conservation Best Management Practices Guide*². And, TCEQ has previously granted interbasin transfer permits to applicants that:

- Have adopted water conservation and drought contingency plans;
- Have included a suite of conservation strategies in the water conservation plan that is implementable and has been shown to be practicable and effective; and
- Actively monitor and implement the conservation measures identified in the conservation plan.

NTMWD has met all of the above considerations and more. The NTMWD Water Conservation Plan includes a variety of conservation measures that are actively implemented and monitored by the NTMWD. This suite of water conservation measures goes above and beyond the minimum requirements for conservation plans for a wholesale provider. In accordance with the Texas Administrative Code, Title 30, §288.5, the minimum requirements are:

- Description of the wholesaler's service area;
- Specification of quantifiable conservation goals;
- Description of the means to measure the amount of water from a source;
- Monitoring and record managing program;
- Metering, leak detection and repair program;
- Requirement that wholesale customers must develop and implement a water conservation plan that incorporates the measures in the wholesale water provider plan;
- Reservoir systems operation plan;
- Means for implementing and enforcing the plan; and
- Documentation of coordination with associated regional water planning groups.

The NTMWD Plan meets these minimum requirements, and specifies other conservation activities that the NTMWD and/or its Member Cities and Customers are undertaking to achieve the "highest practicable levels of conservation and efficiency":

- Water conservation workshops for wholesale customers;
- Model Water Conservation and Drought Contingency / Water Emergency Response Plans for Member Cities and Customers;
- Annual reports and tracking of customer water use;
- Reuse and recycling of wastewater;
- Public education and outreach programs;
- Zero discharge from water treatment plants;
- In-house conservation efforts; and
- Landscape water management measures.

Each of these measures is described in the NTMWD Water Conservation Plan.

Below is a brief discussion of some of the on-going conservation activities and the investments by the NTMWD and its Member Cities and Customers in conservation and reuse.

² *Water Conservation Best Management Practices Guide*, Report 362, Texas Water Development Board, November 2004.

Water conservation workshops and meetings. In 2003, the NTMWD began holding a series of conservation workshops with its Member Cities and Customers. These meetings were instrumental in developing the model water conservation and drought contingency/emergency response plans through education and consensus building among NTMWD's Member Cities and Customers. It also provided a forum for the NTMWD wholesale customers to share successes and difficulties encountered during implementation of some conservation measures. These meetings were the precursor to future stakeholder groups held to promote and foster water conservation efforts in North-Central Texas. In 2006, NTMWD was instrumental in the creation of the Water Efficiency Network of North Texas (WENNT), an organization formed to provide a forum to discuss conservation among the different water providers, cities and wholesale customers in the North Texas area. Attendance at the WENNT group meetings is not limited to NTMWD and its Member Cities and Customers, but attendance by NTMWD Member Cities and Customers is high. This is due, in large part, to NTMWD's active participation and initial activities regarding water conservation. WENNT meets monthly and typically provides informational speakers on conservation.

Reuse and Recycling. The NTMWD has a highly developed reuse and recycling program. This program includes indirect reuse of treated effluent from the NTMWD's Wilson Creek Regional Wastewater Treatment facility through Lake Lavon, and via the East Fork Raw Water Supply Project, as well as direct reuse of treated effluent for irrigation purposes in Rockwall and Collin Counties. With these projects, the NTMWD can currently reuse over 100,000 acre-feet per year of water. No other water provider in Texas reuses as much water as NTMWD.

This level of reuse represents about 25 percent of the NTMWD's current supplies. With population growth, the amount of wastewater that will be available for reuse will increase. The expected amount of reuse through the NTMWD's existing projects is projected to increase to over 176,000 acre-feet per year by 2040, which would represent about 40 percent of the NTMWD's currently permitted supplies³.

NTMWD continues to look for opportunities to reuse and recycle its treated wastewater. Treated wastewater is used at each of its 18 wastewater treatment plants for all necessary washdowns and site irrigation. At the NTMWD's water treatment plants, wastewater from plant operations are collected and recycled through the treatment process. NTMWD also provides treated wastewater for off-site irrigation to several customers.

Public education and outreach programs. The NTMWD's public education and outreach programs are designed to assist and supplement the public education efforts of its Member Cities and Customers. NTMWD routinely develops and presents programs to area cities, civic organizations and other groups concerning the need for conservation and strategies that can be implemented. From 1996 through 2006, NTMWD provided the "Learn to Be Water Wise" curriculum to area school districts. Since 2006, NTMWD has invested \$12.3 million in conservation outreach efforts, including development of the state's water conservation/education program, "Water IQ: Know Your Water", which includes television commercials, newspaper ads, radio spots, billboards, a website, community outreach events and other forms of communication. NTMWD uses its website to distribute information on water conservation, Texas Smartscape (a landscaping tool for using native plants), and the Water IQ program. Each of these programs and activities complement the activities of other major water providers in the area that have public media campaigns promoting water conservation across the Metroplex, saving development costs and reaching beyond the NTMWD service area. The NTMWD has received several awards for its public education campaigns on conservation, as detailed below.

Contract Rebate Program. This program provides rebates to those Member Cities and Customers that use less water than contracted. Member City and Customer rates are based on the capacity share plus variable costs for treatment and delivery. The variable costs are applied only to the water used, providing incentives to conserve

³ 2011 Region C Water Plan, Freese and Nichols, Inc. et al., October 2010.

water. The capacity cost is based on historical use and is necessary to fund the regional system infrastructure. This approach is a cost effective means to provide treated water supplies to Member Cities and Customers while encouraging conservation through the rebate program.

These conservation measures represent only some of the activities that the NTMWD has undertaken. Conservation measures that may be appropriate for wholesale water providers were considered and identified as part of the work by the Task Force on water conservation and published in a guide to water conservation best management practices (BMP).⁴

The Wholesale Water Provider BMPs were developed as a slate of potential strategies that a wholesale water provider may use to meet its conservation goals. The BMP Guide recognizes that not every element identified is applicable to every wholesale provider. “The specific measures listed as part of this BMP can be implemented individually or as a group.”⁵ The NTMWD has considered each element of the BMPs during the development of its water conservation plan and has adopted each of the applicable Best Management Practices that are implementable and relevant to its customers. A comparison of the adopted conservation measures by the NTMWD and the Task Force’s Wholesale Water Provider BMPs is shown in Table 1.

⁴ *Water Conservation Best Management Practices Guide*, Report 362, Texas Water Development Board, November 2004.

⁵ *Ibid.*

Table H-1: Water Conservation Implementation Task Force Wholesale Water Provider Best Management Practices

BMP Element of Strategy	Implement	Comment
Baseline Profile	✓	Included in Water Conservation Plan (Chapter 3 and Appendix C)
Wholesale agency goals (5- and 10-year)	✓	Included in Water Conservation Plan (Chapter 4)
Wholesale water system accounting and measurement	✓	Included in Water Conservation Plan (Chapter 5)
Description of practices/devices	✓	Included in Water Conservation Plan (Section 5.1)
Record management	✓	Included in Water Conservation Plan (Section 5.2)
Metering and leak detection	✓	Included in Water Conservation Plan (Section 5.3)
Requirement that every wholesale customer develop a conservation plan	✓	Included in Water Conservation Plan (Section 6.1)
Conservation-oriented rates	✓	While conservation oriented rates are more applicable to retail providers, and NTMWD is a wholesale provider of water to wholesale customers, NTMWD provides rebates to wholesale water customers that use less water than contracted. This rewards the conservation efforts of a retail provider.
<i>Wholesale customer assistance</i>		
Plans and program implementation	✓	NTMWD developed Model Conservation Plans for its wholesale customers
Methodologies for accounting water use and loss	✓	Model Conservation Plans
Coordination of conservation incentive activities	-	The incentive activities are selected by wholesale customers, which target retail customers. NTMWD encourages its customers to select the most appropriate incentives for their community.
Service area education and outreach programs	✓	NTMWD works closely with other wholesale water providers in the region promoting conservation. Customer conservation workshops and meetings
Cost Sharing of programs	✓	
Reuse/recycling of water	✓	NTMWD has the largest reuse program in the state.
<i>Any other practice deemed appropriate</i>		
In-House water conservation	✓	NTMWD has implemented an in-house conservation program that applies to its facilities, including drought tolerant landscapes, limited irrigation, and utilization of reuse water where feasible.
Zero discharge from Water Treatment Plants	✓	NTMWD water treatment plants operate under a “0” discharge permit. Water is recycled through the treatment process.
Means for implementing this BMP	✓	NTMWD has adopted ordinances and provided funding in support of these activities. NTMWD produces an annual report on conservation.

Conservation Water Savings Realized by NTMWD

NTMWD collects water use data annually from its Member Cities and Customers, and uses this information to track per capita water use. Figure H-1 shows the five-year running average municipal per capita use for NTMWD Member Cities and Customers from 1988 to 2012. [The values are plotted for the fifth year of the five-year running average (1992 – 2012).] This figure shows the per capita water use both with adjustments for reuse supplies and without this adjustment. Consistent with NTMWD's Plan, municipal per capita use is defined as the amount of water delivered, less industrial use and reuse, divided by the total service population. As shown on this figure, the average municipal per capita water use peaked during the early 2000s and has continued to decline over time.

Another tool NTMWD uses to assess conservation is a graph that compares the projected dry year water usage without conservation measures implemented after 2000 to actual water use (Figure H-2). This tool provides information for the expected water savings associated with the implemented conservation measures during dry years (2006, 2008, and 2011). Water use during normal and wet years is expected to be less than during a drought and would not be comparable to dry year demands. To estimate the projected dry year use, the year 2000 per capita water use (a dry year that occurred prior to significant conservation measures) is used as the basis for water use.

NTMWD's water use will continue to increase over time due to growth, but the actual water use is less than the potential water use without the implemented conservation measures. In the drier years since 2005, the actual water use is an average of 12% lower than the projected water use without conservation. In the two wetter years during this period (2007 and 2009), the actual water use is an average of 27% lower than the projected water use without the conservation measures implemented since year 2000.

Recognition for NTMWD Conservation Achievements

NTMWD has been recognized by its peers and state agencies for its achievement in conservation. The NTMWD was first recognized in 2007 by the Texas Public Relations Association and the Texas Section of the American Water Works Association (AWWA) for its public education and outreach program, "Water I.Q.: Know Your Water." More recently, the NTMWD was presented with the Texas Section AWWA Water Mark Award for the 2010 Water I.Q. campaign. This award recognizes communications excellence. By targeting the largest water users and implementing an effective communication program on water conservation, NTMWD is able to increase these users' knowledge of water efficiencies and ultimately affect their life style choices to conserve water.

In 2011 NTMWD received the Texas Environmental Excellence Awards for its Water I.Q. program and the East Fork Raw Water Supply Project, which is presented by the Texas Commission on Environmental Quality to honor the State's most outstanding waste reduction and pollution prevention projects. The Water I.Q. program was also the recipient of Large Supplier-Water Conservation and Stewardship Award given by the Texas Water Conservation Advisory Council.

More recent recognition of NTMWD's achievement in conservation and reuse was by the National Association of Environmental Professionals. In 2012, NTMWD was presented with the Environmental Stewardship Award for the East Fork Raw Water Supply Project. This project was recognized for

developing an environmental friendly approach to reclaim water through constructed wetlands for the purpose of augmenting a surface water supply. At the time, the East Fork Raw Water Supply Project represented the largest water reuse project in the United States. Again in 2013, NTMWD was recognized for its achievement in sustainable design for the East Fork Raw Water Supply Project. The North Central Texas Council of Government presented NTMWD with a CLIDE (Celebrating Leadership in Development Excellence) Award. This award is given to projects that demonstrate innovative practices to accommodate the expected growth in North Texas and promote a sustainable future.

Figure H-1

**5-Year Running Average GPCD
 Treated Water for NTMWD Member Cities and Customers**

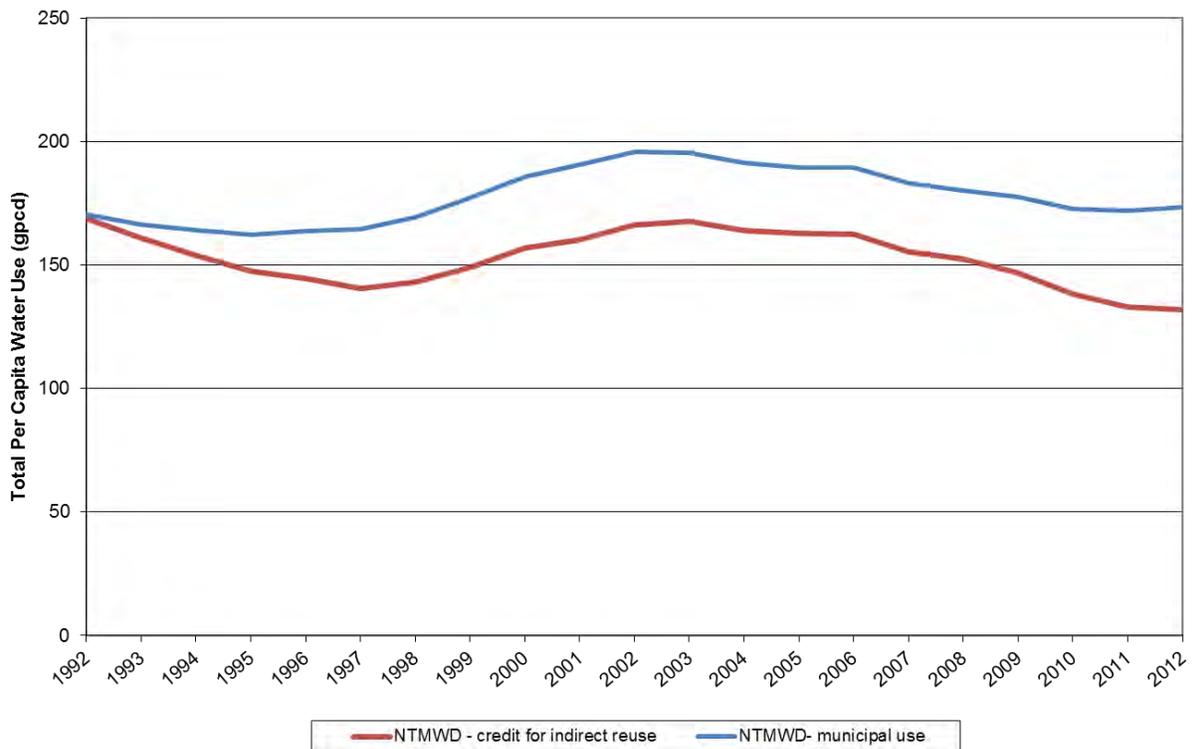
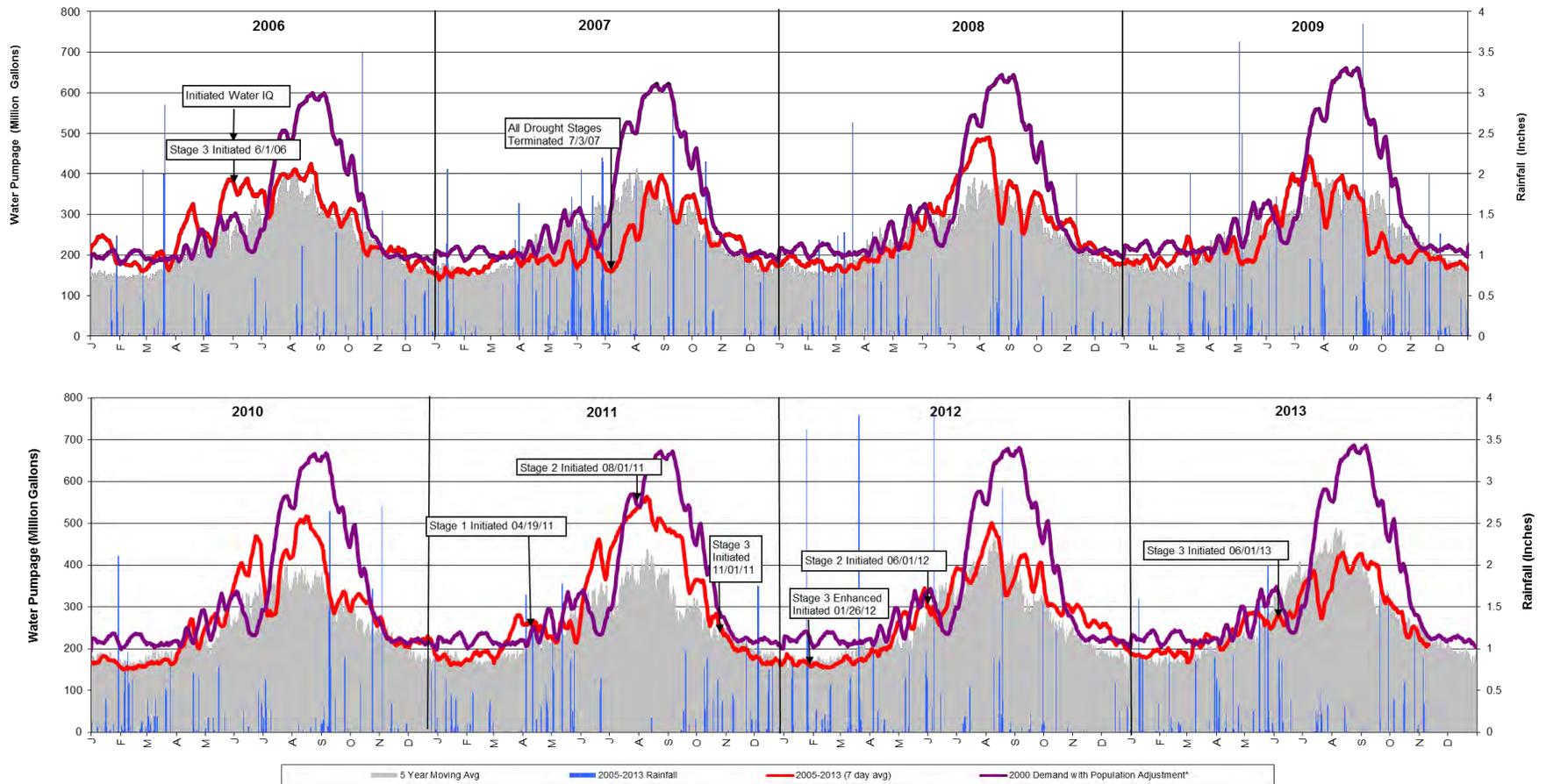


Figure H-2
 North Texas Municipal Water District
 Year 2000 with Projected Increases vs. 2006-2013 Actual Usage
 Daily Water Consumption



* 2000 Demand Plus 37.33% Increase to 2008. Plus 41.45% Increase to 2009. Plus 42.39% Increase to 2010. Plus 43.55% Increase to 2011. Plus 45.07% Increase to 2012. Plus 46.52% Increase to 2013.

H.2 Conservation as an Alternative to the Proposed Appropriation – 288.7 (a)(2)

The water demands for NTMWD totaled 336,000 acre-feet in 2011. According to the *2011 Region C Water Plan* and *2012 State Water Plan*, these demands are projected to double by the year 2060. Based on current water supplies, the District will need to develop an additional 370,000 acre-feet of supply. NTMWD expects to meet a portion of this demand via conservation and reuse. The *2012 State Water Plan* indicates that conservation will provide 27,100 acre-feet of NTMWD's total water supplies by 2020 and approximately 80,000 acre-feet by 2060. Combined, conservation and reuse are estimated to provide 109,000 acre-feet of water supplies in 2010 and 257,000 acre-feet of water supplies by 2060. Combined conservation and reuse efforts are estimated to meet approximately 31% of NTMWD's projected total water demand in 2060.

As is demonstrated by these projections, expanded conservation and reuse are integral strategies in NTMWD's ability to meet projected water demands by 2060. However, in light of NTMWD's projected total demand for 789,466 acre-feet of water by 2060, intensified conservation and reuse alone cannot provide enough water to address such demands. Thus, conservation and reuse strategies are part of the portfolio or suite of strategies that will be pursued by NTMWD in order to meet the rapidly rising demand for municipal water supplies in the NTMWD service area.

H.3 Feasible Alternatives to New Water Development – 288.7(a)(3)

As part of the 2012 state water planning process, many potential water management strategies were identified and evaluated. The *2012 State Water Plan* considered 19 different water management strategies to meet the projected water supply shortages for NTMWD through 2060. Of these considered strategies, eight strategies were recommended for implementation by the NTMWD.

Water supply strategies that are currently being implemented or that are no longer recommended due to changed conditions include:

- Water Conservation (implemented)
- Interim Purchase from GTUA (no longer considered due to changes in NTMWD's operations)
- Main Stem Trinity River Pump Station with Interim Treated Water Purchase from Dallas Water Utilities (partially implemented)

The other five strategies recommended in the *2012 Texas State Water Plan* for implementation include:

- Lower Bois d'Arc Creek Reservoir
- Additional Lake Texoma water with blending with new fresh water supply
- Marvin Nichols Reservoir
- Toledo Bend Reservoir
- Oklahoma water supply

Potential alternatives to a new water surface water appropriation that are not currently being implemented by NTMWD include developing other new reservoirs, transporting water from existing reservoirs, development of new groundwater supplies and desalination of brackish water. At a minimum, the other alternatives will require the construction of infrastructure to store and transport water supplies to the NTMWD service area.

Currently, NTMWD has a water right application before the TCEQ for the proposed Lower Bois d'Arc Creek Reservoir project. This discussion focuses on alternative strategies to a new surface water appropriation for Lower Bois d'Arc Creek Reservoir. Only alternative projects that have not been implemented are discussed here. Descriptions of potential project alternatives are presented below. A synopsis of the applicability of these potential strategies as practicable alternatives to the Lower Bois d'Arc Creek Reservoir is presented in Table H-2.

Each of potential project alternatives with the exception of the Upper Bois d'Arc Creek Reservoir was vetted through the State water planning process and the discussions herein are consistent with the *2011 Region C Water Plan* and the *2012 State Water Plan*. Strategies that are recommended for implementation by NTMWD are part of suite of strategies to meet NTMWD's water needs. As such, these strategies are not alternatives to Lower Bois d'Arc Creek Reservoir but rather complement this project. For completeness, all potential alternatives are discussed in this Appendix, including strategies that are recommended for implementation after Lower Bois d'Arc Creek Reservoir.

NTMWD's evaluation of the potential alternatives considered many factors, including cost of the water, quantity, reliability, the potential impacts of developing the project on the environment, natural resources and other water users, timing to develop the strategy, and potential implementation issues. A comparison of the unit costs for the alternative strategies is shown on Table H-3 and on Figure H-3.

The construction of Lower Bois d'Arc Creek Reservoir is the recommended approach for NTMWD to provide additional near-term water supplies. The NTMWD is projected to have water shortages of approximately 90,000 acre-feet per year by 2020. Some of this shortage could be met through conservation and possibly additional wastewater reuse made available through the Main Stem Trinity River Pump Station. At this time, however, the Main Stem Pump Station project has been delayed and the source of the return flows to be diverted therefrom have not yet been identified or secured through contract, which only further necessitates the need to develop additional water supplies. Lower Bois d'Arc Creek Reservoir would provide the remainder of the supply needed to meet the deficit in 2020. By 2030 the Reservoir would be fully utilized to help meet NTMWD's growing water needs. This source is the preferred alternative because it is located relatively close to the area with need, can provide sufficient water, and has a relatively low unit cost of water. The Lower Bois d'Arc Creek Reservoir could also serve as a fresh water supply to potentially blend with water diverted from Lake Texoma, thereby further extending currently available resources while conserving energy and costs.

Strategies that are not practicable alternatives to the proposed project typically have higher unit costs, greater uncertainty of reliable yield than Lower Bois d'Arc Creek Reservoir, cannot be constructed within the time frame of when the water is needed, provide a smaller amount of supply or may be committed to other users.

Table H-2: List of Potential Water Supply Alternatives for NTMWD

Strategy ¹	Practicable Alternative (Yes/No)	Comment
New Lake Texoma (Blend)	No	Requires additional new source of fresh water to blend to meet drinking water quality standards.
Marvin Nichols Reservoir	No	Greater environmental impacts than Lower Bois d’Arc Creek Reservoir. Requires other participates to make project cost effective. Cannot be implemented within the necessary time frame.
Toledo Bend Reservoir	No	High costs and energy use. Much greater carbon footprint impacts.
Oklahoma Water	No	Current political and legal impediments.
New Lake Texoma (Desalinate)	No	High costs and energy use. Reduced quantity.
Lake O' the Pines	No	Water rights holders have not committed to selling water. Competing local interests.
Wright Patman - Texarkana	No	Water Right holder has not committed to selling water.
Wright Patman - Raise Pool	No	Impacts to White Oak Creek mitigation area. Conflicts with Dallas long-range water supply plan.
Wright Patman - System	No	Water rights holders not committed to sell water. Environmental impacts to mitigation area and conflicts with Dallas’ long-range plan. High costs and energy use.
Carrizo-Wilcox Groundwater	No	High cost and competing local interests for water.
George Parkhouse North	No	Similar size and impacts to Lower Bois d’Arc Creek Reservoir. Yield is impacted by potential upstream reservoirs. Cannot be implemented within the necessary time frame.
George Parkhouse South	No	Impacts to waters of U.S. Yield is impacted by upstream reservoir. Cannot be implemented within the necessary time frame.
Lake Livingston	No	Competing interests for water. High costs
Gulf of Mexico	No	Very high costs and high energy usage
Upper Bois d’Arc Creek Reservoir	No	Does not provide the amount of supply needed.

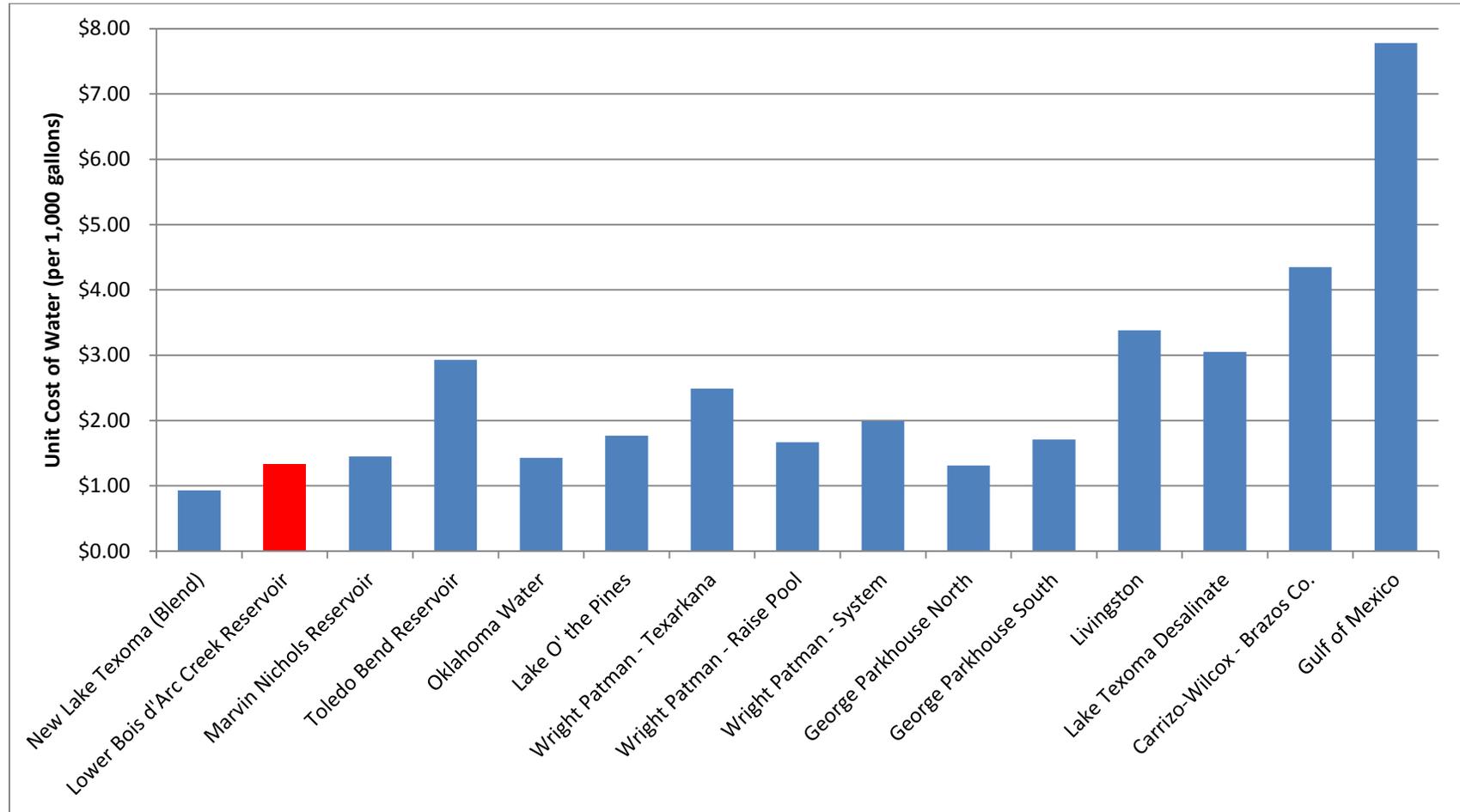
1. Each of these strategies, with the exception of the Upper Bois d’Arc Creek Reservoir, was vetted through the State water planning process. Strategies that are recommended for implementation by NTMWD are part of suite of strategies to meet NTMWD’s water needs. Some strategies that are identified as not practicable at this time may be a viable water supply project in the future.

Table H-3: Costs for Potential Supply Alternatives

Strategy	Texas State Water Plan Costs ¹		
	NTMWD Share of Capital Cost	Unit Cost for NTMWD (\$/kGal.)	
		Pre-Amort.	Post-Amort.
Implemented at same time as Lower Bois d'Arc Creek Reservoir			
New Lake Texoma (Blend)	\$336,356,000	\$0.93	\$0.27
Lower Bois d'Arc Creek Reservoir	\$615,498,000	\$1.33	\$0.21
Potential Alternatives			
Marvin Nichols Reservoir	\$830,894,000	\$1.45	\$0.39
Toledo Bend Reservoir	\$929,822,000	\$2.93	\$0.86
Oklahoma Water	\$210,354,000	\$1.43	\$0.49
Lake O' the Pines	\$402,431,000	\$1.77	\$0.75
Wright Patman - Texarkana	\$684,966,000	\$2.49	\$0.97
Wright Patman - Raise Pool	\$905,929,000	\$1.67	\$0.55
Wright Patman - System	\$781,741,000	\$1.99	\$0.65
George Parkhouse North	\$516,585,000	\$1.31	\$0.35
George Parkhouse South	\$645,810,000	\$1.71	\$0.39
Livingston	\$2,115,111,000	\$3.38	\$1.03
Lake Texoma Desalinate	\$796,532,000	\$3.05	\$1.36
Carrizo-Wilcox - Brazos Co.	\$913,344,000	\$4.35	\$1.80
Gulf of Mexico	\$4,367,727,000	\$7.78	\$2.91

1. Only projects considered in the 2012 State Water Plan are included in Table H-3 and Figure H-3. Costs for the 2012 State Water Plan are reported in September 2008 dollars.

Figure H-3 Cost Comparison of Potential Alternatives to Lower Bois d'Arc Creek Reservoir



Supply from New (undeveloped) Reservoirs

Marvin Nichols Reservoir Alternative

The Marvin Nichols Reservoir is a proposed reservoir in the Sulphur River Basin, and is a recommended strategy in the 2012 Texas State Water Plan for NTMWD, the Tarrant Regional Water District (TRWD), and the Upper Trinity Regional Water District (UTRWD). The total yield of Marvin Nichols Reservoir is 612,300 acre-feet per year, assuming that Lake Ralph Hall is constructed and that Marvin Nichols Reservoir is operated as a system with Wright Patman Lake.

The proposed reservoir, if constructed, would be the largest lake contained completely within the State of Texas. At the recommended conservation pool elevation of 328 feet msl, the reservoir would inundate approximately 67,400 acres. The U.S. Fish and Wildlife Service has classified some of this acreage as Priority 1 bottomland hardwoods, which is the highest quality classified by USFWS (USFWS, 1984). Previous studies indicate that approximately 39 percent of the reservoir site is classified as bottomland hardwood forest, 20 percent upland deciduous forest and 19 percent grasslands (HDR, Inc. *et al*, 2007). Additional studies are needed to confirm the quality and extent of these resources.

The Marvin Nichols Reservoir site is located approximately 29 miles upstream of an ecologically significant stream segment as identified by the Texas Parks and Wildlife Department, but is not directly located on a classified stream segment. The site will impact three known cemeteries, approximately 22 miles of oil and gas pipelines and 4 miles of state and federal highways (HDR, Inc. *et al*, 2007).

The Marvin Nichols Reservoir would provide considerable amounts of new water supply to the North Texas area at a relatively low cost. However, the development of this strategy will have greater environmental impacts than the proposed Lower Bois d'Arc Creek Reservoir. The inundation area of Marvin Nichols Reservoir is more than four times the inundation area of the Lower Bois d'Arc Creek Reservoir. Preliminary estimates of impacted wetlands and bottomland hardwoods for this alternative are considerably greater than the acreage determined for the proposed project. Development of the Marvin Nichols Reservoir also requires multiple participants to effectively achieve the cost benefits and full utilization of the available supply. As a result, the timing for this strategy is dependent upon the needs of other participants. In the 2012 Texas State Water Plan, this strategy is planned in phases, with Phase I being completed in 2030 and Phase II by 2050. Due to the permitting requirements and current opposition to this project, it is unlikely that this reservoir site could be permitted and developed by 2020 as an alternative to the Lower Bois d'Arc Creek Reservoir, and thus, not available within the required timeline. With these considerations, the Marvin Nichols Reservoir could not meet the NTMWD's projected water shortages over the next 10 to 20 years.

The Marvin Nichols Reservoir is not a practicable alternative to the Lower Bois d'Arc Creek Reservoir project because it has greater environmental impacts and cannot be implemented within the time frame required to satisfy the purpose and need of this project.

George Parkhouse South Lake Alternative.

George Parkhouse Lake (South) is a potential reservoir located on the South Sulphur River in Hopkins and Delta Counties. It is located immediately downstream from Jim Chapman Lake and would yield 122,000 acre-feet per year. At conservation elevation 401 feet msl, George Parkhouse Lake (South) would inundate approximately 29,000 acres and store 652,000 acre-feet. The yield of George Parkhouse

Lake (South) would be reduced substantially by the development of Marvin Nichols Reservoir. The yield studies conducted as part of the Reservoir Site Protection Studies indicate the yield of this lake would be reduced by 60 percent to 48,400 acre-feet per year if constructed after Marvin Nichols (HDR *et al*, 2007).

The lake, as currently configured, would abut the dam for Jim Chapman Lake and over fifty percent of the land impacted would be bottomland hardwood forest or marsh (HDR *et al*, 2007). Costs for this project are estimated at \$1.71 per thousand gallons of reservoir yield, which is about 28 percent higher than the estimated costs for the Lower Bois d'Arc Creek Reservoir (\$1.33) However, should the yield of George Parkhouse (South) be reduced due to other developments, the costs to NTMWD would increase.

The proposed George Parkhouse Lake (South) is not a practicable alternative due to the uncertainty of the reliable supply with the development of other reservoirs in the river basin and the environmental impacts. Also, the project likely could not be implemented within the time frame needed for additional water for NTMWD. Since the Marvin Nichols Reservoir is part of long-range water supply plan for NTMWD and other North Texas water suppliers,, it is highly unlikely that George Parkhouse (South) Lake or George Parkhouse (North) Lake will also be developed.

George Parkhouse North Lake Alternative

George Parkhouse Lake (North) is a potential reservoir located on the North Sulphur River in Lamar and Delta Counties, about 15 miles east of the City of Paris. At a proposed conservation elevation of 410.0 feet msl, the reservoir would store 330,871 acre-feet of water and inundate 14,387 acres. The firm yield would be 144,300 acre-feet per year, but its yield would be reduced substantially by the development of Lake Ralph Hall and/or Marvin Nichols Reservoir. A sensitivity study of the reservoir yield found that the yield of George Parkhouse North could range from 32,100 acre-feet per year (assuming both Lake Ralph Hall and Marvin Nichols Reservoir are constructed prior to George Parkhouse North) to 117,400 acre-feet per year, assuming only Lake Ralph Hall is constructed prior to George Parkhouse North (HDR *et al*, 2007).

The reservoir site is located upstream of a designated Priority 1 bottomland hardwood preservation site known as Sulphur River Bottoms West. Most of the land impacted by this alternative is grassland or agricultural lands. Only about 200 acres are classified as bottomland hardwood forest (HDR *et al*, 2007). However, the amount of affected wetlands would require field surveys and verification.

Similar to the George Parkhouse South Lake alternative, the economic viability of the project is dependent upon the ultimate yield of the project. The proposed reservoir is not a practicable alternative to Lower Bois d'Arc Creek Reservoir due to the uncertainty of the reliable supply with the development of other reservoirs in the river basin. Also, the project likely could not be implemented within the time frame needed for additional water for NTMWD.

Upper Bois d'Arc Creek Reservoir

Other potential dam site locations on Bois d'Arc Creek have been considered in previous studies. Most of these sites were studied as potential flood measures to reduce flooding along Bois d'Arc Creek and in the City of Bonham. An Upper Bois d'Arc Creek reservoir site was studied by the USACE in 1968, and subsequently reviewed again by the USACE in 2000 (USACE, 1968 and USACE, 2000). The proposed Upper Bois d'Arc Creek Reservoir would be located about 3.5 miles south of the City of Bonham. It would have a controlled drainage area of 108 square miles, which is about one third of the drainage

area of the proposed project. The proposed reservoir would have a total storage of 137,500 acre-feet, with 82,040 acre-feet dedicated to water supply. Based on the USACE analyses, the Upper Bois d'Arc Creek reservoir would provide flood protection for the 50-year storm event and 24 mgd of water supply. Due to the smaller drainage area and smaller storage in the reservoir, this alternative cannot provide the amount of water supply needed for NTMWD. Also, the project likely could not be implemented within the time frame needed for additional water for NTMWD. A reservoir site upstream of the City of Bonham is not a practicable alternative to the proposed project.

Other New Reservoirs

Several other proposed reservoirs were recommended or considered in the *2012 Texas State Water Plan*, but were not considered for NTMWD because of commitments to other users. The proposed reservoirs include Lake Columbia, Lake Tehuacana, and Lake Ralph Hall. Most of the water from Lake Columbia is committed to users in the Neches River Basin; Lake Tehuacana is located adjacent to Richland-Chambers Reservoir, and would be operated by the Tarrant Regional Water District for its use; and Lake Ralph Hall would be developed and used by the Upper Trinity Regional Water District (UTRWD). A water right for Lake Ralph Hall was recently granted to UTRWD.

Transporting Water From Existing Reservoirs

Transporting water from existing reservoirs to NTMWD's service area requires agreements with the owner of the existing water supplies and often long transmission pipelines. Existing reservoirs that may have uncommitted supplies are commonly located in the eastern part of the State where there is more available surface water. However, most of these sources would require transporting the water over long distances with substantial vertical lift. NTMWD considered the following alternatives:

Lake Texoma Alternatives

Lake Texoma is an existing USACE reservoir on the Red River on the border between Texas and Oklahoma. NTMWD has water rights to divert up to 197,000 acre-feet per year of water from Lake Texoma. Water from Lake Texoma is relatively high in dissolved salts and does not meet secondary drinking water standards. Until 2009, NTMWD diverted up to 84,000 acre-feet of Texoma water and blended the water in Lake Lavon for subsequent use. With the detection of zebra mussels in Lake Texoma, this practice has ceased. Currently, NTMWD is building new infrastructure from Lake Texoma to the Wylie Water Treatment Plant to blend the water with its other sources to make it suitable for municipal use. However, the amount of water that can be blended and still meet secondary drinking water standards is limited.

The options to fully utilize this source include:

- The development of new fresh water supplies to blend at a treatment facility; or
- The construction of a new desalination water treatment facility.

These implementation methods are very different and are considered two different alternatives to Lower Bois d'Arc Creek Reservoir. Each alternative is discussed below.

Transport and Blend Lake Texoma Water with New Fresh Water Supplies

The elevated dissolved salts in Lake Texoma would have some environmental impacts whether the water is used by blending or desalination. Due to environmental concerns and additional costs

associated with large desalination projects, the NTMWD's preferred use of this water source is to blend the Texoma water with a new fresh water supply. It is anticipated that Texoma water would be blended in a constructed balancing reservoir near a treatment facility and not in an existing lake or stream. This would reduce potential impacts of added dissolved solids to local lakes or streams.

At this time, there are no readily available fresh water supplies in the amount needed to blend with the new water supply from Lake Texoma, and existing supplies are not sufficient to provide a blended water of acceptable quality for municipal use. Therefore, the blended alternative cannot be implemented without also implementing another water supply alternative to provide fresh water to NTMWD for blending. NTMWD does plan to make use of water supplies from this source, but only after development of other significant fresh water sources (such as Lower Bois d'Arc Creek Reservoir). Blending cannot be considered an alternative to Lower Bois d'Arc Reservoir in the next 20 years without implementation of another water supply source; thus blending of Lake Texoma water with existing fresh water supplies is not a practicable alternative.

Transport and Desalinate Lake Texoma Water

One option to use Lake Texoma water for municipal purposes is to desalinate the water using reverse osmosis water treatment or another similar treatment method. Desalination can result in the loss of up to one third of the raw supply to the treatment process. With the proposed quantity of 100 million gallons per day (mgd), this option may require disposal of up to 30 mgd of highly salty water. If the desalinated water is partially blended with conventionally treated raw water, the brine discharge would be less. Disposal options include deep injection wells, discharge to a stream, or evaporation ponds.

Desalination is also a more expensive strategy than blending, and there are considerable uncertainties in the operation and long-term costs of a large-scale desalination facility. The estimated costs for desalination of water from Lake Texoma are based on current cost information for large desalination facilities. However, they are more uncertain than other cost estimates developed for the potential alternatives, for the following reasons:

- Most of the large desalination facilities built to date are located on or near the coast. If a 100-mgd or larger plant were to be developed for Lake Texoma water, it would be the largest inland desalination facility in the world. To date large scale inland desalination facilities (greater than 50 mgd) have not been permitted or constructed in Texas or the United States. The Fort Bliss/ El Paso Water Utilities desalination facility, which is the largest inland desalination plant in the United States, produces 27.5 mgd.
- The method, cost and regulatory requirements of brine disposal for such a facility are uncertain. Depending upon the disposal method, brine disposal has the potential to significantly increase the estimated cost for desalination. Deep well injection will likely require multiple sites to accommodate the quantity of discharge required.

The desalination alternative will only provide the equivalent of about 60 percent of reliable treated water supply from the Lower Bois d'Arc Creek Reservoir. There are also environmental, cost and permitting issues associated with the brine disposal for a large-scale inland desalination facility. Estimated costs for desalination of Lake Texoma water is about 1.5 times that of treated water from Lower Bois d'Arc Creek Reservoir. Desalination is also a much more energy intensive process than conventional water treatment. As energy costs continue to increase, these differences are expected to

increase. Large scale desalination of Lake Texoma water (>100 mgd) is not a practicable alternative to the proposed project due to the cost uncertainty, smaller water supply and the greater energy usage associated with large-scale brine operations.

While large scale desalination of Texoma water is currently not a practicable alternative to Lower Bois d'Arc Creek Reservoir, there are some potential options to use a portion of the Texoma water through desalination and blending, but without the development of new fresh water supplies the quantity would be limited. As such, a smaller scale project is not an alternative to the Lower Bois d'Arc Creek Reservoir, but rather a complement to NTMWD's water supply and the proposed Lower Bois d'Arc Creek Reservoir.

Toledo Bend Reservoir Alternative

Toledo Bend Reservoir is an 181,600 acre lake located in East Texas on the Texas-Louisiana state line. The total permitted supply from this source for Texas is 750,000 acre-feet per year. The Sabine River Authority of Texas operates the Texas portion of this lake. In the *2012 Texas State Water Plan* the transport of water from Toledo Bend Reservoir to the North Texas area is a recommended joint strategy for the NTMWD, TRWD, and the Sabine River Authority (SRA). This project, as presented in the *2012 Texas State Water Plan*, could deliver a total of 500,000 acre-feet per year, with 200,000 acre-feet per year for NTMWD.

This alternative will require multiple transmission pipelines to transport the water approximately 200 miles to North Texas. The current concept for this project includes the use and storage of existing reservoirs as part of the transmission system. This transfer of water is anticipated to have a low to medium low impact on the receiving reservoirs.

This strategy requires greater capital costs and energy usage associated with the long transmission pipelines. NTMWD's share of the estimated pumping costs for this alternative is nearly \$38 million per year to transport 200,000 acre-feet per year to its service area. For a comparable quantity of supply to the Lower Bois d'Arc Creek Reservoir project (126,000 acre-feet per year), the estimated pumping costs for water from Toledo Bend Reservoir would be approximately \$24 million as compared to \$4.6 million for water from Lower Bois d'Arc Creek Reservoir. As energy costs continue to increase, the operating costs for water from Toledo Bend Reservoir will increase by a larger amount than estimated for the Lower Bois d'Arc Creek Reservoir. The higher energy usage also places additional burdens on existing and future electrical generating facilities, which creates additional environmental impacts to those directly associated with this project. A carbon footprint analysis indicated that over the 100-year life of a water project, the Toledo Bend pipeline project would have about 5 times the total carbon impacts than the Lower Bois d'Arc Creek Reservoir project. Most of these impacts are associated with the operations.

The Toledo Bend project is not a practicable alternative to the Lower Bois d'Arc Creek Reservoir project because it has significantly higher capital costs, greater energy usage, and greater long-term operating costs than the costs for the Lower Bois d'Arc Creek Reservoir project.

Water from Oklahoma Alternative

Another potential alternative is the use of water from Oklahoma. At the present time, the Oklahoma Legislature has established a moratorium on the export of water from the state. Assuming the moratorium is lifted in the future, the *2012 Texas State Water Plan* recommends that the NTMWD, the TRWD, and the UTRWD jointly develop a project to use water from Oklahoma. The recommended

project is planned for 2060 and includes 50,000 acre-feet per year each for TRWD and NTMWD and 15,000 acre-feet per year for UTRWD.

The NTMWD has applied for water from the Kiamichi River, Muddy Boggy Creek, and stored water in Lake Hugo. At this time, the state cannot act upon these permits without further direction from the Oklahoma Legislature.

Due to the uncertainty of the Oklahoma moratorium on export of water to Texas and the status of the Oklahoma water rights permit, this strategy would likely not be able to be implemented in a timely manner to meet NTMWD's near-term water needs. Thus, it is not a practicable alternative to Lower Bois d'Arc Creek Reservoir.

Lake O' the Pines Alternative

Lake O' the Pines is an existing USACE reservoir in the Cypress River Basin with Texas water rights held by the Northeast Texas Municipal Water District (NETMWD). The NTMWD has explored the possibility of purchasing supplies in excess of local needs from the Cypress Basin. According to the *2012 Texas State Water Plan*, there could be as much as 89,600 acre-feet per year available for export from the basin. There are competing interests for this supply, however, including increased demands for steam electric power in the vicinity of this lake (northeast Texas). The *2012 Texas State Water Plan* shows this source nearly fully allocated to existing users.

Development of this source would require contracts with the NETMWD and other Cypress River Basin suppliers with excess supplies. At this time, NETMWD and other suppliers have not committed to selling this amount of water. Estimated costs indicate water from the Lake of the Pines would be about 33 percent more expensive than water from Lower Bois d'Arc Creek Reservoir during the amortization period and more than three times higher after debt service. The higher costs are associated with the transmission costs and water purchase price. Lake O' the Pines is about 120 miles from the Metroplex, and the distance, the resulting transmission cost, as well as limited supply and uncertainty of reaching agreements with existing water rights holders make this supply uncertain. Due to the distance of this water source from the NTMWD service area it is also expected that the carbon footprint impacts of this strategy would be considerably higher than the Lower Bois d'Arc Creek Reservoir. Therefore, Lake O' the Pines is not a practicable alternative to Lower Bois d'Arc Creek Reservoir.

Lake Wright Patman Alternatives

Lake Wright Patman is an existing reservoir in the Sulphur River Basin, about 150 miles from the NTMWD service area. It is owned and operated by the USACE. The City of Texarkana has contracted with the USACE for storage in the lake and a supply of 13 MGD (14,568 acre-feet per year). Texarkana holds a Texas water right to use up to 180,000 acre-feet per year from the lake. However, to obtain a reliable supply of 180,000 acre-feet per year from Lake Wright Patman, Texarkana would need to activate a contract with the USACE to increase the conservation storage in the lake. Implementation of this contract may require an environmental evaluation of the change in operation of the reservoir as required by the National Environmental Policy Act. The USACE contract specifies that the maximum supply from this operational change is 84 MGD, or about 94,132 acre-feet per year, resulting in a total supply of 108,800 acre-feet per year. Accessing the full 180,000 acre-feet per year in the Texas water right would require additional modifications to the USACE contract.

There are three different strategies by which water could be made available to the NTMWD from Wright Patman Lake:

- Water could be purchased from the City of Texarkana under its existing water right.
- Flood storage in Wright Patman Lake could be converted to conservation storage, and the NTMWD could use the increased yield.
- Wright Patman Lake could be operated as a system with Jim Chapman Lake (formerly Cooper Lake) upstream to further increase yield.

The cost for each of these options is greater than the estimated costs for the Lower Bois d'Arc Creek Reservoir project. There are also other implementation issues that affect the viability of the strategies. Each strategy is discussed in more detail below.

Purchase from Texarkana. Of the 180,000 acre-feet per year for which Texarkana currently has a water right, Texarkana could sell 100,000 acre-feet per year and still have sufficient supplies to meet its projected needs. Development of this supply would require activating the contract between Texarkana and the USACE for additional conservation storage (which would require some environmental studies and mitigation) and improvements to Texarkana's pump station on the lake. This strategy would require Texarkana to be willing to sell water to NTMWD. To date, Texarkana has not committed to selling water. Without such commitments and approval from the USACE to change the current operations, this strategy is not a practicable alternative to the Lower Bois d'Arc Creek Reservoir.

Raise Flood Pool. According to a recent study conducted for the USACE, increasing the top of conservation storage in Wright Patman Lake to elevation 228.64 feet msl and allowing diversions as low as elevation 215.25 feet msl would increase the yield of the project to about 364,000 acre-feet per year (Freese and Nichols, 2003). It was assumed that 180,000 acre-feet per year of the additional supply developed could be made available to water suppliers in North Texas. The remainder of the supply would be reserved for local use. The studies found that increasing the elevation above 228.64 feet msl would inundate portions of the White Oak Creek Mitigation Area, located upstream from Wright Patman Lake. (Approximately 500 acres of the mitigation area are below elevation 230 feet msl, and about 3,800 acres are below elevation 240 feet msl.) This strategy would require changes to the USACE operation of Wright Patman. Also, this strategy is recommended for Dallas in the City's long-range water supply plan and the 2012 *Texas State Water Plan*. Due to the available quantity of water from this source, it is unlikely that both NTMWD and Dallas would pursue this strategy.

Purchase from Texarkana, Raise Flood Pool, and System Operation. The recent study conducted for the USACE indicated that system operation of Lake Wright Patman and Jim Chapman Lake could increase the yield from the two projects by about 108,000 acre-feet per year. It was assumed that the combination of purchasing water from Texarkana, converting flood storage to conservation storage, and system operation with Jim Chapman Lake could make 390,000 acre-feet per year available from Lake Wright Patman. The 2012 State Water Plan assumed that this strategy would be developed jointly with multiple water providers in North Texas. The amount of supply for the NTMWD would be 130,000 acre-feet per year. Other suppliers have not committed to participating with this strategy. In addition to the uncertainty of multiple participating entities, this strategy would have the same implementation and environmental concerns noted for the other Wright Patman alternatives: contractual changes between the USACE and Texarkana, willing sellers, impacts to the White Oak Mitigation Area, changes to USACE

operations of the lake, and conflicts with other potential users.

Comparisons of costs for the Wright Patman alternatives show higher costs than for the Lower Bois d'Arc Creek Reservoir project. The operational costs for the Wright Patman alternatives range from \$0.55 to \$0.95 per 1,000 gallons, which represents 2.6 to 4.6 times the operational cost of the Lower Bois d'Arc Creek Reservoir (\$0.21/1,000 gallons). Over time, it is expected that the cost differential will increase due to higher transmission costs. Due to the distance of this water source from the NTMWD service area it is also expected that the carbon footprint impacts of the Wright Patman strategies would be considerably higher than those for the Lower Bois d'Arc Creek Reservoir.

Due to the uncertainty of reaching contractual agreements with existing water rights holders within the time frame needed for additional supplies, environmental impacts to the White Oak Mitigation Area and surrounding area, conflicts with other water suppliers, and the higher energy and operational costs, water supply from Wright Patman Lake is not considered a practicable alternative to the Lower Bois d'Arc Creek Reservoir at this time.

Lake Livingston Alternative

Lake Livingston is an existing reservoir on the Trinity River. The larger portion of the lake is located in Polk and San Jacinto Counties. The Trinity River Authority (TRA) and the City of Houston hold the water rights for Lake Livingston. The TRA has indicated that as much as 200,000 acre-feet per year might be available to water suppliers in North Texas from the lake. However, according to the 2012 *Texas State Water Plan*, much of this available supply is expected to be used to meet projected needs in the greater Houston area and would not be available for NTMWD. Lake Livingston is about 180 miles from the Metroplex. Due to the distance to NTMWD, this is a relatively expensive strategy. Capital costs for this project are estimated at over \$2 billion, and operating costs are \$1.03 per 1,000 gallons. The operating costs of the Lake Livingston project are nearly 5 times the costs for the Lower Bois d'Arc Creek Reservoir.

This alternative is similar to the Toledo Bend alternative in distance from NTMWD, and as such, it is expected that the carbon footprint impacts would also be similar and considerably higher than the Lower Bois d'Arc Creek Reservoir. These considerations, including the higher costs of this strategy and the competition with other users for supply make this strategy less desirable than the proposed project. The Lake Livingston project is not a practicable alternative to the Lower Bois d'Arc Creek Reservoir.

Other Existing Lakes

Other existing lakes in the vicinity of NTMWD service area include Lake Ray Hubbard, Ray Roberts Lake, Lewisville Lake, Lake Grapevine, Lake Fork, Cedar Creek Reservoir, Richland-Chambers Reservoir, Lake Palestine and Sam Rayburn Reservoir. Each of these sources is fully committed to existing customers. Lakes Ray Hubbard, Ray Roberts, Lewisville, Grapevine, Fork and Palestine are water supply sources for the City of Dallas, and these sources are needed to meet the demands of the City, its customers and other holders of water rights in the lakes. Cedar Creek and Richland-Chambers reservoirs are owned and operated by the TRWD. These water sources are fully committed to meet the water demands of the TRWD. Sam Rayburn is owned by the Lower Neches Valley Authority and it is currently being used by existing customers. Large quantities of water, as needed by NTMWD, are not available from these sources and therefore, purchase of water from these lakes is not a practicable alternative to Lower Bois d'Arc Creek Reservoir.

New Groundwater Supplies

There are limited new groundwater sources that could supply the quantity of water needed by NTMWD. The Ogallala Aquifer in the Texas Panhandle has large quantities of water, but much of this supply is committed to users in the area, including agricultural users and local municipalities. Another potential source is the Carrizo-Wilcox Aquifer. This aquifer is also heavily used by local entities.

Carrizo-Wilcox Aquifer Groundwater Alternative.

The Carrizo-Wilcox aquifer covers a large area of east, central, and south Texas. Organizations and individuals have been studying the development of water supplies in Brazos County and surrounding counties for export. Brazos County is about 150 miles from the NTMWD service area. There are some uncertainties about developing such a large quantity of groundwater and exporting this water to North Texas. The Modeled Available Groundwater values adopted through the Groundwater Joint Planning Process for the Carrizo-Wilcox in Brazos County are less than 40,000 acre-feet in 2020. Also, the costs to develop this alternative are about 48 percent greater than the Lower Bois d'Arc Creek Reservoir and unit costs of water are more than twice that of water from Lower Bois d'Arc Creek Reservoir. Similar to the other long transmission projects, the carbon footprint impacts of this strategy would be considerably higher than the impacts associated with the Lower Bois d'Arc Creek Reservoir. Due to cost considerations, energy impacts and competition for this water source, the Carrizo-Wilcox groundwater alternative is not a practicable alternative to the proposed action.

Desalination of Seawater

Gulf of Mexico With Desalination Alternative

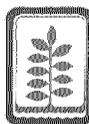
The State of Texas has sponsored initial studies of potential seawater desalination projects, and this is seen as a potential future supply source for the state. Because of the distance to the Gulf of Mexico, seawater desalination is not a particularly promising source of supply for NTMWD. The supply from seawater desalination is essentially unlimited, but this is a high energy use strategy and the cost is much higher than the cost of other water management strategies for NTMWD. The capital costs alone for this alternative are over \$4 billion. The unit cost of water from Gulf of Mexico Desalination is nearly 4 times the cost of water from Lower Bois d'Arc Creek Reservoir. Similar to the other long transmission projects and highly energy intensive projects, it is expected that the carbon footprint impacts of this strategy would be considerably higher than the Lower Bois d'Arc Creek Reservoir. This strategy is not a practicable alternative to the proposed project.

Conclusion

Based upon the aforementioned information and analysis, there are no practicable alternatives to Lower Bois d'Arc Creek Reservoir at this time that can meet the amount of water supply needed by NTMWD within the necessary time frame. Furthermore, based upon the information presented above, NTMWD has determined that conservation and reuse alone are insufficient to meet its future water needs.

APPENDIX I

NORTH TEXAS MUNICIPAL WATER DISTRICT BOARD MINUTES SHOWING ADOPTION OF THE WATER CONSERVATION AND WATER RESOURCE AND EMERGENCY MANAGEMENT PLAN



NORTH TEXAS MUNICIPAL WATER DISTRICT

505 E. Brown Street • Wylie, Texas 75098
(972) 442-5405 – Phone • (972) 295-6440 – Fax

MINUTES OF A REGULAR MEETING OF THE BOARD OF DIRECTORS HELD ON THURSDAY, FEBRUARY 27, 2014 IN THE NTMWD ADMINISTRATIVE OFFICES, WYLIE, TEXAS

The North Texas Municipal Water District Board of Directors met in Regular Session on Thursday, February 27, 2014, at 4:00 p.m. in the Administrative Offices, 505 East Brown Street, Wylie, Texas. Notice of the meeting was legally posted in accordance with Government Code, Title 551, Open Meetings.

President Bill Lofland called the meeting to order. President Bill Lofland advised that Director Larry Parks will be abstaining from voting on Agenda Item Nos. V. B., and VI. E., J., N., R., X., and Z.

I. INVOCATION

Director Jerry Yancey offered the invocation.

II. ROLL CALL

Secretary Joe Joplin conducted a roll call. No Directors were absent. The following Directors were present for the February 27, 2014, Board meeting:

Terry Anderson	Jim Mellody
Don Cates	John Murphy
Gary Downey	Patrick Nicklen
Joe Farmer	Larry Parks
Marvin Fuller	Bobby Robinson
Don Gordon	Richard Sheehan
Darrell Grooms	Lynn Shuyler
Bill Harrison	Shep Stahel
Joe Joplin	John Sweeden
James Kerr	Bob Thurmond
Bill Lofland	Darwin Whiteside
Jack May	Jerry Yancey
Charles McKissick	

The following NTMWD consultants attended the meeting:

Shannon Kackley – Gay McCall Isaacks Gordon & Roberts
David Medanich – First Southwest Company

III. RECOGNITION OF GUESTS

A. Registered Guests

There were no registered guests recognized.

IV. PUBLIC COMMENTS

There were no public comments.

V. CONSENT AGENDA ITEMS

Upon a motion by Director John Murphy and a second by Director James Kerr, the Board of Directors voted unanimously to approve the consent agenda items as follows:

- A. Consider Approval of Board of Directors Meeting Minutes – January 23, 2014
(Please refer to Consent Agenda Item No. 14-02-01)
- B. Consider Approval of Board of Directors Special Meeting Minutes – February 1, 2014
(Please refer to Consent Agenda Item No. 14-02-02)
- C. Consider Approval of Board of Directors Planning Retreat Minutes – February 1, 2014
(Please refer to Consent Agenda Item No. 14-02-03)
- D. Consider Authorization to Make Final Payment on Project No. 280, Floyd Branch Regional Wastewater Treatment Plant, 2012 Odor Control Improvements
(Please refer to Consent Agenda Item No. 14-02-04)
- E. Consider Authorization to Make Final Payment on Project No. 313, Union Pacific Railroad Crossing Protection of the Existing 72-Inch Texoma Pipeline
(Please refer to Consent Agenda Item No. 14-02-05)
- F. Consider Authorizing Change Order No. 2 and Authorization to Make Final Payment on Project No. 229, Wylie Water Treatment Plant Security Enhancements, Phase 2
(Please refer to Consent Agenda Item No. 14-02-06)
- G. Consider Authorizing Additional Engineering Services on Project No. 233, 121 Regional Disposal Facility Fleet Maintenance Weld Services Building
(Please refer to Consent Agenda Item No. 14-02-07)
- H. Consider Authorizing Funding for Retirement Dinner in Honor of NTMWD's Executive Director
(Please refer to Consent Agenda Item No. 14-02-08)

VI. AGENDA ITEMS FOR INDIVIDUAL CONSIDERATION

- A. Consider Authorizing Funding for the Texas Water Smart Coalition Awareness Campaign
(Please refer to Administrative Memorandum No. 4126)

Upon a motion by Director Terry Anderson and a second by Director Jim Mellody the Board of Directors voted unanimously to continue to partner with the Texas Water Smart Coalition by funding the Texas Water Smart Coalition Awareness Campaign in a not-to-exceed amount of \$100,000 on behalf of the NTMWD, Member Cities, and Customers.

- B. Consider Authorizing Additional Engineering Services for Project No. 301, NTMWD Administration Building Structural Repairs, Building Renovations, and Building Additions
(Please refer to Administrative Memorandum No. 4127)

Upon a motion by Director Darrell Grooms and a second by Director Jerry Yancey, the Board of Directors voted unanimously to authorize a change in the scope of services for the NTMWD administration building additions to include design and construction of a standalone building west of the existing administration building and authorize an increase to the engineering services agreement with Huitt-Zollars, Inc., for Project No. 301, NTMWD Administration Building Structural Repairs, Building Renovations, and Building Additions in the not-to-exceed amount of \$45,125, for a revised total engineering services fee of \$588,390.

- C. Consider Authorizing Change Order No. 1 on Project No. 301, NTMWD Administration Building Structural Improvements, Task No. 1
(Please refer to Administrative Memorandum No. 4128)

Upon a motion by Director Lynn Shuyler and a second by Director Joe Farmer, the Board of Directors voted unanimously to authorize Change Order No. 1 for an increase of \$20,634 resulting in a revised contract amount of \$67,634 and a 21-day contract time extension, resulting in a revised final completion date of April 27, 2014, for the NTMWD Administration Building Structural Improvements, Task No. 1, Project No. 301.

- D. Consider Authorizing Amending and Renaming NTMWD's Water Conservation and Drought Contingency/Water Emergency Response Plans, March 2008, and Amendment to District Policy No. 24, Water Conservation and Drought Contingency/Water Emergency Response Plans
(Please refer to Administrative Memorandum No. 4129)

Upon the recommendation of the Water Committee, a motion by Director Terry Anderson, and a second by Director Larry Parks, the Board of Directors voted unanimously to amend and rename the NTMWD's Water Conservation and Drought Contingency/Water Emergency Response

Plans, March 2008, and amend District Policy No. 24, Water Conservation and Drought Contingency/Water Emergency Response Plans.

- E. Consider Authorizing Engineering and Legal Assistance for Project No. 351, Lower Bois d’Arc Creek Reservoir, Phase IIIB
(Please refer to Administrative Memorandum No. 4130)

Upon a motion by Director Darrell Grooms and a second by Director Patrick Nicklen, the Board of Directors voted unanimously to authorize funding for Freese and Nichols, Inc., and Lloyd, Gosselink, Rochelle & Townsend, PC, to perform engineering and legal services for Lower Bois d’Arc Creek Reservoir Phase IIIB, Project No. 351, in the not-to-exceed total amount of \$1,000,000 (funding of \$500,000 for Freese and Nichols, Inc., and funding of \$500,000 for Lloyd, Gosselink, Rochelle & Townsend, PC).

- F. Consider Authorizing Award of Construction Contract on Project No. 335, 121 Site Facility Water Transmission Pipeline Relocation at State Highway 121
(Please refer to Administrative Memorandum No. 4131)

Upon a motion by Director Darrell Grooms and a second by Director John Murphy, the Board of Directors voted unanimously to authorize award of a construction contract to Vessels Construction, A Division of Vescor, Inc., for 121 Site Facility Water Transmission Pipeline Relocation at State Highway 121, Project No. 335, in the amount of \$90,878.

- G. Consider Authorizing Change Order No. 4 on Project No. 277, Water Treatment Plant III, Filter Underdrain Improvements and Conversion to Biologically Active Filters
(Please refer to Administrative Memorandum No. 4132)

Upon a motion by Director James Kerr and a second by Director Joe Farmer, the Board of Directors voted unanimously to authorize Change Order No. 4 for the Water Treatment Plant III Filter Underdrain Improvements and Conversion to Biologically Active Filters, Project No. 277, for an increase in the amount of \$135,947.24, resulting in a revised contract amount of \$6,815,140.95. The final completion date for this project remains January 9, 2016.

- H. Consider Authorizing Additional Engineering Services on Project No. 308, Upper Rowlett and Cottonwood Creek Parallel Force Main Design
(Please refer to Administrative Memorandum No. 4133)

Upon a motion by Director Joe Farmer and a second by Director Lynn Shuyler, the Board of Directors voted unanimously to authorize additional engineering services to Cobb, Fendley & Associates, Inc., for professional services associated with design of the Upper Rowlett and Cottonwood Creek Parallel Force Main, Project No. 308, in the not-to-exceed amount of \$97,785, resulting in a not-to-exceed engineering services fee of \$619,517.

- I. Consider Authorizing Change Order No. 1 on Project No. 278, Wilson Creek Gravity Interceptor Improvements, Phase 1
(Please refer to Administrative Memorandum No. 4134)

Upon a motion by Director Marvin Fuller and a second by Director Patrick Nicklen, the Board of Directors voted unanimously to authorize Change Order No. 1 for an increase of \$61,124.08, resulting in a revised contract amount of \$3,105,029.18 and an additional 150 calendar days of contract time, resulting in a revised final completion date of November 5, 2014, for the Wilson Creek Gravity Interceptor Improvements, Phase 1, Project No. 278.

- J. Consider Authorizing Additional Engineering Services for Fiscal Year 2014 Water Supply Planning Assistance
(Please refer to Administrative Memorandum No. 4135)

Upon a motion by Director Bobby Robinson and a second by Director Lynn Shuyler, the Board of Directors voted unanimously to authorize an increase to the engineering services agreement with Freese and Nichols, Inc., for Fiscal Year 2014 Water Supply Planning Assistance in the not-to-exceed amount of \$150,000 for a revised total engineering services fee of \$350,000.

- K. Consider Authorizing Change Order No. 1 and Authorization to Make Final Payment on Project No. 310, Wylie-McKinney 20-Inch Waterline Relocation at Stinson Road
(Please refer to Administrative Memorandum No. 4136)

Upon a motion by Director Lynn Shuyler and a second by Director Don Gordon, the Board of Directors voted unanimously to authorize Change Order No. 1 for an increase of \$26,566, resulting in a revised contract amount of \$153,828, and authorize final payment to Dowager Utility Construction, Ltd., in the final contract amount of \$153,828 for the Wylie-McKinney 20-Inch Waterline Relocation at Stinson Road, Project No. 310.

- L. Consider Authorizing Award of Construction Contract on Project No. 314, Farmersville Pump Station Pump No. 2
(Please refer to Administrative Memorandum No. 4137)

Upon a motion by Director Patrick Nicklen and a second by Director Joe Farmer, the Board of Directors voted unanimously to authorize award of a construction contract to Crescent Constructors, Inc., for the Farmersville Pump Station Pump No. 2, Project No. 314, in the amount of \$143,700.

- M. Consider Authorizing Additional Engineering Services for Project No. 285, Cooper Pipeline Embankment Improvement Near FM 3218 in Commerce, Texas
(Please refer to Administrative Memorandum No. 4138)

Upon a motion by Director John Murphy and a second by Director Patrick Nicklen, the Board of Directors voted unanimously to authorize additional engineering services to Lockwood, Andrews & Newnam, Inc., for the Cooper Pipeline Embankment Improvement Near FM 3218 in Commerce, Texas, Project No. 285, in the not-to-exceed amount of \$22,733 for a not-to-exceed total of \$141,733.

- N. Consider Authorizing Change Order No. 3 and Authorization to Make Final Payment on Project No. 207, Expand Frisco/McKinney Pump Station to 130 MGD
(Please refer to Administrative Memorandum No. 4139)

Upon a motion by Director Shep Stahel and a second by Director Bobby Robinson, the Board of Directors voted unanimously to authorize Change Order No. 3 for a decrease of \$72,624.12, resulting in a revised contract amount of \$6,520,067.42 and an additional 131 days for final completion resulting in a final completion date of January 15, 2014, and authorize final payment to Archer Western Contractors, Ltd., in the final contract amount of \$6,520,067.52, for Project No. 207, Expand Frisco/McKinney Pump Station to 130 MGD.

- O. Consider Authorizing Change Order No. 2 on Project No. 227, Contract A, Upper White Rock Creek Parallel Force Main
(Please refer to Administrative Memorandum No. 4140)

Upon a motion by Director Shep Stahel and a second by Director Patrick Nicklen, the Board of Directors voted unanimously to authorize Change Order No. 2 for a net decrease of \$41,368.09, resulting in a revised contract amount of \$3,200,390.13 and an additional 30 calendar days resulting in a revised final completion date of April 20, 2014, for the Upper White Rock Creek Parallel Force Main, Project No. 227 (Contract A).

- P. Consider Authorizing Execution of Engineering Services Agreement on Project No. 352, Water System Operations Center
(Please refer to Administrative Memorandum No. 4141)

Upon a motion by Director Don Gordon and a second by Director Charles McKissick, the Board of Directors voted unanimously to table this item.

- Q. Consider Authorizing Change Order No. 24 on Project No. 153, Water Treatment Plants I, II, III, and IV Ozonation
(Please refer to Administrative Memorandum No. 4142)

Upon a motion by Director Darrell Grooms and a second by Director Marvin Fuller, the Board of Directors voted unanimously to authorize Change Order No. 24 for Project No. 153, Water Treatment Plants I, II, III, and IV Ozonation, an increase in the amount of \$38,373.02, resulting in a revised contract amount of \$110,945,965.57.

- R. Consider Authorizing Change Order No. 3 on Project No. 128, Lake Texoma Pump Station Modifications
(Please refer to Administrative Memorandum No. 4143)

Upon a motion by Director Jerry Yancey and second by Director Shep Stahel, the Board of Directors voted unanimously to authorize Change Order No. 3 to the Lake Texoma Pump Station Modifications, Project No. 128, for an increase of \$51,095.65 resulting in revised contract amount of \$6,649,959.78.

- S. Consider Authorizing Additional Engineering Services on Project No. 312, Lake Tawakoni Water Treatment Plant Sludge Lagoon Improvements
(Please refer to Administrative Memorandum No. 4144)

Upon a motion by Director Shep Stahel and a second by Director John Murphy, the Board of Directors voted unanimously to authorize additional engineering services for Black & Veatch Corporation for professional services associated with design for the Lake Tawakoni Water Treatment Plant Sludge Lagoon Improvements, Project No. 312, in the not-to-exceed amount of \$23,958, resulting in a revised engineering services fee amount of \$451,168.

- T. Consider Authorizing Execution of Inspection Services Agreement on Project No. 312, Lake Tawakoni Water Treatment Plant Sludge Lagoon Improvements
(Please refer to Administrative Memorandum No. 4145)

Upon a motion by Director Lynn Shuyler and a second by Director Shep Stahel, the Board of Directors voted unanimously to authorize the Executive Director to execute an inspection services agreement with Dietz Engineering in the not-to-exceed amount of \$105,000 for the Lake Tawakoni Water Treatment Plant Sludge Lagoon Improvements, Project No. 312.

- U. Consider Authorizing Reimbursement to Grayson County for Road Damage, Project No. 268, Lake Texoma Outfall to Wylie Water Treatment Plant Raw Water Pipeline
(Please refer to Administrative Memorandum No. 4146)

Upon the recommendation of the Water Committee, a motion by Director Shep Stahel, and a second by Director James Kerr, the Board of Directors voted unanimously to authorize reimbursement to Grayson County in the amount of \$793,700 for damage to county roads as a result of construction

material delivery for the Lake Texoma Outfall to Wylie Water Treatment Plant Raw Water Pipeline, Project No. 268, per the "Interlocal Agreement between Grayson County and the NTMWD for Road Repairs" dated October 16, 2012.

- V. Consider Authorizing Execution of Engineering Services Agreement on Project No. 330, Wylie Water Treatment Plant II Clearwell and Disinfection Modifications
(Please refer to Administrative Memorandum No. 4147)

Upon the recommendation of the Water Committee, a motion by Director Terry Anderson, and a second by Director John Murphy, the Board of Directors voted unanimously to authorize the Executive Director to execute an engineering services agreement with CH2M HILL Engineers, Inc., for professional services associated with design and construction for the Wylie Water Treatment Plant II Clearwell and Disinfection Modifications, Project No. 330, in the not-to-exceed amount of \$1,350,000.

- W. Consider Authorizing Additional Engineering Services for Project No. 286, Rockwall No. 2 Flow Meter Improvements
(Please refer to Administrative Memorandum No. 4148)

Upon a motion by Director Larry Parks and a second by Director Jerry Yancey, the Board of Directors voted unanimously to authorize an increase to the engineering services agreement with KSA Engineers, Inc., for Rockwall No. 2 Flow Meter Improvements, Project No. 286, in the not-to-exceed amount of \$37,000, for a revised total engineering services fee of \$64,336.

- X. Consider Authorizing Change Order No. 1 on Project No. 188, Expand High Service Pump Station 3-1 to 350 MGD
(Please refer to Administrative Memorandum No. 4149)

Upon a motion by Director James Kerr and a second by Director Darrell Grooms, the Board of Directors voted unanimously to authorize Change Order No. 1 for an increase of \$136,720.94, resulting in a revised contract amount of \$7,857,298.94, and approve an additional 75 calendar days of contract time for Project No. 188, Expand High Service Pump Station 3-1 to 350 MGD.

- Y. Consider Authorizing Additional Engineering Services for Project No. 320, Wylie Water Treatment Plant II, Improvements for Basin Nos. 3 and 4
(Please refer to Administrative Memorandum No. 4150)

Upon a motion by Director Shep Stahel and a second by Director Darrell Grooms, the Board of Directors voted unanimously to authorize additional engineering services for Black & Veatch Corporation for professional services associated with design for the Wylie Water Treatment Plant II Improvements for Basin Nos. 3 and 4, Project No. 320, in the not-to-exceed

amount of \$26,250, resulting in a revised engineering services fee of \$277,150.

- Z. Consider Authorizing Change Order No. 1 on Project No. 275, Chapman Lake Water Access, Task B (Dredging)
(Please refer to Administrative Memorandum No. 4151)

Upon a motion by Director Shep Stahel and a second by Director Don Gordon, the Board of Directors voted unanimously to authorize Change Order No. 1 for an increase of \$56,033.75, resulting in a revised contract amount of \$1,818,239.75 and an additional 20 calendar days of contract time, resulting in a revised final completion date of June 25, 2014, for the Chapman Lake Water Access, Task B (Dredging), Project No. 275.

- AA. Consider Authorizing Change Order No. 5 on Project No. 259, Water Treatment Plant I Conversion to Biologically Active Filtration and Improvement of Existing Underdrains
(Please refer to Administrative Memorandum No. 4152)

Upon a motion by Director Shep Stahel and a second by Director Joe Farmer, the Board of Directors voted unanimously to authorize Change Order No. 5 for the Water Treatment Plant I Conversion to Biologically Active Filtration and Improvement of Existing Underdrains, Project No. 259, for an increase in the amount of \$104,627, resulting in a revised contract amount of \$8,144,796.75.

VII. ADJOURNMENT

There being no further business, the meeting adjourned at approximately 5:22 p.m. The next regular meeting of the NTMWD Board of Directors will be held Thursday, March 27, 2014, at 4:00 p.m. in the NTMWD Administrative Offices, 505 E. Brown Street, Wylie, Texas.

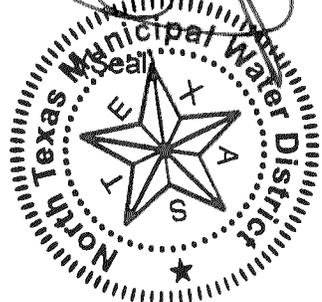
APPROVED:



BILL LOFLAND, President

ATTEST:



JOE JOPLIN, Secretary

APPENDIX J
TEXAS WATER CODE SECTION 11.039

APPENDIX J

TEXAS WATER CODE SECTION 11.039

§ 11.039. DISTRIBUTION OF WATER DURING SHORTAGE.

(a) If a shortage of water in a water supply not covered by a water conservation plan prepared in compliance with Texas Natural Resource Conservation Commission or Texas Water Development Board rules results from drought, accident, or other cause, the water to be distributed shall be divided among all customers pro rata, according to the amount each may be entitled to, so that preference is given to no one and everyone suffers alike.

(b) If a shortage of water in a water supply covered by a water conservation plan prepared in compliance with Texas Natural Resource Conservation Commission or Texas Water Development Board rules results from drought, accident, or other cause, the person, association of persons, or corporation owning or controlling the water shall divide the water to be distributed among all customers pro rata, according to:

(1) the amount of water to which each customer may be entitled; or

(2) the amount of water to which each customer may be entitled, less the amount of water the customer would have saved if the customer had operated its water system in compliance with the water conservation plan.

(c) Nothing in Subsection (a) or (b) precludes the person, association of persons, or corporation owning or controlling the water from supplying water to a person who has a prior vested right to the water under the laws of this state.

Amended by Acts 1977, 65th Leg., p. 2207, ch. 870, § 1, eff. Sept. 1, 1977; Acts 2001, 77th Leg., ch. 1126, § 1, eff. June 15, 2001.

**North Texas Municipal
Water District**

Date/Time Survey Submitted: 3/24/2015 9:04:40 AM

**TEXAS WATER DEVELOPMENT BOARD
WATER USE SURVEY**

WATER USE IN CALENDAR YEAR: 2014

SYSTEM NAME: WYLIE WTP LAKE LAVON
OPERATOR NAME:
MULTIPLE SURVEY ORG: NORTH TEXAS MWD
MAILING ADDRESS 1: PO BOX 2408
MAILING ADDRESS 2:
CITY/STATE/ZIP: WYLIE TX 75098-2408
PWS NAME: NORTH TEXAS MWD WYLIE WTP

SURVEY NUMBER: 0000160
PRIMARY USED COUNTY: COLLIN
PRIMARY USED RIVER BASIN: TRINITY
ORGANIZATION MAIN PHONE: 972-442-5405
MAIN EMAIL:
WEB:
PWS CODE: 430044

INTAKE:

Water Type		County	Basin	Reservoir / River	Water Right #	% Not Returned	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)		
SURFACE WATER SELF SUPPLIED		COLLIN	TRINITY	LAVON LAKE/RESERVOIR	02410-0-G	100.00	M	N	0.00	72,740,696,283		
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	
5,159,850,585	4,730,378,967	5,614,412,730	6,362,240,775	7,275,601,128	6,621,944,022	6,666,259,758	7,676,072,007	7,272,016,767	6,350,835,990	4,644,680,154	4,366,403,400	
Water Type		County	Basin	Reservoir / River	Water Right #	% Not Returned	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)		
SURFACE WATER SELF SUPPLIED		COLLIN	TRINITY	FORK LAKE/RESERVOIR	12152-12152-	100.00	E	N	0.00	0		
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	
0	0	0	0	0	0	0	0	0	0	0	0	
Water Type		County	Basin	Reservoir / River	Water Right #	% Not Returned	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)		
SURFACE WATER SELF SUPPLIED		HUNT	SABINE	UNKNOWN	12164-0-	100.00	M	N	0.00	5,282,060,000		
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	
523,250,000	446,460,000	465,840,000	398,780,000	506,150,000	436,100,000	334,780,000	523,150,000	560,440,000	370,450,000	333,410,000	383,250,000	
Water Type		County	Basin	Reservoir / River	Water Right #	% Not Returned	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)		
SURFACE WATER SELF SUPPLIED		GRAYSON	RED	TEXOMA LAKE/RESERVOIR	05003-5003-A	100.00	E	N	0.00	8,619,410,652		
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	
0	0	0	0	327,480,255	850,145,259	1,497,285,345	683,635,398	1,593,737,241	1,710,066,048	1,030,992,564	926,068,542	

SALES:

Buyer	SALE TYPE (MUNICIPAL or INDUSTRIAL)	COUNTY NAME	BASIN NAME	Water Type	AQUIFER NAME (if GW)	SURFACE WATER Name (if SW)	TOTAL VOLUME (GALLONS)
EAST PLANT	M			SURFACE WATER			1,134,291,000
CASH SPECIAL UD	M			SURFACE WATER			233,061,000
CITY OF ROYSE CITY	M			SURFACE WATER			469,494,000
EAST FORK SUD	M			SURFACE WATER			311,974,000
TOWN OF FAIRVIEW	M			SURFACE WATER			702,422,000
CITY OF FATE	M			SURFACE WATER			290,446,000
FORNEY LAKE WSC	M			SURFACE WATER			252,041,000
CITY OF FRISCO	M			SURFACE WATER			7,699,740,000
GENERAL WATER DISTRIBUTION SYSTEM (GARLAND)	M			SURFACE WATER			9,552,429,000
RAY OLINGER STEAM ELECT PLANT	I			SURFACE WATER			18,899,358
COPEVILLE SUD	M			SURFACE WATER			78,288,000
CITY OF FARMERSVILLE	M			SURFACE WATER			152,367,000
CADDO BASIN SUD	M			SURFACE WATER			277,329,000
GASTONIA SCURRY SUD	M			SURFACE WATER			50,899,000
CITY OF JOSEPHINE	M			SURFACE WATER			45,430,000
LAVON WSC	M			SURFACE WATER			170,641,000
CITY OF LUCAS	M			SURFACE WATER			452,410,000
CITY WATER DEPARTMENT	M			SURFACE WATER			195,740,000
CITY OF MESQUITE	M			SURFACE WATER			5,254,180,000
MILLIGAN WSC	M			SURFACE WATER			91,885,000
MOUNT ZION WSC	M			SURFACE WATER			84,604,000
CITY OF MURPHY	M			SURFACE WATER			960,686,000
NEVADA WSC	M			SURFACE WATER			73,111,000
CITY OF MCKINNEY	M			SURFACE WATER			8,875,798,000
NORTH COLLIN WSC	M			SURFACE WATER			291,042,000
CITY OF PRINCETON	M			SURFACE WATER			381,560,000
TOWN OF PROSPER	M			SURFACE WATER			897,212,000
CITY OF RICHARDSON	M			SURFACE WATER			7,090,034,000

CITY OF ALLEN	M			SURFACE WATER			4,417,039,000
CITY OF PLANO	M			SURFACE WATER			17,518,088,000
CITY OF PARKER	M			SURFACE WATER			375,123,000
CITY OF ROCKWALL	M			SURFACE WATER			2,244,016,000
CITY OF ROWLETT	M			SURFACE WATER			2,176,060,000
CITY OF SACHSE	M			SURFACE WATER			916,099,000
SEIS LAGOS UD	M			SURFACE WATER			100,457,000
TOWN OF SUNNYVALE	M			SURFACE WATER			453,100,000
COLLEGE MOUND SUD	M			SURFACE WATER			3,410,000
CITY OF TERRELL	M			SURFACE WATER			1,155,655,000
CITY OF FORNEY	M			SURFACE WATER			1,389,052,000
CITY OF KAUFMAN	M			SURFACE WATER			425,152,000
ROSE HILL SUD	M			SURFACE WATER			60,411,000
CITY OF WYLIE	M			SURFACE WATER			1,391,489,000
WYLIE NORTHEAST SUD	M			SURFACE WATER			169,446,000
GTUA	M			SURFACE WATER			139,510,000
KAUFMAN FOUR ONE	M			SURFACE WATER			442,896,000
ABLE SPRINGS WSC	M			SURFACE WATER			69,184,000
WYLIE RETAIL CUSTOMERS	M			SURFACE WATER			3,548,000

WATER SYSTEM INFORMATION:

Estimated full-time residential population served directly by this system	65
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CONTACTS:

LAST NAME	FIRST NAME	TITLE	PHONE	PHONE EXT.	EMAIL
Green	Buford	Asst. Water Syst. Mgr	972-442-5405	263	bgreen@ntmwd.com
KILPATRICK	TED	WATER SYSTEM MANAGER	972-442-5405		TKILPATRICK@NTMWD.COM

Date/Time Survey Submitted: 3/21/2016 1:58:19 PM

**TEXAS WATER DEVELOPMENT BOARD
WATER USE SURVEY**

WATER USE IN CALENDAR YEAR: 2015

SYSTEM NAME: WYLIE WTP LAKE LAVON

OPERATOR NAME:

MULTIPLE SURVEY ORG: NORTH TEXAS MWD

MAILING ADDRESS 1: PO BOX 2408

MAILING ADDRESS 2:

CITY/STATE/ZIP: WYLIE TX 75095-2408

SURVEY NUMBER: 0000160

PRIMARY USED COUNTY: COLLIN

PRIMARY USED RIVER BASIN: TRINITY

ORGANIZATION MAIN PHONE: 972-442-5405

MAIN EMAIL:

WEB:

INTAKE:

Water Type		County	Basin	Reservoir / River	Water Right #	% Not Returned	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
SURFACE WATER SELF SUPPLIED		GRAYSON	RED	TEXOMA LAKE/RESERVOIR	05003-5003-A	100.00	M	N	0.00	13,569,806,000	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
880,759,000	818,085,000	943,131,000	1,042,758,000	1,099,008,000	1,509,093,000	1,717,288,000	1,684,893,000	1,505,427,000	1,363,517,000	491,088,000	514,759,000
Water Type		County	Basin	Reservoir / River	Water Right #	% Not Returned	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
SURFACE WATER SELF SUPPLIED		COLLIN	TRINITY	LAVON LAKE/RESERVOIR	02410-0-G	100.00	M	N	0.00	78,625,951,000	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
4,264,206,000	3,731,489,000	4,063,899,000	4,361,252,000	4,396,782,000	6,046,890,000	9,557,464,000	12,537,320,000	10,376,665,000	8,752,743,000	5,479,067,000	5,058,174,000
Water Type		County	Basin	Seller Name and/or Seller System		River / Reservoir	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
SURFACE WATER PURCHASED		HUNT	SABINE	SABINE RIVER AUTHORITY LK TAWAKONI 05010		Lake Tawakoni	M	N	0.00	4,446,258,000	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
21,850,000	409,920,000	523,505,000	441,970,000	313,070,000	372,690,000	553,850,000	611,902,000	113,360,000	548,940,000	284,871,000	250,330,000

SALES:

BUYER	SALE TYPE (MUNICIPAL or INDUSTRIAL)	COUNTY NAME	BASIN NAME	WATER TYPE	AQUIFER NAME (if GW)	SURFACE WATER Name (if SW)	RAW or TREATED	TOTAL VOLUME (GALLONS)
WYLIE RETAIL CUSTOMERS	M			SURFACE WATER			Treated	5,087,000
ABLE SPRINGS WSC	M			SURFACE WATER			Treated	74,056,000
KAUFMAN FOUR ONE	M			SURFACE WATER			Treated	406,520,000
GTUA	M			SURFACE WATER			Treated	255,950,000

WYLIE NORTHEAST SUD	M			SURFACE WATER			Treated	194,366,000
CITY OF WYLIE	M			SURFACE WATER			Treated	1,708,832,000
ROSE HILL SUD	M			SURFACE WATER			Treated	90,428,000
CITY OF KAUFMAN	M			SURFACE WATER			Treated	413,722,000
CITY OF TERRELL	M			SURFACE WATER			Treated	1,225,607,000
CITY OF FORNEY	M			SURFACE WATER			Treated	1,739,129,000
COLLEGE MOUND SUD	M			SURFACE WATER			Treated	71,662,000
TOWN OF SUNNYVALE	M			SURFACE WATER			Treated	544,697,000
CITY OF PLANO	M			SURFACE WATER			Treated	20,275,042,000
CITY OF ALLEN	M			SURFACE WATER			Treated	4,966,173,000
SEIS LAGOS UD	M			SURFACE WATER			Treated	117,543,000
CITY OF SACHSE	M			SURFACE WATER			Treated	1,083,650,000
CITY OF ROWLETT	M			SURFACE WATER			Treated	2,463,351,000
CITY OF ROCKWALL	M			SURFACE WATER			Treated	2,554,552,000
CITY OF PARKER	M			SURFACE WATER			Treated	433,478,000
CITY OF RICHARDSON	M			SURFACE WATER			Treated	8,078,544,000
TOWN OF PROSPER	M			SURFACE WATER			Treated	1,094,004,000
CITY OF PRINCETON	M			SURFACE WATER			Treated	436,760,000
NORTH COLLIN WSC	M			SURFACE WATER			Treated	305,408,000
CITY OF MCKINNEY	M			SURFACE WATER			Treated	10,128,654,000
NEVADA SUD	M			SURFACE WATER			Treated	91,498,000
CITY OF MURPHY	M			SURFACE WATER			Treated	1,251,600,000
MOUNT ZION WSC	M			SURFACE WATER			Treated	96,776,000
MILLIGAN WSC	M			SURFACE WATER			Treated	92,611,000
CITY OF MESQUITE	M			SURFACE WATER			Treated	5,922,807,000
CITY WATER DEPARTMENT	M			SURFACE WATER			Treated	246,526,000
CITY OF LUCAS	M			SURFACE WATER			Treated	513,777,000
LAVON SUD	M			SURFACE WATER			Treated	213,884,000
CITY OF JOSEPHINE	M			SURFACE WATER			Treated	51,781,000
GASTONIA SCURRY SUD	M			SURFACE WATER			Treated	63,640,000

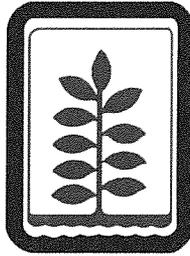
CADDO BASIN SUD	M			SURFACE WATER			Treated	304,620,000
CITY OF FARMERSVILLE	M			SURFACE WATER			Treated	169,133,000
COPEVILLE SUD	M			SURFACE WATER			Treated	78,360,000
RAY OLINGER STEAM ELECT PLANT	I			SURFACE WATER			Raw	6,191,169
GENERAL WATER DISTRIBUTION SYSTEM (GARLAND)	M			SURFACE WATER			Treated	9,943,051,000
CITY OF FRISCO	M			SURFACE WATER			Treated	9,367,940,000
FORNEY LAKE WSC	M			SURFACE WATER			Treated	277,192,000
CITY OF FATE	M			SURFACE WATER			Treated	355,193,000
TOWN OF FAIRVIEW	M			SURFACE WATER			Treated	754,493,000
EAST FORK SUD	M			SURFACE WATER			Treated	362,850,000
CITY OF ROYSE CITY	M			SURFACE WATER			Treated	539,499,000
CASH SUD	M			SURFACE WATER			Treated	265,906,000
EAST PLANT	M			SURFACE WATER			Treated	1,107,942,000

WATER SYSTEM INFORMATION:

Estimated full-time residential population served directly by this system: 65

CONTACTS:

LAST NAME	FIRST NAME	TITLE	PHONE	PHONE EXT.	EMAIL
Green	Buford	Asst. Water Syst. Mgr	469-626-4407		bgreen@ntmwd.com
KILPATRICK	TED	WATER SYSTEM MANAGER	972-442-5405		TKILPATRICK@NTMWD.COM
Mata	Frank		-		Frank.Mata@twdb.texas.gov



**NORTH TEXAS MUNICIPAL
WATER DISTRICT**

Regional Service Through Unity

February 27, 2016

Texas Commission on Environmental Quality
Water Rights Permitting MC 160
P.O. Box 13087
Austin, TX 78711-3087

CMRRR 7014 1820 0000 1025 5662

Re: North Texas Municipal Water District
Surface Water Reports for Year Ending 12/31/2016

Water Rights Permitting Section:

Please find the applicable TCEQ Surface Water Reports for NTMWD fully completed and enclosed with this transmittal letter. We are pleased to submit this information as directed and in compliance with the March 1, 2017 deadline.

If you have any questions concerning these reports, please contact my office at (972) 442-5405.

Sincerely,

BUFORD GREEN
Assistant Water System Manager

BG/kr

Enclosures

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Certificate of Adjudication

WATER RIGHT NO:4920
B 2

WUR USE: AGRICULTURE
AUTH USE: AGRICULTURE - IRRIGATION

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE	AGRICULTURE	
	Irrigation	Wildlife, Aquaculture, Stockraising and/or Other Agriculture
Month	Diverted Amount (acre-feet)	Diverted Amount (acre-feet)
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sept	0	0
Oct	0	0
Nov	0	0
Dec	0	0
Total:	0	0
	Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input type="checkbox"/> GPM) 0	Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input type="checkbox"/> GPM) 0

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?

N/A

(eg. Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17
Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Certificate of Adjudication

WATER RIGHT NO:4798
B 3

WUR USE: MUNICIPAL/DOMESTIC
AUTH USE: MUNICIPAL/DOMESTIC

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE: MUNICIPAL/DOMESTIC	
Month	Diverted Amount (acre-feet)
Jan	0
Feb	0
Mar	0
Apr	0
May	0
Jun	0
Jul	215
Aug	4,145
Sept	3,647
Oct	1,886
Nov	4,509
Dec	845
Total:	15,247
Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM)	
37,500	

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?

N/A
(eg., Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____
 The Lake Chapman dam is owned, operated, and maintained by the USACE.

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17
 Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

Return completed form by March 01, 2017 to:
 Texas Commission on Environmental Quality * Water Rights Permitting MC 160 * PO Box 13087 * Austin TX 78711-3087
 Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Permit

WATER RIGHT NO: 12151
B 2

WUR USE: INDUSTRIAL
AUTH USE: INDUSTRIAL

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted and consumed (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE: INDUSTRIAL		
Month	Diverted Amount (acre-feet)	Consumed Amount (acre-feet)
Jan	0	
Feb	0	
Mar	0	
Apr	0	
May	0	
Jun	0	
Jul	0	
Aug	0	
Sept	0	
Oct	0	
Nov	0	
Dec	0	
Total:	0	
Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM) 0		

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?

N/A

(eg. Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____

The dam at Lake Fork is owned, operated and maintained by Sabine River Authority.

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17
 Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality * Water Rights Permitting MC 160 * PO Box 13087 * Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Permit

WATER RIGHT NO:12151
B 2

WUR USE: OTHER
AUTH USE: RECREATION

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit this form to TCEQ. Please coordinate your water use reporting with all owners of this Water Right in order to avoid duplicative reporting.

Please answer the following questions. When answering all questions below and completing the table on the right, **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

1. If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam? _____
(eg., Good, Fair, Poor)

Do you have working low flow outlet(s) on your Impoundment(s)? Yes No

2. Did you divert any permitted water from a watercourse (i.e., a stream and/or on-channel reservoir)? Yes No (If No, skip to question 3 below) If Yes, Complete the Diverted Column in the table on the right by entering the total amount of water diverted (even if zero).

Check all uses for which water was diverted:

- Recreation Instream Wetlands Public Parks Game Preserves
 Hydroelectric Flood Control Navigation Water Quality Other

3. Did you allow permitted water to remain in the watercourse under the terms of your permit?

Yes No

If Yes,

Complete the Used Column in the table on the right by entering the total amount of water used (even if zero).

Check all uses for which water was used:

- Recreation Instream Wetlands Public Parks Game Preserves
 Hydroelectric Flood Control Navigation Water Quality Other

Complete the Diverted column below if you answered 'Yes' to question 2.
Complete the Used column below if you answered 'Yes' to question 3.

Month	Diverted (acre-feet)	Used (acre-feet)
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sept	0	0
Oct	0	0
Nov	0	0
Dec	0	0
Total:	0	0
Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM)		
0		

Comments: _____

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17

Contact Name: Thomas W. Kula (972) 442-5405

Print Name

Telephone Number

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality * Water Rights Permitting MC 160 * PO Box 13087 * Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

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Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Permit

WATER RIGHT NO:12151
B 2

WUR USE: AGRICULTURE
AUTH USE: AGRICULTURE - IRRIGATION

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE	AGRICULTURE	
	Irrigation	Wildlife, Aquaculture, Stockraising and/or Other Agriculture
Month	Diverted Amount (acre-feet)	Diverted Amount (acre-feet)
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sept	0	0
Oct	0	0
Nov	0	0
Dec	0	0
Total:	0	0
	Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM)	Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM)
	0	0

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?
N/A
(eg, Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____
The Lake Fork dam is owned, operated, and maintained by the Sabine River Authority.

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17
Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Permit

WATER RIGHT NO: 12151
B 2

WUR USE: MUNICIPAL/DOMESTIC
AUTH USE: MUNICIPAL/DOMESTIC

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE: MUNICIPAL/DOMESTIC	
Month	Diverted Amount (acre-feet)
Jan	0
Feb	0
Mar	0
Apr	0
May	0
Jun	0
Jul	0
Aug	0
Sept	0
Oct	0
Nov	0
Dec	0
Total:	0
Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM)	
0	

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?

N/A
(eg, Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____
 The Lake Tawakoni dam is owned, operated and maintained by the Sabine River Authority.

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17
 Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Permit

WATER RIGHT NO: 13037
B 8

WUR USE: MUNICIPAL/DOMESTIC
AUTH USE: MUNICIPAL/DOMESTIC

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE: MUNICIPAL/DOMESTIC	
Month	Diverted Amount (acre-feet)
Jan	0
Feb	0
Mar	0
Apr	0
May	0
Jun	0
Jul	0
Aug	0
Sept	0
Oct	0
Nov	0
Dec	0
Total:	0
	Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM)
	0

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?
N/A
(eg, Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17
Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Permit

WATER RIGHT NO:12152
B 8

WUR USE: INDUSTRIAL
AUTH USE: INDUSTRIAL

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted and consumed (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE: INDUSTRIAL		
Month	Diverted Amount (acre-feet)	Consumed Amount (acre-feet)
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sept	0	0
Oct	0	0
Nov	0	0
Dec	0	0
Total:	0	0
Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM)		
0		

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?

N/A
(e.g. Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____

The Lake Tawakoni dam is owned, operated and maintained by the Sabine River Authority.

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17

Contact Name: Thomas W. Kula (972) 442-5405

Print Name Telephone Number

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Permit

WATER RIGHT NO:12152
B 8

WUR USE: MUNICIPAL/DOMESTIC
AUTH USE: MUNICIPAL/DOMESTIC

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE: MUNICIPAL/DOMESTIC	
Month	Diverted Amount (acre-feet)
Jan	0
Feb	0
Mar	0
Apr	0
May	0
Jun	0
Jul	621
Aug	2,026
Sept	3,484
Oct	5,617
Nov	4,473
Dec	3,610
Total:	19,831
Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM)	
41,667	

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?
N/A
(e.g. Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____
The Lake Tawakoni dam is owned, operated and maintained by the Sabine River Authority.

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17
Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

Return completed form by March 01, 2017 to:
Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Certificate of Adjudication

WATER RIGHT NO:4925
B 2

WUR USE: MUNICIPAL/DOMESTIC
AUTH USE: MUNICIPAL/DOMESTIC

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE: MUNICIPAL/DOMESTIC	
Month	Diverted Amount (acre-feet)
Jan	113
Feb	96
Mar	100
Apr	108
May	104
Jun	123
Jul	172
Aug	163
Sept	144
Oct	129
Nov	118
Dec	122
Total:	1,492
Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM)	
2,048	

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?

N/A
(eg, Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____
The Lake Bonham dam is owned, operated, and maintained by the City of Bonham.

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17
 Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

Return completed form by March 01, 2017 to:
 Texas Commission on Environmental Quality * Water Rights Permitting MC 160 * PO Box 13087 * Austin TX 78711-3087
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Return completed form by March 01, 2017 to:

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Certificate of Adjudication

WATER RIGHT NO: 2410
B 8

WUR USE: AGRICULTURE
AUTH USE: AGRICULTURE

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE	AGRICULTURE	
	Irrigation	Wildlife, Aquaculture, Stockraising and/or Other Agriculture
Month	Diverted Amount (acre-feet)	Diverted Amount (acre-feet)
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sept	0	0
Oct	0	0
Nov	0	0
Dec	0	0
Total:	0	0
	Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM) 0	Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM) 0

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?
N/A
(eg. Good, Fair, Poor)

Do you have working low flow outlet(s) on your Impoundment(s)? Yes No

Comments: _____
The Lake Lavon dam is owned, operated and maintained by the USACE.

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17
Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Certificate of Adjudication

WATER RIGHT NO: 2410
B 8

WUR USE: OTHER
AUTH USE: WETLANDS

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit this form to TCEQ. Please coordinate your water use reporting with all owners of this Water Right in order to avoid duplicative reporting.

Please answer the following questions. When answering all questions below and completing the table on the right, **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

Complete the Diverted column below if you answered 'Yes' to question 2.
Complete the Used column below if you answered 'Yes' to question 3.

1. If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam? N/A
(eg, Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

2. Did you divert any permitted water from a watercourse (i.e., a stream and/or on-channel reservoir)? Yes No (If No, skip to question 3 below) If Yes, Complete the Diverted Column in the table on the right by entering the total amount of water diverted (even if zero).

Check all uses for which water was diverted:

- Recreation Instream Wetlands Public Parks Game Preserves
 Hydroelectric Flood Control Navigation Water Quality Other

3. Did you allow permitted water to remain in the watercourse under the terms of your permit?

Yes No

If Yes,

Complete the Used Column in the table on the right by entering the total amount of water used (even if zero).

Check all uses for which water was used:

- Recreation Instream Wetlands Public Parks Game Preserves
 Hydroelectric Flood Control Navigation Water Quality Other

Month	Diverted (acre-feet)	Used (acre-feet)
Jan	0	0
Feb	1,915	0
Mar	2,716	0
Apr	0	0
May	0	0
Jun	0	0
Jul	1,270	110
Aug	4,128	3,604
Sept	3,299	3,750
Oct	3,331	3,641
Nov	3,651	3,544
Dec	3,748	4,545
Total:	24,058	19,194
Maximum Diversion Rate <small>(Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM)</small>		
33,333		

Comments: Used water for municipal supply and to maintain wetlands

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17
Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Certificate of Adjudication

WATER RIGHT NO:2410
B 8

WUR USE: INDUSTRIAL
AUTH USE: INDUSTRIAL, INDUSTRIAL - POWER
GENERATION

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted and consumed (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE: INDUSTRIAL		
Month	Diverted Amount (acre-feet)	Consumed Amount (acre-feet)
Jan	1	1
Feb	0	0
Mar	4	4
Apr	2	2
May	2	2
Jun	4	4
Jul	10	10
Aug	17	17
Sept	3	3
Oct	2	2
Nov	1	1
Dec	0	0
Total:	46	46
Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input type="checkbox"/> GPM) N/A		

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?
N/A
(eg, Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____

The Lake Lavon dam is owned, operated and maintained by the USACE.

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17

Contact Name: Thomas W. Kula (972) 442-5405

Print Name Telephone Number

Return completed form by March 01, 2017 to:
 Texas Commission on Environmental Quality * Water Rights Permitting MC 160 * PO Box 13087 * Austin TX 78711-3087
 Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

If you have a change in name, address or ownership, please indicate the changes on this form.

6

Return completed form by March 01, 2017 to:

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Certificate of Adjudication

WATER RIGHT NO: 2410
B 8

WUR USE: MUNICIPAL/DOMESTIC
AUTH USE: MUNICIPAL/DOMESTIC

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE: MUNICIPAL/DOMESTIC	
Month	Diverted Amount (acre-feet)
Jan	14,473
Feb	15,043
Mar	16,340
Apr	17,152
May	17,134
Jun	21,848
Jul	33,399
Aug	31,970
Sept	30,830
Oct	29,166
Nov	19,306
Dec	16,679
Total:	263,340
Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM)	
330,940	

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?
N/A
(eg, Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments:

1953 Priority - 60,000 acre ft
1965 Priority - 44,000 acre ft
2005 Priority - 5,943 acre ft

The Lake Lavon dam is owned, operated and maintained by the USACE.

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17
Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

If you have a change in name, address or ownership, please indicate the changes on this form.

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Permit

WATER RIGHT NO: 5003
B 2

WUR USE: MUNICIPAL/DOMESTIC
AUTH USE: MUNICIPAL/DOMESTIC

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE: MUNICIPAL/DOMESTIC	
Month	Diverted Amount (acre-feet)
Jan	2,514
Feb	2,107
Mar	2,377
Apr	3,147
May	3,940
Jun	3,610
Jul	2,010
Aug	3,616
Sept	970
Oct	328
Nov	3,222
Dec	1,673
Total:	29,514
Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM)	
43,750	

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?
N/A
(eg. Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____
All water - 2005 Priority - 29,514 acre ft

_____ Claimed 77,300 acre ft from 1986 Priority for spill credit

_____ The Texoma dam is owned, operated, and maintained by the USACE.

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17

Contact Name: Thomas W. Kula (972) 442-5405

Print Name Telephone Number

Return completed form by March 01, 2017 to:
Texas Commission on Environmental Quality * Water Rights Permitting MC 160 * PO Box 13087 * Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Permit

WATER RIGHT NO:5003
B 2

WUR USE: INDUSTRIAL
AUTH USE: INDUSTRIAL

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted and consumed (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE: INDUSTRIAL		
Month	Diverted Amount (acre-feet)	Consumed Amount (acre-feet)
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sept	0	0
Oct	0	0
Nov	0	0
Dec	0	0
Total:	0	0
Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM) 0		

Please answer the following questions.

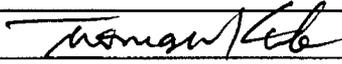
If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?
N/A

(eg. Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____
 The Texoma dam is owned, operated and maintained by the USACE.

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature:  Date: 2/24/17
 Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality * Water Rights Permitting MC 160 * PO Box 13087 * Austin TX 78711-3087
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If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Permit

WATER RIGHT NO: 5003
B 2

WUR USE: MINING
AUTH USE: MINING

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted and consumed (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE: MINING		
Month	Diverted Amount (acre-feet)	Consumed Amount (acre-feet)
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sept	0	0
Oct	0	0
Nov	0	0
Dec	0	0
Total:	0	0
Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM) <div style="text-align: center; margin-top: 5px;">0</div>		

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?

N/A

(eg. Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____
lake Texoma dam is owned, operated, and maintained by the USACE.

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/24/17
 Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

If you have a change in name, address or ownership, please indicate the changes on this form.

Return completed form by March 01, 2017 to:

Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov

Telephone: (512) 239-4691

Table 6 - Water Right Reporting for Water Rights Associated with Lake Lavon for 2016

(6.1) Col. No. --> Units-->	Diversions from Lake Lavon			P-5003		CA-4797 & 4798		P-4301A	
	(6.2) ac-ft	(6.3) ac-ft	(6.4) ac-ft	(6.5) ac-ft	(6.6) ac-ft	(6.7) ac-ft	(6.8) ac-ft	(6.9) ac-ft	(6.10) ac-ft
Month	Total	Industrial	Municipal	Diversion from Texoma	Texoma Inflow to Lavon	Diversion from Chapman	Chapman Inflow to Lavon	GTUA Diversion from Texoma for NTMWD	GTUA Inflow to Lavon
January	14,474	1	14,473	2,514	0	0	0	0	0
February	15,043	0	15,043	2,107	0	0	0	0	0
March	16,344	4	16,340	2,377	0	0	0	0	0
April	17,154	2	17,152	3,147	0	0	0	0	0
May	17,136	2	17,134	3,940	0	0	0	0	0
June	21,852	4	21,848	3,610	0	0	0	0	0
July	33,409	10	33,399	2,010	0	215	215	0	0
August	31,987	17	31,970	3,616	0	4,145	4,145	0	0
September	30,833	3	30,830	970	0	3,647	3,647	0	0
October	29,168	2	29,166	328	0	1,886	1,886	0	0
November	19,307	1	19,306	3,222	0	4,509	4,509	0	0
December	16,679	0	16,679	1,673	0	845	845	0	0
Total	263,386	46	263,340	29,514	0	15,247	15,247	0	0

(6.1) Col. No. --> Units-->	CA-4669C & 4670A		Other Data					
	(6.11) ac-ft	(6.12) ac-ft	(6.13) ac-ft	(6.14) ac-ft	(6.15) ac-ft	(6.16) ac-ft	(6.17) ac-ft	(6.18) ac-ft
Month	Diversion from Upper Sabine	Lavon Inflow from Upper Sabine	Texoma Overdraft	Chapman Overdraft	Wilson Creek WWTP	Other WWTPs to Lavon	East Fork Conveyance PS	Use of Stored RF and Imported Water
January	795	0	9,659	0	4,748	67	0	0
February	829	0	11,204	0	3,794	45	0	0
March	880	0	11,639	0	4,615	90	0	0
April	1,134	0	11,585	0	5,249	72	0	0
May	1,353	0	12,609	0	4,481	46	0	0
June	1,540	0	3,700	13,003	5,097	52	0	0
July	2,453	1,003	16,904	0	4,344	28	110	0
August	4,082	2,548	0	0	4,506	28	3,604	0
September	3,714	2,619	0	0	4,212	25	3,750	0
October	5,855	4,791	0	0	4,195	26	3,641	0
November	4,703	3,942	0	0	4,558	34	3,544	0
December	3,694	2,546	0	0	4,092	32	4,545	0
Total	31,032	17,449	77,300	13,003	53,891	545	19,194	0

WASTEWATER RETURN FLOWS 2016

Plant Name	TPDES Permit No.	Current Flow (MGD)	Current Permit Flow (MGD)	2050 Projected Combined Flow (MGD)
Rowlett Creek WWTP	10363-001	17.67	24.00	122.10
Wilson Creek WWTP	12446-001	47.85	56.00	
South Mesquite Creek WWTP	10221-001	19.63	25.00	51.60
Seis Lagos WWTP	11451-001	0.13	0.25	0.25
Muddy Creek WWTP	14216-001	6.59	10.00	15.30
Wylie WWTP	10384-001	0.00	2.00	
Murphy WWTP	11783-001	0.00	0.25	
Buffalo Creek WWTP	12047-001	1.50	2.25	11.10
Squabble Creek WWTP	10262-001	0.84	1.20	
Rush Creek WWTP	11259-001	0.00		2.50
Shepherds Glen WWTP	11894-001	0.00		
South Side WWTP	13776-001	0.00		
Terry Lane WWTP	13788-001	0.00		
Farmersville WWTP No.1	10442-001	0.00	0.23	3.00
Farmersville WWTP No. 2	10442-002	0.36	0.53	
Garland Rowlett Creek WWTP	24686-001	12.14	24.00	63.30
Garland Duck Creek WWTP	24678-001	16.44	30.00	
Floyd Branch		2.47		
Cottonwood Creek		0.17		
Seagoville				
Stewart Creek West		4.42		
Bear Creek		0.19		
Sabine Creek		1.41		
Panther Creek		4.59		
Crandall				
Kaufman				
Terrell		2.10		
Little Elm		1.50		
Total		139.99		

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Permit

WATER RIGHT NO:4044
B 2

WUR USE: AGRICULTURE
AUTH USE: AGRICULTURE - IRRIGATION

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE	AGRICULTURE	
	Irrigation	Wildlife, Aquaculture, Stockraising and/or Other Agriculture
Month	Diverted Amount (acre-feet)	Diverted Amount (acre-feet)
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	580	0
Aug	0	0
Sept	0	0
Oct	0	0
Nov	0	0
Dec	0	0
Total:	580	0
	Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM) 6,150	Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM) 0

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?
N/A
(eg. Good, Fair, Poor)

Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/28/17
Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

Return completed form by March 01, 2017 to:
Texas Commission on Environmental Quality * Water Rights Permitting MC 160 * PO Box 13087 * Austin TX 78711-3087
Forms may be submitted electronically to WUR@tceq.texas.gov Telephone: (512) 239-4691

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REPORT OF SURFACE WATER USED FOR THE YEAR ENDING 2016

for
Permit

WATER RIGHT NO: 4033
B 2

WUR USE: AGRICULTURE
AUTH USE: AGRICULTURE - IRRIGATION

I am reporting water used for the water right holder(s) listed below.
CN601365448 North Texas Municipal Water District
Additional water right holders may be listed on the back.
 Please check the box if you have a change in name, address or ownership and indicate the changes on the back of this form.

NORTH TEXAS MUNICIPAL WATER DISTRICT
PO BOX 2408
WYLIE, TX 75098-2408

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

If you are receiving this Water Use Report form, you must complete, sign, and return this form to TCEQ. Even if your water use is zero, indicate that on this form, provide a reason or explanation in the comment field, and submit the form to TCEQ. Please coordinate your water use reporting with all holders of this Water Right in order to avoid duplicative reporting.

Complete the table below by entering the amount of water that you diverted (even if zero). **EXCLUDE GROUNDWATER and WATER THAT YOU PURCHASED UNDER A CONTRACT.**

USE	AGRICULTURE	
	Irrigation	Wildlife, Aquaculture, Stockraising and/or Other Agriculture
Month	Diverted Amount (acre-feet)	Diverted Amount (acre-feet)
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sept	0	0
Oct	0	0
Nov	0	0
Dec	0	0
Total:	0	0
	Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM) 0	Maximum Diversion Rate (Specify <input type="checkbox"/> CFS or <input checked="" type="checkbox"/> GPM) 0

Please answer the following questions.

If you have a permitted on-channel impoundment or reservoir, what is the condition of your dam?
N/A
(eg, Good, Fair, Poor)

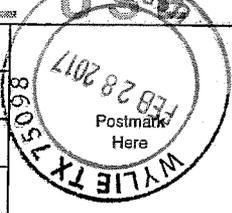
Do you have working low flow outlet(s) on your impoundment(s)? Yes No

Comments: _____

A water right holder who fails to file a completed form by the due date is liable for a penalty for each day past the due date in an amount not to exceed: (1) \$100 per day for a water right authorization of 5,000 acre-feet or less per year; or (2) \$500 per day for a water right authorizing more than 5,000 acre-feet per year.

Signature: Thomas W. Kula Date: 2/28/17
Contact Name: Thomas W. Kula (972) 442-5405
Print Name Telephone Number

SENDER: COMPLETE THIS SECTION	COMPLETE THIS SECTION ON DELIVERY														
<ul style="list-style-type: none"> Complete items 1, 2, and 3. Print your name and address on the reverse so that we can return the card to you. Attach this card to the back of the mailpiece, or on the front if space permits. 	<p>A. Signature <input type="checkbox"/> Agent <input type="checkbox"/> Addressee</p> <p>X</p> <p>B. Received by (Printed Name) C. Date of Delivery</p>														
<p>1. Article Addressed to:</p> <p>TCEQ Water Rights Permitting MC160 P.O. Box 13087 Austin, TX 78711-3087</p>  <p>9590 9401 0017 5205 2072 60</p>	<p>D. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input type="checkbox"/> No</p> <p style="text-align: center; font-size: 1.2em;">SRD/CPA</p> <p style="text-align: center; font-size: 1.5em;">MAR 02 2017</p>														
<p>2. Article Number (Transfer from service label)</p> <p style="text-align: center; font-size: 1.2em;">7014 1820 0000 1025 5662</p>	<p>3. Service Type</p> <table border="0"> <tr> <td><input type="checkbox"/> Adult Signature</td> <td><input type="checkbox"/> Priority Mail Express®</td> </tr> <tr> <td><input type="checkbox"/> Adult Signature Restricted Delivery</td> <td><input checked="" type="checkbox"/> Registered Mail™</td> </tr> <tr> <td><input checked="" type="checkbox"/> Certified Mail®</td> <td><input type="checkbox"/> Registered Mail Restricted Delivery</td> </tr> <tr> <td><input type="checkbox"/> Certified Mail Restricted Delivery</td> <td><input checked="" type="checkbox"/> Return Receipt for Merchandise</td> </tr> <tr> <td><input type="checkbox"/> Collect on Delivery</td> <td><input type="checkbox"/> Signature Confirmation™</td> </tr> <tr> <td><input type="checkbox"/> Collect on Delivery Restricted Delivery</td> <td><input type="checkbox"/> Signature Confirmation Restricted Delivery</td> </tr> <tr> <td><input type="checkbox"/> Restricted Delivery</td> <td></td> </tr> </table>	<input type="checkbox"/> Adult Signature	<input type="checkbox"/> Priority Mail Express®	<input type="checkbox"/> Adult Signature Restricted Delivery	<input checked="" type="checkbox"/> Registered Mail™	<input checked="" type="checkbox"/> Certified Mail®	<input type="checkbox"/> Registered Mail Restricted Delivery	<input type="checkbox"/> Certified Mail Restricted Delivery	<input checked="" type="checkbox"/> Return Receipt for Merchandise	<input type="checkbox"/> Collect on Delivery	<input type="checkbox"/> Signature Confirmation™	<input type="checkbox"/> Collect on Delivery Restricted Delivery	<input type="checkbox"/> Signature Confirmation Restricted Delivery	<input type="checkbox"/> Restricted Delivery	
<input type="checkbox"/> Adult Signature	<input type="checkbox"/> Priority Mail Express®														
<input type="checkbox"/> Adult Signature Restricted Delivery	<input checked="" type="checkbox"/> Registered Mail™														
<input checked="" type="checkbox"/> Certified Mail®	<input type="checkbox"/> Registered Mail Restricted Delivery														
<input type="checkbox"/> Certified Mail Restricted Delivery	<input checked="" type="checkbox"/> Return Receipt for Merchandise														
<input type="checkbox"/> Collect on Delivery	<input type="checkbox"/> Signature Confirmation™														
<input type="checkbox"/> Collect on Delivery Restricted Delivery	<input type="checkbox"/> Signature Confirmation Restricted Delivery														
<input type="checkbox"/> Restricted Delivery															
<p>PS Form 3811, April 2015 PSN 7530-02-000-9053 Domestic Return Receipt</p>															

U.S. Postal Service™ CERTIFIED MAIL® RECEIPT <i>Domestic Mail Only</i>	
For delivery information, visit our website at www.usps.com ®.	
OFFICIAL USE	
<p style="text-align: right; font-size: 1.2em;">7014 1820 0000 1025 5662</p> <p>Postage \$ 1.82</p> <p>Certified Fee 3.35</p> <p>Return Receipt Fee (Endorsement Required) 2.75</p> <p>Restricted Delivery Fee (Endorsement Required)</p> <p>Total Postage & Fees \$ 7.92</p>	 <p>Postmark Here</p>
<p>Sent To TCEQ Water Rights Permitting MC160</p> <p>Street & Apt. No. or PO Box No. P.O. Box 13087</p> <p>City, State, ZIP+4 Austin TX 78711-3087</p>	
<p>PS Form 3800, July 2014 See Reverse for Instructions</p>	

North Texas Municipal Water District
FY 17 SWIFT Multi-Year Funding Commitment
Lower Bois d'Arc Creek Reservoir & Treatment and Treated Water
Distribution

Part C

Supporting Documentation and Attachments

NORTH TEXAS MUNICIPAL WATER DISTRICT

Entity	2016-2017 Water Rates			
	Minimum Annual Demand 1,000 gallons	Water Rate per 1,000 gallons	Minimum Annual Charge	Excess Water Rate per 1,000 gallons
Members:				
Allen	6,011,208	\$ 2.53	\$ 15,208,356.24	\$0.41
Farmersville	280,467	\$ 2.53	\$ 709,581.51	\$0.41
Forney	1,849,256	\$ 2.53	\$ 4,678,617.68	\$0.41
Frisco	10,225,090	\$ 2.53	\$ 25,869,477.70	\$0.41
Garland	13,721,955	\$ 2.53	\$ 34,716,546.15	\$0.41
McKinney	10,762,780	\$ 2.53	\$ 27,229,833.40	\$0.41
Mesquite	8,297,666	\$ 2.53	\$ 20,993,094.98	\$0.41
Plano	26,719,809	\$ 2.53	\$ 67,601,116.77	\$0.41
Princeton	485,886	\$ 2.53	\$ 1,229,291.58	\$0.41
Richardson	11,019,311	\$ 2.53	\$ 27,878,856.83	\$0.41
Rockwall	3,330,881	\$ 2.53	\$ 8,427,128.93	\$0.41
Royse City	448,255	\$ 2.53	\$ 1,134,085.15	\$0.41
Wylie	1,877,558	\$ 2.53	\$ 4,750,221.74	\$0.41
Total Members	95,030,122		\$ 240,426,208.66	
Customers:				
Ables Springs SUD	75,600	\$ 2.58	\$ 195,048.00	\$0.46 a
BHP WSC	138,023	\$ 2.58	\$ 356,099.34	d
Bonham	640,000	\$ 2.53 b	\$ 1,619,200.00	c
Bear Creek SUD	235,321	\$ 2.58	\$ 607,128.18	\$0.46
Caddo Basin SUD	334,397	\$ 2.58	\$ 862,744.26	\$0.46
Cash SUD	305,643	\$ 2.58	\$ 788,558.94	\$0.46
College Mound SUD	66,769	\$ 2.58	\$ 172,264.02	\$0.46
Copeville SUD	88,587	\$ 2.58	\$ 228,554.46	c
East Fork SUD	404,972	\$ 2.58	\$ 1,044,827.76	\$0.46
Fairview	887,811	\$ 2.58	\$ 2,290,552.38	\$0.46
Fate	279,932	\$ 2.58	\$ 722,224.56	\$0.46
Fate No. 2	529,453	\$ 2.58	\$ 1,365,988.74	\$0.46
Forney Lake WSC	329,424	\$ 2.58	\$ 849,913.92	\$0.46
Gastonia Scurry SUD	110,490	\$ 2.58	\$ 285,064.20	e
GTUA	383,733	\$ 2.58	\$ 990,031.14	\$0.46
Josephine	62,039	\$ 2.58	\$ 160,060.62	\$0.46
Kaufman	459,989	\$ 2.58	\$ 1,186,771.62	d
Kaufman Four-One	528,801	\$ 2.58	\$ 1,364,306.58	\$0.46
Little Elm	1,235,350	\$ 2.58	\$ 3,187,203.00	c
Lucas	628,590	\$ 2.58	\$ 1,621,762.20	\$0.46
Melissa	248,326	\$ 2.58	\$ 640,681.08	\$0.46
Milligan WSC	149,894	\$ 2.58	\$ 386,726.52	c
Mt. Zion WSC	159,302	\$ 2.58	\$ 410,999.16	\$0.46
Murphy	1,404,775	\$ 2.58	\$ 3,624,319.50	\$0.46
Nevada SUD	47,179	\$ 2.58	\$ 121,721.82	\$0.46
Nevada SUD No.2	70,985	\$ 2.58	\$ 183,141.30	\$0.46
North Collin SUD	346,058	\$ 2.58	\$ 892,829.64	d
Parker	533,654	\$ 2.58	\$ 1,376,827.32	\$0.46
Prosper	1,317,827	\$ 2.58	\$ 3,399,993.66	d
Rose Hill SUD	143,271	\$ 2.58	\$ 369,639.18	c
Rowlett	3,192,039	\$ 2.58	\$ 8,235,460.62	c
Sachse	1,332,153	\$ 2.58	\$ 3,436,954.74	\$0.46
Seis Lagos MUD	133,220	\$ 2.58	\$ 343,707.60	\$0.46
Sunnyvale	595,071	\$ 2.58	\$ 1,535,283.18	c
Terrell	1,400,000	\$ 2.58	\$ 3,612,000.00	c
Wylie N.E. SUD	216,350	\$ 2.58	\$ 558,183.00	\$0.46
Total Customers	19,015,028		\$ 49,026,772.24	
Total	114,045,150		\$ 289,452,980.90	

a Water consumed over 365,000,000 gallons shall be charged at a rate of \$2.58 / 1,000 gallons.

b Pays Member Rate.

c Excess Water Rate Subject to Contract Minimums.

d Water consumed over Minimum Annual Demand shall be charged at a rate of \$2.58 / 1,000 gallons.

e Water consumed over Minimum Annual Demand shall be charged at a rate of \$5.16 / 1,000 gallons.

CAUSE NO. D-1-GN-17-000861

EX PARTE,

§ IN THE DISTRICT COURT

**§
§
§
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§
§
§
§**

OF TRAVIS COUNTY, TEXAS

**NORTH TEXAS MUNICIPAL
WATER DISTRICT**

98th JUDICIAL DISTRICT

**NORTH TEXAS MUNICIPAL WATER DISTRICT'S
ORIGINAL PETITION FOR EXPEDITED DECLARATORY JUDGMENT**

TO THE HONORABLE JUDGE OF SAID COURT:

North Texas Municipal Water District (the "District") files this Original Petition, seeking an expedited declaratory judgment pursuant to Chapter 1205 of the Texas Government Code (the "Expedited Declaratory Judgment Act" or "EDJA").

**I.
EXECUTIVE SUMMARY**

1. On December 14, 2016, District member cities Garland, Mesquite, Plano, and Richardson (collectively, the "PUC Petitioners") filed a petition (the "PUC Petition") at the Public Utility Commission of Texas (the "PUC").¹ The PUC Petition, though titled a "rate appeal" (hereafter, the action before the PUC is the "PUC Proceeding"), in substance impermissibly challenges the validity of the PUC Petitioners' August 1, 1988 Regional Water Supply Facilities Amendatory Contract (the "Contract") with the District.² The PUC Petitioners

¹ See *Original Petition Appealing Wholesale Water Rates*, Public Utility Commission of Texas (P.U.C.) Docket No. 46662 (Dec. 14, 2016), available at http://interchange.puc.state.tx.us/WebApp/Interchange/Documents/46662_1_921904.PDF.

² The Cities of Allen, Forney, Farmersville, Frisco, McKinney, Princeton, Rockwall, Royse City, and Wylie (collectively, the "Intervenors") subsequently intervened in the proceeding at the PUC. Together the PUC Petitioners and the Intervenors are the "Member Cities." Further, Allen and Frisco signed the Contract as separate instruments in 1998 and 2001 respectively. The signatories to the 1988 Contract are the cities of Forney, Farmersville, Garland, Mesquite, McKinney, Plano, Princeton, Richardson, Rockwall, Royse City, and Wylie

challenge the Contract despite the fact that the Legislature, by statute, has deemed the Contract valid, binding, and incontestable for any reason.

2. Because the Contract provides the principal source and security for payment of the District's outstanding bonds,³ the PUC Petition necessarily also challenges the legality and validity of the Bonds. Therefore, the District seeks the following declaratory judgments: (1) the District was authorized to issue the Bonds; (2) the District's actions authorizing the Bonds were legal and valid; (3) the Contract is legal and valid in all respects, including not being void as against public policy, and not being adverse to the public interest; (4) the rate and/or charges imposed by the Contract is legal and valid; (5) the revenues pledged to secure the Bonds are legal and valid; (6) the expenditures of the money relating to the issuance of the Bonds are legal and valid; and (7) the Bonds are legal and valid.

II. DISCOVERY LEVEL

3. Limited discovery in this case, if any, shall be conducted under Level 3, as provided for in Tex. R. Civ. P. 190.4. If allowed, discovery in this case should be expedited to meet the statutory standards. *See* Tex. Gov't Code § 1205.065(a) (“[t]he court shall ***with the least possible delay***: (1) hear and determine each legal or factual question in the declaratory judgment action; and (2) render a final judgment.”) (emphasis added).

III. VENUE AND JURISDICTION

4. Travis County, Texas, is the proper venue for this lawsuit. Tex. Gov't Code § 1205.022.

(collectively, the “1988 Contract Cities”).

³ The District's outstanding bonds are the Series 2008 Bonds, the Series 2009A Bonds, the Series 2009B Bonds, the Series 2009C Bonds, the Series 2009D Bonds, the Series 2010 Bonds, the Series 2010A Bonds, the Series 2012 Bonds, the Series 2014 Bonds, the Series 2015 Bonds, and the Series 2016 Bonds, which are each defined more specifically in Paragraph 27 below and are referenced collectively as the “Bonds.”

5. This Court has jurisdiction over the subject matter of this action, over all interested parties, and over the Attorney General of Texas pursuant to the EDJA.

**IV.
NATURE OF THE PROCEEDING**

6. This is an *in rem* proceeding. As provided in the EDJA, any judgment in this action is a class action binding on all persons who (1) reside in the District's territory; (2) own property located within the District's boundaries; (3) are taxpayers of the District; or (4) have or claim a right, title, or interest in any property or money to be affected by the public security authorization or the issuance of the public securities (the "Interested Parties"). Tex. Gov't Code § 1205.023.

**V.
SERVICE ON ATTORNEY GENERAL**

7. In accordance with Section 1205.042 of the EDJA, the Attorney General of Texas (the "Attorney General") must be served a copy of this petition and the accompanying order before the twentieth day before the trial date set in such order. The Attorney General of Texas may be served with citation at the following address: Office of the Attorney General, 300 W. 15th Street, Austin, Texas 78701.

**VI.
INTERESTED PARTIES AND NOTICE TO INTERESTED PARTIES**

8. Subject to the notice requirements imposed by the EDJA and described below, all Interested Parties are parties to this action, and the Court's jurisdiction extends to each of them as though they were individually named and personally served in this action. Tex. Gov't Code § 1205.044. Any Interested Party may become a named party to this action by filing an answer to this petition on or before the time set for trial, or thereafter with leave of court. Tex. Gov't Code § 1205.062.

9. Section 1205.041 of the EDJA requires the Court, upon receipt of this petition, to “immediately issue” an order, in the form of a notice, advising all Interested Parties and the Attorney General of their right to appear for trial at 10:00 a.m., on the first Monday after the 20th day after the date of the Court’s order and to show cause why this petition should not be granted and the public securities or public security authorization validated and confirmed. A copy of the proposed order is attached hereto as Exhibit A.

10. Pursuant to Section 1205.043 of the EDJA, the Clerk of the Court is required to publish “a substantial copy of the order” in a “newspaper of general circulation” in Travis County, Texas; the county of the District’s principal office, which is Collin County; and each county in which the District has territory, which are Dallas, Denton, Collin, Hunt, Kaufman, and Rockwall counties. The District is also providing notice to each of the counties located in the District’s service area, though not located in the District’s territory, which are Fannin, Grayson, Hopkins, Rains, and Van Zandt counties. Such notice shall be published “once in each of two consecutive calendar weeks, with the date of first publication before the 14th day before the trial date.”⁴ *Id.*

VII. AUTHORITY TO BRING ACTION

11. Each of the Bonds constitutes a “public security” within the meaning of Section 1205.001 of the Government Code. The EDJA affords issuers of public securities, such as the District, and Interested Parties with an efficient method of adjudicating the validity of public securities and their associated contracts. Section 1205.021 provides in pertinent part:

An issuer may bring an action under [the EDJA] to obtain a declaratory judgment as to: (1) the authority of the issuer to issue the public securities; (2) the legality

⁴ As a courtesy and in the interest of ensuring that all Member Cities receive actual notice of this suit, a copy of the Petition has also been provided to each of the Member Cities, as reflected in the Certificate of Service attached hereto.

and validity of each public security authorization relating to the public securities, including if appropriate: . . . (B) the organization or boundaries of the issuer; . . . (D) the execution or proposed execution of a contract; (E) the imposition of a rate, fee, charge, or toll or the enforcement of a remedy relating to the imposition of that rate, fee, charge, or toll; and (F) the pledge or encumbrance of a tax, revenue, receipts, or property to secure the public securities; (3) the legality and validity of each expenditure or proposed expenditure of money relating to the public securities; and (4) the legality and validity of the public securities.

Tex. Gov't Code § 1205.021. The EDJA affords issuers such as the District the ability to bring an EDJA suit before or after the public securities at issue are authorized, issued, or delivered.

Tex. Gov't Code § 1205.025.

VIII. FACTUAL BACKGROUND

A. North Texas Municipal Water District.

12. The District is a conservation and reclamation district and political subdivision of the State of Texas, created and functioning under Article 16, Section 59, of the Texas Constitution. The District is comprised of 13 Member Cities and it provides wholesale water service to those Member Cities and other non-member regional customers (the “Customers”). The District’s water system consists of six water treatment plants, 573 miles of water transmission pipelines, nine pump stations, and water rights in four lakes and ultimately serves a population of approximately 1.6 million people across 11 counties in one of the fastest growing areas of the nation (the “Water System”).

13. By enacting Act of April 4, 1951, 52nd Leg., R.S., ch. 62, 1951 Tex. Gen. Laws 96, 103-04 (the “Original Enabling Act”),⁵ the Legislature created the District at the urging of

⁵ The Original Enabling Act has since been amended. Act of April 4, 1951, 52nd Leg., R.S., ch. 62, 1951 Tex. Gen. Laws 96, 103-04; Act of April 24, 1969, 61st Leg., R.S., ch. 122, 1969 Tex. Gen. Laws 334, 334-337; Act of April 23, 1975, 64th Leg., R.S., ch. 90, 1975 Tex. Gen. Laws 238, 238-242; Act of April 28, 2009, 81st Leg., R.S., ch. 20, 2009 Tex. Gen. Laws 37, 37-40. The Original Enabling Act, as amended and as it currently exists, is hereinafter referred to collectively as the “Enabling Act.”

the residents of the Original Member Cities⁶ that each needed a source of water supply, but were not individually able to secure bonds and meet the revenue requirements necessary to own and operate a municipal water system.⁷ The District's principal office is located in Collin County, Texas.

B. The Contract between the District and 1988 Contract Cities.

14. The District and the Original Member Cities entered into a water supply contract in 1953 to purchase potable water that was ultimately to be provided to the Original Member Cities' ratepayers. Subsequently, in 1988 the 1988 Contract Cities entered into the Contract, which set out the terms under which the 1988 Contract Cities pledged revenues sufficient for the District to secure and maintain a water supply for the benefit of the Member Cities.

15. Under the Contract, a true and correct copy of which is attached as Exhibit B, the District is obligated to issue bonds and acquire and construct the Water System to provide treated water to the Member Cities with no limit as to the amount or capacity. Contract, §§ 2-3. In return, each 1988 Contract City agreed in the Contract to pay its proportionate share of the Water System annual debt service and operation and maintenance costs (defined as the "Annual Requirement") with such proportionate share, again according to the Contract, to be based on each Member City's highest actual historic annual use. Contract, § 9(c).

16. In addition, each 1988 Contract City contractually agreed to be unconditionally obligated to pay its proportionate share whether or not it actually receives or uses the water from the Water System. Contract, § 10(g). This arrangement is reasonable because the District must

⁶ The Original Member Cities are the cities of Farmersville, Forney, Garland, McKinney, Mesquite, Plano, Princeton, Rockwall, Royse City, and Wylie.

⁷ BILL SLOAN, GIFT OF WATER, LEGACY OF SERVICE: A HISTORY OF THE NORTH TEXAS MUNICIPAL WATER DISTRICT, 23-46 (Taylor Publishing Co., 1994), <https://www.ntmwd.com/documents/gift-water-legacy-service-book/>.

construct and install the infrastructure necessary to provide water to each of the Member Cities regardless of the amount of water the Member Cities take. Stated differently, the District's capital investment costs are fixed and must be incurred to have the facilities necessary to provide water service.

17. Since its inception, the District's Enabling Act has provided, and still currently provides, in Section 14:

After any bonds . . . are authorized by the District, such bonds and the record relating to their issuance shall be submitted to the Attorney General for his examination as to the validity thereof. Where such bonds recite that they are secured by a pledge of the proceeds of a contract therefore made between the District and any city or other governmental agency or district, a copy of such contract and the proceedings of the city or other governmental agency or District authorizing such contract shall also be submitted to the Attorney General. If such bonds have been authorized and if such contracts have been made in accordance with the Constitution and Laws of the State of Texas he shall approve the bonds and such contracts and the bonds then shall be registered by the Comptroller of Public Accounts. ***Thereafter the bonds, and the contracts, if any, shall be valid and binding and shall be incontestable for any cause.***⁸

Also, the Enabling Act, as it existed at the time the Contract was executed and approved by the Attorney General (now replaced with a reference to Chapter 1202 of the Texas Government Code, which includes essentially the same language) stated the following in Section 27:

(j) All bonds issued pursuant to this section and the appropriate proceedings authorizing their issuance shall be submitted to the Attorney General of the State of Texas for examination. . . . Also, if the bonds recite that they are secured by a pledge of revenues of any contract, a copy of such contract and the proceedings relating thereto shall be submitted to the [A]ttorney [G]eneral. If he finds that such bonds have been authorized and any such contract has been made in accordance with the law, he shall approve the bonds and any such contract, and thereupon the bonds shall be registered by the Comptroller of Public Accounts for the State of Texas; and after such approval and registration, such bonds and any such contract ***shall be incontestable in any court or other forum for any reason,***

⁸ Enabling Act, § 14 (emphasis added).

and shall be valid and binding obligations in accordance with [its] terms for all purposes.⁹

18. Therefore, the District is required to submit its bonds and the Contract for examination and approval by the Attorney General. Once the Attorney General approves the bonds and the Contract, the bonds and Contract are required to be registered by the Comptroller. Once approved and registered with the Comptroller, the bonds and the Contract become valid, binding, ***and incontestable in any court or other forum for any reason.***

19. Accordingly, in 1989, the District submitted its Water System Revenue Bonds, Series 1989¹⁰ (the “1989 Bonds”) and the Contract to the Attorney General, and the Attorney General approved the 1989 Bonds and the Contract, including specifically the revenues generated from payments made under the Contract for the District’s repayment of the 1989 Bonds (the “Pledged Revenues”).¹¹ After approval, the 1989 Bonds were registered with the Comptroller.¹²

⁹ Act of April 23, 1975, 64th Leg., R.S., ch. 90, § 1, sec. 27(j), 1975 Tex. Gen. Laws 238, 238-242 (emphasis added). In 2009, the Legislature removed this Section 27(j) from the Enabling Act and replaced it with a reference to Texas Government Code Chapter 1202, which contains substantially similar language. Act of April 28, 2009, 81st Leg., R.S., ch. 20, § 4, sec. 27(j), 2009 Tex. Gen. Laws 37, 39 (“Chapter 1202, Government Code, applies to the issuance of bonds by the district.”). Section 1202.006(a) provides: “A public security and any contract the proceeds of which are pledged to the payment of the public security are valid and incontestable in a court or other forum and are binding obligations for all purposes according to their terms: (1) after the public security is approved by the [A]ttorney [G]eneral and registered by the comptroller; and (2) on issuance of the public security.” Section 27(j), both as effective in 1988 when the Contract was executed and approved by the Attorney General, and as it presently exists, makes the Contract incontestable. In addition, the Legislature has also enacted a similar provision generally applicable to all districts created under Article XVI, Section 59 of the Texas Constitution. Tex. Water Code Ann. § 49.184(a), (e) (West 2008).

¹⁰ The Board’s action (Resolution Authorizing the Issuance, Sale, and Delivery of North Texas Municipal Water District Water System Revenue Bonds, Series 1989, and Approving and Authorizing Instruments and Procedures Relating Thereto) authorizing the issuance of the District’s 1989 Bonds is attached as Exhibit C.

¹¹ Letter from Jim Mattox, Attorney General of the State of Texas (Aug. 10, 1989) (attached as Exhibit D).

¹² Comptroller Registration from Bob Bullock, Comptroller of the State of Texas (Aug. 10, 1989) (attached as Exhibit E).

20. Each subsequent bond series specifically pledged revenues from the Contract for repayment of the Bonds.¹³ The District submitted all of the Bonds to the Attorney General, and the Attorney General has approved all of the Bonds and repeatedly reaffirmed its approval of the pledge of the Pledged Revenues.¹⁴ All of the Bonds have also been registered with the Comptroller.¹⁵

21. Therefore, the Bonds and the Contract are, as a matter of law, “incontestable in any court or other forum for any reason, and . . . [are] valid and binding . . . for all purposes.” Section 27(j);¹⁶ *see also* Enabling Act, § 14; Tex. Gov’t Code § 1202.006(a); Tex. Water Code § 49.184(e).

IX. WHY THIS EXPEDITED DECLARATORY JUDGMENT IS NECESSARY

22. The District currently has outstanding \$1,387,285,000 in Water System revenue bonds and plans to issue more bonds in 2018. Yet, despite the fact that the Legislature, by statute, has deemed the Bonds and Contract valid and binding for all purposes, and incontestable for any reason in any forum, the PUC Petitioners contest the Contract’s terms in the PUC Petition.

23. In the PUC Petition, the PUC Petitioners have represented that they do not challenge the revenue requirement set by the District, but rather contest the Contract’s terms that set forth the method for allocating the recovery of the District’s revenue requirement among the

¹³ Pertinent excerpts from Official Statements for Series 2008 Bonds; Series 2009C Bonds; Series 2009D Bonds; Series 2010 Bonds; Series 2010A Bonds; Series 2012 Bonds; Series 2014 Bonds; Series 2015 Bonds; and Series 2016 Bonds are attached collectively as Exhibit F. There are no Official Statements for the Series 2009A Bonds or Series 2009B Bonds.

¹⁴ The Attorney General approval letters for each of the Bonds are attached collectively as Exhibit G.

¹⁵ The Comptroller Registration Certificates for each of the Bonds are attached collectively as Exhibit H.

¹⁶ *See supra* note 9, at 8.

Member Cities. The first part of the PUC Petition is a request for a finding that the Contract is not in the public interest. Only after the PUC makes such a finding (step 1) may the PUC consider and grant further relief (step 2). However, the PUC Petitioners do not request the PUC to grant the only relief in step 2 that is provided for under the PUC's rules, which is to establish a new cost-of-service rate. Instead, the PUC Petitioners improperly request that the PUC reform the Contract. Specifically, the PUC Petitioners ask the PUC to change the Contract's cost-allocation provisions that provide the revenue pledged to repay the Bonds.

24. Recognizing that a challenge to a contract providing revenues pledged to secure repayment of the District's bonds could disrupt Water System financing, the Legislature specifically provided statutory protection for the Contract when it created the District. Enabling Act, § 14. Beyond that, the Legislature crafted this EDJA mechanism by which bond issuers generally can further ensure certainty with respect to their public securities and insulate the issuer from situations such as this one. Tex. Gov't Code §§ 1205.001-1205.152.

25. Without the certainty the EDJA provides, such challenges could limit or inhibit the District from being able to repay its Bonds, jeopardize the Contract executed by the District—the revenue from which was pledged to secure payment of the Bonds—and call into question the Contract's rate and/or charges that are intended to be used to make payment on the Bonds.

X.
CAUSE OF ACTION: DECLARATORY JUDGMENT

A. Pleading Requirements.

Section 1205.024 of the EDJA provides that this pleading contain at least certain information. That information is set forth above and summarized as follows:

26. Section 1205.024(1): “the issuer’s authority to issue the public securities” – The District has authority to issue the Bonds pursuant to the Enabling Act and Chapters 1207 and 1371 of the Texas Government Code. Specifically, pursuant to the Enabling Act, the District has broad powers to (1) impound, control, store, preserve, treat, transmit and use storm and floodwater, the water of rivers and streams, and underground water, for irrigation, power, and all other useful purposes, and to supply water for municipal, domestic, power, industrial and commercial uses and purposes, and all other beneficial uses and purposes; (2) collect, transport, process, treat, dispose of, and control, all municipal, domestic, industrial, or commercial waste whether in fluid, solid, or composite state, including specifically the control, abatement, or reduction of all types of pollution; and (3) to refund obligations issued for the foregoing purposes. Enabling Act, §§ 27(a), (h). Chapter 1207 authorizes water districts to issue refunding bonds “to refund all or any part of the issuer’s outstanding bonds, notes, or other general or special obligations,” and secure such bonds by and payable from the District’s revenue. Tex. Gov’t Code §§ 1207.002, 1207.005. Similarly, Chapter 1371 authorizes local governments such as the District to issue, sell, and deliver a bond obligation to (1) finance a project cost; or (2) refund an obligation issued in connection with an eligible project. Tex. Gov’t Code § 1371.051.

27. Section 1205.024(2): “the purpose of the public securities” – The purposes of the Bonds are as follows:

- Water System Revenue Bonds, Series 2008 (“Series 2008 Bonds”) – to provide funds for improving the Water System.
- Water System Revenue Bonds, Series 2009A (“Series 2009A Bonds”) – to provide funds for improving the Water System, and in particular for paying costs required to obtain necessary permits for the Lower Bois D’Arc Creek Reservoir.
- Water System Revenue Bonds, Series 2009B (“Series 2009B Bonds”) – to provide funds for improving the Water System.
- Water System Revenue Refunding and Improvement Bonds, Series 2009C (“Series 2009C Bonds”) – to provide funds for (1) improving the Water System through the acquisition of mitigation land and interests in such land necessary for the Lower Bois D’Arc Creek Reservoir and through the acquisition and construction of certain treatment process improvements, and (2) refunding the District’s Water System Revenue Bonds, Series 2001.
- Water System Revenue Bonds, Taxable Series 2009D-Build America Bonds (“Series 2009D Bonds”) – to provide funds for improving the Water System through the acquisition of mitigation land and interests in such land necessary for the Lower Bois D’Arc Creek Reservoir, and through the acquisition and construction of certain water treatment process improvements.
- Water System Revenue Bonds, Series 2010 (“Series 2010 Bonds”) – to provide funds for (1) improving the Water System through prepayment of amounts payable by the District pursuant to a Water Storage Agreement with the Department of the Army with respect to Lake Texoma, (2) making a

deposit to the reserve fund, and (3) paying costs incident to the issuance of the bonds.

- Water System Revenue Bonds Taxable, Series 2010A-Build America Bonds (“Series 2010A Bonds”) – to provide funds for (1) improving the Water System through acquisition and construction of ozonation facilities at the District’s Wylie Wastewater Treatment Plant, (2) making a deposit to the reserve fund, and (3) paying costs incident to the issuance of the bonds.
- Water System Revenue Refunding and Improvement Bonds, Series 2012 (“Series 2012 Bonds”) – to provide funds for (1) improving the Water System through the design, acquisition, and construction of facilities for the extension of the Texoma Raw Water Pipeline to the Wylie Water Treatment Plant and other related improvements to the Water System; (2) refunding the refunded bonds, (3) making a deposit to the reserve fund; and (4) paying the costs of issuance of such bonds.
- Water System Revenue Refunding and Improvement Bonds, Series 2014 (“Series 2014 Bonds”) – for the purpose of (1) improving the Water System through the acquisition of property and design of the dam for Lower Bois D’Arc Creek Reservoir, construction of the Wylie Water Treatment Plant II filter underdrain improvements, construction of Shiloh Pump Station improvements, and other related Water System improvements; (2) refunding the refunded bonds; (3) making a deposit to the reserve fund; and (4) paying the costs of issuance of such bonds.

- Water System Revenue Refunding and Improvement Bonds, Series 2015 (“Series 2015 Bonds”) – for the purpose of (1) constructing the Trinity Main Stem Pump Station, purchasing pipe material for the Trinity Main Stem raw water pipeline, construction of the Wylie water treatment plant chemical system improvements, and other related improvements to the Water System; (2) refunding the refunded bonds; and (3) paying the costs of issuance of such bonds.
- Water System Revenue Refunding and Improvement Bonds, Series 2016 (“Series 2016 Bonds”) – for the purpose of (1) improving the Water System by constructing the Wylie Water Treatment Plant No. 4 70 MGD Expansion, constructing the Trinity River Main Stem Pump Station and Pipeline, constructing the North System Exchange Parkway 13.5 MG Ground Storage Facilities, constructing the North McKinney Pipeline, and other Water System improvements; (2) refunding the refunded bonds; (3) making a deposit to the reserve fund; and (4) paying the costs of issuance of such bonds.

28. Section 1205.024(3): “the holding and result of any required election” – Not applicable because no elections are required to affect any revenue bond issuance of the District.

29. Section 1205.024(4): “a copy of or a pertinent excerpt from each public security authorization, including any essential action or expenditure of money” – The Board’s actions authorizing the issuance of the District’s Bonds are attached collectively as Exhibit I.

30. Section 1205.024(5): “the amount or proposed maximum amount of the public securities” – The total amount of the Bonds is \$1,387,285,000. Specifically, each of the Bonds are in the following amounts, which equal the above-referenced total:

Date	Outstanding Bond Amount	Issue Description
06/15/2008	\$5,065,000	Series 2008 Bonds
03/01/2009	\$9,930,000	Series 2009A Bonds
07/15/2009	\$25,750,000	Series 2009B Bonds
11/15/2009	\$13,575,000	Series 2009C Bonds
11/15/2009	\$103,740,000	Series 2009D Bonds
10/15/2010	\$14,250,000	Series 2010 Bonds
10/15/2010	\$108,345,000	Series 2010A Bonds
06/15/2012	\$312,720,000	Series 2012 Bonds
06/15/2014	\$167,230,000	Series 2014 Bonds
04/15/2015	\$296,120,000	Series 2015 Bonds
10/15/2016	\$330,560,000	Series 2016 Bonds

31. Section 1205.024(6): “the interest rate or rates or the proposed maximum interest rate of the public securities” – The interest rates on the Bonds are as follows:

- Series 2008 Bonds – the interest rate ranges from 4.000 percent to 5.000 percent.
- Series 2009A Bonds – the interest rate ranges from 1.452 percent to 3.018 percent.
- Series 2009B Bonds – the interest rate ranges from 0.854 percent to 2.706 percent.
- Series 2009C Bonds – the interest rate ranges from 4.000 percent to 5.000 percent.

- Series 2009D Bonds – the interest rate ranges from 4.363 percent to 6.123 percent.
- Series 2010 Bonds – the interest rate ranges from 3.500 percent to 4.000 percent.
- Series 2010A Bonds – the interest rate ranges from 4.320 percent to 6.010 percent.
- Series 2012 Bonds – the interest rate ranges from 3.125 percent to 5.250 percent.
- Series 2014 Bonds – the interest rate ranges from 3.500 percent to 5.000 percent.
- Series 2015 Bonds – the interest rate ranges from 3.000 percent to 5.000 percent.
- Series 2016 Bonds – the interest rate ranges from 4.000 percent to 5.000 percent.

32. Section 1205.024(7): “in a suit relating to the validity or organization of an issuer, the authority for and the proceedings relating to the creation of the issuer or a boundary change” – Not applicable because the validity or organization of the District is not in dispute.

B. Declaratory Judgment.

33. The District has brought this action under the EDJA in order to obtain the following declaratory judgments:

- (1) the District was authorized to issue the Bonds;
- (2) the District’s actions authorizing the Bonds were legal and valid;

- (3) the Contract is legal and valid in all respects, including not being void as against public policy and not being adverse to the public interest;
- (4) the rate and/or charges imposed by the Contract are legal and valid;
- (5) the revenues pledged to secure the Bonds are legal and valid;
- (6) the expenditures of the money relating to the issuance of the Bonds are legal and valid; and
- (7) the Bonds are legal and valid.

XI.
OPPOSING PARTIES MUST POST BOND

34. The District would further request, pursuant to Texas Government Code Sections 1205.101-104, this Court to require any party opposing this action, or any intervenor, other than the Attorney General, to post a bond, with sufficient surety approved by the Court, payable to the District, for the payment of all damages and costs, including but not limited to changes in the interest rate, increased transaction costs, increased construction costs, increased securities law disclosure compliance costs, and lost savings resulting from the delay that will be occasioned by the continued participation of such opposing party or intervenor in these proceedings in the event the District finally prevails and obtains substantially the judgment prayed for in this Petition. All of these damages may occur and may impact the District with respect to anticipated bonds with a principal amount in excess of \$735,000,000 to primarily fund a portion of the construction of the Lower Bois D'Arc Creek Reservoir Project, which the District expects to issue in early 2018 following a resolution approving that issuance. The District further requests that if said opposing parties are ordered to post a bond by this Court and they do not comply within ten (10) days from such order to post a bond, such opposing parties or intervenors be dismissed from this suit.

**XII.
COSTS OF SUIT**

35. The District would further show and request that, pursuant to Texas Government Code Section 1205.066(b), all costs of this suit should be taxed against any opposing or intervening party, other than the Attorney General, to this suit.

**XIII.
APPLICATION FOR PERMANENT INJUNCTION**

36. Paragraphs 1-35 are incorporated herein by reference.

37. Pursuant to Texas Government Code Section 1205.151(c), the judgment validating the Bonds operates as a permanent injunction against the filing of any proceeding by any person contesting the validity of (1) the Bonds, (2) the 1988 Contract, and (3) any other matter that could have been raised in this action. The District requests that the Court grant such permanent injunction following trial on the merits.

**XIV.
PRAYER**

WHEREFORE, PREMISES CONSIDERED, the District respectfully prays for the following:

(a) this Court, upon presentation of this Petition, immediately enter and issue the Order in the form and having the terms attached hereto as Exhibit A, in accordance with Sections 1205.041 and 1205.042 of the EDJA, directed to all Interested Parties and the Attorney General of Texas;

(b) The District further prays the Court, prior to the date set for hearing and trial, to order the Clerk of the Court to provide the required notice of this proceeding pursuant to Section 1205.043 of the EDJA by publishing a substantial copy of the Order in a newspaper of general circulation in Travis County and Dallas, Denton, Collin, Fannin, Grayson, Hopkins, Hunt,

Kaufman, Rains, Rockwall, and Van Zandt counties, said notice to be so published once in each of two consecutive calendar weeks, with the date of the first publication to be not less than 14 days prior to the date set for the hearing and trial;

(c) The District further prays the Court, pursuant to Section 1205.101 of the EDJA, to require any party who intervenes or opposes this action, other than the Attorney General, to post a bond, with sufficient surety, payable to the District, for the payment of all damages and costs incurred by the continued participation of such opposing or intervening party in the event the District prevails and obtains substantially the judgment prayed for in this Petition, and further that if said opposing parties do not comply with this Court's order to post a bond within ten (10) days of the bond order, that such opposing parties or intervenors be dismissed from suit;

(d) The District further prays the Court, pursuant to Section 1205.065 of the EDJA, to hear and determine "with the least possible delay" each factual and legal question raised by this Petition and render judgment;

(e) The District further prays the Court, upon trial and final hearing, to enter the following declaratory judgments:

- i. the District was authorized to issue the Bonds;
- ii. the District's actions authorizing the Bonds were legal and valid;
- iii. the Contract is legal and valid in all respects, including not being void as against public policy and not being adverse to the public interest;
- iv. the rate and/or charges imposed by the Contract are legal and valid;
- v. the revenues pledged to secure the Bonds are legal and valid;
- vi. the expenditures of the money relating to the issuance of the Bonds are legal and valid; and

vii. the Bonds are legal and valid.

(f) Upon trial and final hearing, the District further prays that the Court to award the District the following additional relief:

- i. an award of all costs of this suit incurred by the District against any party that opposes or intervenes in this suit pursuant to Section 1205.066(b) of the EDJA;
- ii. a decree, pursuant to Section 1205.151 of the EDJA, that the judgment herein prayed for shall, as to all matters adjudicated, or which could have been raised in this proceeding, be forever binding and conclusive against the District, the Attorney General of Texas, the Comptroller of Texas, and all parties to the cause, whether mentioned in and served with notice of the proceedings, or included in the description all “others having or claiming any right, title, or interest in any properties or funds to be affected by the proceedings and/or issuance of the Bonds, or interested or affected in any way thereby, or by the proceedings, including all actions and expenditures of funds, taken or made and/or proposed to be taken or made in connection with or affecting said Bonds,” and that same shall constitute a permanent injunction against the institution by any person or entity of any action or proceedings contesting the validity of the Bonds, the proceedings authorizing the Bonds, the expenditure of moneys relating to the Bonds, each provision made for the payment of the Bonds, including specifically the Contract and the rates and/or charges imposed thereunder, or of any

- interest on the Bonds, or any matters adjudicated by this judgment, or which could have been raised in this proceeding; and
- iii. grant the District have such other and further relief and orders to which it may be entitled at law and equity.

Respectfully submitted,

LLOYD GOSSELINK
ROCHELLE & TOWNSEND, P.C.
816 Congress Avenue, Suite 1900
Austin, Texas 78701
Telephone: (512) 322-5800
Fax: (512) 472-0532

By: /s/ Jose E. de la Fuente
JOSE E. de la FUENTE
State Bar No. 00793605
jdelafuente@lglawfirm.com
JAMES F. PARKER, III
State Bar No. 24027591
jparker@lglawfirm.com
ASHLEY D. THOMAS
State Bar No. 24090430
athomas@lglawfirm.com
LAUREN S. MARTIN
State Bar No. 24079380
lmartin@lglawfirm.com

ATTORNEYS FOR PLAINTIFF

CERTIFICATE OF SERVICE

As a courtesy, copies of this pleading have been provided to the following Member Cities
via certified mail, return receipt requested on this 1st day of March, 2017:

City of Allen

Peter G. Smith
psmith@njdhs.com
Nichols, Jackson, Dillard, Hager & Smith,
LLP
500 N. Akard Street
Suite 1800
Dallas, TX 75201
214.965.9900

City of Allen, Texas
Peter Smith
City Attorney
305 Century Parkway
Allen, TX 75013
214.509.4100

City of Farmersville

Alan Lathrom
alathrom@bhlaw.net
Brown & Hofmeister, LLP
740 East Campbell Road
Suite 800
Richardson, TX 75081
214.747.6100

City of Farmersville, Texas
Alan Lathrom
City Attorney
205 S. Main
Farmersville, TX 75442
972.782.6151

City of Forney

Jon Thatcher
jthatcher@cityofforney.org
City Attorney
101 E Main Street
Forney, TX 75126
972.564.7300

PO Box 826
Forney, TX 75126

City of Frisco

Richard Abernathy
rabernathy@abernathy-law.com
Abernathy, Roeder, Boyd & Hullett, P.C.
1700 N. Redbud Boulevard
Suite 300
McKinney, TX 75069
214.544.4000

City of Frisco, Texas
George A. Purefoy Municipal Center
6101 Frisco Square Blvd.
Frisco, TX 75034
972.292.5000

City of Garland

Brad Neighbor
BNeighbor@ci.garland.tx.us
bneighbor@garlandtx.gov
City of Garland
200 N. Fifth Street
Garland, TX 75040
972.205.2380

PO Box 469002
Garland, TX 75046
972.205.2384

City of McKinney

Mark S. Houser
222 N. Tennessee Street
McKinney, TX 75069

PO Box 517
McKinney TX 75070
972.547.7500

Mark S. Houser
Brown & Hofmeister, LLP
mhouser@bhlaw.net
740 East Campbell Road
Suite 800
Richardson, TX 75081
214.747.6100

City of Mesquite

B. J. Smith
bjsmith@cityofmesquite.com
City Attorney
Mesquite
PO Box 850137
Mesquite, TX, 75185-0137
(972) 216-6272
(972) 216-6442

City of Plano

Paige Mims
paigem@plano.gov
City Attorney
Plano
PO Box 860358
Plano, TX, 75086-0358
(972) 941-5235
(972) 424-0099

1520 Avenue K
Suite 340
Plano, TX 75074
972.941.7125

City of Princeton

Bonnie Lee Goldstein
123 W Princeton Drive
Princeton, TX 75407

PO Box 970
Princeton, TX 75407
972.734-2416

Honorable Bonnie Lee Goldstein
Dallas County District Court
44th Civil District
George L. Allen, Sr. Courts Building
600 Commerce Street
Box 540
Dallas, TX 75202
214.653.7427

City of Richardson

Peter G. Smith
psmith@njdhs.com
Nichols, Jackson, Dillard, Hager & Smith,
LLP
500 N. Akard Street
Suite 1800
Dallas, TX 75201
214.965.9900

City of Richardson, Texas
City Attorney
Peter Smith
411 W. Arapahoe Road
Richardson, TX 75080

PO Box 830309
Richardson, TX 75083
972.744.4203

City of Rockwall

Frank Garza
Davidson, Troilo, Ream & Garza
601 NW Loop 410, Suite 100
San Antonio, TX 78216
210.349.6484

City of Rockwall, Texas
Frank Garza, City Attorney
c/o Rockwall City Hall
385 S. Goliad Street
Rockwall, TX 75087

City of Wylie

Richard Abernathy
rabernathy@abernathy-law.com
Abernathy, Roeder, Boyd & Hullett, P.C.
1700 N. Redbud Boulevard
Suite 300
McKinney, TX 75069
214.544.4000
City of Wylie, Texas
City Attorney
Richard Abernathy
300 Country Club Drive
Wylie, TX 75098
972.516.6010

City of Royse City

Jason Day
jason.day@roysecity.com
City Attorney
Royse City
PO Box 638
Royse City, TX, 75189-0638
(972) 524-4822
(972) 635-2434

/s/ Jose E. de la Fuente

JOSE E. de la FUENTE

EXHIBIT A

CAUSE NO. _____

EX PARTE,

§ IN THE DISTRICT COURT
§
§
§ OF TRAVIS COUNTY, TEXAS

NORTH TEXAS MUNICIPAL
WATER DISTRICT

§
§
§ _____ JUDICIAL DISTRICT

NOTICE OF PROCEEDING AND ORDER

The Court issues the following Notice of Proceedings and Order pursuant to Chapter 1205 of the Texas Government Code.

NOTICE IS HEREBY GIVEN to all persons who (i) reside in North Texas Municipal Water District’s (the “District”) territory; (ii) own property located within the District’s boundaries; (iii) are taxpayers of the District; or (iv) have or claim a right, title, or interest in any property or money to be affected by the proceedings described below, the issuance of the public securities described below, including all actions or expenditures of funds, taken or made and/or proposed to be taken or made in connection with or affecting the securities described below. For purposes of this Notice of Proceedings and Order, the persons named in sections (i), (ii), (iii), and (iv) above shall be referred to as the “Interested Parties.”

The District is a conservation and reclamation district and political subdivision of the State of Texas, created and functioning under Article 16, Section 59, of the Texas Constitution.

Pursuant to the District's Enabling Act¹ and Chapters 1207 and 1371 of the Texas Government Code, the District has the authority to issue public securities.

The District's Board authorized the issuance of the following public securities (collectively, the "Bonds") in the aggregate amount of is \$1,387,285,000. The Bonds have been issued for the following purposes:

- Water System Revenue Bonds, Series 2008 ("Series 2008 Bonds") – to provide funds for improving the Water System.
- Water System Revenue Bonds, Series 2009A ("Series 2009A Bonds") – to provide funds for improving the Water System, and in particular for paying costs required to obtain necessary permits for the Lower Bois D'Arc Creek Reservoir.
- Water System Revenue Bonds, Series 2009B ("Series 2009B Bonds") – to provide funds for improving the Water System.
- Water System Revenue Refunding and Improvement Bonds, Series 2009C ("Series 2009C Bonds") – to provide funds for (1) improving the Water System through the acquisition of mitigation land and interests in such land necessary for the Lower Bois D'Arc Creek Reservoir and through the acquisition and construction of certain treatment process improvements, and (2) refunding the District's Water System Revenue Bonds, Series 2001.
- Water System Revenue Bonds, Taxable Series 2009D-Build America Bonds ("Series 2009D Bonds") – to provide funds for improving the Water System

¹ Act of April 4, 1951, 52nd Leg., R.S., ch. 62, 1951 Tex. Gen. Laws 96, 103-04; Act of April 24, 1969, 61st Leg., R.S., ch. 122, 1969 Tex. Gen. Laws 334, 334-337; Act of April 23, 1975, 64th Leg., R.S., ch. 90, 1975 Tex. Gen. Laws 238, 238-242; Act of April 28, 2009, 81st Leg., R.S., ch. 20, 2009 Tex. Gen. Laws 37, 37-40.

through the acquisition of mitigation land and interests in such land necessary for the Lower Bois D'Arc Creek Reservoir, and through the acquisition and construction of certain water treatment process improvements.

- Water System Revenue Bonds, Series 2010 (“Series 2010 Bonds”) – to provide funds for (1) improving the Water System through prepayment of amounts payable by the District pursuant to a Water Storage Agreement with the Department of the Army with respect to Lake Texoma, (2) making a deposit to the reserve fund, and (3) paying costs incident to the issuance of the bonds.
- Water System Revenue Bonds Taxable, Series 2010A-Build America Bonds (“Series 2010A Bonds”) – to provide funds for (1) improving the Water System through acquisition and construction of ozonation facilities at the District’s Wylie Wastewater Treatment Plant, (2) making a deposit to the reserve fund, and (3) paying costs incident to the issuance of the bonds.
- Water System Revenue Refunding and Improvement Bonds, Series 2012 (“Series 2012 Bonds”) – to provide funds for (1) improving the Water System through the design, acquisition, and construction of facilities for the extension of the Texoma Raw Water Pipeline to the Wylie Water Treatment Plant and other related improvements to the Water System; (2) refunding the refunded bonds, (3) making a deposit to the reserve fund; and (4) paying the costs of issuance of such bonds.
- Water System Revenue Refunding and Improvement Bonds, Series 2014 (“Series 2014 Bonds”) – for the purpose of (1) improving the Water System

through the acquisition of property and design of the dam for Lower Bois D’Arc Creek Reservoir, construction of the Wylie Water Treatment Plant II filter underdrain improvements, construction of Shiloh Pump Station improvements, and other related Water System improvements; (2) refunding the refunded bonds; (3) making a deposit to the reserve fund; and (4) paying the costs of issuance of such bonds.

- Water System Revenue Refunding and Improvement Bonds, Series 2015 (“Series 2015 Bonds”) – for the purpose of (1) constructing the Trinity Main Stem Pump Station, purchasing pipe material for the Trinity Main Stem raw water pipeline, construction of the Wylie water treatment plant chemical system improvements, and other related improvements to the Water System; (2) refunding the refunded bonds; and (3) paying the costs of issuance of such bonds.
- Water System Revenue Refunding and Improvement Bonds, Series 2016 (“Series 2016 Bonds”) – for the purpose of (1) improving the Water System by constructing the Wylie Water Treatment Plant No. 4 70 MGD Expansion, constructing the Trinity River Main Stem Pump Station and Pipeline, constructing the North System Exchange Parkway 13.5 MG Ground Storage Facilities, constructing the North McKinney Pipeline, and other Water System improvements; (2) refunding the refunded bonds; (3) making a deposit to the reserve fund; and (4) paying the costs of issuance of such bonds.

The District has filed an *in rem* action for declaratory judgment (the “Petition”) seeking, among other things, the following declarations:

- (1) the District was authorized to issue the Bonds;
- (2) the District's actions authorizing the Bonds were legal and valid;
- (3) the August 1, 1988 Regional Water Supply Facilities Amendatory Contract (the "Contract") between the District and the cities of Farmersville, Forney, Garland, McKinney, Mesquite, Plano, Princeton, Richardson, Rockwall, Royse City, and Wylie is legal and valid in all respects, including not being void as against public policy and not being adverse to the public interest;
- (4) the rate and/or charges imposed by the Contract are legal and valid;
- (5) the revenues pledged to secure the Bonds are legal and valid;
- (6) the expenditures of the money relating to the issuance of the Bonds are legal and valid; and
- (7) the Bonds are legal and valid.

A full description of the lawsuit and the relief sought is contained District's Petition, *Ex Parte North Texas Municipal Water District*, Cause No. _____, filed in the _____ Judicial District Court of Travis County, Texas.

IT IS HEREBY ORDERED and Notice is hereby given, that any Interested Party or the Attorney General of the State of Texas may become a named party to these proceedings by pleading to the Petition on or before, and may appear for hearing and trial in the courtroom of the 53rd Judicial District Court of Travis County, Texas at 10:00am on Monday, March 27, 2017, it being the first Monday after the expiration of 20 days from the date this Order is issued. After said date, Interested Parties may become named parties by intervention on leave of court.

IT IS FURTHER ORDERED, that, at such hearing and trial, any Interested Parties desiring to do so may appear, and the Attorney General of the State Texas shall appear, and show

cause why the prayers of the District's Petition filed in this action and generally described above should not be granted and the Bonds described above should not be validated and confirmed as therein prayed. Be on further notice that, at such time, place, and date the Court will proceed to full and final hearing on the merits of all matters and prayers within the District's Petition.

SO ORDERED

SIGNED this 1st day of March, 2017.

DISTRICT JUDGE PRESIDING

3. Irrespective of the PUC Petitioners' entreaties to the PUC, it is the Legislature that sets the public policy of the State of Texas. And the Legislature has already deemed the Contract valid and binding for all purposes, and incontestable for *any* reason. In light of the Legislature's pronouncement, there is nothing for the PUC to decide with respect to the Contract, the PUC therefore lacks jurisdiction to adjudicate any of the issues presented by the PUC Petitioners.

4. The PUC Petitioners filed the PUC Petition under Title 16, Section 24.128 of the Texas Administrative Code and seek the PUC's review of the PUC Petition under Sections 24.128 through 24.138 of the same Title. The District has an incontestable contract with the PUC Petitioners, and the PUC's application or threatened application of Sections 24.128 through 24.138 to the Contract interferes with and impairs, or threatens to interfere with or impair, the legal rights and privileges of the District.

5. Therefore, pursuant to the legislative requirements of the District's enabling statute and Section 2001.038 of the Texas Government Code, the District seeks the following declaratory judgments: (1) the Contract is valid and binding for all purposes; (2) the Contract, including all provisions thereof, is incontestable in any forum—including the PUC—for any reason; (3) the Contract is not and cannot be found to be adverse to the public interest or contrary to public policy; (4) the application or threatened application of Title 16, Sections 24.128 through 24.138 of the Texas Administrative Code by the PUC to the Contract interferes with and impairs, or threatens to interfere with and impair, the District's legal rights and privileges under the Contract and the District's enabling statute to repay its outstanding bond debt; (5) Title 16, Sections 24.128 through 24.138 of the Texas Administrative Code are not applicable to the Contract; and (6) the PUC, therefore, lacks jurisdiction to consider the PUC Petition. Further,

this Court should enjoin the PUC from taking any further action in response to the PUC Petitioners' request for relief and issue an order restraining the PUC from taking any further action in response to the PUC Petition.

II. PARTIES

6. The Plaintiff is the North Texas Municipal Water District, a conservation and reclamation district created by the Legislature pursuant to authority granted under Article XVI, Section 59 of the Texas Constitution. *See* Act of April 4, 1951, 52nd Leg., R.S., ch. 62, 1951 Tex. Gen. Laws 96.

7. Pursuant to Section 2001.038(c) of the Texas Government Code, the Public Utility Commission of Texas must be made a party to this action. The PUC may be served with process by serving Brian Lloyd, Executive Director of the PUC, at Public Utility Commission of Texas, 1701 N. Congress Avenue, PO Box 13326, Austin, TX 78711-3326. The District will also provide a copy of this Petition to Mr. Jim Davis, Deputy Attorney General for Civil Litigation of the Office of the Attorney General, 300 West 15th Street, Austin, Texas 78701.

III. DISCOVERY LEVEL

8. Discovery in this case, if any, shall be conducted under Level 3, as provided for in Tex. R. Civ. P. 190.4.

IV. VENUE AND JURISDICTION

9. Travis County, Texas, is the mandatory venue for this lawsuit under Section 2001.038(b) of the Texas Government Code.

10. This Court has jurisdiction over the subject matter of this action and over the PUC as the state agency subject to this action under Section 2001.038(c) of the Texas Government Code.

**V.
NATURE OF THE PROCEEDING**

11. This is a declaratory judgment action under Section 2001.038 of the Texas Government Code, which provides:

The validity or applicability of a rule, including an emergency rule adopted under Section 2001.034, may be determined in an action for declaratory judgment if it is alleged that the rule or its threatened application interferes with or impairs, or threatens to interfere with or impair, a legal right or privilege of the plaintiff.

Tex. Gov't Code Ann. § 2001.038(a) (West 2016).

**VI.
AUTHORITY TO BRING ACTION**

12. Section 2001.038 of the Texas Government Code authorizes a plaintiff to request declaratory judgment determining the applicability of a rule of an administrative agency when it is alleged that the rule or its threatened application interferes with or impairs, or threatens to interfere with or impair, a legal right or privilege of the plaintiff. As explained in more detail herein, the PUC's application of certain administrative rules to the District and the Contract interferes with and impairs, or threatens to interfere with or impair, certain legal rights and privileges of the District relating to the District's contractual and statutory authority and ability to raise revenue to fund its operations.

**VII.
FACTUAL BACKGROUND**

A. North Texas Municipal Water District.

13. The District is a conservation and reclamation district and political subdivision of the State of Texas, created and functioning under Article XVI, Section 59, of the Texas

Constitution. The District is comprised of 13 cities—collectively referred to as the Member Cities—and it provides wholesale water service to those 13 Member Cities and other non-member regional customers (the “Customers”).¹ The District’s water system consists of six water treatment plants, 573 miles of water transmission pipelines, nine pump stations, and water rights in four lakes, and ultimately serves a population of approximately 1.6 million people across 10 counties in one of the fastest growing areas of the nation (the “System”).

14. The Legislature created the District in 1951 at the urging of the residents of the original member cities² who each needed a source of water supply, but were not individually able to secure bonds and meet the revenue requirements necessary to own and operate a municipal water system.³ The District’s principal office is located in Collin County, Texas.

B. The Contract between the District and Member Cities.

15. The District and the original member cities entered into a water supply contract in 1953 to purchase potable water ultimately to be provided to the member cities’ ratepayers. In 1988, the original member cities, the City of Richardson,⁴ and the District entered into the Regional Water Supply Facilities Amendatory Contract (the “Contract”) to set out the terms under which the Member Cities pledge revenues sufficient for the District to secure water supply for the benefit of the Member Cities.

¹ The Member Cities are the cities of Allen, Farmersville, Forney, Frisco, Garland, McKinney, Mesquite, Plano, Princeton, Richardson, Rockwall, Royse City, and Wylie.

² The original member cities are the cities of Farmersville, Forney, Garland, McKinney, Mesquite, Plano, Princeton, Rockwall, Royse City, and Wylie.

³ BILL SLOAN, GIFT OF WATER, LEGACY OF SERVICE: A HISTORY OF THE NORTH TEXAS MUNICIPAL WATER DISTRICT, 23-46 (Taylor Publishing Co., 1994), <https://www.ntmwd.com/documents/gift-water-legacy-service-book/>.

⁴ The remaining two Member Cities—Allen and Frisco—receive water at the same rate as the rest of the Member Cities under separate contracts with the District, which were executed after the Contract. The contracts with Allen and Frisco have substantively identical terms—including cost allocation—as the Contract, but are not at issue in this suit.

16. Under the Contract, a true and correct copy of which is attached as Exhibit A, the District is obligated to issue bonds and acquire and construct the System to provide treated water to the Member Cities with no limit as to the amount or capacity.⁵ (Ex. A at § 2.) In return, each Member City agreed in the Contract to pay its proportionate share of the System annual debt service and operation and maintenance costs (commonly referred to by the Contract parties as the “Annual Requirement”) with such proportionate share, again according to the Contract, to be based on each Member City’s highest actual historic annual use (commonly referred to by the Contract parties as the “Annual Minimum”). (Ex. A at § 9(c).)

17. In addition, each Member City contractually agreed to be unconditionally obligated to pay its proportionate share irrespective of whether they actually receive or use the water from the System. (Ex. A at §10(g).) This “take-or-pay” arrangement is reasonable because the District must construct and install the infrastructure necessary to provide water to each of the Member Cities regardless of the amount of water the Member Cities take. Stated differently, the District’s capital investment costs are fixed and must be incurred to have the facilities necessary to provide water service. Over the years, the District has issued over \$1.3 billion dollars in System revenue bonds based on the Contract and plans to issue more bonds in 2018.

18. Since its inception, the District’s Enabling Act has provided at Section 14:

After any bonds . . . are authorized by the District, such bonds and the record relating to their issuance shall be submitted to the Attorney General for his examination as to the validity thereof. Where such bonds recite that they are secured by a pledge of the proceeds of a contract therefore made between the District and any city or other governmental agency or district, a copy of such contract and the proceedings of the city or other governmental agency or District authorizing such contract shall also be submitted to the Attorney General. If such bonds have been authorized and if such contracts have been made in accordance with the Constitution and Laws of the State of Texas he shall approve the bonds

⁵ See Footnote 4, *supra*.

and such contracts. . . . *Thereafter the bonds, and the contracts, if any, shall be valid and binding and shall be incontestable for any cause.*⁶

Also, the Enabling Act, as it existed at the time the Contract was executed and approved by the Attorney General, further provided the following:

any such contract shall be incontestable in any court or other forum for any reason, and shall be valid and binding obligations in accordance with [its] terms for all purposes.⁷

19. In accordance with the Enabling Act and its obligations under the Contract, the District has, over time, issued bonds for the benefit of the development of the System and the provision of service to all of the member cities. The District is currently preparing another bond issue for early 2018. North Tex. Mun. Water Dist., 2016-2017 Annual Budget (Sept. 22, 2016), at xvi, 160, <https://www.ntmwd.com/wp-content/uploads/2016/11/2016-17-Annual-Budget.pdf> (hereinafter “2016-2017 Budget”). All of the District’s bonds are secured by the proceeds of the Contract. (Ex. A at § 10(g).) In 1989, the Attorney General approved both the Water System Revenue Bonds, Series 1989 (the “1989 Bonds”) and the Contract pursuant to Sections 14 and 27(j) of the District’s Enabling Act.⁸ Letter from Jim Mattox, Attorney General of the State of

⁶ Act of April 4, 1951, 52nd Leg., R.S., ch. 62, § 14, 1951 Tex. Gen. Laws 96, 103-04; Act of April 24, 1969, 61st Leg., R.S., ch. 122, 1969 Tex. Gen. Laws 334, 334-337; Act of April 23, 1975, 64th Leg., R.S., ch. 90, 1975 Tex. Gen. Laws 238, 238-242; Act of April 28, 2009, 81st Leg., R.S., ch. 20, 2009 Tex. Gen. Laws 37, 37-40 (West) (hereinafter, collectively, “Enabling Act”) (emphasis added).

⁷ Act of April 23, 1975, 64th Leg., R.S., ch. 90, § 1, sec. 27(j), 1975 Tex. Gen. Laws 238, 238-242 (emphasis added). In 2009, the Legislature removed this Section 27(j) from the Enabling Act and replaced it with a reference to Texas Government Code Chapter 1202, which contains substantially similar language. Act of April 28, 2009, 81st Leg., R.S., ch. 20, § 4, sec. 27(j), 2009 Tex. Gen. Laws 37, 39 (“Chapter 1202, Government Code, applies to the issuance of bonds by the district.”). Section 1202.006(a) provides: “A public security and any contract the proceeds of which are pledged to the payment of the public security are valid and incontestable in a court or other forum and are binding obligations for all purposes according to their terms: (1) after the public security is approved by the [A]ttorney [G]eneral and registered by the comptroller; and (2) on issuance of the public security.” Section 27(j), both as effective in 1988 when the Contract was executed and approved by the Attorney General, and as it presently exists, makes the Contract incontestable. In addition, the Legislature has also enacted a similar provision generally applicable to all districts created under Article XVI, Section 59 of the Texas Constitution. Tex. Water Code Ann. § 49.184(a), (e) (West 2008).

⁸ Subsequent to the Attorney General’s approval of the Contract, the Legislature, in 2009, amended Section 27(j) of the District’s Enabling Act to incorporate by reference Chapter 1202 of the Texas Government

Texas (Aug. 10, 1989) (attached as Exhibit B). Subsequently, the Comptroller of Public Accounts certified registration of the Bonds.⁹ As such, the Contract—including the cost allocation provisions therein—is *“incontestable in any court or other forum for any reason, and [is] valid . . . for all purposes.”* Act of April 23, 1975, 64th Leg., R.S., ch. 90, § 27(j), 1975 Tex. Gen. Laws 238, 238-242 (emphasis added); *see also* Enabling Act § 14; Tex. Gov’t Code § 1202.006; Tex. Water Code § 49.184(e).

C. The District’s Bonds.

20. To meet its obligations under the Contract, the District currently has outstanding the following bonds: North Texas Municipal Water District System Revenue Bonds, Series 2008, 2009A, 2009B, 2009C, 2009D, 2010, 2010A, 2012, 2014, 2015, and 2016, (the “District Bonds”) each of which the District has specifically secured as payment and first lien on, and pledged revenues from, the Contract.¹⁰

21. Because the District’s ability to repay the outstanding bond debt is specifically dependent on the continued enforceability of the Contract, any legal challenge to the validity of the Contract—or any of its terms—interferes with and impairs, or threatens to interfere with and impair, the legal rights and privileges the District has to pledge revenues for the repayment of the bonds under the terms of the Contract, the respective bond resolutions as approved and certified by the Attorney General of Texas and registered by the Office of Comptroller of the State of Texas, and the District’s enabling statute as enacted by the Texas Legislature.

Code, which includes similar language to that formerly included in Section 27(j). Act of April 28, 2009, 81st Leg., R.S., ch. 20, 2009 Tex. Gen. Laws 37, 39. The statutory language quoted herein reflects the applicable statute as it existed at the time the Contract was approved and became incontestable as a matter of law.

⁹ A copy of the Comptroller of Public Accounts certification is attached as Exhibit C.

¹⁰ The District’s resolution approving and issuing the latest bond series—Series 2016, which secures more than 350 million dollars in public securities by the pledge of Contract revenues—is attached hereto as Exhibit D. The Series 2016 resolution references all District Bonds and notes that all are secured and payable by “Pledged Revenues” specifically including the Contract. Exhibit D, at 18, 22-23.

22. More specifically, the District must generate revenues from the rates paid by the Member Cities, and specifically the Member Cities' respective Annual Minimums as required under the Contract, to repay the outstanding bond debt. Each of the District Bonds has been approved and certified by the Attorney General of Texas as a valid and binding special obligation of the District secured by and payable from the pledge of revenues from the Contract.

23. Under the District's enabling statute as it existed at the time, when the Attorney General approved the 1989 Bonds and the Contract, and once the 1989 Bonds were registered by the Comptroller of Public Accounts of the State of Texas, the Contract became incontestable in any court or other forum for any reason, and the Contract became a valid and binding obligation in accordance with its terms for all purposes. Act of April 23, 1975, 64th Leg., R.S., ch. 90, § 27(j), 1975 Tex. Gen. Laws 238, 240-241. The Attorney General subsequently approved numerous subsequent bond series, including the District Bonds.¹¹ The Comptroller certified each bond series.¹²

D. PUC's Threatened Application of Administrative Rules.

24. Each of the four PUC Petitioners is a Member City of the District and is a party to the Contract, having agreed to the unconditional obligation to pay its respective Annual Minimums.

25. Despite each of the PUC Petitioners' unconditional obligation to pay the Annual Minimums and the Legislature's declaration that the Contract is valid and binding for all purposes and incontestable in any forum, the PUC Petitioners have requested through the PUC

¹¹ The Attorney General approval letter for the 2016 Series District Bonds is attached as Exhibit E.

¹² The Comptroller certification for the Series 2016 District Bonds is attached as Exhibit F.

Petition that the PUC declare the Contract's cost allocation adverse to the public interest under Title 16, Section 24.133 of the Texas Administrative Code.¹³

26. The PUC has taken action in response to the PUC Petition by setting a procedural schedule for briefing and threatens to refer the PUC Petition to the State Office of Administrative Hearings for a contested case hearing for a determination of whether the Contract's rate/rate mechanism is adverse to the public interest as provided under Title 16, Section 24.132 of the Texas Administrative Code.

27. Any application of these Rules by the PUC to the District or the Contract, including a determination of whether the Contract is adverse to the public interest, is directly contrary to the Legislature's declaration that the Contract is incontestable in any court or other forum.

28. A determination of whether a contract is adverse to the public interest is a jurisdictional prerequisite to the PUC holding a hearing on a contested water rate charged pursuant to a contract. *Texas Water Comm'n v. City of Fort Worth*, 875 S.W.2d 332, 336-37 (Tex. App.—Austin 1994, writ denied); 16 Tex. Admin. Code § 24.132(a).

29. As noted above, the Legislature already has determined and unambiguously pronounced that the Contract is valid and binding for all purposes, and is incontestable in any court or other forum, which necessarily includes the PUC.¹⁴ Any action by the PUC regarding

¹³ A true and correct copy of the PUC Petition is attached hereto as Exhibit G (exhibits omitted for size); a full copy of the PUC Petition with exhibits is available online at http://interchange.puc.texas.gov/WebApp/Interchange/application/dbapps/filings/pgSearch_Results.asp?TXT_CNT_R_NO=46662&TXT_ITEM_NO=1. The PUC Petition directly complains that "the allocation of costs is unjust and is disproportionate." Exhibit G, at 18. The true complaint in the PUC Petition concerns an "effective rate" invented by the PUC Petitioners as a work-around to attempt to invoke jurisdiction that the PUC does not have. *See* Exhibit G, at 7-8, 11, 13-14, 17-18.

¹⁴ Act of April 23, 1975, 64th Leg., R.S., ch. 90, § 27(j), 1975 Tex. Gen. Laws 238, 240-241; *see* Exhibit B, Exhibit C, and Exhibit D (Attorney General approval and Comptroller registration of the Contract and related 1989 Bonds and Series 2016 District Bonds for which the Contract revenues are pledged as repayment); *see*

the District's incontestable Contract would therefore necessarily impair the District's contract rights. Such action by the PUC would be beyond its authority, unconstitutional, and void.

30. Therefore, any threatened application to the District or the Contract of the PUC's administrative rules governing the PUC's determination of whether a water supply contract is adverse to the public interest has necessarily been pre-empted and precluded by the Legislature through its pronouncement in the District's enabling statute.

VIII. CAUSE OF ACTION: DECLARATORY JUDGMENT

31. Section 2001.038(a) of the Texas Government Code is part of the Administrative Procedure Act and provides a legal mechanism to seek a declaration from a Travis County District Court regarding the applicability of administrative rules when the application or threatened application of those rules interferes with or impairs, or threatens to interfere with or impair, a legal right or privilege of the plaintiff.

32. The PUC's application, and continued threatened application, of the rules adopted by the PUC as Title 16, Sections 24.131 through 24.138 of the Texas Administrative Code interferes with and impairs, and threatens to interfere with and impair, the District's legal rights and privileges relating to its ability to rely on and enforce an unimpaired Contract and to repay the outstanding District Bonds through revenues pledged from the rates and Annual Minimums collected by the District from the Member Cities under the terms of the Contract.

33. This matter does not concern a hearing in which a suspension, revocation, or cancellation of a license by a state agency is at issue.

34. Under Section 2001.038 of the Texas Government Code, the District seeks the following declarations from the Court:

also Tex. Gov't Code § 1202.006 (codification of incontestability requirement enacted in 2009).

(a) the Regional Water Supply Facilities Amendatory Contract is valid and binding for all purposes, as declared by the Texas Legislature;

(b) further, the Regional Water Supply Facilities Amendatory Contract is incontestable in any court or other forum—including the Public Utility Commission of Texas—for any reason, as declared by the Texas Legislature;

(c) as such, the Regional Water Supply Facilities Amendatory Contract, including all provisions thereof, is not adverse to the public interest or contrary to the public policy of the State of Texas;

(d) the application or threatened application of Title 16, Sections 24.128 through 24.138 of the Texas Administrative Code by the Public Utility Commission of Texas to the Regional Water Supply Facilities Amendatory Contract interferes with and impairs, or threatens to interfere with and impair, the North Texas Municipal Water District's legal rights and privileges under the Regional Water Supply Facilities Amendatory Contract and the District's enabling statute to repay its outstanding bond debt through pledged revenues from rates and Annual Minimums collected by the District under the Contract as approved by the Attorney General of Texas and registered with the Comptroller of Public Accounts of the State of Texas;

(e) the rules adopted as Title 16, Section 24.128 through 24.138 of the Texas Administrative Code are not applicable to the Regional Water Supply Facilities Amendatory Contract; and

(f) the Public Utility Commission of Texas, therefore, lacks jurisdiction to consider the Original Petition Appealing Wholesale Water Rates filed on December 14, 2016 by the Cities of Garland, Mesquite, Plano, and Richardson, Texas.

IX.
APPLICATION FOR TEMPORARY RESTRAINING ORDER

35. Paragraphs 1-34 are incorporated herein by reference.

36. To obtain injunctive relief, a party must (1) plead for some form of permanent relief; (2) show it has a probable right to relief; and (3) plead it will suffer a probable injury. *See Butnaru v. Ford Motor Co.*, 84 S.W.3d 198, 204 (Tex. 2002). Probable injury requires a showing that the harm is imminent, the injury would be irreparable, and the applicant has no other adequate legal remedy. *Harbor Perfusion, Inc. v. Floyd*, 45 S.W.3d 713, 716 (Tex. App.—Corpus Christi 2001, no pet.).

37. The District is likely to succeed on the merits of this lawsuit because the Contract the PUC Petitioners have contested before the PUC is incontestable as a matter of law.¹⁵ Therefore, the administrative rules cited herein are not applicable to the Contract.

38. As set out in Section VII, above, the District will suffer a probable, imminent, and irreparable injury as a result of the PUC's continued exercise of jurisdiction in response to the PUC Petition, for which it has no adequate remedy at law. Specifically, the only remedy available under Section 2001.038 is declaratory judgment relating to the validity or applicability of administrative rules. If the PUC during the pendency of this lawsuit enforces rules that are inapplicable to the District and the Contract, the District would be required to participate in the continued adjudication of the PUC Petition concurrent with this proceeding, thus incurring unnecessary expenses for which the District cannot be compensated under the relief available to it in this proceeding. Further, the District's right to rely on and enforce a Contract without any of the Contract's obligations being impaired and its ability to repay the District Bonds could be

¹⁵ Act of April 23, 1975, 64th Leg., R.S., ch. 90, § 27(j), 1975 Tex. Gen. Laws 238, 240-241; *see* Exhibit B, Exhibit C, and Exhibit D (Attorney General approval and Comptroller registration of the Contract and related 1989 Bonds and Series 2016 District Bonds for which the Contract revenues are pledged as repayment).

harm, and the District would incur significant financial injury for which it cannot be compensated under the available statutory relief.

39. The District therefore requests that this Court order the PUC to be enjoined from taking any further action or exercising, or purporting to exercise, jurisdiction under Title 16, Sections 24.128 through 24.138 of the Texas Administrative Code in response to the PUC Petition.

40. As a matter of courtesy and pursuant to the Travis County Local Rule 10.4, the District is providing notice of this application for temporary restraining order by facsimile and telephonic conference to each party to the PUC Proceeding, counsel of record for each of those parties in the PUC Proceeding, the executive director of the PUC, and the Office of the Attorney General.

41. The District is willing to post a bond pursuant to TEX. R. CIV. P. 684 in an amount deemed reasonable by the Court. The requested injunction is against a subdivision of the State in its governmental capacity and the subdivision has no pecuniary interest in this suit and no monetary damages are available. The District provides a verification of this application for injunctive relief.

X.
APPLICATION FOR TEMPORARY INJUNCTION

42. Paragraphs 1-41 are incorporated herein by reference.

43. The District hereby requests that the Court set a hearing on its Application for Temporary Injunction.

44. This Court has authority to enjoin an administrative agency from enforcing its rules in a declaratory judgment proceeding brought under Section 2001.038 of the Texas Government Code. *Texas Dep't State Health Servs v. Balquinta*, 429 S.W.3d 726, 749-50 (Tex.

App.—Austin 2014, pet. dismissed); see *Texas Alcoholic Beverage Comm'n v. Amusement & Music Operators Inc.*, 997 S.W.2d 651, 657-58 (Tex. App.—Austin 1999, pet. dismissed w.o.j.).

45. The District is likely to succeed on the merits of this lawsuit because the Contract the PUC Petitioners have contested before the PUC is incontestable as a matter of law.¹⁶ Therefore, the administrative rules cited herein are not applicable to the Contract.

46. As set out in Sections VII and IX, above, the District will suffer a probable, imminent, and irreparable injury as a result of the PUC's continued exercise of jurisdiction in response to the PUC Petition for which it has no adequate remedy at law. Specifically, the only remedy available under Section 2001.038 is declaratory judgment relating to the validity or applicability of administrative rules. If the PUC during the pendency of this lawsuit enforces rules that are inapplicable to the District and the Contract, the District would be required to participate in the continued adjudication of the PUC Petition concurrent with this proceeding, thus incurring unnecessary expenses for which the District cannot be compensated under the relief available to it in this proceeding. Further, the District's right to rely on and enforce a Contract without any of the Contract's obligations being impaired and its ability to repay the District Bonds could be harmed, and the District would incur significant financial injury for which it cannot be compensated under the available statutory relief.

47. The District does not have adequate alternative remedy at law because the PUC Petitioners have attempted to invoke the PUC's administrative rules cited herein, and the PUC has begun an administrative proceeding under those rules. Seeking declaratory judgment under Section 2001.038 of the Texas Government Code is the statutorily prescribed means for the District to obtain relief from further PUC action.

¹⁶ Act of April 23, 1975, 64th Leg., R.S., ch. 90, § 27(j), 1975 Tex. Gen. Laws 238, 240-241; see Exhibit B, Exhibit C, and Exhibit D (Attorney General approval and Comptroller registration of the Contract and related 1989 Bonds and Series 2016 District Bonds for which the Contract revenues are pledged as repayment).

48. The District requests that this Court issue an order temporarily enjoining the PUC from taking any further action or exercising jurisdiction in response to the Original Petition Appealing Wholesale Water Rates filed on December 14, 2016 by the Cities of Garland, Mesquite, Plano, and Richardson, Texas until such time as this Court has issued a judgment on the merits of the declaratory relief requested herein. The District further requests that such order set this matter for trial on the merits.

49. The District is willing to post a bond pursuant to TEX. R. CIV. P. 684 in an amount deemed reasonable by the Court. The requested injunction is against a subdivision of the State in its governmental capacity and the subdivision has no pecuniary interest in this suit and no monetary damages are available. The District provides a verification of this application for injunctive relief.

**XI.
APPLICATION FOR PERMANENT INJUNCTION**

50. Paragraphs 1-49 are incorporated herein by reference.

51. The District hereby asks the Court to grant a permanent injunction after a trial on the merits. Specifically, the District asks the Court to (1) permanently enjoin the PUC from taking any further action or exercising, or purporting to exercise, jurisdiction under Title 16, Sections 24.128-.138 of the Texas Administrative Code in response to the PUC Petition and (2) require the PUC to dismiss the PUC Petition.

**XII.
PRAYER**

52. WHEREFORE, PREMISES CONSIDERED, the District respectfully prays that this Court, upon trial and final hearing, enter a declaratory judgment as set forth in paragraph 33. The District also respectfully prays that this Court, upon presentation of this Petition, immediately issue a Temporary Restraining Order enjoining the PUC from taking further action

in response to the PUC Petition or, in the alternative, immediately set a hearing on the District's application for a Temporary Restraining Order. The District further prays that this Court hold a hearing on the application for temporary injunction and, thereafter, issue an order enjoining the PUC from taking any further action in response to the PUC Petition during the pendency of this lawsuit. The District further prays that the Court, upon trial and final hearing, award the District the following additional relief:

- a. Permanently enjoin the PUC from taking any further action or exercising, or purporting to exercise, jurisdiction under Title 16, Sections 24.128-.138 in response to the PUC Petition or any filing with the PUC challenging the validity of the Contract, and ordering the PUC to dismiss the PUC Petition; and
- b. Grant the District such other and further relief and orders to which it may be entitled at law and equity.

Respectfully submitted,

LLOYD GOSSELINK
ROCHELLE & TOWNSEND, P.C.
816 Congress Avenue, Suite 1900
Austin, Texas 78701
Telephone: (512) 322-5800
Fax: (512) 472-0532

By: /s/ Jose E. de la Fuente
JOSE E. de la FUENTE
State Bar No. 00793605
jdelafuente@lglawfirm.com
JAMES F. PARKER, III
State Bar No. 24027591
jparker@lglawfirm.com
JAMES T. ALDREDGE
State Bar No. 24058514
jaldredge@lglawfirm.com
LAUREN S. MARTIN
State Bar No. 24079380
lmartin@lglawfirm.com

ATTORNEYS FOR PLAINTIFF

VERIFICATION

STATE OF TEXAS §
 §
COUNTY OF TRAVIS §

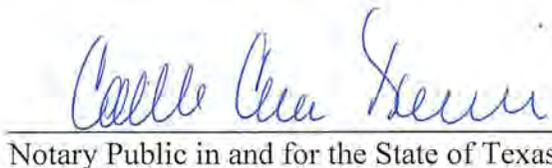
BEFORE ME, the undersigned authority, on this day personally appeared Jose E. de la Fuente who being first duly sworn stated under oath that:

1. My name is Jose E. de la Fuente. I am the attorney of record for North Texas Municipal Water District.
2. I am over twenty-one (21) years of age, have never been convicted of a felony or crime of moral turpitude, and am competent and qualified to make this Affidavit.
3. I have read the above and foregoing Original Petition for Declaratory Judgment and Application for Temporary Restraining Order, Temporary Injunction, and Permanent Injunction and, based upon my personal knowledge, verify that the factual allegations contained in this Petition are true and correct.

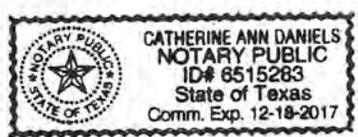


Jose E. de la Fuente

SUBSCRIBED AND SWORN TO BEFORE ME by the said Jose E. de la Fuente on this the 1st day of March, 2017.



Notary Public in and for the State of Texas



COLLIN COUNTY, TEXAS

**TABLE 2.1 - ESTIMATED MARKET VALUE AND ASSESSED TAXABLE VALUE OF PROPERTY
LAST TEN FISCAL YEARS
(Amounts expressed in thousands)**

Fiscal Year	Estimated Market Value				Total Estimated Market Value	Total Direct Tax Rate	Total Taxable Assessed Value	Ratio of Assessed to Estimated Actual Value
	Land	City Property	Personal Property	Telegraph, Telephone, Pipe Lines, Railroads				
2007	\$ 9,049,440	\$ 61,702,163	\$ 6,366,060	\$ 1,125,090	\$ 78,242,753	0.2450	\$ 68,657,179	87.75%
2008	9,695,904	66,354,782	6,651,770	1,147,176	83,849,632	0.2450	71,722,229	85.54%
2009	8,825,306	66,273,585	5,983,838	1,057,334	82,140,063	0.2425	70,717,823	86.09%
2010	8,248,766	66,968,360	5,679,387	1,134,592	82,031,105	0.2400	70,754,686	86.25%
2011	7,983,632	68,281,616	6,375,337	1,128,258	83,768,843	0.2400	72,462,519	86.50%
2012	7,944,762	69,805,761	6,688,508	1,163,062	85,602,092	0.2400	76,803,859	89.72%
2013	7,191,586	74,789,159	7,168,208	1,182,787	90,331,741	0.2375	79,238,767	87.72%
2014	7,777,835	82,546,359	7,435,466	1,338,257	99,097,917	0.2350	86,871,451	87.66%
2015	8,216,239	92,922,808	7,873,733	1,387,774	110,400,555	0.2250	96,807,570	87.69%
2016	8,640,176	105,893,191	8,802,125	1,328,248	124,663,742	0.2084	109,041,422	87.47%

Source: County Report of Property Value filed by the Collin County Central Appraisal District.
Collin County CAFR

Note: Property in the county is reassessed annually. The county assesses all property, real and personal, at 100%. The difference between estimated market value and assessed value is due to tax-exemptions and exclusions.

COLLIN COUNTY, TEXAS

**TABLE 2.2 - PROPERTY TAX RATES - ALL DIRECT AND OVERLAPPING GOVERNMENTS
(PER \$100 OF ASSESSED VALUE)
LAST TEN FISCAL YEARS**

Governmental Subdivision	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Collin County	\$ 0.24500	\$ 0.24250	\$ 0.24250	\$ 0.24000	\$ 0.24000	\$ 0.24000	\$ 0.23750	\$ 0.23500	\$ 0.22500	\$ 0.20840
Cities:										
Allen	0.55800	0.55700	0.55500	0.55400	0.55300	0.55200	0.55000	0.54000	0.53000	0.52000
Anna	0.52500	0.57500	0.62273	0.65033	0.65033	0.65033	0.65033	0.64900	0.63900	0.62900
Blue Ridge	0.54479	0.55598	0.58087	0.60591	0.61004	0.61463	0.59337	0.58952	0.56176	0.53865
Carrollton	0.63288	0.61788	0.61788	0.61788	0.61788	0.61788	0.61788	0.61538	0.61288	0.60370
Celina	0.69000	0.65500	0.64500	0.64500	0.64500	0.64500	0.64500	0.64500	0.64500	0.64500
Dallas	0.72920	0.74790	0.74790	0.79700	0.79700	0.79700	0.79700	0.79700	0.79700	0.78250
Fairview	0.36500	0.36500	0.36500	0.36500	0.36500	0.36000	0.36000	0.35999	0.35999	0.36000
Farmersville	0.59976	0.60517	0.58611	0.61007	0.64290	0.69750	0.69750	0.78574	0.85900	0.78756
Frisco	0.45000	0.45000	0.46500	0.46500	0.46191	0.46191	0.46191	0.46000	0.46000	0.45000
Garland		-	-	-	-	-	-	0.70460	0.70460	0.70460
Josephine	0.37927	0.37284	0.48583	0.55268	0.55268	0.57000	0.59000	0.61500	0.60000	0.58000
Lavon	0.41450	0.41450	0.41450	0.41450	0.45570	0.45570	0.45570	0.45570	0.45570	0.45570
Lowry Crossing	0.22978	0.22978	0.22978	0.22978	0.22978	0.22978	0.22978	0.22978	0.22977	0.22954
Lucas	0.37500	0.37500	0.37418	0.37418	0.37418	0.37418	0.35562	0.32066	0.32066	0.31795
McKinney	0.58800	0.58550	0.58550	0.58550	0.58550	0.58550	0.58550	0.58300	0.58300	0.57300
Melissa	0.52000	0.52000	0.61001	0.61000	0.61000	0.61000	0.61000	0.61000	0.61000	0.61000
Murphy	0.46830	0.46830	0.53841	0.56500	0.56500	0.57000	0.57000	0.55000	0.53000	0.51000
Nevada	0.14712	0.15499	0.16101	0.16101	0.17698	0.19288	0.19288	0.19125	0.20163	0.19115
New Hope	0.21000	0.21000	0.21000	0.21000	0.21000	0.21000	0.21000	0.21000	0.20600	0.19600
Parker	0.37708	0.37708	0.37708	0.37708	0.37708	0.37708	0.35708	0.35098	0.35098	0.36598
Plano	0.47350	0.47350	0.48860	0.48860	0.48860	0.48860	0.48860	0.48860	0.48860	0.47860
Princeton	0.64970	0.64960	0.72839	0.72839	0.72839	0.75693	0.73900	0.72180	0.69189	0.68989
Prosper	0.49882	0.52000	0.52000	0.52000	0.52000	0.52000	0.52000	0.52000	0.52000	0.52000
Richardson	0.57516	0.57516	0.57516	0.63516	0.63516	0.63516	0.63516	0.63516	0.63516	0.62516
Royse City	0.49450	0.49450	0.65760	0.65760	0.67290	0.68530	0.69800	0.67710	0.67710	0.67710
Sachse	0.55341	0.55341	0.70582	0.70582	0.77082	0.77082	0.77082	0.77082	0.75728	0.75728
St. Paul	0.44354	0.42437	0.42128	0.42128	0.41178	0.41178	0.40491	0.39228	0.37500	0.36900
Westminster	-	-	-	-	-	-	-	-	-	-
Weston	0.25000	0.25000	0.25000	0.30000	0.30000	0.30000	0.36000	0.36000	0.36000	0.36000
Wylie	0.70678	0.73325	0.89890	0.89890	0.89890	0.88890	0.88390	0.87890	0.86890	0.84890

(continued)

COLLIN COUNTY, TEXAS

TABLE 2.2 - PROPERTY TAX RATES - ALL DIRECT AND OVERLAPPING GOVERNMENTS

(PER \$100 OF ASSESSED VALUE)

LAST TEN FISCAL YEARS

Governmental Subdivision	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
School Districts:										
Allen I.S.D.	\$ 1.77510	\$ 1.47030	\$ 1.54000	\$ 1.54000	\$ 1.67000	\$ 1.67000	\$ 1.67000	\$ 1.64000	\$ 1.61000	\$ 1.59000
Anna I.S.D.	1.48148	1.48148	1.54005	1.54000	1.54000	1.54000	1.54000	1.54000	1.67000	1.67000
Bland I.S.D.		-	-	-	-	-	-	1.51630	1.53400	1.48800
Blue Ridge I.S.D.	1.78000	1.55600	1.47650	1.67000	1.67000	1.61667	1.61660	1.59750	1.57149	1.57149
Celina I.S.D.	1.74799	1.51900	1.54000	1.64000	1.64000	1.64000	1.64000	1.64000	1.64000	1.64000
Community I.S.D.	1.54000	1.49500	1.49500	1.49500	1.49500	1.62500	1.62500	1.61500	1.62500	1.62500
Farmersville I.S.D.	1.61680	1.31000	1.31000	1.31000	1.34000	1.37000	1.40000	1.43090	1.42950	1.39000
Frisco I.S.D.	1.58000	1.35000	1.39000	1.39000	1.42000	1.46000	1.46000	1.46000	1.46000	1.46000
Gunter I.S.D.		-	-	-	-	-	-	1.62000	1.62000	1.62000
Leonard I.S.D.		-	-	-	-	-	-	1.27096	1.27310	1.26620
Lovejoy I.S.D.	1.69340	1.47630	1.53500	1.53500	1.53500	1.53500	1.53500	1.56000	1.56000	1.67000
McKinney I.S.D.	1.84100	1.51700	1.54000	1.52800	1.54000	1.54000	1.67000	1.67000	1.67000	1.62000
Melissa I.S.D.	1.78000	1.53500	1.54000	1.54000	1.54000	1.54000	1.54000	1.54000	1.67000	1.67000
Plano I.S.D.	1.57840	1.26840	1.32840	1.35340	1.37340	1.37340	1.45300	1.44800	1.43900	1.43900
Princeton I.S.D.	1.59140	1.36870	1.49000	1.49000	1.47360	1.48000	1.51000	1.62000	1.62000	1.62000
Prosper I.S.D.	1.80000	1.67000	1.64000	1.63000	1.67000	1.67000	1.67000	1.67000	1.67000	1.67000
Rockwall I.S.D.	-	-	-	-	-	-	-	1.44000	1.44000	1.46500
Royse City I.S.D.	-	-	-	-	-	-	-	1.67000	1.67000	1.67000
Trenton I.S.D.	-	-	-	-	-	-	-	1.45140	1.46000	1.46000
Van Alstyne I.S.D.	-	-	-	-	-	-	-	1.52000	1.52000	1.52000
Whitewright I.S.D.	-	-	-	-	-	-	-	1.37000	1.37000	1.35000
Wylie I.S.D.	1.70250	1.39000	1.59000	1.64000	1.64000	1.64000	1.64000	1.64000	1.64000	1.64000
Special Districts:										
Seis Lagos										
Utility Dist	0.45030	0.42892	0.44918	0.44826	0.46037	0.46245	0.46929	0.43564	0.26489	0.26573
Collin College	0.08768	0.08698	0.08630	0.08630	0.08630	0.08630	0.08364	0.08196	0.08196	0.08122
Collin County										
M.U.D. #1	-	-	-	-	-	1.05000	1.05000	1.05000	1.05000	1.05000
Frisco										
M.U.D. #1	-	-	-	-	-	-	-	-	-	-
McKinney										
M.U.D. #1	-	-	-	-	-	-	-	1.05000	1.05000	1.05000
Direct Rate Applied										
by Collin County	0.24500	0.24250	0.24250	0.24000	0.24000	0.24000	0.23750	0.23500	0.22500	0.20840
Weighted Average All										
Entities	0.60426	0.54166	0.56314	0.57335	0.57934	0.60211	0.60672	0.63646	0.65392	0.63875

Source: Central Appraisal District

COLLIN COUNTY, TEXAS

**TABLE 2.2 - PROPERTY TAX RATES - ALL DIRECT AND OVERLAPPING GOVERNMENTS
(PER \$100 OF ASSESSED VALUE)
LAST TEN FISCAL YEARS**

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
0.24500	0.24250	0.24250	0.24000	0.24000	0.24000	0.23750	0.23500	0.22500	0.20840
									-
0.55800	0.55700	0.55500	0.55400	0.55300	0.55200	0.55000	0.54000	0.53000	0.52000
0.52500	0.57500	0.62273	0.65033	0.65033	0.65033	0.65033	0.64900	0.63900	0.62900
0.54479	0.55598	0.58087	0.60591	0.61004	0.61463	0.59337	0.58952	0.56176	0.53865
0.00285	0.00278	0.00278	0.00278	0.00278	0.00278	0.00278	0.00277	0.00276	0.00272
0.61410	0.58295	0.57405	0.57405	0.57405	0.57405	0.57405	0.57405	0.57405	0.57405
0.02217	0.02274	0.02274	0.02423	0.02423	0.02423	0.02423	0.02423	0.02423	0.02379
0.36500	0.36500	0.36500	0.36500	0.36500	0.36000	0.36000	0.35999	0.35999	0.36000
0.59964	0.60504	0.58599	0.60995	0.64277	0.69736	0.69736	0.78558	0.85883	0.78741
0.27900	0.27900	0.28830	0.28830	0.28638	0.28638	0.28638	0.28520	0.28520	0.27900
-	-	-	-	-	-	-	0.00606	0.00606	0.00606
0.35272	0.34674	0.45183	0.51399	0.51399	0.53010	0.54870	0.57195	0.55800	0.53940
0.41450	0.41450	0.41450	0.41450	0.45570	0.45570	0.45570	0.45570	0.45570	0.45570
0.22978	0.22978	0.22978	0.22978	0.22978	0.22978	0.22978	0.22978	0.22977	0.22954
0.37500	0.37500	0.37418	0.37418	0.37418	0.37418	0.35562	0.32066	0.32066	0.31795
0.58800	0.58550	0.58550	0.58550	0.58550	0.58550	0.58550	0.58300	0.58300	0.57300
0.52000	0.52000	0.61001	0.61000	0.61000	0.61000	0.61000	0.61000	0.61000	0.61000
0.46830	0.46830	0.53841	0.56500	0.56500	0.57000	0.57000	0.55000	0.53000	0.51000
0.14712	0.15499	0.16101	0.16101	0.17698	0.19288	0.19288	0.19125	0.20163	0.19115
0.21000	0.21000	0.21000	0.21000	0.21000	0.21000	0.21000	0.21000	0.20600	0.19600
0.37708	0.37708	0.37708	0.37708	0.37708	0.37708	0.35708	0.35098	0.35098	0.36598
0.45456	0.45456	0.46906	0.46906	0.46906	0.46906	0.46906	0.46906	0.46906	0.45946
0.64970	0.64960	0.72839	0.72839	0.72839	0.75693	0.73900	0.72180	0.69189	0.68989
0.35915	0.37440	0.37440	0.37440	0.37440	0.37440	0.37440	0.37440	0.37440	0.37440
0.20131	0.20131	0.20131	0.22231	0.22231	0.22231	0.22231	0.22231	0.22231	0.21881
0.16319	0.16319	0.21701	0.21701	0.22206	0.22615	0.23034	0.22344	0.22344	0.22344
0.13282	0.13282	0.16940	0.16940	0.18500	0.18500	0.18500	0.18500	0.18175	0.18175
0.44354	0.42437	0.42128	0.42128	0.41178	0.41178	0.40491	0.39228	0.37500	0.36900
-	-	-	-	-	-	-	-	-	-
0.25000	0.25000	0.25000	0.30000	0.30000	0.30000	0.36000	0.36000	0.36000	0.36000
0.68558	0.71125	0.87193	0.87193	0.87193	0.86223	0.85738	0.85253	0.84283	0.82343

COLLIN COUNTY, TEXAS

TABLE 2.2 - PROPERTY TAX RATES - ALL DIRECT AND OVERLAPPING GOVERNMENTS
(PER \$100 OF ASSESSED VALUE)
LAST TEN FISCAL YEARS

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1.77510	1.47030	1.54000	1.54000	1.67000	1.67000	1.67000	1.64000	1.61000	1.59000
1.48148	1.48148	1.54005	1.54000	1.54000	1.54000	1.54000	1.54000	1.67000	1.67000
-	-	-	-	-	-	-	0.17362	0.17564	0.17038
1.78000	1.55600	1.47650	1.67000	1.67000	1.61667	1.61660	1.59750	1.57149	1.57149
1.74799	1.51900	1.54000	1.64000	1.64000	1.64000	1.64000	1.64000	1.64000	1.64000
1.45453	1.41203	1.41203	1.41203	1.41203	1.53481	1.53481	1.52537	1.53481	1.53481
1.61648	1.30974	1.30974	1.30974	1.33973	1.36973	1.39972	1.43061	1.42921	1.38972
1.05860	0.90450	0.93130	0.93130	0.95140	0.97820	0.97820	0.97820	0.97820	0.97820
-	-	-	-	-	-	-	0.00842	0.00842	0.00842
-	-	-	-	-	-	-	0.13955	0.13979	0.13903
1.69340	1.47630	1.53500	1.53500	1.53500	1.53500	1.53500	1.56000	1.56000	1.67000
1.84100	1.51700	1.54000	1.52800	1.54000	1.54000	1.67000	1.67000	1.67000	1.62000
1.78000	1.53500	1.54000	1.54000	1.54000	1.54000	1.54000	1.54000	1.67000	1.67000
1.57840	1.26840	1.32840	1.35340	1.37340	1.37340	1.45300	1.44800	1.43900	1.43900
1.59140	1.36870	1.49000	1.49000	1.47360	1.48000	1.51000	1.62000	1.62000	1.62000
1.42164	1.31897	1.29527	1.28737	1.31897	1.31897	1.31897	1.31897	1.31897	1.31897
-	-	-	-	-	-	-	0.00029	0.00029	0.00029
-	-	-	-	-	-	-	1.67000	1.67000	1.67000
-	-	-	-	-	-	-	0.04775	0.04803	0.04803
-	-	-	-	-	-	-	0.20672	0.20672	0.20672
-	-	-	-	-	-	-	0.02644	0.02644	0.02606
1.70250	1.39000	1.59000	1.64000	1.64000	1.64000	1.64000	1.64000	1.64000	1.64000
0.45030	0.42892	0.44918	0.44826	0.46037	0.46245	0.46929	0.43564	0.26489	0.26573
0.08768	0.08698	0.08630	0.08630	0.08630	0.08630	0.08364	0.08196	0.08196	0.08122
-	-	-	-	-	1.05000	1.05000	1.05000	1.05000	1.05000
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	1.05000	1.05000	1.05000
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
33.83838	30.87468	32.09878	32.68075	33.02251	34.32036	34.58288	36.91458	37.92715	37.68603
56	57	57	57	57	57	57	58	58	59
0.60426	0.54166	0.56314	0.57335	0.57934	0.60211	0.60672	0.63646	0.65392	0.63875

North Texas Municipal
Water District

North Texas Municipal Water District
2017 SWIFT Application
Response - Question 45-A

	Projected	Projected	Net Available	Existing	\$44,650,000	\$522,510,000	\$609,820,000	BAB Subsidy	Total Debt	Projected
FYE	Gross Revenues	Expenses	for Debt Service	Debt Paid by	2017 SWIFT	2018 SWIFT	2019 SWIFT	&	Paid by	Coverage
				Sys Revs	@ 3.00%	@ 3.50%	@ 3.75%	Other Bonds	Utility Sys Revs	
2017	302,532,000	194,518,000	108,014,000	111,663,365				(4,258,559)	107,404,807	1.01x
2018	329,169,000	174,789,000	154,380,000	111,761,892	2,279,500			(4,212,900)	109,828,492	1.41x
2019	360,911,000	181,167,000	179,744,000	112,569,329	2,276,300	28,407,850		(486,813)	142,766,666	1.26x
2020	399,345,000	205,167,000	194,178,000	112,445,877	2,277,350	28,408,650	34,203,250	8,345,063	185,680,190	1.05x
2021	434,934,000	232,053,000	202,881,000	111,345,712	2,277,500	28,412,025	34,203,188	16,719,544	192,957,969	1.05x
2022	462,031,000	258,609,000	203,422,000	108,084,448	2,276,750	28,407,450	34,202,188	21,046,156	194,016,992	1.05x
2023	481,296,000	276,574,000	204,722,000	108,811,186	2,280,100	28,409,750	34,204,688	23,902,838	197,608,561	1.04x
2024	497,583,000	282,485,000	215,098,000	108,616,495	2,277,400	28,408,225	34,204,938	33,817,739	207,324,796	1.04x
2025	512,612,000	294,222,000	218,390,000	103,701,301	2,278,800	28,407,525	34,202,375	42,010,631	210,600,633	1.04x
2026	526,752,000	308,450,000	218,302,000	103,548,511	2,279,150	28,412,125	34,201,438	42,167,915	210,609,139	1.04x
2027	539,585,000	319,672,000	219,913,000	103,447,757	2,278,450	28,411,325	34,201,375	44,427,042	212,765,949	1.03x
2028	552,878,000	321,903,000	230,975,000	100,961,612	2,276,700	28,409,775	34,201,438	55,556,142	221,405,667	1.04x
2029	564,715,000	322,324,000	242,391,000	99,752,123	2,278,900	28,411,950	34,205,875	69,780,567	234,429,414	1.03x
2030	576,977,000	320,753,000	256,224,000	98,666,952	2,279,900	28,407,150	34,203,750	84,908,545	248,466,298	1.03x
2031	589,060,000	314,025,000	275,035,000	100,085,179	2,279,700	28,410,025	34,204,500	100,876,408	265,855,812	1.03x
2032	599,585,000	310,658,000	288,927,000	100,187,771	2,278,300	28,409,700	34,202,188	116,399,251	281,477,210	1.03x
2033	610,353,000	334,299,000	276,054,000	74,292,933	2,275,700	28,410,650	34,201,063	125,929,962	265,110,307	1.04x
2034	619,491,000	346,279,000	273,212,000	74,050,379	2,276,900	28,412,175	34,205,188	126,162,249	265,106,891	1.03x
2035	628,985,000	361,524,000	267,461,000	68,541,528	2,276,750	28,408,575	34,203,438	128,225,242	261,655,533	1.02x
2036	641,564,700	375,984,960	265,579,740	51,261,507	2,280,250	28,409,325	34,205,063	129,478,125	245,634,269	1.08x
2037	654,395,994	391,024,358	263,371,636	44,155,678	2,277,250	28,408,550	34,203,938	130,741,090	239,786,505	1.10x
2038	667,483,914	406,665,333	260,818,581	43,946,336	2,277,900	28,410,550	34,204,125	132,014,350	240,853,260	1.08x
2039	680,833,592	422,931,946	257,901,646	37,213,265	2,277,050	28,409,450	34,204,500	125,944,478	228,048,743	1.13x
2040	694,450,264	439,849,224	254,601,040	30,055,954	2,279,700	28,409,550	34,203,938	117,033,384	211,982,525	1.20x
2041	708,339,269	457,443,193	250,896,076	22,120,400	2,275,700	28,409,975	34,201,313	111,760,491	198,767,879	1.26x
2042	722,506,055	475,740,921	246,765,134	22,178,200	2,280,200	28,409,850	34,205,500	110,774,599	197,848,349	1.25x
2043	736,956,176	494,770,557	242,185,618	22,245,000	2,277,900	28,408,300	34,205,000	108,298,755	195,434,955	1.24x
2044	751,695,299	514,561,380	237,133,920	22,309,200	2,278,950	28,409,450	34,203,688	93,212,466	180,413,754	1.31x
2045	766,729,205	535,143,835	231,585,370	14,974,600	2,278,200	28,407,250	34,205,250	94,212,466	174,077,766	1.33x
2046	782,063,789	556,549,588	225,514,201	14,970,800	2,275,650	28,410,825	34,203,188	95,212,466	175,072,929	1.29x
2047	797,705,065	578,811,572	218,893,493		2,276,300	28,408,950	34,201,188	92,037,304	156,923,741	1.39x
2048	813,659,166	601,964,035	211,695,132			28,410,750	34,202,750	75,310,097	137,923,597	1.53x
2049	829,932,350	626,042,596	203,889,754				34,201,188	76,310,097	110,511,285	1.84x
Totals					\$ 2,237,965,292	\$ 68,339,200	\$ 852,287,700	\$ 1,026,101,500	\$ 2,523,657,192	\$ 6,708,350,884

Note: FY17 Per Budget.

2018 - 2035 Projected Gross Revenues, Projected Expenses, and Total Debt Paid by Utility Sys Revs are based on 2/2016 Water Rate Projections.

2036 - 2049 Projected Gross Revenues increased 2% Annually, Projected Expenses Increased 4% Annually, Total Debt Adjusted for Retirement of Future Bonds.

Projected Expenses do not include depreciation or any other 'noncash' items. Decrease from FY17 to FY18 is due to decrease in funding of Cap Imp Fund while increasing debt financing.

North Texas Municipal
Water District

NORTH TEXAS MUNICIPAL WATER DISTRICT
WATER SYSTEM
COMPARATIVE STATEMENT OF NET POSITION
FEBRUARY 28, 2017

	February 28 2017	September 30 2016	Increase (Decrease)
ASSETS:			
CURRENT ASSETS:			
Unrestricted Assets:			
Cash and cash equivalents	\$ 79,129,345	\$ 77,727,425	\$ 1,401,920
Investments	76,998,720	66,075,060	10,923,660
Interest receivable	-	-	-
Accounts receivable	24,141,209	20,391,106	3,750,103
Due from other funds	147,871	1,198,537	(1,050,666)
Prepaid expenses	2,477,088	2,752,930	(275,842)
Unbilled receivables	227,852	254,252	(26,400)
Total unrestricted assets	<u>183,122,085</u>	<u>168,399,310</u>	<u>14,722,775</u>
Restricted Assets:			
Cash and cash equivalents	240,196,533	89,785,998	150,410,535
Investments	275,367,039	147,327,878	128,039,161
Contracts receivable	26,400	26,400	-
Interest receivable	609,910	672,701	(62,791)
Accounts receivable	-	-	-
Due from other funds	126,680	118,339	8,341
Total restricted assets	<u>516,326,562</u>	<u>237,931,316</u>	<u>278,395,246</u>
LONG-TERM ASSETS:			
Net capital assets	<u>1,852,367,079</u>	<u>1,817,637,771</u>	<u>34,729,308</u>
Accrued OPEB asset	<u>663,140</u>	<u>663,140</u>	<u>-</u>
TOTAL ASSETS	<u>2,552,478,866</u>	<u>2,224,631,537</u>	<u>327,847,329</u>
DEFERRED OUTFLOWS OF RESOURCES			
Deferred pension outflow	9,304,772	9,304,772	-
Deferred loss on refunding	22,450,108	17,420,595	5,029,513
TOTAL DEFERRED OUTFLOWS OF RESOURCES	<u>31,754,880</u>	<u>26,725,367</u>	<u>5,029,513</u>
TOTAL ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	<u>2,584,233,746</u>	<u>2,251,356,904</u>	<u>332,876,842</u>
LIABILITIES:			
CURRENT LIABILITIES:			
Payable from Unrestricted Assets:			
Accounts payable and other liabilities	6,691,283	17,578,180	(10,886,897)
Due to other funds	3,229	48,603	(45,374)
Customer Advance Payments	-	175,411	(175,411)
Accrued interest - notes	310,581	820,215	(509,634)
Accrued interest capital lease	-	-	-
Current portion of notes	1,497,624	1,452,272	45,352
Current portion of capital lease obligation	-	-	-
Total payable from unrestricted assets	<u>8,502,717</u>	<u>20,074,681</u>	<u>(11,571,964)</u>
Payable from Restricted Assets:			
Accounts payable	5,893,103	16,839,419	(10,946,316)
Due to other funds	-	61,216	(61,216)
Accrued interest - revenue bonds	29,241,644	4,616,774	24,624,870
Current portion of revenue bonds	49,410,000	42,225,000	7,185,000
Total payable from restricted assets	<u>84,544,747</u>	<u>63,742,409</u>	<u>20,802,338</u>
LONG-TERM LIABILITIES			
Accrued vacation and sick - less current portion	2,571,338	2,571,338	-
Net pension liability	17,233,385	17,233,385	-
Deferred compensation	335,000	347,500	(12,500)
Capital lease obligation - less current portion	-	-	-
Long-term debt - less current portion	1,511,646,374	1,236,720,811	274,925,563
Total long-term liabilities	<u>1,531,786,097</u>	<u>1,256,873,034</u>	<u>274,913,063</u>
TOTAL LIABILITIES	<u>1,624,833,561</u>	<u>1,340,690,124</u>	<u>284,143,437</u>
DEFERRED INFLOWS OF RESOURCES			
Deferred pension inflow	5,333,791	5,333,791	-
Deferred insurance proceeds	-	1,289,915	(1,289,915)
TOTAL DEFERRED INFLOW OF RESOURCES	<u>5,333,791</u>	<u>6,623,706</u>	<u>(1,289,915)</u>
TOTAL LIABILITIES AND DEFERRED INFLOWS OF RESOURCES	<u>1,630,167,352</u>	<u>1,347,313,830</u>	<u>282,853,522</u>
NET POSITION:			
Net investment in capital assets	685,065,767	688,869,056	(3,803,289)
Restricted for debt service	109,236,402	83,827,441	25,408,961
Unrestricted	159,764,225	131,346,577	28,417,648
TOTAL NET POSITION	<u>\$ 954,066,394</u>	<u>\$ 904,043,074</u>	<u>\$ 50,023,320</u>

**NORTH TEXAS MUNICIPAL WATER DISTRICT
WATER SYSTEM
STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION
FOR THE FIVE MONTHS ENDED FEBRUARY 28, 2017**

	Current Month	Year to Date
	<u> </u>	<u> </u>
OPERATING REVENUES:		
Water sales	\$ 24,124,326	\$ 120,619,835
Deferred charges for services	-	-
Other operating revenues	207,180	466,918
Total operating revenues	<u>24,331,506</u>	<u>121,086,753</u>
OPERATING EXPENSES:		
Personnel	3,223,937	17,347,835
Electric power	1,090,805	4,692,547
Chemicals	965,207	5,854,172
Other operating supplies and services	2,442,382	8,688,888
Total operating expenses excluding depreciation	<u>7,722,331</u>	<u>36,583,442</u>
EXCESS OF REVENUES OVER EXPENSES BEFORE DEPRECIATION		
	16,609,175	84,503,311
Depreciation expense	3,216,896	16,045,266
Total depreciation	<u>3,216,896</u>	<u>16,045,266</u>
OPERATING INCOME (LOSS)	<u>13,392,279</u>	<u>68,458,045</u>
NONOPERATING REVENUES (EXPENSES):		
Investment income	399,128	1,611,065
Miscellaneous revenue/expense	(71,609)	(427,086)
Federal programs revenues	2,000,919	2,000,919
Gain (loss) on sale of capital assets	-	12,368
Interest expenses - long term debt	(4,296,798)	(21,631,991)
Total nonoperating revenues (expenses)	<u>(1,968,360)</u>	<u>(18,434,725)</u>
CHANGE IN NET POSITION	11,423,919	50,023,320
NET POSITION, BEGINNING BALANCE	<u>942,642,475</u>	<u>904,043,074</u>
NET POSITION, ENDING BALANCE	<u>\$ 954,066,394</u>	<u>\$ 954,066,394</u>

**NORTH TEXAS MUNICIPAL WATER DISTRICT
WATER SYSTEM
STATEMENT OF CASH FLOWS
FOR THE FIVE MONTHS ENDED FEBRUARY 28, 2017**

	Current Month	Year to Date
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 24,299,221	\$ 115,927,677
Cash received from other funds	924,958	4,638,701
Cash received from (paid to) others	256,671	990,315
Cash paid to suppliers for goods and services	(6,390,580)	(37,160,440)
Cash paid for employees for services	(2,291,338)	(12,443,307)
Cash paid to other funds	(2,568)	(13,376)
Net cash provided by operating activities	<u>16,796,364</u>	<u>71,939,570</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds	-	283,758,296
Cash paid for capital assets	(12,954,798)	(64,662,723)
Interest paid on long-term debt	-	-
Interest paid on U.S. government contracts	-	(915,679)
Principal payments on long-term debt	-	-
Payments on U.S. government contracts	-	(1,403,951)
Payments for bond issue costs	-	(1,552,569)
Federal Program Revenues	2,000,919	2,000,919
Net cash used for capital and related financing activities	<u>(10,953,879)</u>	<u>217,224,293</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments	-	72,518,613
Purchase of investments	-	(211,372,988)
Interest received	467,647	1,502,967
Net cash provided by (used for) investing activities	<u>467,647</u>	<u>(137,351,408)</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	6,310,132	151,812,455
CASH AND CASH EQUIVALENTS - Beginning of year	313,015,746	167,513,423
CASH AND CASH EQUIVALENTS - End of year	<u>\$ 319,325,878</u>	<u>\$ 319,325,878</u>
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET POSITION		
Unrestricted cash and cash equivalents	79,129,345	79,129,345
Restricted cash and cash equivalents	240,196,533	240,196,533
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	13,392,279	68,458,045
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation	3,216,896	16,045,266
Change in current assets and liabilities:		
Accounts receivable and deferred billings	71,776	(4,364,331)
Prepaid expenses	5,003	275,842
Net pension liability	-	-
Due to/from other funds	69,803	1,026,019
Accounts payable, accrued liabilities and developers' deposit	40,607	(9,325,860)
Accrued vacation and Accrued sick	-	-
Accrued OPEB	-	-
Customer advance payments	-	(175,411)
Total adjustments	<u>3,404,085</u>	<u>3,481,525</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	<u>\$ 16,796,364</u>	<u>\$ 71,939,570</u>
NONCASH TRANSACTION DISCLOSURES		
Gain on disposal of capital assets	-	12,368
Interest capitalized on construction	-	-
Amortization of bond-related items	(969,014)	(3,675,374)
Change in fair value of investments	60,667	234,665
Change in actuarial value of net pension assets	-	-
Refunding bonds issued	-	83,115,000
Refunding proceeds deposited in escrow	-	98,818,916

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF NET POSITION
SEPTEMBER 30, 2016**

ASSETS	Water System	Regional Wastewater System
CURRENT ASSETS:		
Unrestricted assets:		
Cash and cash equivalents	\$ 77,727,425	\$ 5,893,462
Investments	66,075,060	-
Accounts receivable	20,391,106	654,690
Due from other funds	1,198,537	34,929
Prepaid expenses	2,752,930	344,466
Unbilled receivable	254,252	269,853
Total unrestricted assets	168,399,310	7,197,400
Restricted assets:		
Cash and cash equivalents	89,785,998	68,306,682
Investments	147,327,878	70,246,452
Contracts receivable	26,400	-
Note receivable	367,715	-
Interest receivable	304,986	128,568
Due from other funds	118,339	-
Unbilled receivables	-	-
Total restricted assets	237,931,316	138,681,702
TOTAL CURRENT ASSETS	406,330,626	145,879,102
LONG-TERM ASSETS:		
Nondepreciable:		
Land	58,934,292	1,739,328
Easements	42,741,627	-
Construction-in-progress	407,202,758	17,629,407
Total nondepreciable assets	508,878,677	19,368,735
Depreciable:		
Land improvements	3,712,838	1,321,303
Water treatment, storage, and transmission facilities	1,272,448,065	-
Wastewater treatment and disposal facilities	-	283,067,665
Solid waste transfer and disposal facilities	-	-
Reservoir facilities and water rights	376,541,066	-
Buildings	24,372,470	2,047,667
Automobiles and trucks	6,621,988	1,892,614
Office furniture and fixtures	934,659	101,610
Other equipment	16,822,407	9,608,947
Total depreciable assets	1,701,453,493	298,039,806
Less accumulated depreciation	(392,694,399)	(99,347,816)
Net capital assets	1,817,637,771	218,060,725
Accrued OPEB asset	663,140	165,181
TOTAL LONG-TERM ASSETS	1,818,300,911	218,225,906
TOTAL ASSETS	2,224,631,537	364,105,008
DEFERRED OUTFLOWS OF RESOURCES:		
Deferred loss on refunding	17,420,595	3,057,759
Deferred pension outflow	9,304,772	2,509,378
TOTAL DEFERRED OUTFLOWS OF RESOURCES	26,725,367	5,567,137
TOTAL ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	\$ 2,251,356,904	\$ 369,672,145

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF NET POSITION
SEPTEMBER 30, 2016**

LIABILITIES	Water System	Regional Wastewater System
CURRENT LIABILITIES:		
Payable from unrestricted assets:		
Accounts payable and accrued liabilities	\$ 17,578,180	\$ 4,074,271
Due to other funds	48,603	295,028
Customers' advance payments	175,411	2,463,193
Accrued interest payable on U.S. government contracts	820,215	-
Current portion of U.S. government contracts	1,452,272	-
Total payable from unrestricted assets	20,074,681	6,832,492
Payable from restricted assets:		
Accounts payable and accrued liabilities	16,839,419	3,943,773
Due to other funds	61,216	4,472
Accrued landfill closure and post-closure care cost	-	-
Accrued interest payable on revenue bonds	4,616,774	1,706,185
Current portion of note payable	-	-
Current portion of revenue bonds	42,225,000	12,370,000
Total payable from restricted assets	63,742,409	18,024,430
TOTAL CURRENT LIABILITIES	83,817,090	24,856,922
LONG-TERM LIABILITIES:		
Accrued landfill closure costs	-	-
Accrued vacation—less current portion	973,044	260,675
Accrued sick—less current portion	1,598,294	386,648
Net pension liability	17,233,385	4,812,791
Deferred compensation	347,500	-
Long-term debt—less current portion	1,236,720,811	230,267,702
TOTAL LONG-TERM LIABILITIES	1,256,873,034	235,727,816
TOTAL LIABILITIES	1,340,690,124	260,584,738
DEFERRED INFLOWS OF RESOURCES:		
Deferred pension inflow	5,333,791	1,462,272
Deferred insurance proceeds	1,289,915	-
TOTAL DEFERRED INFLOWS OF RESOURCES	6,623,706	1,462,272
TOTAL LIABILITIES AND DEFERRED INFLOWS OF RESOURCES	1,347,313,830	262,047,010
NET POSITION:		
Net investment in capital assets	688,869,056	93,371,653
Restricted for debt service	83,827,441	18,172,746
Unrestricted	131,346,577	(3,919,264)
TOTAL NET POSITION	\$ 904,043,074	\$ 107,625,135

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
YEAR ENDED SEPTEMBER 30, 2016**

	<u>Water System</u>	<u>Regional Wastewater System</u>
OPERATING REVENUES:		
Water sales	\$ 252,591,522	\$ -
Wastewater service fees	-	54,467,985
Solid waste service fees	-	-
Other operating revenues	398,998	161,189
Total operating revenues	<u>252,990,520</u>	<u>54,629,174</u>
OPERATING EXPENSES:		
Personnel	39,180,330	10,369,874
Operating Supplies:		
Chemicals	19,864,912	4,849,607
Other supplies	5,404,587	3,386,731
Operating Services:		
Electric power	13,116,951	2,788,573
Wholesale water purchases	2,662,651	-
Other services	9,181,436	13,695,309
Depreciation	32,964,843	7,638,327
Total operating expenses	<u>122,375,710</u>	<u>42,728,421</u>
OPERATING INCOME	<u>130,614,810</u>	<u>11,900,753</u>
NONOPERATING REVENUES (EXPENSES):		
Investment income	1,927,950	382,606
Miscellaneous revenue (expense)	(432,253)	-
Federal program revenues	4,005,982	-
Gain on sale of capital assets	42,617	42,490
Interest expense	(37,163,917)	(6,044,530)
Total nonoperating revenues (expenses)	<u>(31,619,621)</u>	<u>(5,619,434)</u>
CHANGE IN NET POSITION	<u>98,995,189</u>	<u>6,281,319</u>
NET POSITION AT OCTOBER 1, 2015	<u>805,047,885</u>	<u>101,343,816</u>
NET POSITION AT SEPTEMBER 30, 2016	<u>\$ 904,043,074</u>	<u>\$ 107,625,135</u>

The notes to the basic financial statements are an integral part of this statement.

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF CASH FLOWS
YEAR ENDED SEPTEMBER 30, 2016

	<u>Water System</u>	<u>Regional Wastewater System</u>
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 258,221,100	\$ 53,756,437
Cash received from other funds	9,790,187	411,816
Cash received from (paid to) others	2,305,758	33,249
Cash paid to suppliers for goods and services	(77,508,689)	(19,279,869)
Cash paid for employee services	(27,176,986)	(7,156,183)
Cash paid to other funds	(28,881)	(7,567,107)
Net cash provided by operating activities	<u>165,602,489</u>	<u>20,198,343</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds	-	60,962,368
Cash paid for capital assets	(109,578,332)	(12,366,444)
Interest paid on long-term debt	(57,204,448)	(6,911,960)
Interest paid on U.S. government contracts	(1,051,777)	-
Principal payments on long-term debt	(41,205,000)	(11,665,000)
Payments on U.S. government contracts	(1,406,824)	-
Payments for bond issue costs	-	(988,225)
Grant income	43,839	-
Federal Program Revenues	4,005,982	-
Interfund advance	(367,715)	-
Net cash provided by (used for) capital and related financing activities	<u>(206,764,275)</u>	<u>29,030,739</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments	187,018,896	36,946,121
Purchases of investments	(122,084,790)	(60,044,259)
Interest received	2,377,266	462,212
Net cash provided by (used for) investing activities	<u>67,311,372</u>	<u>(22,635,926)</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	26,149,586	26,593,156
CASH AND CASH EQUIVALENTS—Beginning of year	141,363,837	47,606,988
CASH AND CASH EQUIVALENTS—End of year	<u>\$ 167,513,423</u>	<u>\$ 74,200,144</u>
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET POSITION		
Unrestricted cash and cash equivalents	\$ 77,727,425	\$ 5,893,462
Restricted cash and cash equivalents	89,785,998	68,306,682
	<u>\$ 167,513,423</u>	<u>\$ 74,200,144</u>
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	\$ 130,614,810	\$ 11,900,753
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	32,964,843	7,638,327
Change in current assets and liabilities:		
Accounts receivable and unbilled receivable	(475,087)	(151,488)
Prepaid expenses	(14,755)	(7,019)
Net pension liability	123,492	32,908
Due to/from other funds	(1,062,612)	74,984
Accounts payable, accrued liabilities, and developers' deposits	3,283,402	1,211,022
Accrued vacation and accrued sick	384,530	131,629
Accrued OPEB	(381,714)	(92,037)
Landfill liability	-	-
Customers' advance payments	165,580	(540,736)
Total adjustments	<u>34,987,679</u>	<u>8,297,590</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	<u>\$ 165,602,489</u>	<u>\$ 20,198,343</u>
NONCASH TRANSACTION DISCLOSURES		
Change in landfill liability	\$ -	\$ -
Gain (loss) on disposal of capital assets	2,600	-
Interest capitalized on construction	12,907,512	275,869
Amortization of bond-related items	(8,998,143)	(309,614)
Change in fair value of investments	204,817	61,752
Change in actuarial value of net pension liability	(123,492)	(32,908)
Refunding bonds issued	-	42,225,000
Refunding proceeds deposited in escrow	-	49,989,498

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF NET POSITION
SEPTEMBER 30, 2015**

ASSETS	Water System	Regional Wastewater System
CURRENT ASSETS:		
Unrestricted assets:		
Cash and cash equivalents	\$ 43,382,041	\$ 4,514,553
Investments	54,082,991	-
Accounts receivable	19,121,480	891,499
Due from other funds	170,442	74,982
Prepaid expenses	2,738,175	337,447
Unbilled receivables	247,209	-
Total unrestricted assets	119,742,338	5,818,481
Restricted assets:		
Cash and cash equivalents	97,981,796	43,092,435
Investments	224,702,719	47,223,413
Contracts receivable	26,400	-
Interest receivable	200,984	10,125
Due from other funds	105,015	-
Unbilled receivables	-	-
Total restricted assets	323,016,914	90,325,973
TOTAL CURRENT ASSETS	442,759,252	96,144,454
LONG-TERM ASSETS:		
Nondepreciable:		
Land	56,208,646	1,739,328
Easements	32,853,007	-
Construction-in-progress	683,625,679	15,248,036
Total nondepreciable assets	772,687,332	16,987,364
Depreciable:		
Land improvements	3,712,838	1,321,303
Water treatment, storage, and transmission facilities	910,311,729	-
Wastewater treatment and disposal facilities	-	273,678,409
Solid waste transfer and disposal facilities	-	-
Reservoir facilities and water rights	368,260,136	-
Buildings	12,898,435	2,047,667
Automobiles and trucks	4,427,370	1,708,385
Office furniture and fixtures	421,772	101,610
Other equipment	15,721,778	8,099,702
Total depreciable assets	1,315,754,058	286,957,076
Less accumulated depreciation	(359,976,956)	(92,002,048)
Net capital assets	1,728,464,434	211,942,392
Accrued OPEB asset	281,426	73,144
TOTAL LONG-TERM ASSETS	1,728,745,860	212,015,536
TOTAL ASSETS	2,171,505,112	308,159,990
DEFERRED OUTFLOWS OF RESOURCES:		
Deferred loss on refunding	18,427,869	1,500,210
Deferred pension outflow	1,691,734	480,626
TOTAL DEFERRED OUTFLOWS OF RESOURCES	20,119,603	1,980,836
TOTAL ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	\$ 2,191,624,715	\$ 310,140,826

The notes to the basic financial statements are an integral part of this statement.

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF NET POSITION
SEPTEMBER 30, 2015

LIABILITIES	Water System	Regional Wastewater System
CURRENT LIABILITIES:		
Payable from unrestricted assets:		
Accounts payable and accrued liabilities	\$ 16,990,972	\$ 2,863,249
Due to other funds	85,295	263,198
Customers' advance payments	9,831	3,003,929
Accrued interest payable on U.S. government contracts	856,063	-
Current portion of U.S. government contracts	1,406,824	-
Total payable from unrestricted assets	19,348,985	6,130,376
Payable from restricted assets:		
Accounts payable and accrued liabilities	13,403,408	2,854,257
Due to other funds	53,947	14,525
Accrued landfill closure and post-closure care cost	-	-
Accrued interest payable on revenue bonds	4,767,037	1,988,131
Current portion of revenue bonds	41,205,000	11,665,000
Total payable from restricted assets	59,429,392	16,521,913
TOTAL CURRENT LIABILITIES	78,778,377	22,652,289
LONG-TERM LIABILITIES:		
Accrued landfill closure costs	-	-
Accrued vacation—less current portion	903,711	226,622
Accrued sick—less current portion	1,283,097	289,072
Net pension liability	12,508,883	3,553,788
Deferred compensation	377,500	-
Long-term debt—less current portion	1,290,403,499	181,415,624
TOTAL LONG-TERM LIABILITIES	1,305,476,690	185,485,106
TOTAL LIABILITIES	1,384,255,067	208,137,395
DEFERRED INFLOWS OF RESOURCES:		
Deferred pension inflow	2,321,763	659,615
TOTAL DEFERRED INFLOWS OF RESOURCES	2,321,763	659,615
TOTAL LIABILITIES AND DEFERRED INFLOWS OF RESOURCES	1,386,576,830	208,797,010
NET POSITION:		
Net investment in capital assets	632,201,993	88,254,194
Restricted for debt service	88,333,822	17,491,516
Unrestricted	84,512,070	(4,401,894)
TOTAL NET POSITION	\$ 805,047,885	\$ 101,343,816

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
YEAR ENDED SEPTEMBER 30, 2015**

	<u>Water System</u>	<u>Regional Wastewater System</u>
OPERATING REVENUES:		
Water sales	\$ 215,871,181	\$ -
Wastewater service fees	-	45,161,269
Solid waste service fees	-	-
Other operating revenues	275,049	49,829
Total operating revenues	<u>216,146,230</u>	<u>45,211,098</u>
OPERATING EXPENSES:		
Personnel	31,606,156	8,818,219
Operating Supplies:		
Chemicals	17,725,803	4,642,731
Other supplies	3,872,644	2,272,635
Operating Services:		
Electric power	17,280,685	3,254,943
Wholesale water purchases	6,909,337	-
Other services	12,712,999	9,629,951
Depreciation	30,442,841	7,394,744
Total operating expenses	<u>120,550,465</u>	<u>36,013,223</u>
OPERATING INCOME	<u>95,595,765</u>	<u>9,197,875</u>
NONOPERATING REVENUES (EXPENSES):		
Investment income	1,396,948	195,295
Miscellaneous revenue (expense)	325,064	-
Grant income	62,233	-
Federal program revenues	4,013,998	-
Interest expense	(33,365,638)	(5,665,182)
Total nonoperating revenues (expenses)	<u>(27,567,395)</u>	<u>(5,469,887)</u>
CHANGE IN NET POSITION	<u>68,028,370</u>	<u>3,727,988</u>
NET POSITION AT OCTOBER 1, 2014 (As Previously Stated)	752,557,960	101,752,306
CUMULATIVE EFFECT OF CHANGE IN ACCOUNTING PRINCIPLE	<u>(15,538,445)</u>	<u>(4,136,478)</u>
NET POSITION AT OCTOBER 1, 2014	<u>737,019,515</u>	<u>97,615,828</u>
NET POSITION AT SEPTEMBER 30, 2015	<u>\$ 805,047,885</u>	<u>\$ 101,343,816</u>

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF CASH FLOWS
YEAR ENDED SEPTEMBER 30, 2015**

	<u>Water System</u>	<u>Regional Wastewater System</u>
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 230,079,045	\$ 47,025,242
Cash received from other funds	7,079,178	371,896
Cash received from others	2,044,721	36,195
Cash paid to suppliers for goods and services	(92,365,934)	(17,244,950)
Cash paid for employee services	(23,215,676)	(6,180,713)
Cash paid to other funds	(33,549)	(6,021,340)
Net cash provided by operating activities	<u>123,587,785</u>	<u>17,986,330</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds	140,148,334	54,928,480
Cash paid for capital assets	(85,801,557)	(11,597,144)
Interest paid on long-term debt	(55,392,673)	(6,030,444)
Interest paid on U.S. government contracts	(1,095,802)	-
Principal payments on long-term debt	(41,740,000)	(9,420,000)
Payments on U.S. government contracts	(1,362,798)	-
Payments for bond issue costs	(2,397,294)	(560,617)
Grant income	62,233	-
Federal Program Revenues	4,013,998	-
Net cash provided by (used for) capital and related financing activities	<u>(43,565,559)</u>	<u>27,320,275</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments	118,996,109	17,204,726
Purchases of investments	(206,578,810)	(34,947,604)
Interest received	585,206	(45,506)
Net cash provided by (used for) investing activities	<u>(86,997,495)</u>	<u>(17,788,384)</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	(6,975,269)	27,518,221
CASH AND CASH EQUIVALENTS—Beginning of year	148,339,106	20,088,767
CASH AND CASH EQUIVALENTS—End of year	\$ 141,363,837	\$ 47,606,988
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET POSITION		
Unrestricted cash and cash equivalents	\$ 43,382,041	\$ 4,514,553
Restricted cash and cash equivalents	97,981,796	43,092,435
	<u>\$ 141,363,837</u>	<u>\$ 47,606,988</u>
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	\$ 95,595,765	\$ 9,197,875
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	30,442,841	7,394,744
Change in current assets and liabilities:		
Accounts receivable and unbilled receivable	(1,469,757)	491,011
Prepaid expenses	183,504	64,377
Net pension liability	(1,420,976)	(403,701)
Due to/from other funds	(12,506)	81,823
Accounts payable, accrued liabilities, and developers' deposits	580,912	(128,289)
Accrued vacation and accrued sick	79,149	3,283
Accrued OPEB	(400,978)	(106,112)
Landfill liability	-	-
Customers' advance payments	9,831	1,391,319
Total adjustments	<u>27,992,020</u>	<u>8,788,455</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	\$ 123,587,785	\$ 17,986,330
NONCASH TRANSACTION DISCLOSURES		
Change in landfill liability	\$ -	\$ -
Interest capitalized on construction	12,807,125	217,600
Amortization of bond-related items	(9,754,980)	(125,645)
Change in fair value of investments	(341,056)	(47,895)
Change in actuarial value of net pension liability	1,420,976	403,701
Refunding bonds issued	181,285,000	13,945,000
Refunding proceeds deposited in escrow	212,191,922	16,028,752

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF NET POSITION
SEPTEMBER 30, 2014**

ASSETS	Water System	Regional Wastewater System
CURRENT ASSETS:		
Unrestricted Assets:		
Cash and cash equivalents	\$ 32,717,170	\$ 4,071,276
Investments	51,023,480	-
Accounts receivable	20,892,759	279,871
Due from other funds	126,999	89,399
Prepaid expenses	2,921,679	401,824
Total unrestricted assets	107,682,087	4,842,370
Restricted Assets:		
Cash and cash equivalents	115,621,936	16,017,491
Investments	139,367,281	29,239,037
Interest and accounts receivable	211,291	95,323
Due from other funds	78,086	-
Total restricted assets	255,278,594	45,351,851
TOTAL CURRENT ASSETS	362,960,681	50,194,221
DEFERRED OUTFLOWS OF RESOURCES:		
Deferred customer billings (unrestricted assets)	-	46,059
Deferred customer billings (restricted assets)	-	-
Total deferred outflows of resources from current assets	-	46,059
LONG-TERM ASSETS:		
Nondepreciable:		
Land	53,508,729	1,739,328
Easements	32,853,007	-
Construction-in-progress	618,830,219	13,360,709
Total nondepreciable assets	705,191,955	15,100,037
Depreciable:		
Land improvements	3,712,838	1,321,303
Water treatment, storage, and transmission facilities	888,732,531	-
Wastewater treatment and disposal facilities	-	266,215,741
Solid waste transfer and disposal facilities	-	-
Reservoir facilities and water rights	366,121,044	-
Buildings	12,878,435	75,911
Automobiles and trucks	10,167,249	1,677,050
Office furniture and fixtures	407,014	101,610
Other equipment	4,496,970	7,161,930
Total depreciable assets	1,286,516,081	276,553,545
Less accumulated depreciation	(329,548,236)	(84,552,169)
Net capital assets	1,662,159,800	207,101,413
DEFERRED OUTFLOWS OF RESOURCES:		
Long term deferred customer billings, less current portion	240,240	545,379
Deferred loss on refunding	13,718,420	1,001,149
Total deferred outflows of resources from long-term assets	13,958,660	1,546,528
Net pension assets	978,557	269,854
TOTAL LONG-TERM ASSETS	1,677,097,017	208,917,795
TOTAL ASSETS	\$ 2,040,057,698	\$ 259,158,075

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF NET POSITION
SEPTEMBER 30, 2014**

LIABILITIES	<u>Water System</u>	<u>Regional Wastewater System</u>
CURRENT LIABILITIES:		
Payable from unrestricted assets:		
Accounts payable and accrued liabilities	\$ 14,976,742	\$ 2,835,397
Due to other funds	50,297	210,314
Customers' advance payments	-	1,612,610
Accrued interest payable on U.S. government contracts	890,790	-
Current portion of U.S. government contracts	<u>1,362,798</u>	<u>-</u>
Total payable from unrestricted assets	<u>17,280,627</u>	<u>4,658,321</u>
Payable from restricted assets:		
Accounts payable and accrued liabilities	19,152,937	2,424,000
Due to other funds	47,071	8,577
Accrued landfill closure and post-closure care cost	-	-
Accrued interest payable on revenue bonds	4,621,543	2,010,147
Current portion of revenue bonds	<u>37,535,000</u>	<u>9,420,000</u>
Total payable from restricted assets	<u>61,356,551</u>	<u>13,862,724</u>
TOTAL CURRENT LIABILITIES	<u>78,637,178</u>	<u>18,521,045</u>
LONG-TERM LIABILITIES:		
Accrued landfill closure costs	-	-
Accrued vacation—less current portion	821,910	216,072
Accrued sick—less current portion	1,285,749	296,339
Accrued OPEB liability	119,552	32,968
Deferred compensation	407,500	-
Long-term debt—less current portion	<u>1,206,227,849</u>	<u>138,339,345</u>
TOTAL LONG-TERM LIABILITIES	<u>1,208,862,560</u>	<u>138,884,724</u>
TOTAL LIABILITIES	<u>1,287,499,738</u>	<u>157,405,769</u>
NET POSITION:		
Net investment in capital assets	577,425,883	85,529,233
Restricted for debt service	86,763,823	16,223,111
Unrestricted	<u>88,368,254</u>	<u>(38)</u>
TOTAL NET POSITION	<u>\$ 752,557,960</u>	<u>\$ 101,752,306</u>

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
YEAR ENDED SEPTEMBER 30, 2014**

	<u>Water System</u>	<u>Regional Wastewater System</u>
OPERATING REVENUES:		
Water sales	\$ 197,954,585	\$ -
Wastewater service fees	-	43,668,905
Solid waste service fees	-	-
Other operating revenues	730,721	150,364
Total operating revenues	<u>198,685,306</u>	<u>43,819,269</u>
OPERATING EXPENSES:		
Personnel	31,210,628	9,008,763
Operating Supplies:		
Chemicals	16,224,958	5,060,096
Other supplies	3,461,717	2,458,544
Operating Services:		
Electric power	19,856,736	3,478,249
Wholesale water purchases	11,249,696	-
Other services	14,083,933	7,736,061
Depreciation and amortization	29,484,255	7,177,384
Total operating expenses	<u>125,571,923</u>	<u>34,919,097</u>
OPERATING INCOME	<u>73,113,383</u>	<u>8,900,172</u>
NONOPERATING REVENUES (EXPENSES):		
Investment income	513,007	142,365
Miscellaneous revenue (expense)	2,351,148	-
Federal program revenues	4,018,329	-
Gain (loss) on sale of capital assets	(35,798)	23,865
Interest expense	(35,396,947)	(5,800,146)
Total nonoperating revenues (expenses)	<u>(28,550,261)</u>	<u>(5,633,916)</u>
CHANGE IN NET POSITION	44,563,122	3,266,256
NET POSITION AT OCTOBER 1, 2013	<u>707,994,838</u>	<u>98,486,050</u>
NET POSITION AT SEPTEMBER 30, 2014	<u>\$ 752,557,960</u>	<u>\$ 101,752,306</u>

The notes to the basic financial statements are an integral part of this statement.

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF CASH FLOWS
YEAR ENDED SEPTEMBER 30, 2014

	Water System	Regional Wastewater System
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 208,878,217	\$ 42,709,614
Cash received from other funds	6,391,243	319,600
Cash received from (paid to) others	2,273,964	37,032
Cash paid to suppliers for goods and services	(98,949,736)	(15,682,513)
Cash paid for employee services	(21,594,761)	(5,773,468)
Cash paid to other funds	(30,012)	(5,270,703)
Net cash provided by operating activities	<u>96,968,915</u>	<u>16,339,562</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds	77,455,962	-
Cash paid for capital assets	(124,698,997)	(11,888,774)
Interest paid on long-term debt	(50,320,760)	(6,344,744)
Interest paid on U.S. government contracts	(1,138,450)	-
Principal payments on long-term debt	(34,185,000)	(9,045,000)
Payments on U.S. government contracts	(1,320,151)	-
Payments for bond issue costs	(1,408,489)	29
Federal Program Revenues	4,018,329	-
Net cash used for capital and related financing activities	<u>(131,597,556)</u>	<u>(27,278,489)</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments	186,152,155	13,990,922
Purchases of investments	(140,233,324)	(15,002,276)
Interest received	942,616	326,957
Net cash provided by (used for) investing activities	<u>46,861,447</u>	<u>(684,397)</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	<u>12,232,606</u>	<u>(11,623,324)</u>
CASH AND CASH EQUIVALENTS—Beginning of year	<u>136,106,300</u>	<u>31,712,091</u>
CASH AND CASH EQUIVALENTS—End of year	<u>\$ 148,339,106</u>	<u>\$ 20,088,767</u>
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET POSITION		
Unrestricted cash and cash equivalents	\$ 32,717,170	\$ 4,071,276
Restricted cash and cash equivalents	115,621,936	16,017,491
	<u>\$ 148,339,106</u>	<u>\$ 20,088,767</u>
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	\$ 73,113,383	\$ 8,900,172
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	29,484,255	7,177,384
Change in current assets and liabilities:		
Accounts receivable and deferred billings	(1,833,391)	462,692
Prepaid expenses	122,524	(159,593)
Net pension assets	(289,462)	(69,281)
Due to/from other funds	(3,675,160)	133,855
Accounts payable, accrued liabilities, and developers' deposits	289,436	982,813
Accrued vacation and accrued sick	91,205	92,924
Accrued OPEB	(308,713)	(91,684)
Landfill liability	-	-
Customers' advance payments	(25,162)	(1,089,720)
Total adjustments	<u>23,855,532</u>	<u>7,439,390</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	<u>\$ 96,968,915</u>	<u>\$ 16,339,562</u>
NONCASH TRANSACTION DISCLOSURES		
Change in landfill liability	\$ -	\$ -
Gain (loss) on disposal of capital assets	(48,840)	-
Interest capitalized on construction	11,432,850	265,218
Amortization of bond-related items	(5,884,185)	(174,613)
Change in fair value of investments	133,205	7,452
Change in actuarial value of net pension assets	289,462	69,281
Refunding bonds issued	102,055,000	-
Refunding proceeds deposited in escrow	121,218,261	-

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT
STATEMENT OF NET POSITION
SEPTEMBER 30, 2013**

ASSETS	Water System	Regional Wastewater System
CURRENT ASSETS:		
Unrestricted Assets:		
Cash and cash equivalents	\$ 45,334,774	\$ 3,808,444
Investments	45,374,680	-
Accounts receivable	15,963,523	588,098
Due from other funds	142,076	176,315
Prepaid expenses	3,044,203	242,231
Total unrestricted assets	109,859,256	4,815,088
Restricted Assets:		
Cash and cash equivalents	90,771,526	27,903,647
Investments	191,364,232	28,412,021
Interest and accounts receivable	262,682	94,494
Due from other funds	3,536,603	-
Total restricted assets	285,935,043	56,410,162
TOTAL CURRENT ASSETS	395,794,299	61,225,250
DEFERRED OUTFLOWS OF RESOURCES:		
Deferred customer billings (unrestricted assets)	-	202,593
Deferred customer billings (restricted assets)	-	-
Total deferred outflows of resources from current assets	-	202,593
LONG-TERM ASSETS:		
Nondepreciable:		
Land	53,118,136	1,739,328
Easements	32,758,486	-
Construction-in-progress	519,455,101	8,564,494
Total nondepreciable assets	605,331,723	10,303,822
Depreciable:		
Land improvements	3,712,838	1,321,303
Water treatment, storage, and transmission facilities	865,207,070	-
Wastewater treatment and disposal facilities	-	258,936,446
Solid waste transfer and disposal facilities	-	-
Reservoir facilities and water rights	366,121,044	-
Buildings	12,875,435	75,911
Automobiles and trucks	9,000,794	1,644,141
Office furniture and fixtures	407,014	61,847
Other equipment	4,407,255	6,656,827
Total depreciable assets	1,261,731,450	268,696,475
Less accumulated depreciation	(300,171,884)	(77,511,534)
Net capital assets	1,566,891,289	201,488,763
DEFERRED OUTFLOWS OF RESOURCES:		
Long term deferred customer billings, less current portion	-	544,139
Deferred loss on refunding	4,577,975	1,259,400
Total deferred outflows of resources from long-term assets	4,577,975	1,803,539
Net pension assets	689,095	200,573
TOTAL LONG-TERM ASSETS	1,572,158,359	203,492,875
TOTAL ASSETS	\$ 1,967,952,658	\$ 264,920,718

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT
STATEMENT OF NET POSITION
SEPTEMBER 30, 2013**

LIABILITIES	Water System	Regional Wastewater System
CURRENT LIABILITIES:		
Payable from unrestricted assets:		
Accounts payable and accrued liabilities	\$ 17,734,397	\$ 2,352,588
Due to other funds	3,731,959	163,375
Customers' advance payments	25,162	2,702,330
Accrued interest payable on U.S. government contracts	924,429	-
Current portion of U.S. government contracts	1,320,151	-
Total payable from unrestricted assets	23,736,098	5,218,293
Payable from restricted assets:		
Accounts payable and accrued liabilities	30,747,903	1,309,175
Due to other funds	10,174	10,938
Accrued landfill closure and post-closure care cost	-	-
Accrued interest payable on revenue bonds	4,420,501	2,114,914
Current portion of revenue bonds	34,185,000	9,045,000
Total payable from restricted assets	69,363,578	12,480,027
TOTAL CURRENT LIABILITIES	93,099,676	17,698,320
LONG-TERM LIABILITIES:		
Accrued landfill closure costs	-	-
Accrued vacation—less current portion	777,914	186,071
Accrued sick—less current portion	1,238,540	233,416
Accrued OPEB liability	428,265	124,652
Long-term debt—less current portion	1,164,413,425	148,192,209
TOTAL LONG-TERM LIABILITIES	1,166,858,144	148,736,348
TOTAL LIABILITIES	1,259,957,820	166,434,668
NET POSITION:		
Net investment in capital assets	543,085,734	82,469,291
Restricted for debt service	81,413,161	16,104,777
Unrestricted	83,495,943	(88,018)
TOTAL NET POSITION	\$ 707,994,838	\$ 98,486,050

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT
STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
YEAR ENDED SEPTEMBER 30, 2013**

	<u>Water System</u>	<u>Regional Wastewater System</u>
OPERATING REVENUES:		
Water sales	\$ 184,641,152	\$ -
Wastewater service fees	-	40,635,007
Solid waste service fees	-	-
Other operating revenues	<u>232,969</u>	<u>125,907</u>
Total operating revenues	<u>184,874,121</u>	<u>40,760,914</u>
OPERATING EXPENSES:		
Personnel	26,125,386	8,846,037
Operating Supplies:		
Chemicals	16,396,401	4,143,535
Other supplies	3,295,466	1,960,891
Operating Services:		
Electric power	20,698,672	4,388,815
Wholesale water purchases	6,180,945	-
Other services	5,231,011	7,394,108
Depreciation and amortization	<u>28,446,785</u>	<u>5,032,114</u>
Total operating expenses	<u>106,374,666</u>	<u>31,765,500</u>
OPERATING INCOME	<u>78,499,455</u>	<u>8,995,414</u>
NONOPERATING REVENUES (EXPENSES):		
Investment income	894,079	117,292
Miscellaneous revenue (expense)	18,233	-
Federal program revenues	4,141,736	186,430
Gain on sale of capital assets	24,098	27,943
Interest expense	<u>(39,401,412)</u>	<u>(4,321,604)</u>
Total nonoperating revenues (expenses)	<u>(34,323,266)</u>	<u>(3,989,939)</u>
CHANGE IN NET POSITION	<u>44,176,189</u>	<u>5,005,475</u>
NET POSITION AT OCTOBER 1, 2012 (As Previously Stated)	670,997,970	94,778,265
CUMULATIVE EFFECT OF CHANGE IN ACCOUNTING PRINCIPLE	(7,179,321)	(1,297,690)
NET POSITION AT OCTOBER 1, 2012 (As Restated)	<u>663,818,649</u>	<u>93,480,575</u>
NET POSITION AT SEPTEMBER 30, 2013	<u>\$ 707,994,838</u>	<u>\$ 98,486,050</u>

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT
STATEMENT OF CASH FLOWS
YEAR ENDED SEPTEMBER 30, 2013**

	Water System	Regional Wastewater System
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 188,374,577	\$ 40,404,730
Cash received from other funds	6,509,782	343,388
Cash received from (paid to) others	1,460,006	24,382
Cash paid to suppliers for goods and services	(69,349,093)	(16,425,739)
Cash paid for employee services	(19,654,301)	(5,448,298)
Cash paid to other funds	-	(4,658,958)
Net cash provided by operating activities	<u>107,340,971</u>	<u>14,239,505</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds	-	24,655,267
Cash paid for capital assets	(261,229,847)	(11,184,404)
Interest paid on long-term debt	(57,874,923)	(6,112,890)
Interest paid on U.S. government contracts	(1,179,762)	-
Principal payments on long-term debt	(34,965,000)	(7,895,000)
Payments on U.S. government contracts	(1,278,838)	-
Payments for bond issue costs	(3,500)	(217,894)
Federal Program Revenues	4,141,736	186,430
Net cash used for capital and related financing activities	<u>(352,390,134)</u>	<u>(568,491)</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments	295,684,030	15,538,098
Purchases of investments	(217,902,330)	(28,385,424)
Interest received	1,129,523	81,049
Net cash provided by (used for) investing activities	<u>78,911,223</u>	<u>(12,766,277)</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	(166,137,940)	904,737
CASH AND CASH EQUIVALENTS—Beginning of year	302,244,240	30,807,354
CASH AND CASH EQUIVALENTS—End of year	<u>\$ 136,106,300</u>	<u>\$ 31,712,091</u>
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET POSITION		
Unrestricted cash and cash equivalents	\$ 45,334,774	\$ 3,808,444
Restricted cash and cash equivalents	90,771,526	27,903,647
	<u>\$ 136,106,300</u>	<u>\$ 31,712,091</u>
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	\$ 78,499,455	\$ 8,995,414
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	28,446,785	5,032,114
Change in current assets and liabilities:		
Accounts receivable and deferred billings	(2,207,974)	53,647
Prepaid expenses	591,117	75,088
Net pension assets	(282,886)	(82,228)
Due to/from other funds	123,600	(105,774)
Accounts payable, accrued liabilities, and developers' deposits	5,040,893	616,858
Accrued vacation and Accrued sick	(292,000)	(57,843)
Accrued OPEB	(2,507,763)	131,570
Landfill liability	-	-
Customers' advance payments	(70,256)	(419,341)
Total adjustments	<u>28,841,516</u>	<u>5,244,091</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	<u>\$ 107,340,971</u>	<u>\$ 14,239,505</u>
NONCASH TRANSACTION DISCLOSURES		
Change in landfill liability	\$ -	\$ -
Gain on sale of capital assets	24,098	27,943
Interest capitalized on construction	10,987,899	1,612,002
Amortization of bond-related items	(6,108,076)	(220,746)
Change in fair value of investments	(67,640)	(28,930)
Change in actuarial value of net pension assets	282,886	82,228
Refunding bonds issued	-	-
Refunding proceeds deposited in escrow	-	-

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF NET ASSETS
SEPTEMBER 30, 2012**

ASSETS	Water System	Regional Wastewater System
CURRENT ASSETS:		
Unrestricted Assets:		
Cash and cash equivalents	\$ 65,942,279	\$ 4,165,150
Investments	24,968,139	-
Accounts receivable	13,943,319	779,501
Due from other funds	124,901	24,575
Prepaid expenses	3,635,320	317,319
Deferred customer billings	-	210,251
Total unrestricted assets	108,613,958	5,496,796
Restricted Assets:		
Cash and cash equivalents	236,301,961	26,642,204
Investments	289,787,380	15,527,833
Interest and accounts receivable	74,912	2,322
Due from other funds	37,077	-
Deferred customer billings	-	-
Total restricted assets	526,201,330	42,172,359
TOTAL CURRENT ASSETS	634,815,288	47,669,155
LONG-TERM ASSETS:		
Nondepreciable:		
Land	8,965,180	1,739,328
Easements	28,764,718	-
Construction-in-progress	339,634,906	89,402,134
Total nondepreciable assets	377,364,804	91,141,462
Depreciable:		
Land improvements	3,712,838	64,146
Water treatment, storage, and transmission facilities	811,656,621	-
Wastewater treatment and disposal facilities	-	169,611,434
Solid waste transfer and disposal facilities	-	-
Reservoir facilities and water rights	368,121,044	-
Buildings	12,798,905	75,911
Automobiles and trucks	7,502,238	1,622,303
Office furniture and fixtures	407,014	61,847
Other equipment	4,362,554	6,492,748
Total depreciable assets	1,208,561,214	177,928,389
Less accumulated depreciation	(271,865,664)	(73,120,453)
Net capital assets	1,312,060,354	195,949,398
Long term deferred billings, less current portion	-	490,897
Net pension assets	406,209	118,345
Bond issue costs, net	7,179,321	1,297,690
TOTAL LONG-TERM ASSETS	1,319,645,884	197,856,330
TOTAL ASSETS	\$ 1,954,461,172	\$ 245,525,485

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF NET ASSETS
SEPTEMBER 30, 2012**

LIABILITIES	Water System	Regional Wastewater System
CURRENT LIABILITIES:		
Payable from unrestricted assets:		
Accounts payable and accrued liabilities	\$ 11,597,034	\$ 2,376,060
Due to other funds	91,183	117,409
Customers' advance payments	95,418	3,121,671
Accrued interest payable on U.S. government contracts	957,016	-
Current portion of U.S. government contracts	1,278,839	-
Total payable from unrestricted assets	14,019,490	5,615,140
Payable from restricted assets:		
Accounts payable and accrued liabilities	20,099,507	3,319,228
Due to other funds	12,898	12,656
Accrued landfill closure and post-closure care cost	-	-
Accrued interest payable on revenue bonds	8,078,414	1,991,485
Current portion of revenue bonds	29,555,000	7,895,000
Total payable from restricted assets	57,745,819	13,218,369
TOTAL CURRENT LIABILITIES	71,765,309	18,833,509
LONG-TERM LIABILITIES:		
Accrued landfill closure costs	-	-
Accrued vacation—less current portion	660,133	199,731
Accrued sick—less current portion	1,243,055	298,085
Accrued OPEB liability	2,936,028	(6,918)
Long-term debt—less current portion	1,206,858,677	131,422,813
TOTAL LONG-TERM LIABILITIES	1,211,697,893	131,913,711
TOTAL LIABILITIES	1,283,463,202	150,747,220
NET ASSETS:		
Invested in capital assets—net of related debt	496,694,095	78,765,015
Restricted for debt service	77,662,728	14,715,560
Unrestricted	96,641,147	1,297,690
TOTAL NET ASSETS	\$ 670,997,970	\$ 94,778,265

The notes to the basic financial statements are an integral part of this statement.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET ASSETS
YEAR ENDED SEPTEMBER 30, 2012**

	<u>Water System</u>	<u>Regional Wastewater System</u>
OPERATING REVENUES:		
Water sales	\$ 161,588,387	\$ -
Wastewater service fees	-	37,739,440
Solid waste service fees	-	-
Other operating revenues	511,559	72,015
Total operating revenues	<u>162,099,946</u>	<u>37,811,455</u>
OPERATING EXPENSES:		
Personnel	26,863,470	7,871,586
Operating Supplies:		
Chemicals	17,047,398	3,951,082
Other supplies	3,123,875	2,047,781
Operating Services:		
Electric power	17,133,881	4,126,392
Wholesale water purchases	2,519,799	
Other services	5,972,908	6,239,776
Depreciation and amortization	26,094,343	4,964,306
Total operating expenses	<u>98,755,674</u>	<u>29,200,923</u>
OPERATING INCOME	<u>63,344,272</u>	<u>8,610,532</u>
NONOPERATING REVENUES (EXPENSES):		
Investment income	1,429,167	143,926
Miscellaneous revenue	3,042,601	-
Federal program revenues	4,330,095	-
Gain on sale of capital assets	67,723	11,297
Interest expense	(35,711,289)	(2,383,559)
Total nonoperating revenues (expenses)	<u>(26,841,703)</u>	<u>(2,228,336)</u>
CHANGE IN NET ASSETS	36,502,569	6,382,196
NET ASSETS AT OCTOBER 1, 2011	<u>634,495,401</u>	<u>88,396,069</u>
NET ASSETS AT SEPTEMBER 30, 2012	<u>\$ 670,997,970</u>	<u>\$ 94,778,265</u>

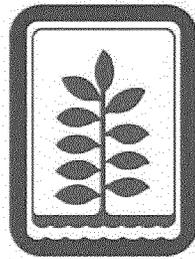
The notes to the basic financial statements are an integral part of this statement.

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF CASH FLOWS
YEAR ENDED SEPTEMBER 30, 2012

	Water System	Regional Wastewater System
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 165,485,551	\$ 39,280,380
Cash received from other funds	5,953,309	313,475
Cash received from (paid to) others	1,533,784	8,221
Cash paid to suppliers for goods and services	(59,776,270)	(15,544,068)
Cash paid for employee services	(17,686,176)	(5,237,685)
Cash paid to other funds	-	(3,747,578)
Net cash provided by operating activities	<u>95,510,198</u>	<u>15,072,745</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds	373,915,045	14,295,947
Cash paid for capital assets	(151,799,458)	(20,367,965)
Interest paid on long-term debt	(39,612,608)	(5,906,929)
Interest paid on U.S. government contracts	(1,219,782)	-
Principal payments on long-term debt	(21,770,000)	(8,035,000)
Payments on U.S. government contracts	(1,238,819)	-
Payments for bond issue costs	(2,130,178)	(301,817)
Federal interest subsidy	4,330,095	-
Net cash provided by (used for) capital and related financing activities	<u>160,474,295</u>	<u>(20,315,764)</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments	232,174,419	20,162,105
Purchases of investments	(376,474,505)	(26,152,162)
Interest received	944,155	119,538
Net cash provided by (used for) investing activities	<u>(143,355,931)</u>	<u>(5,870,519)</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	112,628,562	(11,113,538)
CASH AND CASH EQUIVALENTS—Beginning of year	189,615,678	41,920,892
CASH AND CASH EQUIVALENTS—End of year	<u>\$ 302,244,240</u>	<u>\$ 30,807,354</u>
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET ASSETS		
Unrestricted cash and cash equivalents	\$ 65,942,279	\$ 4,165,150
Restricted cash and cash equivalents	236,301,961	26,642,204
	<u>\$ 302,244,240</u>	<u>\$ 30,807,354</u>
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	\$ 63,344,272	\$ 8,610,532
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	25,672,634	4,771,147
Amortization	421,709	193,159
Change in current assets and liabilities:		
Accounts receivable and deferred billings	(1,576,399)	337,662
Prepaid expenses	(451,523)	148,724
Net pension assets	(53,875)	(11,768)
Due to/from other funds	8,120	(64,834)
Accounts payable, accrued liabilities, and developers' deposits	7,217,269	198,724
Accrued vacation and Accrued sick	(54,684)	4,610
Accrued OPEB	898,311	(16,096)
Landfill liability	-	-
Customers' advance payments	84,364	900,885
Total adjustments	<u>32,165,926</u>	<u>6,462,213</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	<u>\$ 95,510,198</u>	<u>\$ 15,072,745</u>
NONCASH TRANSACTION DISCLOSURES		
Change in landfill liability	\$ -	\$ -
Gain on sale of capital assets	67,723	11,297
Interest capitalized on construction	7,062,641	3,296,824
Amortization of bond-related items	(1,306,891)	(37,975)
Change in fair value of investments	(190,147)	(41,567)
Change in actuarial value of net pension assets	53,875	11,768
Refunding bonds issued	39,410,000	-
Refunding proceeds deposited in escrow	44,086,445	-

The notes to the basic financial statements are an integral part of this statement.

North Texas Municipal Water District



2015 - 2016 Comprehensive Annual Financial Report

**For Fiscal Year Ended:
September 30, 2016**

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**NORTH TEXAS MUNICIPAL WATER DISTRICT
WYLIE, TEXAS
COMPREHENSIVE ANNUAL FINANCIAL REPORT**

**FISCAL YEAR ENDED
SEPTEMBER 30, 2016**

**AS PREPARED BY THE
NTMWD ACCOUNTING DEPARTMENT**

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**NORTH TEXAS MUNICIPAL WATER DISTRICT
 COMPREHENSIVE ANNUAL FINANCIAL REPORT
 FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 2016**

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INTRODUCTORY SECTION

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NORTH TEXAS MUNICIPAL WATER DISTRICT

BOARD OF DIRECTORS

Terry Sam Anderson	President	Mesquite
Robert Thurmond, Jr.	Vice President	Wylie
John Sweeden	Secretary	Richardson
Don Cates		Forney
Phil Dyer		Plano
Joe Farmer		Allen
William Forbus		Royse City
Marvin Fuller		Wylie
Bill Glass		Princeton
Don Gordon		Garland
James Hogan		Plano
Joe Joplin		McKinney
James Kerr		Allen
Bill Lofland		Rockwall
Michael Lopez		Forney
Jack May		Garland
Wayne May		Farmersville
Charles McKissick		McKinney
Jim Mellody		Royse City
John Murphy		Richardson
Larry Parks		Rockwall
Richard Peasley		Frisco
Bobby Robinson		Mesquite
Richard Sheehan		Princeton
Lynn Shuyler		Frisco

* * * * *

Thomas W. Kula
Executive Director/General Manager

NORTH TEXAS MUNICIPAL WATER DISTRICT

ORGANIZATIONAL STRUCTURE

Executive Director/General Manager	Thomas W. Kula
Deputy Director (Engineering & CIP)	Joe Stankiewicz
Assistant Deputy Director – CIP	R. J. Muraski
Assistant Deputy Director – Engineering	Cesar Baptista
Deputy Director (Operations & Maintenance)	Mike Rickman
Assistant Deputy Director – Solid Waste	Jeff Mayfield
Assistant Deputy Director – Wastewater	Jenna Covington
Assistant Deputy Director – Water	Billy George
Chief Information Officer	Jim Shirley
Maintenance Officer	Dave Patton
Deputy Director (Finance & Personnel)	Judd Sanderson
Assistant Deputy Director – Finance & Personnel	Rodney Rhoades
Accounting Manager	Teresa Wigington
Finance Manager	Erik Felthous
Human Resources Manager	John Montgomery
Records Manager	Kelly O'Brian



NORTH TEXAS MUNICIPAL WATER DISTRICT

Regional Service Through Unity

January 16, 2017

TO THE BOARD OF DIRECTORS OF THE NORTH TEXAS MUNICIPAL WATER DISTRICT

State law requires that the North Texas Municipal Water District (the "District") publish within six months of the close of each fiscal year a complete set of financial statements presented in conformity with accounting principles generally accepted in the United States of America ("GAAP") and audited in accordance with generally accepted auditing standards by a firm of licensed certified public accountants. Pursuant to that requirement, we hereby issue the comprehensive annual financial report of the North Texas Municipal Water District for the fiscal year ended September 30, 2016.

This report consists of management's representations concerning the finances of the District. Consequently, management assumes full responsibility for the completeness and reliability of all of the information presented in this report. To provide a reasonable basis for making these representations, management of the District has established a comprehensive internal control framework that is designed both to protect the District's assets from loss, theft or misuse and to compile sufficient reliable information for the preparation of the District's financial statements in conformity with GAAP. Because the cost of internal controls should not outweigh their benefits, the District's comprehensive framework of internal controls has been designed to provide reasonable rather than absolute assurance that the financial statements will be free from material misstatements. As management, we assert that, to the best of our knowledge and belief, this financial report is complete and reliable in all material respects.

The District's financial statements have been audited by Weaver & Tidwell LLP, independent auditors. The goal of the independent audit was to provide reasonable assurance that the financial statements of the District as of and for the fiscal year ended September 30, 2016 are free of material misstatement. The independent audit involved examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements; assessing the accounting principles used and significant estimates made by management; and evaluating the overall financial statement presentation. The independent auditors concluded that the financial statements present fairly, in all material respects, the respective financial position of each major fund as of September 30, 2016, and the respective changes in financial position and respective cash flows, thereof for the year then ended in conformity with GAAP. The independent auditor's report is presented as the first component of the financial section of this report.

GAAP require that management provide a narrative introduction, overview and analysis to accompany the basic financial statements in the form of Management's Discussion and Analysis ("MD&A"). This letter of transmittal is designed to complement MD&A and should be read in conjunction with it. The District's MD&A can be found immediately following the report of the independent auditors.

Profile of the District

The District, a conservation and reclamation district and political subdivision of the state of Texas created in 1951, provides treated water, wastewater, and solid waste service to over 1.6 million citizens living in north Texas. The District currently serves a 2,200 square-mile service area located in ten counties adjacent to the north and east boundaries of Dallas, Texas, and comprises all of the territory of its 13 member cities (Allen, Farmersville, Forney, Frisco, Garland, McKinney, Mesquite, Plano, Princeton, Richardson, Rockwall, Royse City and Wylie).

The District is governed by a 25-member Board of Directors. Each member city having a population of 5,000 or more is represented by two Directors and each member city having a population of less than 5,000 (Farmersville) is represented by one Director. Directors are appointed by the governing bodies of the respective member cities for two-year terms.

The annual budget serves as the basis for the District's financial planning and control. Budgetary controls are maintained to ensure the proper management of resources and are required pursuant to contracts for service. Although there are no legal requirements to include comparative budget-to-actual expense statements in this report, such information is provided to the Board of Directors on a monthly basis throughout the year.

Charges for services are based on budgeted operating expenses, including debt service requirements and capital expenditures but excluding depreciation and amortization. In the Wastewater, Sewer, Solid Waste and Interceptor Systems, charges for services are adjusted accordingly at the end of each year to a break-even basis. These year-end adjustments are recorded as amounts due to or due from the cities.

Factors Affecting Financial Condition

The information presented in the financial statements is perhaps best understood when it is considered from the broader perspective of the specific environment within which the District operates.

Local Economy. The District's cities continue to experience economic activity and residential growth. In the absence of outward migration of population and/or industry, the demands for basic services of water, wastewater and solid waste are not significantly affected by changes in the economy. The diversity and size of the District's service area tends to moderate changes in any particular area and future growth is anticipated that will require the development of additional raw water supplies and capital expenditures for system improvements in all areas of service.

Long-term financial planning. The District maintains 20-Year Water Rate Projections for the Water System, 10-Year Cost Projections for the Solid Waste System, and 10-Year Cost Projections for the Wastewater and Interceptor Systems that are updated annually. The objective of these projections is to provide sufficient resources to fund needed capital projects, cover operations and maintenance expenses, manage debt incurred from bond sales, and to notify the member cities of projected future cost changes.

The February 2016 Water System rate projection includes funding for \$3.2 billion of capital projects to be developed over the next twenty year period. To fund these projects the projection assumes that the District will issue \$1.6 billion of revenue bonds between 2017 and 2021 for several projects including the Lower Bois D'Arc Creek Reservoir Project. Also, between 2028 and 2032, it is assumed that the District will issue \$1.1 billion of bonds for additional system improvements including funds for the development of a Sulphur River Basin Water Supply Project.

The February 2016 water rate projections indicate that at least a \$1.70 per 1,000 gallons rate adjustment may be required to fund future expenditures over the next ten year period. Should projected expenditures increase or decrease significantly or should the development of expected projects be accelerated or rescheduled, the water rate will be adjusted accordingly.

The May 2016 Wastewater System cost projection reflects several major improvement projects including the Rowlett Creek Wastewater Treatment Plant Peak Flow Management Project for 2016, 2018 and 2019, the Wilson Creek Wastewater Treatment Plant Advanced Treatment Project for 2016, and the expansion of the Wilson Creek Wastewater Treatment Plant from 56 mgd to 64 mgd by 2019. These projects will require the issuance of \$199 million of revenue bonds over the next three years.

Awards and Acknowledgements

The Government Finance Officers Association (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to the North Texas Municipal Water District for its Consolidated Annual Financial Report (CAFR) for the fiscal year ended September 30, 2015. This was the twenty sixth consecutive year that the District has received this prestigious award. In order to be awarded a Certificate of Achievement, the District published an easily readable and efficiently organized CAFR. This report satisfied both GAAP and applicable legal requirements.

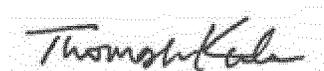
A Certificate of Achievement is valid for a period of one year only. We believe that the current CAFR continues to meet the Certificate of Achievement Program's requirements and we are submitting it to the GFOA to determine its eligibility for another certificate.

The preparation of this report would not have been possible without the efficient and dedicated services of the entire staff of the accounting and finance departments. We would like to express our appreciation to all members of the organization who assisted and contributed to the preparation of this report.

In particular, our appreciation is extended to Teresa Wigington, Accounting Manager, Holly Matthews, Assistant Accounting Manager, and Tammy Turner, Financial Reporting Accountant, who worked many extra hours and exhibited extraordinary effort in ensuring the accuracy and timeliness of this report.

Our appreciation is also extended to the President and members of the Board of Directors for providing their continued support to maintain the highest standards of professionalism in the management of the District's finances.

Respectfully Submitted,



Thomas W. Kula
Executive Director/General Manager



Rodney D. Rhoades
Assistant Deputy Director – Finance & Personnel

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Government Finance Officers Association

**Certificate of
Achievement
for Excellence
in Financial
Reporting**

Presented to

**North Texas
Municipal Water District**

For its Comprehensive Annual
Financial Report
for the Fiscal Year Ended

September 30, 2015

Executive Director/CEO

Water System

For 60 years, NTMWD has delivered dependable, high-quality water to North Texans. We manage a large and complex system that serves 1.6 million people living in a service area of 2,200 square miles across 10 counties – an area twice the size of Rhode Island. The availability of water has enabled these communities to prosper.

Water Fast Facts:

- Capacity to treat 807 million MGD
- 97.3 billion gallons of treated water delivered per year
- \$351+ million in water system construction contracts
- Reuse more than 14 billion gallons annually.

Based in the Upper Trinity Water Basin, we transport water from four lakes and a man-made wetlands reuse project to one of six water treatment plants. The Wylie campus houses our original treatment plant, and three other treatment facilities with the capacity to treat up to 770 MGD. Two other treatment facilities, located at Lake Tawakoni and in the City of Bonham, bring the total regional system capacity to 807 MGD. NTMWD operates one of the largest treatment facilities with ozone disinfection in the country, one of the best treatment processes used.

National news on lead contamination in Flint, Michigan, and questions about Chromium 6 and other contaminants in public water systems have raised concerns about the safety of north Texas water. In 2016, we opened the doors of our facilities and laboratory to media and public officials to show them how our water is tested rigorously for these constituents and others. We routinely perform a range of water quality tests before, during and after the treatment process to ensure the water is high quality and safe to drink. Our state-certified laboratory monitors and tests an average of 685 samples every day or 250,000 annually. We meet or exceed regulatory, health and aesthetic standards set by the Texas Commission on Environmental Quality (TCEQ) and the Environmental Protection Agency (EPA). NTMWD water quality reports are posted monthly on its website.

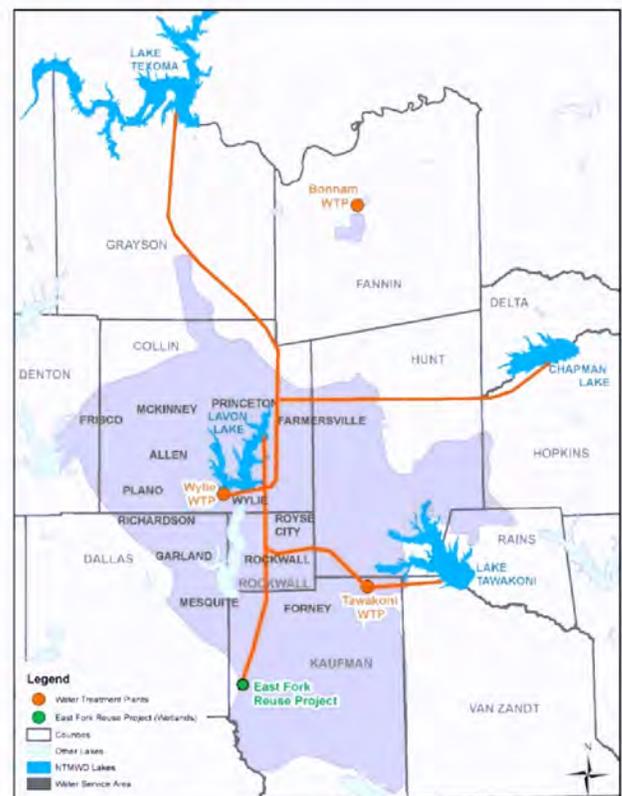
Primary Sources of Water:

- Lavon Lake
- Jim Chapman Lake
- Lake Texoma
- Lake Tawakoni
- Lake Bonham
- East Fork Water Supply / Reuse Project

Communities Served:*

Member Cities

- City of Allen
- City of Farmersville
- City of Forney
- City of Frisco
- City of Garland
- City of McKinney
- City of Mesquite
- City of Plano
- City of Princeton
- City of Richardson
- City of Rockwall
- City of Royse City
- City of Wylie



Water System Customers

Ables Springs Special Utility District
Bear Creek Special Utility District
Caddo Basin Special Utility District
Cash Special Utility District
City of Bonham
City of Fate
City of Josephine
City of Kaufman
City of Lucas
City of Melissa
City of Murphy
City of Parker
City of Rowlett
City of Sachse
City of Terrell
College Mound Special Utility District
Copeville Special Utility District

East Fork Special Utility District
Forney Lake Water Supply Corporation
Gastonia-Scurry Special Utility District
Greater Texoma Utility Authority
Kaufman Four-One (Crandall)
Milligan Water Supply Corporation
Mt. Zion Water Supply Corporation
Nevada Special Utility District
North Collin Water Supply Corporation
Rose Hill Special Utility District
Seis Lagos Utility District
Town of Fairview
Town of Little Elm
Town of Prosper
Town of Sunnyvale
Wylie N.E. Special Utility District

**Does not include communities indirectly served by NTMWD member cities or customers.*

Critical Supply Projects

The population of the area the District serves is projected to double to 3.7 million by 2070. In order to ensure there is a dependable water supply, the District advanced two critical water projects in 2016.

The **Trinity River Main Stem Pump Station and Pipeline project** will allow us to expand our water reuse supplies. The proposed pump station will allow us to pump nearly 100 million gallons per day (MGD) from the Trinity River through 17 miles of 72-inch-diameter pipeline to the wetlands for natural treatment. To make this project possible, NTMWD is contracting with the Trinity River Authority to purchase 50 MGD of treated effluent flows in the main stem of the Trinity River.



Pipe Delivered to Main Stem Pump Station Project Construction Site

Once construction is complete in 2018, the Main Stem Pump Station and Pipeline will divert river water to the East Fork Reuse Project, commonly known as the “wetlands,” which will use natural filtration to further cleanse the raw water. As the water passes through 1,840 acres of wetlands, the aquatic plants and sunlight help purify the water – a natural process that removes about 95 percent of the sediment, 80 percent of the nitrogen and 65 percent of the phosphorus. The cleansed water from the wetlands will then be piped 40 miles through an existing pipeline to the north end of Lavon Lake and blended with our other raw water sources. In the fall of 2016, final permits were received, which allowed construction to begin. The project cost is estimated at \$120 million.

The proposed **Lower Bois d'Arc Creek Reservoir (LBCR) project** in Fannin County will be a critical new water source to meet future needs. The LBCR will provide access to an additional 123,000 acre-feet of water annually for our region. Once approved, this will be the first new reservoir constructed in Texas in nearly 30 years. The District has invested more than \$130 million through FY 2016 to plan and permit the project over the past two decades.

The District has already secured the State Water Rights Permit and is seeking the federal 404 Clean Water Act Permit necessary to begin construction of the reservoir. NTMWD planned for the lake to be online in 2020 to help serve the expected population growth. However, the EPA and the U.S. Army Corps of Engineers (USACE) have requested additional analysis of the potential environmental impacts, a request that has resulted in a two-year delay to the project. NTMWD officials continue to work closely with federal and state agencies to expedite permitting. Bi-partisan legislative efforts are underway to help move this project forward and avoid further delays. The total cost is estimated at approximately \$1.2 billion (2016 dollars).

Construction of the reservoir will provide economic stimulus and jobs for the region. Fannin County specifically is anticipated to see a boost in taxable real estate values by an estimated \$316 million. Additionally, recreational amenities provided by the reservoir could generate \$166 million of annual economic activity per year in Fannin County through activities such as fishing and boating, as well as new industrial and commercial opportunities.*

NTMWD is partnering with Fannin County on a public process to establish development guidelines and potential recreational amenities for areas surrounding the reservoir once it is completed. Fannin County adopted this comprehensive plan in October 2016.

**Based on 2015 updated independent analysis by T. Clower and B. Weinstein*

Leader in Reuse and Conservation

According to the 2017 State Water Plan, water conservation and reuse will account for a quarter of future supplies in North Texas through 2070.

Reusing water reduces our reliance on acquiring new water sources, extends existing supplies and provides a drought-resistant water resource. With the largest water reuse program in Texas, NTMWD diverts and treats more than 14 billion gallons annually. Our East Fork Reuse Project is a man-made wetland area covering nearly 2,000 acres with about 1.6 million aquatic plants that naturally purify the water. The

largest man-made wetland in the country, the East Fork Reuse Project essentially acts as a large-scale recycling project, diverting treated wastewater (effluent) flows from the East Fork of the Trinity River and filtering it naturally before it is returned to blend with other water supplies for future treatment and use.



As our region endured several years of prolonged drought, the public's efforts to conserve water became critical to stretch our existing supplies. During that time, NTMWD has reduced the amount of water it delivers by an estimated 400 MGD per day during peak summer months. We delivered up to 15 percent less water annually thanks to the reduction in water use by customers in the communities we serve, despite a growing population.

As a statewide leader in water conservation education, NTMWD invests in campaigns that educate consumers and businesses on where their source water comes from and how they can help conserve and use water more efficiently. Our research shows that the more knowledgeable consumers are about their water source, supplies and water use habits, the more inclined they are to make changes in their water use. That's why NTMWD has invested \$17 million in water education since 2006. Conservation is important to sustain water supplies and help consumers manage water bills. NTMWD's water education efforts focus on three key programs: WaterIQ, Water My Yard, and Water4Otter.



The first statewide public awareness conservation program in Texas, [WaterIQ](#)* provides easy water-saving tips, resources and information. In 2016, the North Texas Water IQ campaign made more than 32 million impressions through events and advertising.

More than 50 percent of landscape water is wasted due to overwatering, inefficient watering or broken or poorly maintained sprinkler systems. [Water My Yard](#) is an online tool that informs North Texans how much to water their landscapes.

In 2016, we increased Water My Yard subscribers by 46 percent, and partnered with other regional water providers to develop regional landscaping water use tools.

Aimed at grade-school students, [Water4Otter](#) features Otis the Otter, which connects the water we drink to the water needed to support wildlife and the environment for students in area schools. In 2016, we were able to reach 6,720 students in 44 school performances.

**Water IQ is a licensed service mark of the Texas Water Development Board*

Protecting Source Water Quality

The Texas State Soil and Water Conservation Board provided a grant that has allowed the District to begin developing a watershed protection plan (WPP) to protect and improve the source water in its watershed. This voluntary, non-regulatory approach allows us to identify and address water quality issues at the source. By addressing source water quality issues, such as bacteria, nutrients and other pollutants, we can potentially prevent the need to implement more costly treatment processes.

The NTMWD Watershed Management program kicked-off development of a [Watershed Protection Plan for Lavon Lake](#) in September 2016. About 80 stakeholders – including regional and county representatives, local Soil and Water Conservation District members, business and industry representatives, area landowners and residents, and state and federal agency personnel – attended public meetings held in Wylie and McKinney.

NTMWD also partnered with Texas A&M AgriLife to hold a free Texas Watershed Steward program workshop in McKinney. Workshop participants learned about water quality best management practices and how watershed planning can be used to protect water sources.

Celebrating 60 Years of Water Delivery

Sixty years ago, we celebrated a monumental achievement for our region – the first delivery of water from our original water treatment plant in Wylie. We honored that milestone in 2016 with an open house for our member cities and customers.

Our cities and customers were well represented by the mayors, city managers, council members, public works directors, board directors and staff who came to celebrate with us. Visitors viewed displays to learn more about all that’s involved in delivering safe, reliable water.



The NTMWD Water Treatment Plant treated the first surface water to flow to the cities in November 1956.

Wastewater System

NTMWD provides wholesale wastewater services to 24 communities and 1 million residents of North Texas. These critical services protect human health, protect and enhance the water environment, and support economic development. Regional service allows communities to share costs and avoid building and maintaining separate facilities, providing cost efficiencies.

The NTMWD wastewater system consists of more than 250 miles of large-diameter pipelines, 25 lift stations and 14 wastewater treatment plants. These facilities convey and treat approximately 152 MGD of wastewater. A portion of this treated water (effluent) can then be used to blend with drinking water sources, as well as for irrigation and to sustain aquatic life.

Communities Served:

Wastewater System Members

Allen
 Forney
 Frisco
 Heath
 McKinney
 Mesquite
 Plano
 Princeton
 Prosper
 Richardson
 Rockwall
 Seagoville

Wastewater System Customers

Anna
 Fairview
 Lucas
 Melissa
 Parker

Sewer System Participants

Farmersville
 Fate
 Frisco
 Lavon
 Murphy
 Rockwall
 Royse City
 Seis Lagos Utility District
 Wylie

Wastewater Fast Facts:

- 42.95 billion gallons of wastewater
- 250+ miles of large-diameter wastewater pipelines
- \$158+ million in wastewater constructions contracts
- Operate 14 wastewater treatment facilities

Regional Plan to Increase Reliability

In 2016, NTMWD initiated a regional wastewater workgroup by partnering with 12 members to develop a comprehensive plan using an industry approach called capacity, management, operations and maintenance (CMOM). The **CMOM program** streamlines and integrates regional and city system plans, projects and operations — ultimately saving NTMWD communities money by ensuring continued regulatory compliance and a more reliable system.



Wastewater Treatment Plants: Improvements and Expansion

Two of our wastewater treatment facilities began receiving a major upgrade this year. Most recently, the **Wilson Creek Regional Wastewater Treatment Plant (WWTP)** began construction on a new headworks building, a structure that removes sticks, stones, grit and sand from wastewater. The new building will enable us to take in an additional 32 MGD of wastewater and remove even more pollutants from the wastewater stream. Both projects are expected to be completed by early 2019.

Stewart Creek West WWTP expansion construction began late in 2015 to better serve the City of Frisco. The expansion will double the plant's existing capacity to 10 MGD and allow the plant to divert flows to the Panther Creek WWTP as needed. NTMWD also enhanced system reliability by installing emergency generators at 8 of its lift stations to ensure that the lift stations and pumps can still operate in the event of a power outage.



Expansion of the Stewart Creek West Wastewater Treatment Plant in Frisco, Texas

Solid Waste System

Collin County municipalities rely on NTMWD to operate transfer station collection sites and a regional disposal facility to manage their waste. NTMWD designed its solid waste system to dispose of waste safely and reliably while protecting the environment and water quality. Our solid waste landfill is located, designed, operated and monitored in compliance with the TCEQ's and the EPA's regulations. Twice a month, solid waste member city residents can drop off certain types of waste — including used motor oil and used oil filters — at one of our Citizen Convenience Centers.

Lookout Drive Transfer Station

In 2016, NTMWD began construction of the new \$12.9 million **Lookout Drive Transfer Station** in Richardson to increase operating efficiency and meet future service demands. The new facility is progressing on schedule and is expected to be operational by the end of May 2017.

Our solid waste system processed nearly 8 percent more waste in FY 2016 than the previous year — accepting a total of about 950,000 tons of solid waste. The only Member City that didn't show an increase was the City of McKinney, which actually delivered less tonnage than the previous year due in part to an increase in commercial recycling efforts. While some of the solid waste could be reduced through more aggressive recycling messages, the majority of the increase is a reflection of the growth of our cities.

Composting Services

In April 2016, NTMWD executed a 10-year contract with the City of Plano for composting services. Since 2003, NTMWD has partnered with the City of Plano on a composting program to turn yard waste into reusable compost. In FY 2016, 51,553 tons of yard waste were diverted from the regional landfill to the composting facility. The compost is sold through local vendors at our **Custer Road Transfer Station** in Plano and at our landfill in Melissa. An added benefit of using compost in landscapes is that it enhances soils' ability to absorb water, which helps save water.

Solid Waste Fast Facts:

- 950,000+ tons of municipal solid waste disposed in 2016
- 3,650 tons of solid waste disposed per day at the 121 Regional Disposal Facility (landfill)
- 49,782 tons of yard waste composted annually
- 4 regional and citizen convenience centers



Construction of the Lookout Drive Transfer Station in Richardson, Texas



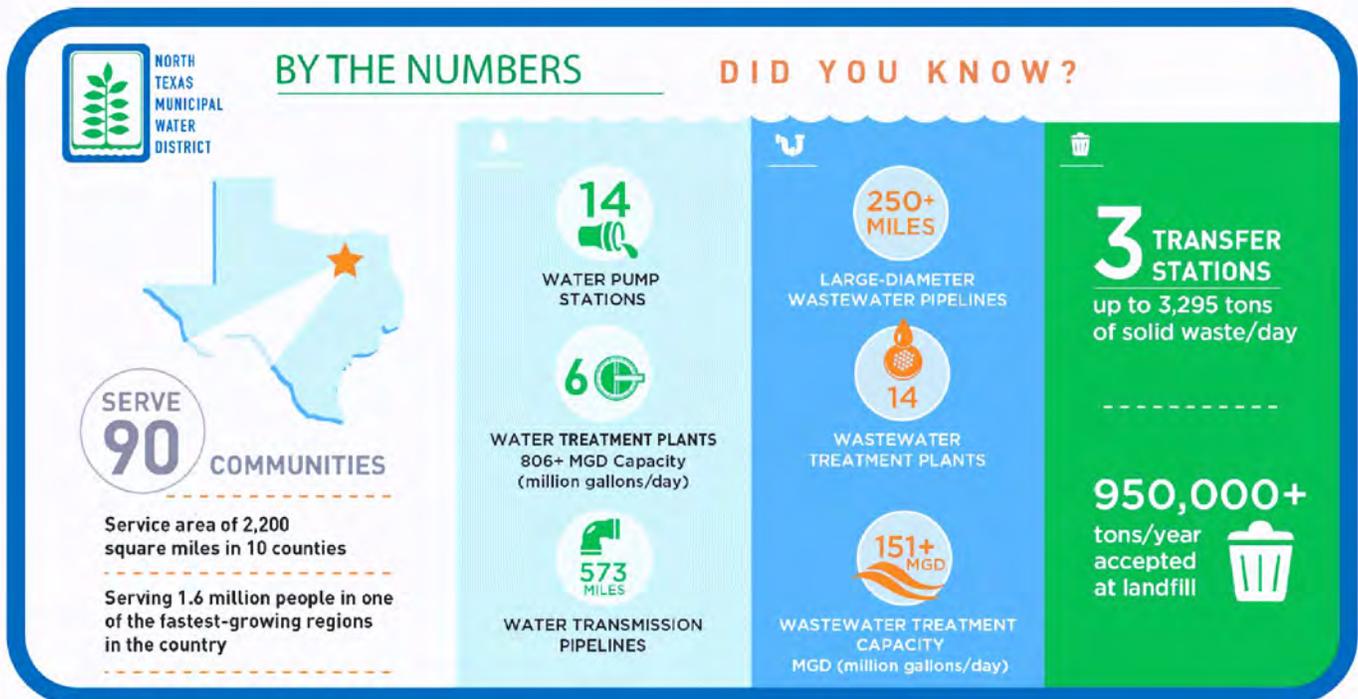
City of Plano's composting area

Gas Harvesting Project

In the summer of 2016, NTMWD added 23 new gas wells to the **121 Regional Disposal Facility (landfill)** in Melissa, bringing a total of 89 gas wells on the site. The wells allow the District to harvest the gas produced by the decomposition of solid waste within the landfill – typically methane gas – to help control odor. The majority of the gas is currently burned away in candlestick flares, but we are working with Morrow Renewables on a gas-to-energy production project. This new project, scheduled to start in 2017, will allow us to capture and clean the gas and convert it to natural gas, which will help generate revenue and offset the operating costs of our solid waste system.

Communities Served:

City of Allen
City of Frisco
City of McKinney
City of Plano
City of Richardson
Collin County and surrounding area



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FINANCIAL SECTION

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INDEPENDENT AUDITOR'S REPORT

Members of the Board of Directors
North Texas Municipal Water District
City of Wylie, Texas

Report on the Financial Statements

We have audited the accompanying financial statements of each major fund of the North Texas Municipal Water District (the District), as of and for the year ended September 30, 2016, and the related notes to the financial statements, which collectively comprise the District's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinions

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of each major fund of the North Texas Municipal Water District as of September 30, 2016, and the respective changes in financial position, and, where applicable, cash flows, thereof for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matter

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and the schedules of funding progress for the District's Retirement Plan and Other Postemployment Benefits Plan on pages 4-9 and 51-52 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Information

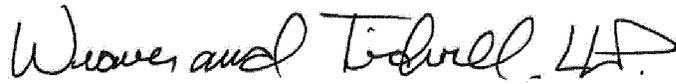
Our audit was conducted for the purpose of forming opinions on the financial statements that collectively comprise the North Texas Municipal Water District's basic financial statements. The Introductory Section and Statistical Section are presented for purposes of additional analysis and are not a required part of the basic financial statements.

The Sewer System Supplemental Schedules are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Sewer System Supplemental Schedules are fairly stated in all material respects in relation to the basic financial statements as a whole.

The introductory and statistical sections have not been subjected to the auditing procedures applied in the audit of the basic financial statements and, accordingly, we do not express an opinion or provide any assurance on them.

Other Reporting Required by Government Auditing Standards

In accordance with Government Auditing Standards, we have also issued our report dated January 16, 2017, on our consideration of the North Texas Municipal Water District's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing and not to provide an opinion on internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with Government Auditing Standards in considering North Texas Municipal Water District's internal control over financial reporting and compliance.

A handwritten signature in black ink that reads "Weaver and Tidwell, L.L.P." with a stylized flourish at the end.

WEAVER AND TIDWELL, L.L.P.

Dallas, Texas
January 16, 2017

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MANAGEMENT'S DISCUSSION AND ANALYSIS

Management's Discussion and Analysis (Unaudited)

As management of the North Texas Municipal Water District, we offer readers of the District's financial statements this narrative overview and analysis of the financial activities of the District as of and for the fiscal year ended September 30, 2016.

Financial Highlights

- Total assets at the end of the year were approximately \$3.2 billion and exceeded liabilities by approximately \$1.21 billion.
- The District's total net position increased by approximately \$126 million, or 12 percent.
- During the year the District's operating revenues increased by approximately \$60 million, or 18 percent, and operating expenses increased by approximately \$16 million, or 8 percent.
- Construction of the Wylie Water Treatment Plant Ozonation Project, the Lower Bois D'Arc Creek Reservoir Project, and the Lake Texoma to Wylie Pipeline Project led the way in capital expenditures totaling \$244 million.
- The District issued \$238 million in revenue bonds for various projects and to refinance outstanding debt to take advantage of favorable interest rates.

Overview of the Financial Statements

This discussion and analysis are intended to serve as an introduction to the District's basic financial statements which are comprised of fund financial statements and notes to the financial statements. This report also contains other supplementary information in addition to the basic financial statements themselves.

Financial Statements. The financial statements are designed to provide readers with an overview of the District's finances, in a manner similar to private-sector business.

The *Statement of Net Position* presents information on all of the District's assets and liabilities, with the difference between the two reported as *net position*. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position of the District is improving or deteriorating.

The *Statement of Revenues, Expenses and Changes in Net Position* presents information showing how the District's net position changed during the most recent fiscal year. All changes in net position are reported as soon as the underlying event giving rise to the change occurs, regardless of the timing of related cash flows. Thus revenues and expenses are reported in this statement for some items that will only result in cash flows in future fiscal periods (e.g., earned but unused vacation leave).

The *Statement of Cash Flows* presents cash receipts, cash payments, and net changes in cash resulting from operating activities, capital and related financing activities, and investing activities for the year presented.

Enterprise Funds. A fund is a grouping of related accounts that is used to maintain control over resources that have been segregated for specific activities or objectives. The District uses fund accounting to ensure and demonstrate compliance with finance-related legal requirements. All of the funds of the District are categorized as enterprise funds. The District reports five major enterprise funds: Water, Regional Wastewater, Sewer, Solid Waste and Interceptor.

The basic enterprise fund financial statements can be found on pages 10 through 17 of this report.

Notes to the Financial Statements. The notes provide additional information that is essential to a full understanding of the data provided in the fund financial statements. The notes to the financial statements can be found starting on page 18 of this report.

Other Information. In addition to the basic financial statements and accompanying notes, this report also presents certain required supplementary information concerning the District's progress in funding its obligation to provide pension and other postemployment benefits to its employees. Required supplemental information can be found beginning on page 51 of this report.

Financial Analysis

As noted earlier, net position may serve over time as a useful indicator of the District's financial position. In the case of the District, assets and deferred outflows of resources exceeded liabilities and deferred inflows of resources by \$1,210,161,660 at the close of the most recent fiscal year.

North Texas Municipal Water District's Net Position

	As of September 30		Increase/ (Decrease)	Percent Change
	2016	2015		
ASSETS:				
Current and other assets	\$ 733,122,854	\$ 667,541,124	\$ 65,581,730	9.8 %
Capital assets—net	2,510,962,344	2,355,048,633	155,913,711	6.6
Total assets	3,244,085,198	3,022,589,757	221,495,441	7.3
Total deferred outflows of resources	41,081,323	26,665,685	14,415,638	54.1
Total assets and deferred outflows of resources	3,285,166,521	3,049,255,442	235,911,079	7.7
LIABILITIES:				
Current and other liabilities	173,894,028	156,712,119	17,181,909	11.0
Long-term liabilities outstanding	1,891,046,277	1,804,438,409	86,607,868	4.8
Total liabilities	2,064,940,305	1,961,150,528	103,789,777	5.3
Total deferred inflows of resources	10,064,556	3,834,386	6,230,170	100.0
Total liabilities and deferred inflows of resources	2,075,004,861	1,964,984,914	110,019,947	5.6
NET POSITION:				
Net investment in capital assets	942,119,408	864,338,873	77,780,535	9.0
Restricted	141,312,557	142,275,759	(963,202)	(0.7)
Unrestricted	126,729,695	77,655,896	49,073,799	63.2
Total net position	\$ 1,210,161,660	\$ 1,084,270,528	\$ 125,891,132	11.6 %

The largest portion of the District's net position (78 percent) reflects its investment in capital assets (e.g., land, reservoir facilities, water treatment facilities and wastewater disposal facilities) less any related debt used to acquire those assets that is still outstanding. The District uses these capital assets to provide services to its member and customer cities; consequently, these assets are not available for future spending. Although the District's investment in its capital assets is reported net of related debt, it should be noted that the resources needed to repay this debt must be provided from other resources, since the capital assets themselves are not intended to be used to liquidate these liabilities.

An additional portion of the District's net position (12 percent) represents resources that are subject to external restrictions on how they may be used. The District's restricted net position consists primarily of the reserve funds required by bond resolutions.

The remaining balance of the District's net position represents unrestricted net position (10 percent) and may be used to meet the District's ongoing obligations.

The increase in net position of \$125,891,132, or 11.6%, during the current fiscal year indicates an improved financial position.

While the Statement of Net Position provides the components of the District's assets, deferred outflows of resources, liabilities, deferred inflows of resources and net position at year-end, the Statement of Revenues, Expenses and Changes in Net Position provides information on the source of the change during the year. The primary sources of the increase in net position of \$125,891,132 were operating income of \$173,379,684 offset by interest expense of \$54,997,252.

North Texas Municipal Water District's Changes in Net Position

	<u>Year Ended September 30</u>		<u>Increase (Decrease)</u>	<u>Percent Change</u>
	<u>2016</u>	<u>2015</u>		
Operating Revenues:				
Water sales	\$ 252,591,522	\$ 215,871,181	\$ 36,720,341	17.0 %
Wastewater service fees	113,132,055	93,754,382	19,377,673	20.7
Solid waste service fees	30,760,383	27,603,397	3,156,986	11.4
Other operating revenues	1,584,262	1,284,498	299,764	23.3
Total Operating Revenues	<u>398,068,222</u>	<u>338,513,458</u>	<u>59,554,764</u>	<u>17.6</u>
Operating Expenses:				
Personnel	65,389,176	53,098,135	12,291,041	23.1
Operating Supplies:				
Chemicals	28,283,012	25,325,219	2,957,793	11.7
Other supplies	14,560,209	10,964,239	3,595,970	32.8
Operating Services:				
Electric power	19,187,942	23,997,861	(4,809,919)	(20.0)
Wholesale water purchases	2,662,651	6,909,337	(4,246,686)	(61.5)
Other services	40,506,216	37,783,612	2,722,604	7.2
Depreciation and amortization	54,099,332	50,508,623	3,590,709	7.1
Total Operating Expenses	<u>224,688,538</u>	<u>208,587,026</u>	<u>16,101,512</u>	<u>7.7</u>
Operating Income	<u>173,379,684</u>	<u>129,926,432</u>	<u>43,453,252</u>	<u>33.4</u>
Investment Income	3,059,347	2,034,940	1,024,407	50.3
Miscellaneous Revenue (Expense)	(432,253)	325,064	(757,317)	(233.0)
Grant Income	-	62,233	(62,233)	(100.0)
Federal Program Revenues	4,005,982	4,013,998	(8,016)	(0.2)
Gain (Loss) on Sale of Capital Assets	875,624	-	875,624	100.0
Interest Expense	<u>(54,997,252)</u>	<u>(49,531,332)</u>	<u>(5,465,920)</u>	<u>11.0</u>
Net Nonoperating Expense	<u>(47,488,552)</u>	<u>(43,095,097)</u>	<u>(4,393,455)</u>	<u>10.2</u>
Change in Net Position	125,891,132	86,831,335	39,059,797	45.0
Net Position, Beginning of Year (As Previously Stated)	<u>1,084,270,528</u>	<u>1,022,463,377</u>	<u>61,807,151</u>	<u>6.0</u>
Change in Reporting	<u>-</u>	<u>(25,024,184)</u>	<u>25,024,184</u>	
Net Position, Beginning of Year	<u>1,084,270,528</u>	<u>997,439,193</u>	<u>86,831,335</u>	<u>8.7</u>
Net Position, End of Year	<u>\$ 1,210,161,660</u>	<u>\$ 1,084,270,528</u>	<u>\$ 125,891,132</u>	<u>11.6%</u>

Total operating revenues for the District for the years ended September 30, 2016 and 2015 were \$398,068,222 and \$338,513,458, respectively. The \$59,554,764 increase in total operating revenues was primarily due to an 11% increase in the member cities water rate, a 20% increase in wastewater charges, and an 11% increase in solid waste service fees to fund capital projects and operating costs. Other operating revenues increased 23.3% due to additional miscellaneous operating revenues, including Mastercard and miscellaneous rebates.

Total operating expenses for the District for the years ended September 30, 2016 and 2015 were \$224,688,538 and \$208,587,026, respectively. Several key factors account for the \$16,101,512 increase in total operating expenses including increased staffing levels (a total increase of 77 employees across all funds) resulting in increased personnel expenses of \$12.3 million, increased operating supplies and services expenses of \$9.3 million primarily as a result of increased chemical expenses, mechanical supplies and pipeline supplies, and an increase in depreciation of \$3.6 million. These increases were offset by decreases in power costs of \$4.9 million and decreased water purchases of \$4.2 million.

Net non-operating expense increased by \$4,393,455 primarily due to an increase in interest expense.

Capital Asset and Debt Administration

Capital Assets

The District's capital assets as of September 30, 2016, amounted to \$2,510,962,344 (net of accumulated depreciation). These capital assets include land and land improvements, reservoir facilities, water treatment and transmission facilities, wastewater treatment and disposal facilities, buildings and other equipment and water rights. The total increase in the District's investment in capital assets for the current year was 6.6%.

Major capital asset events during the current fiscal year included the following:

- Development of the Lower Bois D'Arc Creek Reservoir Project continued; construction in progress at the end of the fiscal year totaled \$80,912,942.
- Construction of the Wylie Water Treatment Plant Ozonation Project continued; construction in progress at the end of the fiscal year totaled \$143,007,506.
- Lake Texoma to Wylie Water Treatment Plant Raw Water Pipeline placed in service totaling \$330,494,153.
- Capitalized improvements at the South Mesquite Regional Wastewater Treatment Plant including the expansion of the plant, electrical improvements and the operations building totaling \$6,546,732. Phases of these improvements were capitalized during the fiscal year for a total of \$4,438,650.
- Lift station generators capitalized in the interceptor system for a total of \$7,849,728.

North Texas Municipal Water District's Capital Assets

(net of accumulated depreciation)

	As of September 30		Increase (Decrease)	Percent Change
	2016	2015		
Land	\$ 71,771,379	\$ 69,129,011	\$ 2,642,368	3.8 %
Easements	58,131,259	47,759,846	10,371,413	21.7 %
Land improvements	3,257,883	3,532,175	(274,292)	(7.8)%
Water treatment, storage and transmission facilities	1,009,252,966	670,329,096	338,923,870	50.6
Wastewater treatment and disposal facilities	487,099,005	465,361,577	21,737,428	4.7
Solid waste transfer and disposal facilities	34,282,199	33,543,714	738,485	2.2
Reservoir facilities and water rights	288,385,014	287,558,416	826,598	0.3
Buildings	36,927,728	26,353,801	10,573,927	40.1
Automobiles and trucks	4,531,603	2,573,516	1,958,087	76.1
Office furniture and fixtures	679,314	221,541	457,773	206.6
Other equipment	22,027,970	20,029,771	1,998,199	10.0
Construction in progress	494,616,024	728,656,169	(234,040,145)	(32.1)
Total	<u>\$ 2,510,962,344</u>	<u>\$ 2,355,048,633</u>	<u>\$ 155,913,711</u>	<u>6.6 %</u>

Additional information on the District's capital assets can be found in Note 4 of this report.

Debt Administration

At the end of the current fiscal year, the District had total outstanding debt of \$1,787,809,381. Of this amount 66% is reflected in the Water System and 12% is reflected in the Regional Wastewater System.

North Texas Municipal Water District's Outstanding Debt

	As of September 30		Increase (Decrease)	Percent Change
	2016	2015		
U.S. government contracts payable	\$ 31,049,381	\$ 32,456,205	\$ (1,406,824)	(4.3)%
Revenue bonds	1,756,760,000	1,686,930,000	69,830,000	4.1
Total	\$ 1,787,809,381	\$ 1,719,386,205	\$ 68,423,176	4.0 %

During the current fiscal year, the District refinanced a portion of the existing debt in order to take advantage of favorable interest rates. The result is expected to decrease future debt service payments by \$6,970,801 in the Wastewater System, \$2,441,896 in the Sewer System, \$484,888 in the Solid Waste System and \$5,254,880 in the Interceptor System.

The District's revenue bonds have been rated as follows:

	Moody's	S&P
Water System	Aa2	AAA
Wastewater System	Aa2	AAA
Solid Waste System	Aa3	AA-
Interceptor System	Aa1	AAA

Additional information on the District's long-term debt can be found in Note 8 of this report.

Economic Factors and Next Year's Budgets and Rates

The Annual Budget outlines the District's plans to continue to provide high quality, cost-effective service to its member and customer cities. As a result of the continued growth in the District's service area, the need for the development of raw water resources and capital expenditures to fund system expansions and improvements continues to increase. Such growth has been considered in developing the District's budget for the 2017 fiscal year.

The 2017 Water System budget provides funding for debt service for \$284 million of bonds to be issued for the construction of the Trinity River Main Stem Pump Station, the Wylie Water Treatment Plant 70 MGD expansion and other system improvements. In order to fund these debt service requirements and the additional operations and maintenance costs, the budget requires a \$.24 per 1,000 gallons rate adjustment. Additional rate adjustments can be expected in the future as the District continues to develop additional raw water supplies and construct treatment and transmission system improvements to meet system demands.

Requests for Information

This financial report is designed to provide a general overview of the District's finances and to demonstrate the District's accountability for the funds it receives. Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to the office of the Accounting Manager, P.O. Box 2408, Wylie, Texas 75098.

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BASIC FINANCIAL STATEMENTS

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF NET POSITION
SEPTEMBER 30, 2016**

ASSETS	Water System	Regional Wastewater System
CURRENT ASSETS:		
Unrestricted assets:		
Cash and cash equivalents	\$ 77,727,425	\$ 5,893,462
Investments	66,075,060	-
Accounts receivable	20,391,106	654,690
Due from other funds	1,198,537	34,929
Prepaid expenses	2,752,930	344,466
Unbilled receivable	254,252	269,853
Total unrestricted assets	168,399,310	7,197,400
Restricted assets:		
Cash and cash equivalents	89,785,998	68,306,682
Investments	147,327,878	70,246,452
Contracts receivable	26,400	-
Note receivable	367,715	-
Interest receivable	304,986	128,568
Due from other funds	118,339	-
Unbilled receivables	-	-
Total restricted assets	237,931,316	138,681,702
TOTAL CURRENT ASSETS	406,330,626	145,879,102
LONG-TERM ASSETS:		
Nondepreciable:		
Land	58,934,292	1,739,328
Easements	42,741,627	-
Construction-in-progress	407,202,758	17,629,407
Total nondepreciable assets	508,878,677	19,368,735
Depreciable:		
Land improvements	3,712,838	1,321,303
Water treatment, storage, and transmission facilities	1,272,448,065	-
Wastewater treatment and disposal facilities	-	283,067,665
Solid waste transfer and disposal facilities	-	-
Reservoir facilities and water rights	376,541,066	-
Buildings	24,372,470	2,047,667
Automobiles and trucks	6,621,988	1,892,614
Office furniture and fixtures	934,659	101,610
Other equipment	16,822,407	9,608,947
Total depreciable assets	1,701,453,493	298,039,806
Less accumulated depreciation	(392,694,399)	(99,347,816)
Net capital assets	1,817,637,771	218,060,725
Accrued OPEB asset	663,140	165,181
TOTAL LONG-TERM ASSETS	1,818,300,911	218,225,906
TOTAL ASSETS	2,224,631,537	364,105,008
DEFERRED OUTFLOWS OF RESOURCES:		
Deferred loss on refunding	17,420,595	3,057,759
Deferred pension outflow	9,304,772	2,509,378
TOTAL DEFERRED OUTFLOWS OF RESOURCES	26,725,367	5,567,137
TOTAL ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	\$ 2,251,356,904	\$ 369,672,145

The notes to the basic financial statements are an integral part of this statement.

<u>Sewer System</u>	<u>Solid Waste System</u>	<u>Interceptor System</u>	<u>Total Enterprise Funds</u>
\$ 3,874,109	\$ 5,761,025	\$ 4,173,017	\$ 97,429,038
-	-	-	66,075,060
650,748	277,566	121,274	22,095,384
88,791	290,417	20,065	1,632,739
257,552	208,324	183,095	3,746,367
249,477	408,272	311,746	1,493,600
<u>5,120,677</u>	<u>6,945,604</u>	<u>4,809,197</u>	<u>192,472,188</u>
33,267,280	13,535,947	37,134,410	242,030,317
37,167,457	9,392,381	27,147,565	291,281,733
-	-	-	26,400
-	-	-	367,715
54,329	10,439	37,887	536,209
-	-	-	118,339
-	5,233,611	-	5,233,611
<u>70,489,066</u>	<u>28,172,378</u>	<u>64,319,862</u>	<u>539,594,324</u>
75,609,743	35,117,982	69,129,059	732,066,512
469,516	10,628,243	-	71,771,379
4,072,113	-	11,317,519	58,131,259
30,525,599	9,554,476	29,703,784	494,616,024
<u>35,067,228</u>	<u>20,182,719</u>	<u>41,021,303</u>	<u>624,518,662</u>
417,138	2,517,715	-	7,968,994
29,946,174	-	-	1,302,394,239
159,499,011	-	231,791,699	674,358,375
-	68,187,078	-	68,187,078
-	-	-	376,541,066
25,923	21,647,821	-	48,093,881
490,684	5,505,117	412,951	14,923,354
-	-	-	1,036,269
2,488,607	20,395,872	2,997,550	52,313,383
<u>192,867,537</u>	<u>118,253,603</u>	<u>235,202,200</u>	<u>2,545,816,639</u>
<u>(54,769,293)</u>	<u>(59,423,831)</u>	<u>(53,137,618)</u>	<u>(659,372,957)</u>
<u>173,165,472</u>	<u>79,012,491</u>	<u>223,085,885</u>	<u>2,510,962,344</u>
<u>72,836</u>	<u>132,312</u>	<u>22,873</u>	<u>1,056,342</u>
<u>173,238,308</u>	<u>79,144,803</u>	<u>223,108,758</u>	<u>2,512,018,686</u>
<u>248,848,051</u>	<u>114,262,785</u>	<u>292,237,817</u>	<u>3,244,085,198</u>
2,109,084	1,036,959	2,176,302	25,800,699
899,229	2,355,813	211,432	15,280,624
<u>3,008,313</u>	<u>3,392,772</u>	<u>2,387,734</u>	<u>41,081,323</u>
<u>\$ 251,856,364</u>	<u>\$ 117,655,557</u>	<u>\$ 294,625,551</u>	<u>\$ 3,285,166,521</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF NET POSITION
SEPTEMBER 30, 2016**

LIABILITIES	Water System	Regional Wastewater System
CURRENT LIABILITIES:		
Payable from unrestricted assets:		
Accounts payable and accrued liabilities	\$ 17,578,180	\$ 4,074,271
Due to other funds	48,603	295,028
Customers' advance payments	175,411	2,463,193
Accrued interest payable on U.S. government contracts	820,215	-
Current portion of U.S. government contracts	1,452,272	-
Total payable from unrestricted assets	20,074,681	6,832,492
Payable from restricted assets:		
Accounts payable and accrued liabilities	16,839,419	3,943,773
Due to other funds	61,216	4,472
Accrued landfill closure and post-closure care cost	-	-
Accrued interest payable on revenue bonds	4,616,774	1,706,185
Current portion of note payable	-	-
Current portion of revenue bonds	42,225,000	12,370,000
Total payable from restricted assets	63,742,409	18,024,430
TOTAL CURRENT LIABILITIES	83,817,090	24,856,922
LONG-TERM LIABILITIES:		
Accrued landfill closure costs	-	-
Accrued vacation—less current portion	973,044	260,675
Accrued sick—less current portion	1,598,294	386,648
Net pension liability	17,233,385	4,812,791
Deferred compensation	347,500	-
Long-term debt—less current portion	1,236,720,811	230,267,702
TOTAL LONG-TERM LIABILITIES	1,256,873,034	235,727,816
TOTAL LIABILITIES	1,340,690,124	260,584,738
DEFERRED INFLOWS OF RESOURCES:		
Deferred pension inflow	5,333,791	1,462,272
Deferred insurance proceeds	1,289,915	-
TOTAL DEFERRED INFLOWS OF RESOURCES	6,623,706	1,462,272
TOTAL LIABILITIES AND DEFERRED INFLOWS OF RESOURCES	1,347,313,830	262,047,010
NET POSITION:		
Net investment in capital assets	688,869,056	93,371,653
Restricted for debt service	83,827,441	18,172,746
Unrestricted	131,346,577	(3,919,264)
TOTAL NET POSITION	\$ 904,043,074	\$ 107,625,135

The notes to the basic financial statements are an integral part of this statement.

Sewer System	Solid Waste System	Interceptor System	Total Enterprise Funds
\$ 2,050,718	\$ 2,971,248	\$ 1,341,632	\$ 28,016,049
1,187,589	15,005	99,254	1,645,479
1,520,317	1,119,830	1,107,408	6,386,159
-	-	-	820,215
-	-	-	1,452,272
<u>4,758,624</u>	<u>4,106,083</u>	<u>2,548,294</u>	<u>38,320,174</u>
6,427,033	6,470,690	6,781,536	40,462,451
-	-	39,911	105,599
-	4,630,382	-	4,630,382
2,300,040	161,173	1,898,535	10,682,707
367,715	-	-	367,715
11,780,000	3,385,000	9,565,000	79,325,000
<u>20,874,788</u>	<u>14,647,245</u>	<u>18,284,982</u>	<u>135,573,854</u>
25,633,412	18,753,328	20,833,276	173,894,028
-	603,229	-	603,229
142,204	232,023	37,134	1,645,080
89,067	660,287	46,763	2,781,059
1,784,780	4,080,318	496,146	28,407,420
-	-	-	347,500
171,192,976	43,873,961	175,206,539	1,857,261,989
<u>173,209,027</u>	<u>49,449,818</u>	<u>175,786,582</u>	<u>1,891,046,277</u>
198,842,439	68,203,146	196,619,858	2,064,940,305
532,671	1,309,634	136,273	8,774,641
-	-	-	1,289,915
<u>532,671</u>	<u>1,309,634</u>	<u>136,273</u>	<u>10,064,556</u>
199,375,110	69,512,780	196,756,131	2,075,004,861
32,099,035	45,306,722	82,472,942	942,119,408
22,084,376	3,793,390	13,434,604	141,312,557
(1,702,157)	(957,335)	1,961,874	126,729,695
<u>\$ 52,481,254</u>	<u>\$ 48,142,777</u>	<u>\$ 97,869,420</u>	<u>\$ 1,210,161,660</u>

(Concluded)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
YEAR ENDED SEPTEMBER 30, 2016**

	<u>Water System</u>	<u>Regional Wastewater System</u>
OPERATING REVENUES:		
Water sales	\$ 252,591,522	\$ -
Wastewater service fees	-	54,467,985
Solid waste service fees	-	-
Other operating revenues	398,998	161,189
Total operating revenues	<u>252,990,520</u>	<u>54,629,174</u>
OPERATING EXPENSES:		
Personnel	39,180,330	10,369,874
Operating Supplies:		
Chemicals	19,864,912	4,849,607
Other supplies	5,404,587	3,386,731
Operating Services:		
Electric power	13,116,951	2,788,573
Wholesale water purchases	2,662,651	-
Other services	9,181,436	13,695,309
Depreciation	32,964,843	7,638,327
Total operating expenses	<u>122,375,710</u>	<u>42,728,421</u>
OPERATING INCOME	<u>130,614,810</u>	<u>11,900,753</u>
NONOPERATING REVENUES (EXPENSES):		
Investment income	1,927,950	382,606
Miscellaneous revenue (expense)	(432,253)	-
Federal program revenues	4,005,982	-
Gain on sale of capital assets	42,617	42,490
Interest expense	(37,163,917)	(6,044,530)
Total nonoperating revenues (expenses)	<u>(31,619,621)</u>	<u>(5,619,434)</u>
CHANGE IN NET POSITION	<u>98,995,189</u>	<u>6,281,319</u>
NET POSITION AT OCTOBER 1, 2015	<u>805,047,885</u>	<u>101,343,816</u>
NET POSITION AT SEPTEMBER 30, 2016	<u>\$ 904,043,074</u>	<u>\$ 107,625,135</u>

The notes to the basic financial statements are an integral part of this statement.

<u>Sewer System</u>	<u>Solid Waste System</u>	<u>Interceptor System</u>	<u>Total Enterprise Funds</u>
\$ -	\$ -	\$ -	\$ 252,591,522
33,836,506	-	24,827,564	113,132,055
-	30,760,383	-	30,760,383
439,650	544,807	39,618	1,584,262
<u>34,276,156</u>	<u>31,305,190</u>	<u>24,867,182</u>	<u>398,068,222</u>
4,326,192	10,012,400	1,500,380	65,389,176
1,629,436	38,001	1,901,056	28,283,012
1,562,491	3,639,030	567,370	14,560,209
1,640,508	178,732	1,463,178	19,187,942
-	-	-	2,662,651
6,607,078	7,246,658	3,775,735	40,506,216
5,292,843	3,278,897	4,924,422	54,099,332
<u>21,058,548</u>	<u>24,393,718</u>	<u>14,132,141</u>	<u>224,688,538</u>
<u>13,217,608</u>	<u>6,911,472</u>	<u>10,735,041</u>	<u>173,379,684</u>
375,981	135,948	236,862	3,059,347
-	-	-	(432,253)
-	-	-	4,005,982
1,803	782,493	6,221	875,624
<u>(5,177,101)</u>	<u>(1,622,010)</u>	<u>(4,989,694)</u>	<u>(54,997,252)</u>
<u>(4,799,317)</u>	<u>(703,569)</u>	<u>(4,746,611)</u>	<u>(47,488,552)</u>
<u>8,418,291</u>	<u>6,207,903</u>	<u>5,988,430</u>	<u>125,891,132</u>
<u>44,062,963</u>	<u>41,934,874</u>	<u>91,880,990</u>	<u>1,084,270,528</u>
<u>\$ 52,481,254</u>	<u>\$ 48,142,777</u>	<u>\$ 97,869,420</u>	<u>\$ 1,210,161,660</u>

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
STATEMENT OF CASH FLOWS
YEAR ENDED SEPTEMBER 30, 2016

	<u>Water System</u>	<u>Regional Wastewater System</u>
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 258,221,100	\$ 53,756,437
Cash received from other funds	9,790,187	411,816
Cash received from (paid to) others	2,305,758	33,249
Cash paid to suppliers for goods and services	(77,508,689)	(19,279,869)
Cash paid for employee services	(27,176,986)	(7,156,183)
Cash paid to other funds	(28,881)	(7,567,107)
Net cash provided by operating activities	<u>165,602,489</u>	<u>20,198,343</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds	-	60,962,368
Cash paid for capital assets	(109,578,332)	(12,366,444)
Interest paid on long-term debt	(57,204,448)	(6,911,960)
Interest paid on U.S. government contracts	(1,051,777)	-
Principal payments on long-term debt	(41,205,000)	(11,665,000)
Payments on U.S. government contracts	(1,406,824)	-
Payments for bond issue costs	-	(988,225)
Grant income	43,839	-
Federal Program Revenues	4,005,982	-
Interfund advance	(367,715)	-
Net cash provided by (used for) capital and related financing activities	<u>(206,764,275)</u>	<u>29,030,739</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments	187,018,896	36,946,121
Purchases of investments	(122,084,790)	(60,044,259)
Interest received	2,377,266	462,212
Net cash provided by (used for) investing activities	<u>67,311,372</u>	<u>(22,635,926)</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	26,149,586	26,593,156
CASH AND CASH EQUIVALENTS—Beginning of year	141,363,837	47,606,988
CASH AND CASH EQUIVALENTS—End of year	<u>\$ 167,513,423</u>	<u>\$ 74,200,144</u>
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET POSITION		
Unrestricted cash and cash equivalents	\$ 77,727,425	\$ 5,893,462
Restricted cash and cash equivalents	89,785,998	68,306,682
	<u>\$ 167,513,423</u>	<u>\$ 74,200,144</u>
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	\$ 130,614,810	\$ 11,900,753
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	32,964,843	7,638,327
Change in current assets and liabilities:		
Accounts receivable and unbilled receivable	(475,087)	(151,488)
Prepaid expenses	(14,755)	(7,019)
Net pension liability	123,492	32,908
Due to/from other funds	(1,062,612)	74,984
Accounts payable, accrued liabilities, and developers' deposits	3,283,402	1,211,022
Accrued vacation and accrued sick	384,530	131,629
Accrued OPEB	(381,714)	(92,037)
Landfill liability	-	-
Customers' advance payments	165,580	(540,736)
Total adjustments	<u>34,987,679</u>	<u>8,297,590</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	<u>\$ 165,602,489</u>	<u>\$ 20,198,343</u>
NONCASH TRANSACTION DISCLOSURES		
Change in landfill liability	\$ -	\$ -
Gain (loss) on disposal of capital assets	2,600	-
Interest capitalized on construction	12,907,512	275,869
Amortization of bond-related items	(8,998,143)	(309,614)
Change in fair value of investments	204,817	61,752
Change in actuarial value of net pension liability	(123,492)	(32,908)
Refunding bonds issued	-	42,225,000
Refunding proceeds deposited in escrow	-	49,989,498

The notes to the basic financial statements are an integral part of this statement.

Sewer System	Solid Waste System	Interceptor System	Total Enterprise Funds
\$ 32,870,732	\$ 29,015,861	\$ 25,333,269	\$ 399,197,399
-	2,678,007	106,933	12,986,943
34,919	1,143,076	16,408	3,533,410
(12,156,845)	(12,578,125)	(7,148,985)	(128,672,513)
(3,058,605)	(6,803,378)	(992,402)	(45,187,554)
(3,229,591)	(1,506,771)	(888,027)	(13,220,377)
<u>14,460,610</u>	<u>11,948,670</u>	<u>16,427,196</u>	<u>228,637,308</u>
75,541,285	15,546,722	23,574,083	175,624,458
(22,712,953)	(9,711,988)	(32,450,638)	(186,820,355)
(6,054,862)	(1,812,660)	(7,485,371)	(79,469,301)
-	-	-	(1,051,777)
(12,740,000)	(3,535,000)	(8,455,000)	(77,600,000)
-	-	-	(1,406,824)
(1,265,885)	(313,519)	(446,159)	(3,013,788)
-	-	-	43,839
-	-	-	4,005,982
367,715	-	-	-
<u>33,135,300</u>	<u>173,555</u>	<u>(25,263,085)</u>	<u>(169,687,766)</u>
15,015,036	-	31,987,890	270,967,943
(41,326,883)	(5,996,801)	(15,014,900)	(244,467,633)
436,285	157,711	305,538	3,739,012
<u>(25,875,562)</u>	<u>(5,839,090)</u>	<u>17,278,528</u>	<u>30,239,322</u>
21,720,348	6,283,135	8,442,639	89,188,864
<u>15,421,041</u>	<u>13,013,837</u>	<u>32,864,788</u>	<u>250,270,491</u>
<u>\$ 37,141,389</u>	<u>\$ 19,296,972</u>	<u>\$ 41,307,427</u>	<u>\$ 339,459,355</u>
\$ 3,874,109	\$ 5,761,025	\$ 4,173,017	\$ 97,429,038
33,267,280	13,535,947	37,134,410	242,030,317
<u>\$ 37,141,389</u>	<u>\$ 19,296,972</u>	<u>\$ 41,307,427</u>	<u>\$ 339,459,355</u>
\$ 13,217,608	\$ 6,911,472	\$ 10,735,041	\$ 173,379,684
5,292,843	3,278,897	4,924,422	54,099,332
(113,193)	137,513	139,550	(462,705)
(15,831)	(8,267)	(66,930)	(112,802)
11,649	31,944	2,556	202,549
986,091	(16,787)	52,604	34,280
(3,360,268)	913,279	198,150	2,245,585
858	158,770	63,317	739,104
(44,157)	(71,656)	(16,832)	(606,396)
-	134,298	-	134,298
(1,514,990)	479,207	395,318	(1,015,621)
<u>1,243,002</u>	<u>5,037,198</u>	<u>5,692,155</u>	<u>55,257,624</u>
<u>\$ 14,460,610</u>	<u>\$ 11,948,670</u>	<u>\$ 16,427,196</u>	<u>\$ 228,637,308</u>
\$ -	\$ 134,298	\$ -	\$ 134,298
-	62,132	-	64,732
353,298	99,097	810,750	14,446,526
(1,210,411)	(130,061)	(943,602)	(11,591,831)
14,853	2,167	33,494	317,083
(11,649)	(31,944)	(2,556)	(202,549)
16,390,000	4,245,000	17,630,000	80,490,000
17,844,849	4,916,112	23,293,495	96,043,954

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Reporting Entity

The North Texas Municipal Water District (the District) is a conservation and reclamation district and political subdivision of the State of Texas, created and functioning under Article XVI, Section 59, of the Texas Constitution, pursuant to Chapter 62, Acts of 1951, 52nd Legislature of Texas, Regular Session, as amended (the Act). The District was created for the purpose of providing a source of water supply for municipal, domestic and industrial use and for the treatment, processing and transportation of such water to its 13 member cities (as defined below) and other customers located in North Central Texas. Under the State of Texas Constitution and the Statutes, the District has broad powers to effect flood control and the conservation and use, for all beneficial purposes, of storm and floodwaters and unappropriated flow waters and, as a necessary aid to these purposes, the specific authority to construct, own and operate water supply, treatment, and distribution facilities and sewage gathering, transmission and disposal facilities and to collect, transport, treat, dispose of and control all municipal, domestic, industrial, or communal waste, whether in fluid, solid, or composite state.

The District comprises all of the territory of its member cities: Allen, Farmersville, Forney, Frisco, Garland, McKinney, Mesquite, Plano, Princeton, Richardson, Rockwall, Royse City, and Wylie (the member cities). The District's Administrative Office is located at 501 E. Brown Street, Wylie, Texas. The District is governed by a 25-member Board of Directors. Each member city having a population of 5,000 or more is represented by two members on the Board of Directors. A member city with a population of less than 5,000 (Farmersville) is represented by one member on the Board of Directors. Members of the Board of Directors are appointed by the governing bodies of the respective member cities for two-year terms.

Measurement Focus, Basis of Accounting and Financial Presentation

Measurement Focus

The accompanying basic financial statements are reported using the economic resources measurement focus and the full accrual basis of accounting. Revenues are recorded when earned and expenses are recorded when a liability is incurred, regardless of the timing of the related cash flows. The District's operating revenues are derived from charges to users, primarily for the sale and treatment of water and wastewater. The District constructs facilities to provide services to others, which are financed in part by the issuance of its revenue bonds. Users, primarily member cities, generally contract to pay amounts equal to the District's operating and maintenance expenses, debt service requirements and any other obligations payable from the revenues of the District. Grants and similar items are recognized as revenue as soon as all eligibility requirements imposed by the provider have been met.

Basis of Presentation

The District presents its financial statements in accordance with GASB Statement 34 guidance for governments engaged in business type activities. Accordingly, the basic financial statements and Required Supplementary Information (RSI) of the District consist of MD&A, Statement of Net Position, Statement of Revenues, Expenses and Changes in Net Position, Statement of Cash Flows, Notes to the Financial Statements, and Trend Information for the Retirement and Other Post-Employment Benefits Plan.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES – CONTINUED

Basis of Presentation – Continued

The District presents its activities in five major funds: Water System, Regional Wastewater System, Sewer System, Solid Waste System and Interceptor System.

Funds

The Water Fund owns and operates a wholesale water treatment and transmission system consisting of raw water facilities, water treatment works and water transmission facilities and provides treated water to municipalities, water supply corporations, and individual customers. The Regional Wastewater, Sewer, and Interceptor Funds own and operate wastewater treatment and disposal systems consisting of facilities to receive, treat and dispose of wastewater. The Solid Waste Fund owns and operates landfill sites and solid waste transfer stations.

Revenues

Charges for treated water are based upon the current budgeted expenditure requirements (including debt service payments and excluding charges for depreciation and amortization) and amounts designated by the Board of Directors for capital improvements. Charges for wastewater and solid waste disposal are based upon the current budgeted expenditure requirements (including debt service payments and excluding charges for depreciation and amortization) and are adjusted for the difference between budgeted and actual expenditures for the same period. The District derives approximately 70% of its revenues from the Cities of Frisco, Garland, McKinney, Mesquite, Plano, and Richardson. Such revenues derived directly from the respective systems are defined by the District as operating revenues. All other revenues not directly related to the operations of the systems are reported as non-operating revenues. Revenues are shown net of rebates and/or excess billings.

Expenses

Direct charges attributable to the operations of the District's systems, including depreciation and amortization, are reported as operating expenses. Interest expense and other similar charges not directly related to the systems' operations are reported as non-operating expenses.

Cash and Cash Equivalents

All highly liquid investments (including restricted assets) with original maturities of three months or less when purchased are considered to be cash equivalents.

Deposits

The District's collateral agreement requires that all deposits be fully collateralized by government securities or Texas municipal bonds rated A or better that have a market value exceeding the total amount of cash and investments held at all times.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES – CONTINUED

Investments

All of the District's investments are reported at fair value in accordance with GASB Statement No. 72, *Fair Value Measurement and Application*. Accordingly, the change in fair value of investments is recognized as an increase or decrease to investment assets and investment income. Fair values are determined based on quoted market prices. Investments in U.S. government securities are guaranteed or insured by the U.S. government.

Accounts Receivable

Management considers accounts receivable to be fully collectible as of September 30, 2016; accordingly, no allowance for doubtful accounts is deemed necessary. As of September 30, 2016, member cities Allen, Garland, McKinney, Mesquite, Plano, Richardson, Rockwall, and Royse City accounted for approximately 70% of total accounts receivable.

Material and Supplies Inventory

Inventory of supplies and parts is maintained at different warehouses for use in the operation and is recorded as an expense when consumed or placed in service. Inventory is valued based on first-in-first-out methodology.

Capital Assets

All purchased capital assets are stated at historical cost unless they are determined to be impaired based on GASB Statement No. 42, *Accounting and Financial Reporting for Impairment of Capital Assets and for Insurance Recoveries*. Donated assets are stated at their estimated fair values on the date donated.

Repairs and maintenance are recorded as expenses; renewals and betterments are capitalized.

According to the District's capitalization policy, assets capitalized have an original cost of \$5,000 or more and two or more years of estimated useful life. Depreciation is calculated on each class of depreciable property using the straight-line method. Estimated useful lives are as follows:

Water treatment, storage and transmission facilities	40 to 75 years
Wastewater treatment and disposal facilities	30 to 50 years
Solid waste transfer and disposal facilities	40 years
Land improvements	20 years
Water rights	50 years
Reservoir facilities	50 years
Buildings	10 to 40 years
Automobiles and trucks	5 years
Office furniture and fixtures	7 to 10 years
Other equipment	5 to 20 years

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES – CONTINUED

Capitalized Interest

Interest related to the construction of major projects is capitalized. During the fiscal year ended September 30, 2016, \$14,446,526 of interest expense was capitalized.

Compensated Absences

Employees are allowed to accumulate vacation within certain limitations. Payment for accrued vacation (within limits) upon termination is subject to the employee leaving in good standing. Payment for accrued sick leave (within limits) is paid upon retirement. At September 30, 2016, a liability of \$3,439,070 for unused vacation and \$4,326,036 for unused sick leave has been accrued. The short-term portion is included in “accounts payable and accrued liabilities” in the accompanying statement of net position.

A summary of changes in accrued vacation and sick leave for the year ended September 30, 2016 is as follows:

	<u>Beginning Liability</u>	<u>Additions</u>	<u>Reductions</u>	<u>Ending Liability</u>	<u>Amount due within one year</u>
Vacation	\$ 2,890,178	\$ 3,220,524	\$ 2,671,632	\$ 3,439,070	\$ 1,793,990
Sick	3,684,069	1,831,620	1,189,653	4,326,036	1,544,977

Net Position

Net position is reported as (1) net investment in capital assets; (2) restricted for debt service and; (3) unrestricted. When both restricted and unrestricted net position are available for use, it is the District's policy to use restricted net position first, then unrestricted net position.

Budgets and Budgetary Accounting

The District is not required under its enabling act to adopt a budget; therefore, comparative statements of actual expenses compared to budget expenses are not included.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the amounts reported in the basic financial statements and accompanying notes. Actual results could differ from those estimates.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES – CONTINUED

Pensions

For purposes of measuring the net pension liability, deferred outflows of resources and deferred inflows of resources related to pensions, and pension expense, information about the fiduciary net position of the District has been determined using the flow of economic resources measurement focus and full accrual basis of accounting. Investments are reported at fair value.

Subsequent Events

The District has evaluated all events or transactions that occurred after September 30, 2016 up through January 16, 2016, the date the financial statements were available to be issued. During this period, the following subsequent events required disclosure:

The District issued \$330,560,000 of Series 2016, Regional Water System Revenue Refunding and Improvement bonds on November 30, 2016, \$11,120,000 of Series 2016, Sabine Creek Regional Wastewater System Revenue Refunding and Improvement bonds on November 30, 2016, and \$19,050,000 of Regional Solid Waste Revenue Refunding bonds on December 22, 2016.

NOTE 2. RESTRICTED ASSETS

Restricted assets represent amounts reserved for:

- *Construction Funds*—Construction of facilities, restricted by purpose of the debt issuance.
- *Interest and Redemption (Sinking) Funds*—Current interest and principal of bonded indebtedness.
- *Reserve Funds*—Payment of final serial maturity on bonded indebtedness or payment of interest and principal of bonded indebtedness when and to the extent the amount in the interest and redemption (sinking) fund is insufficient.
- *Contingency Funds* – unexpected or extraordinary expenses for which funds are not otherwise available or for debt service to the extent of interest and redemption (sinking) fund deficiencies as required by bond covenants.
- *Reserve for Maintenance* – Escrow for future maintenance expenses.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 2. RESTRICTED ASSETS – CONTINUED

The cash and cash equivalents, investments, and interest receivable components of each fund represented by restricted assets are as follows:

Fund	Cash and Cash Equivalents	Investments	Interest Receivable
Water:			
Construction Fund	\$ 55,735,616	\$ 74,074,110	\$ 152,755
Interest and Redemption Fund	14,715,795	-	-
Reserve Fund	290,433	73,253,768	152,231
Contingency Fund	18,934,611	-	-
Reserve for Maintenance Fund	109,543	-	-
	<u>89,785,998</u>	<u>147,327,878</u>	<u>304,986</u>
Regional Wastewater:			
Construction Fund	57,170,082	60,025,999	122,053
Interest and Redemption Fund	8,519,783	-	-
Reserve Fund	1,098,935	10,220,453	6,515
Reserve for Maintenance Fund	1,517,882	-	-
	<u>68,306,682</u>	<u>70,246,452</u>	<u>128,568</u>
Sewer:			
Construction Fund	23,152,433	22,009,940	33,668
Interest and Redemption Fund	7,009,310	-	-
Reserve Fund	2,163,260	15,157,517	20,661
Reserve for Maintenance Fund	894,623	-	-
Reserve for Equipment Replacement	47,654	-	-
	<u>33,267,280</u>	<u>37,167,457</u>	<u>54,329</u>
Solid Waste:			
Construction Fund	8,565,858	6,003,931	10,346
Interest and Redemption Fund	555,734	-	-
Reserve Fund	477	3,388,450	93
Reserve for Maintenance Fund	1,041,451	-	-
Reserve for Equipment Replacement	3,372,427	-	-
	<u>13,535,947</u>	<u>9,392,381</u>	<u>10,439</u>
Interceptor:			
Construction Fund	28,450,170	19,009,270	37,664
Interest and Redemption Fund	6,773,837	-	-
Reserve Fund	603,759	8,138,295	223
Reserve for Maintenance Fund	1,306,644	-	-
	<u>37,134,410</u>	<u>27,147,565</u>	<u>37,887</u>
Total	<u>\$ 242,030,317</u>	<u>\$ 291,281,733</u>	<u>\$ 536,209</u>

Unbilled receivables of \$5,233,611 that are reflected as restricted assets in the Solid Waste System represent member cities' obligations for closure and postclosure costs related to solid waste landfills. Based on the contracts for services, member cities will be billed for the actual costs incurred to close the landfills.

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 3. CASH AND INVESTMENTS

The District maintains a cash and investment pool, which includes cash balances and authorized investments of all funds. This pooled cash is invested by the Investment Officer to enhance diversification and interest earnings. The pooled interest earned is allocated to the funds based on cash and investment balances in these funds at the end of each accounting period.

A. Deposits

At September 30, 2016, the carrying amount of cash deposits was \$5,237,326 and total bank balance was \$9,808,928. During 2015-2016, the District's combined deposits were fully insured by federal depository insurance or collateralized with securities pledged to the District and held by the entity or its agent in the entity's name. At September 30, 2016, the District also holds petty cash of \$2,000.

B. Investments

Legal provisions generally permit the District to invest in direct and indirect obligations of the United States of America or its agencies, certain certificates of deposit, repurchase agreements, public funds investment pools and mutual funds. During the year ended September 30, 2016, the District did not own any types of securities other than those permitted by statute.

The District invests in the Texas Local Government Investment Pool (TexPool) and the Local Government Investment Cooperative (LOGIC). TexPool, a public funds investment pool created by the Treasurer of the State of Texas acting by and through the Texas Treasury Safekeeping Trust Company, is empowered to invest funds and act as a custodian of investments purchased with local investment funds. LOGIC is also a public funds investment pool with the same authority as TexPool. It has been organized and established pursuant to an Interlocal Agreement between participating government entities. The District has an undivided beneficial interest in the pool of assets held by these agencies. For both LOGIC and TexPool investments, the fair value of the District's position in the pool is the same as the value of the pool shares. These investments and deposits are fully insured by Federal depository insurance or collateralized by securities held in the name of Texas Treasury Safekeeping Trust Company, the entity that created TexPool and in the name of LOGIC. Authorized investments include obligations of the United States of America or its agencies, direct obligations of the State of Texas or its agencies, certificates of deposit and repurchase agreements.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 3. CASH AND INVESTMENTS – CONTINUED

The District categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. GASB Statement No. 72, Fair Value Measurement and Application provides a framework for measuring fair value which establishes a three-level fair value hierarchy that describes the inputs that are used to measure assets and liabilities.

- Level 1 inputs are quoted prices (unadjusted) for identical assets or liabilities in active markets that a government can access at the measurement date.
- Level 2 inputs are inputs—other than quoted prices included within Level 1—that are observable for an asset or liability, either directly or indirectly.
- Level 3 inputs are unobservable inputs for an asset or liability.

The fair value hierarchy gives the highest priority to Level 1 inputs and the lowest priority to Level 3 inputs. If a price for an identical asset or liability is not observable, a government should measure fair value using another valuation technique that maximizes the use of relevant observable inputs and minimizes the use of unobservable inputs. If the fair value of an asset or a liability is measured using inputs from more than one level of the fair value hierarchy, the measurement is considered to be based on the lowest priority level input that is significant to the entire measurement.

The District has recurring fair value measurements as presented in the table below. The District's investment balances and weighted average maturity of such investments are as follows:

	Fair Value Measurements Using					Percent of Total Investments	Weighted Average Maturity (Days)
	September 30, 2016	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)			
<i>Investments not Subject to Fair Value:</i>							
Investment Pools:							
Texpool	\$ 60,568,110	\$ -	\$ -	\$ -	8.76%	42	
LOGIC	273,651,919	-	-	-	39.57%	39	
<i>Investments by Fair Value Level:</i>							
U.S. Government Agency Securities:							
Federal Home Loan Bank	93,131,620	-	93,131,620	-	13.47%	254	
Federal Home Loan Mortgage Corp.	68,488,723	-	68,488,723	-	9.90%	191	
U.S. Treasury Note	195,736,450	195,736,450	-	-	28.30%	221	
<i>Total Value</i>	<u>\$ 691,576,822</u>	<u>\$ 195,736,450</u>	<u>\$ 161,620,343</u>	<u>\$ -</u>			
Portfolio Weighted Average Maturity						135	

Investment Pools are exempt for fair value reporting.

U.S. Government Agency Securities classified in Level 2 of the fair value hierarchy are valued using a matrix pricing technique. Matrix pricing is used to value securities based on the securities' relationship to benchmark quoted prices.

U.S. Treasury Notes classified in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities.

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 3. CASH AND INVESTMENTS – CONTINUED

GASB Statement No. 40, *Deposit and Investment Risk Disclosures*, addresses common deposit and investment risks related to credit risk, custodial credit risk, concentration of credit risk, interest rate risk, and foreign currency risk.

Credit risk is the risk that a security issuer may default on an interest or principal payment. State law and the District's investment policy limits the District to investments in high quality rated instruments that have been evaluated by agencies such as Standard and Poor's or Moody's Investor Service.

Custodial credit risk is the risk that a depository financial institution will not be able to recover collateral securities that are in the possession of an outside party. The District monitors collateral balances at the bank to ensure they are backed by quality rated instruments.

Concentration of credit risk is the risk associated with holding investments that are not pools and full faith credit securities in excess of 5% of the total portfolio. The investment policy of the District contains no limitations on the amount that can be invested in any one issuer. At September 30, 2016, investments other than external investment pools that represent 5% or more of the District's investments are as follows:

<u>Issue</u>	<u>Investment Type</u>	<u>Reported Amount</u>
FHLB	Federal agency notes	\$ 93,131,620
FHLMC	Federal agency notes	68,488,723
T-NOTE	T-Note	195,736,450

The District held a total of \$357,356,793 in securities that equated to 51.3% of the total investment portfolio.

Interest rate risk is the risk that changes in market interest rates will adversely affect the fair value of an investment. Generally, the longer the maturity of an investment, the greater the sensitivity of its fair value to changes in market interest rates. There is no formal policy relating to interest rate risk. However, the District manages its exposure to interest rate risk by investing in investment pools which purchase a combination of short term investments with an average maturity of less than 60 days, thus reducing the interest rate risk. The District monitors the interest rate risk inherent in its portfolio by measuring the weighted average maturity of its portfolio. At September 30, 2016, \$83,995,440 of the District's portfolio had a weighted average maturity of greater than one year.

Foreign currency risk is the potential for loss due to fluctuations in exchange rates. The District is not exposed to foreign currency risk.

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 3. CASH AND INVESTMENTS – CONTINUED

In accordance with GASB Statement No. 31, *Accounting and Financial Reporting for Certain Investments and for External Investment Pools*, investments were stated at fair value using the aggregate method in all funds, resulting in the following investment income:

	Water System	Regional Wastewater System	Sewer System	Solid Waste System	Interceptor System	Total
Investment income:						
Interest	\$ 2,132,767	\$ 444,358	\$ 390,834	\$ 138,115	\$ 270,356	\$ 3,376,430
Net changes in the fair value of investments	(204,817)	(61,752)	(14,853)	(2,167)	(33,494)	(317,083)
Investment income	\$ 1,927,950	\$ 382,606	\$ 375,981	\$ 135,948	\$ 236,862	\$ 3,059,347

In accordance with GASB Statement No. 31, the net changes in the fair value of investments take into account all changes in fair value (including purchases and sales) that occurred during the year. These portfolio value changes are unrealized unless sold.

C. Summary of Cash and Investments

The following is a summary of cash and investments at September 30, 2016:

	Water System	Regional Wastewater System	Sewer System	Solid Waste System	Interceptor System	Total
Unrestricted						
Cash and cash equivalents	\$ 77,727,425	\$ 5,893,462	\$ 3,874,109	\$ 5,761,025	\$ 4,173,017	\$ 97,429,038
Investments	66,075,060	-	-	-	-	66,075,060
Total unrestricted	143,802,485	5,893,462	3,874,109	5,761,025	4,173,017	163,504,098
Restricted						
Cash and cash equivalents	89,785,998	68,306,682	33,267,280	13,535,947	37,134,410	242,030,317
Investments	147,327,878	70,246,452	37,167,457	9,392,381	27,147,565	291,281,733
Total restricted	237,113,876	138,553,134	70,434,737	22,928,328	64,281,975	533,312,050
Total	\$ 380,916,361	\$ 144,446,596	\$ 74,308,846	\$ 28,689,353	\$ 68,454,992	\$ 696,816,148

Note: Capital Improvement Funds in the amount of \$101,263,859 in the Water System, \$633,292 in the Regional Wastewater System, \$135,846 in the Sewer System, \$2,613,287 in the Solid Waste System, and \$2,163,996 in the Interceptor System are included in Unrestricted Cash and Investments. Please refer to Note 11 for commitments under construction contracts.

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 3. CASH AND INVESTMENTS – CONTINUED

At September 30, 2016, the District had the following deposits and investments:

	Credit Quality Ratings	Fair Value	Weighted Average Maturity
<u>Unrestricted Cash and Investments</u>			
Cash and cash equivalents:			
Deposits with a financial institution	Not Rated	\$ 5,237,264	n/a
Cash on hand	Not Rated	2,000	n/a
TexPool	AAAm	25,734,375	42 Days
LOGIC	AAAm	66,455,399	39 Days
		<u>97,429,038</u>	
Total cash and cash equivalents			
Investments—Securities of U.S. Government Agencies:			
Treasury Note - US Treasuries	Aaa	41,019,850	183 Days
FHLMC - Federal Home Loan Bank Mortgage Corp Agency Note	Aaa	13,044,580	250 Days
FHLB - Federal Home Loan Bank Agency Note	Aaa	12,010,630	313 Days
		<u>66,075,060</u>	
Total Securities of U.S. Government Agencies			
Total Unrestricted Investments and Cash Equivalents			
		<u>163,504,098</u>	
<u>Restricted Cash and Investments</u>			
Cash and Cash Equivalents			
Deposits with a financial institution	Not Rated	62	n/a
TexPool	AAAm	34,833,735	42 Days
LOGIC	AAAm	207,196,520	39 Days
		<u>242,030,317</u>	
Total cash and cash equivalents			
Investments—Securities of U.S. Government Agencies:			
FHLB - Federal Home Loan Bank Agency Note	Aaa	81,120,990	245 Days
Treasury Note - US Treasuries	Aaa	154,716,600	231 Days
FHLMC - Federal Home Loan Mortgage Corp Agency Note	Aaa	55,444,143	177 Days
		<u>291,281,733</u>	
Total Securities of U.S. Government Agencies			
Total Restricted Investments and Cash Equivalents			
		<u>533,312,050</u>	
Total Cash and Investments			
		<u>\$ 696,816,148</u>	

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 4. CAPITAL ASSETS

A summary of changes in capital assets follows:

	Balance at October 1, 2015	Additions and Transfers	Disposals and Transfers	Adjustments	Balance at September 30, 2016
Nondepreciable:					
Land	\$ 69,129,011	\$ 2,791,318	\$ 148,950	\$ -	\$ 71,771,379
Easements	47,759,846	10,371,413	-	-	58,131,259
Construction in progress	728,656,169	201,956,925	435,997,070	-	494,616,024
Total nondepreciable assets	845,545,026	215,119,656	436,146,020	-	624,518,662
Depreciable:					
Land improvements	7,968,994	-	-	-	7,968,994
Water treatment, storage and transmission facilities	940,257,903	362,136,336	-	-	1,302,394,239
Wastewater treatment and disposal facilities	636,794,884	37,563,491	-	-	674,358,375
Solid waste transfer and disposal facilities	66,426,512	1,760,566	-	-	68,187,078
Reservoir facilities and water rights	368,260,136	8,280,930	-	-	376,541,066
Buildings	36,572,463	11,521,418	-	-	48,093,881
Automobiles and trucks	12,261,771	3,101,175	439,592	-	14,923,354
Office furniture and fixtures	523,382	512,887	-	-	1,036,269
Other equipment	46,521,226	6,216,070	423,913	-	52,313,383
Total depreciable assets	2,115,587,271	431,092,873	863,505	-	2,545,816,639
Less accumulated depreciation on:					
Land improvements	(4,436,819)	(274,292)	-	-	(4,711,111)
Water treatment, storage and transmission facilities	(269,928,807)	(23,212,466)	-	-	(293,141,273)
Wastewater treatment and disposal facilities	(171,433,307)	(15,826,063)	-	-	(187,259,370)
Solid waste transfer and disposal facilities	(32,882,798)	(1,022,081)	-	-	(33,904,879)
Reservoir facilities and water rights	(80,701,720)	(7,454,332)	-	-	(88,156,052)
Buildings	(10,218,662)	(947,491)	-	-	(11,166,153)
Automobiles and trucks	(9,688,255)	(1,143,088)	(439,592)	-	(10,391,751)
Office furniture and fixtures	(301,841)	(55,114)	-	-	(356,955)
Other equipment	(26,491,455)	(4,164,405)	(370,447)	-	(30,285,413)
Total accumulated depreciation	(606,083,664)	(54,099,332)	(810,039)	-	(659,372,957)
Total depreciable assets—net	1,509,503,607	376,993,541	53,466	-	1,886,443,682
TOTAL CAPITAL ASSETS—Net	\$ 2,355,048,633	\$ 592,113,197	\$ 436,199,486	\$ -	\$ 2,510,962,344

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 5. INTERFUND BALANCES

At September 30, 2016, interfund balances consisted of the following:

	Due From Other Funds	Due to Other Funds
Water System	\$ 1,316,876	\$ 109,819
Regional Wastewater System	34,929	299,500
Sewer System	88,791	1,187,589
Solid Waste System	290,417	15,005
Interceptor System	20,065	139,165
Total	<u>\$ 1,751,078</u>	<u>\$ 1,751,078</u>

The above interfund balances are a result of routine administrative type transactions in the normal course of business and are expected to be repaid in less than one year.

The Regional Water System temporarily advanced \$367,715 to the Sabine Creek WWTP for capital improvement costs, plus interest of \$7,508. As of September 30, 2016 this temporary advance is reported as a note receivable/payable. The Sabine Creek WWTP reimbursed the Regional Water System in October 2016.

NOTE 6. DEFERRED OUTFLOWS OF RESOURCES

At September 30, 2016, deferred outflows of resources consisted of the following:

	Balance at October 1, 2015	Additions	Deletions	Balance at September 30, 2016
Water System:				
Deferred loss on refunded debt	\$ 18,427,869	\$ -	\$ (1,007,274)	\$ 17,420,595
Deferred pension outflow	1,691,734	7,613,038	-	9,304,772
	<u>20,119,603</u>	<u>7,613,038</u>	<u>(1,007,274)</u>	<u>26,725,367</u>
Regional Wastewater:				
Deferred loss on refunded debt	1,500,210	1,884,709	(327,160)	3,057,759
Deferred pension outflow	480,626	2,028,752	-	2,509,378
	<u>1,980,836</u>	<u>3,913,461</u>	<u>(327,160)</u>	<u>5,567,137</u>
Sewer System:				
Deferred loss on refunded debt	2,026,542	308,536	(225,994)	2,109,084
Deferred pension outflow	181,111	718,118	-	899,229
	<u>2,207,653</u>	<u>1,026,654</u>	<u>(225,994)</u>	<u>3,008,313</u>
Solid Waste System:				
Deferred loss on refunded debt	1,032,108	143,989	(139,138)	1,036,959
Deferred pension outflow	386,553	1,969,260	-	2,355,813
	<u>1,418,661</u>	<u>2,113,249</u>	<u>(139,138)</u>	<u>3,392,772</u>
Interceptor System:				
Deferred loss on refunded debt	885,049	1,471,068	(179,815)	2,176,302
Deferred pension outflow	53,883	157,549	-	211,432
	<u>938,932</u>	<u>1,628,617</u>	<u>(179,815)</u>	<u>2,387,734</u>
Total	<u>\$ 26,665,685</u>	<u>\$ 16,295,019</u>	<u>\$ (1,879,381)</u>	<u>\$ 41,081,323</u>

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 7. ACCOUNTS PAYABLE AND ACCRUED LIABILITIES

At September 30, 2016, accounts payable and accrued liabilities consisted of the following:

	Water System	Regional Wastewater System	Sewer System	Solid Waste System	Interceptor System	Total
Payable to vendors/contractors	\$ 28,854,032	\$ 5,298,485	\$ 6,892,727	\$ 3,734,121	\$ 6,709,777	\$ 51,489,142
Insurance claims liability	1,584,241	-	-	-	-	1,584,241
Payable to cities	-	1,517,882	1,033,501	4,413,878	1,306,644	8,271,905
Compensated absences	1,992,545	583,469	288,486	437,519	36,948	3,338,967
Accrued payroll and related benefits	1,986,781	618,208	263,037	856,420	69,799	3,794,245
Total	\$ 34,417,599	\$ 8,018,044	\$ 8,477,751	\$ 9,441,938	\$ 8,123,168	\$ 68,478,500
Payable from unrestricted assets	\$ 17,578,180	\$ 4,074,271	\$ 2,050,718	\$ 2,971,248	\$ 1,341,632	\$ 28,016,049
Payable from restricted assets	16,839,419	3,943,773	6,427,033	6,470,690	6,781,536	40,462,451
Total	\$ 34,417,599	\$ 8,018,044	\$ 8,477,751	\$ 9,441,938	\$ 8,123,168	\$ 68,478,500

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 8. LONG-TERM DEBT

Long-term debt consists of the following at September 30, 2016:

	Balance at October 1, 2015	Issued	Retired or Refunded	Balance at September 30, 2016	Amounts due Within One Year
Water System:					
Water revenue bonds 03/16-09/44, .444-6.123%	\$ 1,188,980,000	\$ -	\$ 41,205,000	\$ 1,147,775,000	\$ 42,225,000
U.S. govt contracts payable, 12/15-10/51, 3.225-3.253%	32,456,205	-	1,406,824	31,049,381	1,452,272
	<u>1,221,436,205</u>	<u>-</u>	<u>42,611,824</u>	<u>1,178,824,381</u>	<u>43,677,272</u>
Regional Wastewater:					
Wastewater revenue bonds, 12/15-06/45, 2.00-5.00%	185,885,000	95,075,000	58,605,000	222,355,000	12,370,000
Sewer System:					
Rockwall contract revenue bonds, 12/15-06/28, 5.00-5.75%	2,385,000	-	270,000	2,115,000	130,000
Mustang Creek Interceptor System revenue bonds, 12/15-06/42, 3.00-6.00%	10,020,000	-	185,000	9,835,000	190,000
Rockwall-Heath contract revenue bonds 12/15-06/25, 3.75-4.25%	1,840,000	-	150,000	1,690,000	155,000
Terrell contract revenue bonds 12/15-06/35, 2.00-5.00%	10,365,000	-	365,000	10,000,000	375,000
McKinney contract revenue bonds, 06/15, 5.0%	-	-	-	-	-
Plano contract revenue bonds, 12/15-06/18, 3.00-3.641%	1,780,000	-	765,000	1,015,000	800,000
Stewart Creek contract revenue bonds, 12/15-06/35, 1.580-5.00%	2,025,000	65,845,000	3,790,000	64,080,000	2,695,000
Little Elm contract revenue bonds, 12/15-06/23, 1.25-2.00%	2,905,000	-	325,000	2,580,000	335,000
Parker Creek Interceptor System, revenue bonds, 12/15-06/23, 4.750-5.125%	1,420,000	-	150,000	1,270,000	155,000
Sabine Creek Interceptor System revenue bonds, 12/15-6/23, 4.75-5.125%	1,145,000	-	120,000	1,025,000	125,000
Sabine Creek Wastewater System revenue bonds, 12/15-6/23, 2.00-3.00%	4,905,000	-	525,000	4,380,000	580,000
Muddy Creek Wastewater System revenue bonds 12/15-06/26, 3.00-5.00%	14,165,000	5,645,000	7,125,000	12,685,000	1,385,000
Muddy Creek Interceptor revenue bonds 12/15-06/24, 3.00-4.00%	1,950,000	-	185,000	1,765,000	190,000
Buffalo Creek Interceptor revenue bonds 12/15-06/27, 3.00-5.00%	11,340,000	-	965,000	10,375,000	1,010,000
Rockwall Water Pumping Facilities bonds 12/15-06/26, 4.50-4.75%	1,430,000	-	100,000	1,330,000	105,000
Panther Creek Wastewater System bonds 12/15-06/29, 3.00-5.00%	37,355,000	-	2,515,000	34,840,000	2,515,000
Lower East Fork Interceptor bonds 12/15-06/26, 3.00-5.00%	12,610,000	10,745,000	12,675,000	10,680,000	895,000
Parker Creek Parallel Interceptor bonds 12/15-06/36, 2.00-3.00%	-	3,045,000	-	3,045,000	140,000
	<u>117,640,000</u>	<u>85,280,000</u>	<u>30,210,000</u>	<u>172,710,000</u>	<u>11,780,000</u>
Solid Waste System--revenue					
bonds, 03/16-09/28, 2.00-5.375%	35,265,000	18,310,000	8,260,000	45,315,000	3,385,000
Interceptor System--revenue					
bonds, 12/15-06/35, 3.00-6.25%	159,160,000	39,470,000	30,025,000	168,605,000	9,565,000
Total	<u>\$ 1,719,386,205</u>	<u>\$ 238,135,000</u>	<u>\$ 169,711,824</u>	<u>\$ 1,787,809,381</u>	<u>\$ 80,777,272</u>

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 8. LONG-TERM DEBT – CONTINUED

In the Statement of Net Position, the long-term liabilities include premiums net of discounts of \$101,573,702 in the Water System, \$20,282,702 in the Regional Wastewater System, \$10,262,976 in the Sewer System, \$1,943,961 in the Solid Waste System and \$16,166,539 in the Interceptor System.

Other long term debt activity for the year ended September 30, 2016, was as follows:

	Balance at October 1, 2015	Additions	Deletions	Balance at September 30, 2016
Water System				
Premiums	\$ 111,579,118	\$ -	\$ (10,005,416)	\$ 101,573,702
	<u>111,579,118</u>	<u>-</u>	<u>(10,005,416)</u>	<u>101,573,702</u>
Regional Wastewater				
Premiums	7,195,624	14,888,641	(1,801,563)	20,282,702
	<u>7,195,624</u>	<u>14,888,641</u>	<u>(1,801,563)</u>	<u>20,282,702</u>
Sewer System				
Premiums	5,060,075	6,840,249	(1,519,290)	10,381,034
Discounts	(134,630)	-	16,572	(118,058)
	<u>4,925,445</u>	<u>6,840,249</u>	<u>(1,502,718)</u>	<u>10,262,976</u>
Solid Waste System				
Premiums	506,231	1,848,813	(328,712)	2,026,332
Discounts	(94,762)	-	12,391	(82,371)
	<u>411,469</u>	<u>1,848,813</u>	<u>(316,321)</u>	<u>1,943,961</u>
Interceptor System				
Premiums	10,590,964	6,951,419	(1,375,844)	16,166,539
	<u>10,590,964</u>	<u>6,951,419</u>	<u>(1,375,844)</u>	<u>16,166,539</u>
Total	<u>\$ 134,702,620</u>	<u>\$ 30,529,122</u>	<u>\$ (15,001,862)</u>	<u>\$ 150,229,880</u>

Revenue bonds outstanding at September 30, 2016, are secured as follows:

- *Water Revenue Bonds*—Assignment of the gross revenues to be derived from the operation of the District’s Water System.
- *Regional Wastewater Revenue Bonds*—Assignment of the gross revenues to be derived from the operation of the District’s Regional Wastewater System and payments made to the District from the Cities of Plano, Mesquite, McKinney, Forney, Allen, Frisco, Princeton, Prosper, Rockwall, Seagoville and Heath, Texas.
- *Murphy Contract Revenue Bonds*—Assignment of the gross revenues to be derived from the operation of the District’s sewage disposal system serving the City of Murphy, Texas and payments made to the District by the City of Murphy, Texas.

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 8. LONG-TERM DEBT – CONTINUED

- *Rockwall Contract Revenue Bonds*—Assignment of the gross revenues to be derived from the operation of the District’s sewage disposal system serving the City of Rockwall, Texas.
- *McKinney Contract Revenue Bonds*—Payments made to the District by the City of McKinney, Texas.
- *Plano Contract Revenue Bonds*— Payments made to the District by the City of Plano, Texas.
- *Stewart Creek Contract Revenue Bonds*—Assignment of the gross revenues to be derived from the operation of the Stewart Creek Wastewater System and payments made to the District by the City of Frisco, Texas.
- *Little Elm Contract Revenue Bonds*—Payments made to the District by the Town of Little Elm, Texas.
- *Parker Creek Interceptor System*—Assignment of the gross revenues to be derived from the operation of the Parker Creek Interceptor System and payments made to the District by the Cities of Fate and Royse City, Texas.
- *Sabine Creek Interceptor System*—Assignment of the gross revenues to be derived from the operation of the Sabine Creek Interceptor System and payments made to the District by the City of Royse City, Texas.
- *Sabine Creek Wastewater System*—Assignment of the gross revenues to be derived from the operation of the Sabine Creek Wastewater System and payments made to the District by the City of Fate and the City of Royse City, Texas.
- *Muddy Creek Wastewater System*—Assignment of the gross revenues to be derived from the operation of the Muddy Creek Wastewater System and payments made to the District by the Cities of Murphy and Wylie, Texas.
- *Muddy Creek Interceptor System*—Assignment of the gross revenues to be derived from the operation of the Muddy Creek Interceptor System and payments made to the District by the Cities of Murphy and Wylie, Texas.
- *Buffalo Creek Interceptor System*—Assignment of the gross revenues to be derived from the operation of the Buffalo Creek Interceptor System and payments made to the District by the Cities of Forney, Heath and Rockwall, Texas.
- *Rockwall/Heath Water Storage Facilities*—Payments to be made to the District by the Cities of Rockwall and Heath, Texas.
- *Terrell Water Transmission Facilities*—Payments to be made to the District by the City of Terrell, Texas.

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 8. LONG-TERM DEBT – CONTINUED

- *Rockwall Water Pumping Facilities*—Payments to be made to the District by the City of Rockwall, Texas.
- *Panther Creek Wastewater System*—Assignment of the gross revenues to be derived from the operation of the Panther Creek Wastewater System and payments made to the District by the City of Frisco, Texas.
- *Lower East Fork Interceptor System*—Assignment of the gross revenues to be derived from the operation of the District's Lower East Fork Interceptor System and payments made to the District by the Cities of Mesquite and Seagoville, Texas.
- *Mustang Creek Interceptor*—Payments to be made to the District by the City of Forney, Texas.
- *Solid Waste Revenue Bonds*—Assignment of the gross revenues to be derived from the operation of the District's Solid Waste System.
- *Interceptor Revenue Bonds*—Assignment of the gross revenues to be derived from the operation of the District's Upper East Fork Interceptor System.

Interest and redemption (sinking) funds, reserve funds and contingency funds have been established, as required, in accordance with bond resolutions. Funds may be placed in secured time deposits or invested in direct obligations of, or obligations guaranteed by, the U.S. government. Interest earned is retained in the applicable funds or transferred to meet debt service requirements in accordance with bond resolutions.

The Water Fund's long-term debt payable to the U.S. government is pursuant to contracts covering the Chapman and Lavon Reservoirs.

Premiums and discounts on bonds are amortized over the life of the debt using the effective interest method.

During the year, the District issued revenue bonds in the amounts of \$52,850,000 in the Wastewater System primarily for the Rowlett Creek and Mesquite Wastewater Treatment Plants, \$68,890,000 in the Sewer System primarily for the expansion of the Stewart Creek Wastewater Treatment Plant, \$14,065,000 in the Solid Waste System primarily for system improvements and \$21,840,000 in the Interceptor System primarily for improvements. The District also issued revenue refunding bonds in the amounts of \$42,225,000 in the Wastewater System, \$16,390,000 in the Sewer System, \$4,245,000 in the Solid Waste System and \$17,630,000 in the Interceptor System.

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 8. LONG-TERM DEBT – CONTINUED

During the year, the District issued revenue refunding bonds in the amount of \$42,225,000 in the Wastewater System to refund a portion of the District's outstanding debt. The net proceeds of the refunding of \$49,989,498 were deposited with an escrow agent to purchase direct obligations of the United States. As a result of the current refunding, the District decreased its aggregate debt service payment to maturity by \$6,970,801 and realized an economic gain (difference between the present value of debt service payments of the old debt and the new debt) of \$6,311,881 .

During the year, the District issued revenue refunding bonds in the amount of \$16,390,000 in the Sewer System to refund a portion of the District's outstanding debt. The net proceeds of the refunding of \$17,844,849 were deposited with an escrow agent to purchase direct obligations of the United States. As a result of the current refunding, the District decreased its aggregate debt service payment to maturity by \$2,441,896 and realized an economic gain (difference between the present value of debt service payments of the old debt and the new debt) of \$2,181,586.

During the year, the District issued revenue refunding bonds in the amount of \$4,245,000 in the Solid Waste System to refund a portion of the District's outstanding debt. The net proceeds of the refunding of \$4,916,112 were deposited with an escrow agent to purchase direct obligations of the United States. As a result of the current refunding, the District decreased its aggregate debt service payment to maturity by \$484,888 and realized an economic gain (difference between the present value of debt service payments of the old debt and the new debt) of \$425,661 .

During the year, the District issued revenue refunding bonds in the amount of \$17,630,000 in the Interceptor System to refund a portion of the District's outstanding debt. The net proceeds of the refunding of \$23,293,495 were deposited with an escrow agent to purchase direct obligations of the United States. As a result of the current refunding, the District decreased its aggregate debt service payment to maturity by \$5,254,880 and realized an economic gain (difference between the present value of debt service payments of the old debt and the new debt) of \$4,705,344.

At September 30, 2016, defeased bonds outstanding totaled \$86,025,000.

For current and advance refunding resulting in defeasance of debt, the difference between the reacquisition price and the net carrying amount of the old debt is deferred and amortized as interest expense over the remaining life of the old debt or the life of the new debt, whichever is shorter. At September 30, 2016, the amount of the unamortized deferred amount on refundings is \$25,800,699.

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 8. LONG-TERM DEBT – CONTINUED

Annual requirements to retire revenue bonds outstanding, including interest, are:

	Water Fund			Regional Wastewater Fund		
	Principal	Interest	Total	Principal	Interest	Total
2017	42,225,000	55,401,293	\$ 97,626,293	12,370,000	8,006,541	\$ 20,376,541
2018	44,100,000	53,473,992	97,573,992	12,085,000	8,837,954	20,922,954
2019	47,055,000	51,537,679	98,592,679	11,220,000	8,289,704	19,509,704
2020	49,055,000	49,417,989	98,472,989	11,720,000	7,787,154	19,507,154
2021	50,315,000	47,060,474	97,375,474	12,225,000	7,262,104	19,487,104
2022-2026	265,375,000	197,524,104	462,899,104	53,795,000	28,597,664	82,392,664
2027-2031	302,660,000	130,076,424	432,736,424	40,190,000	17,316,606	57,506,606
2032-2036	237,655,000	60,297,618	297,952,618	21,420,000	10,918,082	32,338,082
2037-2041	89,160,000	15,254,683	104,414,683	22,470,000	6,783,000	29,253,000
2042-2046	20,175,000	1,640,201	21,815,201	24,860,000	2,408,850	27,268,850
	<u>\$ 1,147,775,000</u>	<u>\$ 661,684,457</u>	<u>\$ 1,809,459,457</u>	<u>\$ 222,355,000</u>	<u>\$ 106,207,658</u>	<u>\$ 328,562,658</u>

	Sewer Fund			Solid Waste Fund		
	Principal	Interest	Total	Principal	Interest	Total
2017	\$ 11,780,000	\$ 6,950,581	\$ 18,730,581	\$ 3,385,000	\$ 1,934,081	\$ 5,319,081
2018	11,570,000	6,575,439	18,145,439	3,495,000	1,798,431	5,293,431
2019	11,765,000	6,136,401	17,901,401	3,645,000	1,634,181	5,279,181
2020	11,720,000	5,640,779	17,360,779	3,775,000	1,493,806	5,268,806
2021	12,220,000	5,199,570	17,419,570	3,910,000	1,332,531	5,242,531
2022-2026	57,665,000	17,762,948	75,427,948	16,130,000	4,280,844	20,410,844
2027-2031	28,545,000	8,260,456	36,805,456	7,215,000	1,260,287	8,475,287
2032-2036	23,975,000	3,017,013	26,992,013	3,760,000	318,982	4,078,982
2037-2041	2,820,000	432,481	3,252,481	-	-	-
2042-2046	650,000	23,563	673,563	-	-	-
	<u>\$ 172,710,000</u>	<u>\$ 59,999,230</u>	<u>\$ 232,709,230</u>	<u>\$ 45,315,000</u>	<u>\$ 14,053,144</u>	<u>\$ 59,368,144</u>

	Interceptor Fund			Total All Funds		
	Principal	Interest	Total	Principal	Interest	Total
2017	\$ 9,565,000	\$ 6,883,192	\$ 16,448,192	\$ 79,325,000	\$ 79,175,689	\$ 158,500,689
2018	10,040,000	6,995,255	17,035,255	81,290,000	77,681,071	158,971,071
2019	9,075,000	6,487,693	15,562,693	82,760,000	74,085,658	156,845,658
2020	9,490,000	6,039,705	15,529,705	85,760,000	70,379,433	156,139,433
2021	9,930,000	5,540,455	15,470,455	88,600,000	66,395,134	154,995,134
2022-2026	53,380,000	19,936,400	73,316,400	446,345,000	268,101,960	714,446,960
2027-2031	41,770,000	8,647,825	50,417,825	420,380,000	165,561,598	585,941,598
2032-2036	15,050,000	2,967,282	18,017,282	301,860,000	77,518,977	379,378,977
2037-2041	4,650,000	1,286,300	5,936,300	119,100,000	23,756,464	142,856,464
2042-2046	5,655,000	522,150	6,177,150	51,340,000	4,594,764	55,934,764
	<u>\$ 168,605,000</u>	<u>\$ 65,306,257</u>	<u>\$ 233,911,257</u>	<u>\$ 1,756,760,000</u>	<u>\$ 907,250,747</u>	<u>\$ 2,664,010,747</u>

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 8. LONG-TERM DEBT – CONTINUED

Annual requirements to amortize contracts payable, including interest, are:

	Water Fund		
	Principal	Interest	Total
2017	\$ 1,452,272	\$ 1,006,330	\$ 2,458,602
2018	1,499,185	959,414	2,458,599
2019	1,547,617	910,983	2,458,600
2020	1,597,613	860,987	2,458,600
2021	1,649,224	809,377	2,458,601
2022-2026	8,151,572	3,212,443	11,364,015
2027-2031	2,738,179	2,248,554	4,986,733
2032-2036	2,457,051	1,864,351	4,321,402
2037-2041	2,883,550	1,437,851	4,321,401
2042-2046	3,384,082	937,319	4,321,401
2047-2051	3,689,036	354,425	4,043,461
	<u>\$ 31,049,381</u>	<u>\$ 14,602,034</u>	<u>\$ 45,651,415</u>

NOTE 9. DEFERRED INFLOWS OF RESOURCES

At September 30, 2016, deferred inflows of resources consisted of the following:

	Balance at October 1, 2015	Additions	Deletions	Balance at September 30, 2016
Water System:				
Deferred inflow of resources	\$ -	\$ 1,289,915	\$ -	\$ 1,289,915
Deferred pension inflow	2,321,763	3,012,028	-	5,333,791
	<u>2,321,763</u>	<u>4,301,943</u>	<u>-</u>	<u>6,623,706</u>
Regional Wastewater:				
Deferred pension inflow	659,615	802,657	-	1,462,272
	<u>659,615</u>	<u>802,657</u>	<u>-</u>	<u>1,462,272</u>
Sewer System:				
Deferred pension inflow	248,554	284,117	-	532,671
	<u>248,554</u>	<u>284,117</u>	<u>-</u>	<u>532,671</u>
Solid Waste System:				
Deferred pension inflow	530,514	779,120	-	1,309,634
	<u>530,514</u>	<u>779,120</u>	<u>-</u>	<u>1,309,634</u>
Interceptor System:				
Deferred pension inflow	73,940	62,333	-	136,273
	<u>73,940</u>	<u>62,333</u>	<u>-</u>	<u>136,273</u>
Total	<u>\$ 3,834,386</u>	<u>\$ 6,230,170</u>	<u>\$ -</u>	<u>\$ 10,064,556</u>

In addition to the deferred pension inflow, the Water Fund has an additional deferred inflow that represents an acquisition of net position that applies to a future period. The \$1,289,915 represents the unspent portion of the advance funds the District received from the insurance company for the hail damage repairs during the fiscal year.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 10. RETIREMENT PLAN

Plan Description

The District provides a Retirement Plan for Employees of North Texas Municipal Water District (the Plan), a single employer defined benefit pension plan, for all of its eligible full-time employees through an AETNA Life Insurance Company group pension defined benefit fund contract. The Plan is administered by the District's Executive Director/General Manager. The Plan does not issue separate financial statements. All employees who have two years of continuous service and have reached 21 years of age are eligible to participate in the Plan.

Benefits Provided

Benefits are established and may be amended by the District's Board of Directors. Benefits provided by the Plan include retirement, disability and preretirement death benefits. The benefit formula provides for a 10-year certain and continuous annuity. Preretirement death benefits are provided as a lump sum equal to the greater of the present value of the accrued benefit or current vested wages. The benefit at retirement is calculated as follows:

- *Normal Retirement (age 65)*—3% of earnings plus 1% of earnings in excess of covered compensation while an active member.
- *Early Retirement (over age 55 with at least 20 years of service)*—The annual accrued benefit equals the accrued benefit based on service to the early retirement date, reduced by 5% for each year a member retires before the normal retirement date. There is no reduction in benefits for a member who retires whose age plus years of service total at least 85.
- *Late Retirement (after normal retirement date)*—The benefit accrued to the late retirement date.
- *Disability (certified to be permanently and totally disabled on or after May 1, 1990)*—60% of final average monthly compensation reduced by 64% of Social Security disability.

Employees Covered by Benefit Terms

As of January 1, 2016, the participants comprised the following:

Active participants	510
Terminated vested participants	59
Disabled Participants	4
Retired participants	99
Beneficiaries	14
Total number of participants	<u>686</u>

The Plan's assets are invested in pooled mutual and commingled funds and are stated at fair value as determined by the Plan's custodian.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 10. RETIREMENT PLAN – CONTINUED

Contributions

The District's annual minimum contribution is actuarially calculated based on the amount required to prevent the unfunded liability from increasing. The significant actuarial assumptions used to compute the actuarially determined contribution requirement are the same as those used to compute the actuarial accrued liability as set forth above. The unfunded actuarial accrued liability is amortized over a closed period of 30 years. Employees make no contributions to the Plan.

For the plan years ended December 31, 2015, 2014, and 2013, the District made contributions of \$4,999,000, \$5,595,000, and \$4,945,000, respectively which represent 16.6%, 21.0% and 19.1%, respectively of annual covered payroll. These contributions were based on actuarially determined contribution requirements through an actuarial valuation performed at January 1, 2016, 2015, and 2014.

Actuarial Assumptions

Valuation date	January 1, 2015	January 1, 2016
Measurement date	December 31, 2014	December 31, 2015
Inflation	2.50%	2.25%
Salary increases including inflation	4.00%	4.00%
Mortality	IRS Stutory Static tables for 2014 based on RP-2000 tables projected to anticipate greater future longevity, with separate rates for non-annuitants and annuitants	SOA RP-2014 adjusted to 2006 mortality tables (blue collar) and MP 2015 mortality improvement scales
Actuarial cost method	Entry Age Normal	Entry Age Normal

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 10. RETIREMENT PLAN – CONTINUED

Actuarial valuations of an ongoing plan involve estimates of the value of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment and mortality trends. Amounts determined regarding the funded status of the plan and the annual required contributions of the employer are subject to continual revision as actual results are compared with past expectations and new estimates are made about the future. The schedule of funding progress, presented as required supplementary information following the notes to the financial statements, presents multiyear trend information that shows whether the actuarial value of plan assets is increasing or decreasing over time relative to the actuarial accrued liabilities for benefits.

Discount Rate

	December 31, 2014	December 31, 2015
Discount rate	8.00%	8.00%
Long-term expected rate of return, net of investment expense	8.00%	8.00%

The plan's fiduciary net position was projected to be available to make all projected future benefit payments of current active and inactive employees. Therefore, the discount rate for calculating the total pension liability is equal to the long-term expected rate of return.

Long-Term Expected Rate of Return

The best-estimate range for the long-term expected rate of return is determined by adding expected inflation to expected long-term real returns and reflecting expected volatility and correlation. The capital market assumptions are per Milliman's investment consulting practice as of December 31, 2015.

Asset Class	Index	Target Allocation*	Long-Term Expected Arithmetic Real Rate of Return	Long-Term Expected Geometric Real Rate of Return
Cash	BAML 3-Mon Tbill	1.00%	3.04%	3.02%
Long Bonds	Barclays LT Gvt/Credit	7.00%	5.65%	5.19%
Short Bonds	Barclays 1-3 Yr Gvt/Credit	6.00%	3.94%	3.90%
Long Gvt Bonds	Barclays Long Gvt	6.00%	4.78%	4.14%
Large Caps	S&P 500	20.00%	7.62%	6.40%
Small Caps	Russell 2000	30.00%	8.55%	6.65%
Large Growth	Russell 1000 Growth	10.00%	8.14%	6.65%
Large Value	Russell 1000 Value	10.00%	7.28%	6.10%
Mid Cap Growth	Russell MidCap Growth	10.00%	8.82%	6.55%
Assumed Inflation - Mean			2.30%	2.30%
Assumed Inflation - Standard Deviation			2.00%	2.00%
Portfolio Real Mean Return			5.15%	4.11%
Portfolio Nominal Mean Return			7.46%	6.51%
Portfolio Standard Deviation			14.59%	14.59%
Long-Term Expected Rate of Return				8.00%

* Aligned with the Plan's investment policy guidelines dated December 15, 2005.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

Note 10. RETIREMENT PLAN – CONTINUED

Sensitivity Analysis

The following presents the net pension liability of the NTMWD, calculated using the discount rate of 8.00%, as well as what the NTMWD's net pension liability would be if it were calculated using a discount rate that is 1 percentage point lower (7.00%) or 1 percentage point higher (9.00%) than the current rate.

	1% Decrease	7.00%	Current Discount Rate 8.00%	1% Increase 9.00%
Total pension liability	\$	104,764,129	\$ 91,084,923	\$ 79,865,139
Fiduciary net position		62,677,503	62,677,503	62,677,503
Net pension liability		42,086,626	28,407,420	17,157,636

Pension Expense and Deferred Outflows/Inflows of Resources Related to Pensions

For the year ended September 30, 2016, the District recognized pension expense of \$5,444,549. The breakdown of the components of pension expense are as follows:

	October 1, 2015 to September 30, 2016
Pension Expense	
Service cost	\$ 3,058,399
Interest on total pension liability	6,614,146
Effect of plan changes	-
Administrative expenses	195,240
Member contributions	-
Expected investment income (net of expense)	(5,032,004)
Recognition of deferred inflows/outflows of resources	
Recognition of economic/demographic gains or losses	92,309
Recognition of assumptions changes or inputs	(922,311)
Recognition of investment gains or losses	1,438,770
Pension expense	\$ 5,444,549

At September 30, 2016, the District reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

	Deferred Inflows of Resources	Deferred Outflows of Resources
Differences between expected and actual experience	\$ (2,798,066)	\$ 7,313,518
Changes of assumptions	(5,976,575)	-
Net difference between projected and actual earnings	-	5,590,102
Contributions made subsequent to measurement date	-	2,377,004
Total	\$ (8,774,641)	\$ 15,280,624

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 10. RETIREMENT PLAN – CONTINUED

Pension Expense and Deferred Outflows/Inflows of Resources Related to Pensions – continued

The net amounts of the employer's balances of deferred outflows and inflows of resources related to pensions, including contributions made subsequent to the measurement date, will be recognized in pension expense as follows:

Year Ended December 31	
2016	\$ 2,985,222
2017	608,217
2018	919,112
2019	1,479,562
2020	205,768
Thereafter	308,102
	<u>\$ 6,505,983</u>

Net Pension Liability

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)
Balances as of September 30, 2015	\$ 82,486,111	\$ 61,827,706	\$ 20,658,405
Changes for the year:			
Service cost	3,058,399		3,058,399
Interest on total pension liability	6,614,146		6,614,146
Effect of plan changes	-		-
Effect of economic/demographic gains or losses	8,442,147		8,442,147
Effect of assumptions changes or inputs	(6,898,886)		(6,898,886)
Benefit payments	(2,616,994)	(2,616,994)	-
Employer contributions		4,999,000	(4,999,000)
Member contributions		-	-
Net investment income		(1,336,969)	1,336,969
Administrative expenses		(195,240)	195,240
Balances as of September 30, 2016	\$ 91,084,923	\$ 62,677,503	\$ 28,407,420
	<u>December 31, 2014</u>		<u>December 31, 2015</u>
Total pension liability	\$ 82,486,111	\$ 61,827,706	\$ 91,084,923
Fiduciary net position		62,677,503	62,677,503
Net pension liability	20,658,405		28,407,420
Fiduciary net position as a % of total pension liability		74.96%	68.81%
Covered payroll	26,654,832		30,084,911
Net pension liability as a % of covered payroll		77.50%	94.42%

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 10. RETIREMENT PLAN – CONTINUED

The District’s total pension liability was determined by an actuarial valuation as of the valuation date, calculated based on the discount rate and actuarial assumptions below. There have been no significant changes between the valuation date and the fiscal year end. Any significant changes during this period must be reflected as prescribed by GASB 67 and 68.

The plan has not had a formal actuarial experience study performed.

Pension plan fiduciary net position

	December 31, 2014	December 31, 2015
Assets		
Cash and cash equivalents	\$ 2,090,755	\$ 1,858,179
Receivables and prepaid expenses	-	-
Investments:		
Fixed income	14,140,493	22,457,649
Stocks	45,596,458	38,361,675
Total investments	59,736,951	60,819,324
Total assets	61,827,706	62,677,503
Liabilities		
Total liabilities	-	-
Net position restricted for pensions	\$ 61,827,706	\$ 62,677,503

Investment gains/losses are recognized in pension expense over a period of five years; economic/demographic gains/losses and assumption changes or inputs are recognized over the average remaining service life for all active and inactive members. Amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense as follows:

	Original Amount	Date Established	Original Recognition Period	Amount Recognized in 9/30/2016 Expense	Balance of Deferred Inflows 9/30/2016	Balance of Deferred Outflows 9/30/2016
Investment (gains) or losses	\$ 6,368,973	9/30/2016	5.0	\$ 1,273,795	\$ -	\$ 5,095,178
	824,874	9/30/2015	5.0	164,975	-	494,924
		Total		\$ 1,438,770	\$ -	\$ 5,590,102
Economic/demographic (gains) or losses	8,442,147	9/30/2016	7.5	\$ 1,128,629	\$ -	\$ 7,313,518
	(4,870,706)	9/30/2015	4.7	(1,036,320)	(2,798,066)	-
		Total		\$ 92,309	\$(2,798,066)	\$ 7,313,518
Assumptions (gains) or losses	(6,898,886)	9/30/2016	7.5	\$ (922,311)	\$(5,976,575)	\$ -
	-	9/30/2015	0.0	-	-	-
		Total		\$ (922,311)	\$(5,976,575)	\$ -

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 10. RETIREMENT PLAN – CONTINUED

In addition to this retirement plan, the District provides health and dental care benefits for certain retirees and their spouses up to age 65. The District pays 100 percent of the health and dental care premiums for participants currently eligible for benefits.

For the year ended September 30, 2016, the District recorded OPEB expense of \$1,275,000, related to these benefits, of which \$748,950 was allocated to the Water System, \$216,015 was allocated to the Wastewater System, \$73,705 was allocated to the Sewer System, \$218,780 was allocated to the Solid Waste System, \$17,550 was allocated to the Interceptor System. See Note 14 for additional disclosure information related to the District’s post- employment benefits.

NOTE 11. COMMITMENTS AND CONTINGENCIES

Commitments

Remaining commitments of construction funds as of September 30, 2016 were as follows:

<u>Payable from:</u>	<u>Regional Water System</u>	<u>Regional Wastewater System</u>	<u>Sewer System</u>	<u>Regional Solid Waste System</u>	<u>Interceptor System</u>	<u>Total Commitments</u>
Unrestricted:						
Capital Improvement Funds	\$ 58,070,463	\$ -	\$ 14,843	\$ -	\$ 1,507,481	\$ 59,592,787
Restricted:						
Bond Funds	125,751,267	56,030,605	52,313,176	12,137,598	22,737,723	268,970,369
Total Commitments	\$ 183,821,730	\$ 56,030,605	\$ 52,328,019	\$ 12,137,598	\$ 24,245,204	\$ 328,563,156

Contingencies

The District is party to an arrangement with the City of Irving involving the construction of various infrastructure projects including a pump station, pipeline, a building and other facilities, a portion of which benefit the District. A substantial amount of work on the construction of these projects, estimated to be approximately \$5,000,000, took place as of September 30, 2013. As of the date of these financial statements, there is no contractual arrangement outlining the District’s share of these costs, and the parties have not come to agreement on the amount of costs which will ultimately be the District’s responsibility. As the amount of final settlement cannot be reasonably estimated, these costs have not been accrued in the financial statements.

The District is involved in threatened litigation and lawsuits arising in the ordinary course of business, including claims involving contract disputes. In the opinion of the District’s management, potential liability in these matters will not have a material impact on the financial statements as of September 30, 2016.

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS

NOTE 12. CLOSURE AND POSTCLOSURE CARE COSTS

State and Federal laws and regulations require the District to place a final cover on its landfill sites when it stops accepting waste and to perform certain maintenance and monitoring functions at the sites for 30 years after closure. Although closure and postclosure care costs will be paid only near or after the date that the landfill stops accepting waste, the District accrues a portion of these estimated closure and postclosure care costs in each period based on landfill capacity used as of each balance sheet date. At September 30, 2016, a liability of \$5,233,611 for landfill closure and postclosure care costs has been accrued in the Solid Waste System Fund in the accompanying statement of net position.

<u>Beginning Liability</u>	<u>Additions</u>	<u>Reductions</u>	<u>Ending Liability</u>
\$ 5,099,313	\$ 134,298	\$ -	\$ 5,233,611

The \$5,233,611 reported as landfill closure and postclosure care liability at September 30, 2016, includes \$203,970 for Transfer Stations, \$1,459,727 for the Maxwell Creek Landfill, \$2,720,932 for the McKinney Landfill and \$848,982 for the 121 Regional Disposal Facility, which represents the cumulative amount reported to date based on the use of 11.7% of the estimated capacity of the 121 Regional Disposal Facility. The Maxwell Creek Landfill was closed during 2006 and the McKinney Landfill was closed during 2009. The District will recognize the remaining cost of closure and postclosure care of \$6,394,888 for the 121 Regional Disposal Facility as the remaining estimated capacity is filled. These amounts are based on what it would cost to perform all closure and postclosure care at September 30, 2016. Based upon the current utilization of capacity, the remaining expected life of the 121 Regional Disposal Facility is estimated to be 32 years. Actual costs may be higher due to inflation, changes in technology, or changes in laws or regulations.

The District is required to provide financial assurance for closure and postclosure care to the State of Texas. In accordance with current regulations, a local government may demonstrate financial assurance for closure and postclosure care, or corrective action by satisfying certain requirements. Management of the District believes they have satisfied such requirements.

NOTE 13. RISK MANAGEMENT

The District is exposed to various risks of loss related to torts; theft of, damage to, and destruction of assets; errors and omissions; injuries to employees; and natural disasters. Commercial insurance is purchased for fire and extended coverage for the buildings, plants, structures and contents with a \$25,000 deductible per occurrence. Commercial insurance is also provided under a commercial floater policy, which covers the heavy off-road equipment with a \$5,000 deductible per occurrence. The District is a member of a public entity risk pool operating as a common risk management and insurance program for a number of water districts and river authorities within the State of Texas. Coverage provided by the pool consists of workers' compensation, general liability, automobile liability, directors' and officers' liability, and automobile physical damage. Annual premiums are paid to the pool. The pool is self-sustaining through member premiums and the purchase of reinsurance through commercial companies. The amount of settlements did not exceed insurance coverage for the last three fiscal years.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 13. RISK MANAGEMENT – CONTINUED

The District maintains a self-insurance program for the employee group medical program. A third-party administrator is utilized to provide claims administration and payment of claims. Insurance is purchased to provide specific stop loss and aggregate stop loss protection.

The liability for insurance claims is based on GASB Statement No. 10, which requires that a liability for claims be reported if information prior to the issuance of the financial statements indicates that it is probable that a liability has been incurred at the date of the financial statements and the amount of the loss can be reasonably estimated. These liabilities are based upon the insurance company's figures for the District's liability for termination claims upon the termination of the policy year and the stop loss premium for any claims above the District's liability. Additionally, the liability for unpaid claims includes the effects of specific incremental claims, adjustment expenses, and if probable and material, salvage, and subrogation. The liability is reported with accounts payable and accrued liabilities in the statement of net position. Changes in the employees' health claims liability amount in fiscal September 30, 2016 and 2015 were:

Fiscal Year	Liability Beginning of Year	Claims Incurred and Change in Estimates	Current Year Claim Payments	Liability End of Year
2015	\$ 1,018,845	\$ 9,196,111	\$ 8,985,151	\$ 1,229,805
2016	1,229,805	10,319,499	9,965,063	\$ 1,584,241

NOTE 14. OTHER POSTEMPLOYMENT BENEFITS

Plan Description

The District provides other postemployment benefits (OPEB) in the form of health and dental insurance benefits for certain retirees and their spouses up to age 65 through a single-employer defined medical plan. These benefits are funded 100 percent by the District for the currently eligible retirees and their spouses. A third-party administrator is utilized to provide claims administration and payment of claims. Insurance is purchased to provide specific stop loss and aggregate stop loss protection.

The District does not issue separate audited financial statements for its plan.

Funding Policy

The District's funding policy is established and may be amended by the District's Board of Directors. The District has established an irrevocable trust fund to accumulate assets for payment of future OPEB benefits.

The District's annual OPEB cost, percentage of annual OPEB costs contributed to its plan and net OPEB obligation for fiscal year 2016 and the two preceding years were as follows:

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 14. OTHER POSTEMPLOYMENT BENEFITS – CONTINUED

Funding Policy – Continued

	<u>2016</u>	<u>2015</u>	<u>2014</u>
Annual required contribution	\$ 660,742	\$ 602,729	\$ 734,169
Interest on prior year Net OPEB obligation	(33,746)	15,623	57,563
Adjustment to annual required contribution	<u>38,878</u>	<u>(17,501)</u>	<u>(63,914)</u>
Annual OPEB cost	665,874	600,851	727,818
Contributions made	<u>1,272,270</u>	<u>1,246,083</u>	<u>1,252,058</u>
Increase (decrease) in net OPEB obligation	(606,396)	(645,232)	(524,240)
Net OPEB obligation (asset) - beginning of year	<u>(449,946)</u>	195,286	719,526
Net OPEB obligation (asset) - end of year	<u><u>(1,056,342)</u></u>	<u><u>(449,946)</u></u>	<u><u>195,286</u></u>

Percentage of annual OPEB costs contributed 191% 207% 172%

The funded status of other postemployment benefits as of October 1, 2016, the date of the latest actuarial valuation, was as follows:

Actuarial accrued liability (AAL)	\$ 8,794,597
Actuarial value of plan assets	5,668,969
Unfunded actuarial accrued liability	<u><u>\$ 3,125,628</u></u>

Funded ratio (actuarial value of plan asset/AAL)	64.5%
Covered Payroll	30,084,911
Unfunded actuarial accrued liability as a percentage of covered payroll	10.39%

Actuarial Methods and Assumptions

Actuarial valuations of an ongoing plan involve estimates of the value of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality, and the healthcare cost trend. The unfunded actuarial accrued liability is being amortized assuming 30 level annual payments on a closed basis. Amounts determined regarding the funded status of the plan and the annual required contributions of the employer are subject to continual revisions as actual results are compared with past expectations and new estimates are made about the future. The schedule of funding progress, presented as required supplementary information following the notes to the financial statements, presents multiyear trend information that shows whether the actuarial value of plan assets is increasing or decreasing over time relative to the actuarial accrued liabilities for benefits.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
NOTES TO THE FINANCIAL STATEMENTS**

NOTE 14. OTHER POSTEMPLOYMENT BENEFITS – CONTINUED

Projections of benefits for financial reporting purposes are based on the substantive plan and include the types of benefits provided at the time of each valuation and the historical pattern of sharing of benefit costs between the employer and plan members to that point. The actuarial methods and assumptions used include techniques that are designed to reduce short-term volatility in actuarial accrued liabilities and the actuarial value of assets, consistent with the long-term perspective of the calculations.

In the October 1, 2016, actuarial valuation, the unit credit actuarial cost method was used. The key actuarial assumptions include: (a) Benefit liabilities as of October 1, 2016, (b) Discount rate for valuing liabilities of 7.5% per annum, compounded annually, (c) 60% of active members are assumed to elect coverage for a spouse upon retirement, (d) Participants are assumed to retire at the earlier of their Normal Retirement Age or the eligibility for unreduced early retirement benefit under the Retirement Plan, and (e) Inflation rate set at a sliding scale of medical inflation from a 5.4% rate in 2016 to 6.7% by 2034.

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REQUIRED SUPPLEMENTAL INFORMATION

North Texas Municipal Employee Retirement System
Schedule of Changes in Net Pension Liability and Related Ratios
Last 10 Fiscal Years
(Dollar amounts in 1,000s)

	Fiscal Year Ending September 30,									
	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Total Pension Liability										
Service cost	\$3,058	\$2,166	\$2,005							
Interest on total pension liability	6,614	6,387	5,854							
Effect of plan changes	0	0	N/A							
Effect of economic/demographic gains or (losses)	8,442	(4,871)	1,527							
Effect of assumptions changes or inputs	(6,899)	0	154							
Benefit payments	(2,617)	(2,055)	(1,700)							
Net change in total pension liability	8,598	1,627	N/A							
Total pension liability, beginning	82,487	80,860	73,020	55,436	47,048	39,331	34,596	30,059	26,041	22,809
Total pension liability, ending (a)	91,085	82,487	80,860	73,020	55,436	47,048	39,331	34,596	30,059	26,041
Fiduciary Net Position										
Employer contributions	\$4,999	\$5,595	\$4,945							
Member contributions	0	0	N/A							
Investment income net of investment expenses	(1,337)	3,689	7,436							
Benefit payments	(2,617)	(2,055)	(1,700)							
Administrative expenses	(195)	(180)	(159)							
Net change in fiduciary net position	850	7,049	10,522							
Fiduciary net position, beginning	61,828	54,779	44,257	35,949	32,430	27,146	19,735	25,072	21,866	17,252
Fiduciary net position, ending (b)	62,678	61,828	54,779	44,257	35,949	32,430	27,146	19,735	25,072	21,866
Net pension liability, ending = (a) - (b)	28,407	20,659	26,081	28,763	19,487	14,618	12,185	14,861	4,987	4,175
Fiduciary net position as a % of total pension liability	68.81%	74.96%	67.75%	60.61%	64.85%	68.93%	69.02%	57.04%	83.41%	83.97%
Covered payroll	\$30,085	\$26,655	\$25,929	\$24,859	\$24,256	\$23,572	\$22,514	\$20,010	\$18,036	\$15,283
Net pension liability as a % of covered payroll	94.42%	77.50%	100.59%	115.70%	80.34%	62.02%	54.12%	74.27%	27.65%	27.31%

North Texas Municipal Employee Retirement System
Schedule of Employer Contributions

Fiscal Year Ending 30-Sep	Actuarially Determined Contribution	Actual Employer Contribution	Contribution Deficiency (Excess)	Covered Payroll	Contribution as a % of Covered Payroll
2007	\$ 1,808,035	\$ 1,982,950	\$ (174,915)	\$ 15,283,344	12.97%
2008	1,846,575	1,981,000	(134,425)	18,035,938	10.98%
2009	2,156,712	2,206,525	(49,813)	20,009,776	11.03%
2010	3,332,543	3,351,291	(18,748)	22,514,217	14.89%
2011	3,290,731	3,345,000	(54,269)	23,571,504	14.19%
2012	3,841,410	3,925,000	(83,590)	24,256,075	16.18%
2013	4,555,190	5,022,000	(466,810)	24,859,093	20.20%
2014	4,504,291	4,945,000	(440,709)	25,929,444	19.07%
2015	4,385,987	5,595,000	(1,209,013)	26,654,832	20.99%
2016	4,599,642	4,999,000	(399,358)	30,084,911	16.62%

North Texas Municipal Employee Other Postemployment Benefits Plan
Schedule of Funding Progress

Actuarial Valuation Date, October 1,	(1) Actuarial Value of Plan Assets	Discount Rate	(2) Actuarial Accrued Liability (AAL)	(3) Unfunded Actuarial Accrued Liability (UAAL) (2) - (1)	(4) Funded Ratio (1) / (2)
2007	\$ -	4.00%	\$ 4,050,859	\$ 4,050,859	0.0%
2008	-	4.00%	5,277,469	5,277,469	0.0%
2009	-	4.00%	6,722,277	6,722,277	0.0%
2010	-	4.00%	7,324,430	7,324,430	0.0%
2011	-	4.00%	9,801,016	9,801,016	0.0%
2012	-	4.00%	10,670,501	10,670,501	0.0%
2013	3,070,768	8.00%	7,279,057	4,208,289	42.2%
2014	4,204,220	8.00%	7,132,628	2,928,408	58.9%
2015	4,641,528	7.50%	8,125,924	3,484,396	57.1%
2016	5,668,969	7.50%	8,794,597	3,125,628	64.5%

NOTE: Actuarial Accrued Liability determined under the projected unit credit cost method.

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SEWER SYSTEM SUPPLEMENTAL SCHEDULES

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF NET POSITION
SEPTEMBER 30, 2016**

ASSETS	Little Elm Water Transmission Facilities	Plano Water Transmission Facilities
CURRENT ASSETS:		
Unrestricted assets:		
Cash and cash equivalents	\$ 3,057	\$ 4,086
Accounts receivable	-	-
Due from other funds	-	-
Prepaid expenses	-	-
Unbilled receivable	-	-
Total unrestricted assets	3,057	4,086
Restricted assets:		
Cash and cash equivalents	192,440	376,730
Investments	390,913	521,217
Interest and accounts receivable	1,972	2,629
Total restricted assets	585,325	900,576
TOTAL CURRENT ASSETS	588,382	904,662
LONG-TERM ASSETS:		
Nondepreciable:		
Land	-	-
Easements	1,148,574	-
Construction-in-progress	-	-
Total nondepreciable assets	1,148,574	-
Depreciable:		
Land improvements	-	-
Water treatment, storage, and transmission facilities	4,140,774	9,233,771
Wastewater treatment and disposal facilities	-	-
Buildings	-	-
Automobiles and trucks	-	-
Other equipment	-	-
Total depreciable assets	4,140,774	9,233,771
Less accumulated depreciation	(923,047)	(3,697,862)
Net capital assets	4,366,301	5,535,909
Accrued OPEB asset	-	-
TOTAL LONG-TERM ASSETS	4,366,301	5,535,909
TOTAL ASSETS	4,954,683	6,440,571
DEFERRED OUTFLOWS OF RESOURCES:		
Deferred loss on refunding	95,558	-
Deferred pension outflow	-	-
TOTAL DEFERRED OUTFLOWS OF RESOURCES	95,558	-
TOTAL ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	\$ 5,050,241	\$ 6,440,571

<u>Kaufman 4-1 Water Distribution Facilities</u>	<u>Rockwall-Heath Water Storage Facilities</u>
\$ 12,243	\$ 1,100
11,323	-
-	-
75	-
-	-
<u>23,641</u>	<u>1,100</u>
54,308	88,120
-	220,515
-	1,112
<u>54,308</u>	<u>309,747</u>
<u>77,949</u>	<u>310,847</u>
-	-
-	-
-	-
-	-
-	-
-	-
-	2,600,259
-	-
-	-
-	-
-	-
<u>-</u>	<u>2,600,259</u>
-	(481,048)
<u>-</u>	<u>2,119,211</u>
-	-
-	2,119,211
<u>77,949</u>	<u>2,430,058</u>
-	-
-	-
-	-
<u>\$ 77,949</u>	<u>\$ 2,430,058</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF NET POSITION
SEPTEMBER 30, 2016**

ASSETS	Terrell Water Transmission Facilities	Rockwall Water Pump Station Facilities
CURRENT ASSETS:		
Unrestricted assets:		
Cash and cash equivalents	\$ 119,340	\$ 28
Accounts receivable	-	-
Due from other funds	-	-
Prepaid expenses	-	-
Unbilled receivable	-	-
Total unrestricted assets	119,340	28
Restricted assets:		
Cash and cash equivalents	313,605	66,967
Investments	701,637	160,374
Interest and accounts receivable	3,539	809
Total restricted assets	1,018,781	228,150
TOTAL CURRENT ASSETS	1,138,121	228,178
LONG-TERM ASSETS:		
Nondepreciable:		
Land	-	-
Easements	-	-
Construction-in-progress	-	-
Total nondepreciable assets	-	-
Depreciable:		
Land improvements	-	-
Water treatment, storage, and transmission facilities	12,039,133	1,932,237
Wastewater treatment and disposal facilities	-	-
Buildings	-	-
Automobiles and trucks	-	-
Other equipment	-	-
Total depreciable assets	12,039,133	1,932,237
Less accumulated depreciation	(2,608,479)	(434,758)
Net capital assets	9,430,654	1,497,479
Accrued OPEB asset	-	-
TOTAL LONG-TERM ASSETS	9,430,654	1,497,479
TOTAL ASSETS	10,568,775	1,725,657
DEFERRED OUTFLOWS OF RESOURCES:		
Deferred loss on refunding	137,502	-
Deferred pension outflow	-	-
TOTAL DEFERRED OUTFLOWS OF RESOURCES	137,502	-
TOTAL ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	\$ 10,706,277	\$ 1,725,657

<u>Murphy WWTP/ Interceptor</u>	<u>Wylie WWTP</u>	<u>South Rockwall (Buffalo Creek) WWTP</u>	<u>North Rockwall (Squabble Creek) WWTP</u>
\$ (1,996)	\$ 8,078	\$ 237,598	\$ 143,838
2,204	-	20,029	-
-	162	1,312	129
-	54	11,716	7,328
-	-	31,300	10,144
<u>208</u>	<u>8,294</u>	<u>301,955</u>	<u>161,439</u>
13,843	23,597	135,770	71,725
-	-	240,562	-
-	-	1,213	-
<u>13,843</u>	<u>23,597</u>	<u>377,545</u>	<u>71,725</u>
<u>14,051</u>	<u>31,891</u>	<u>679,500</u>	<u>233,164</u>
33,018	-	60,724	-
-	-	243,045	-
-	-	-	-
<u>33,018</u>	<u>-</u>	<u>303,769</u>	<u>-</u>
-	-	-	-
-	-	-	-
75,144	2,149,480	8,214,579	1,576,459
-	-	-	-
-	2,949	54,217	36,176
-	53,402	205,703	261,885
<u>75,144</u>	<u>2,205,831</u>	<u>8,474,499</u>	<u>1,874,520</u>
<u>(75,144)</u>	<u>(2,011,108)</u>	<u>(5,284,044)</u>	<u>(1,369,260)</u>
<u>33,018</u>	<u>194,723</u>	<u>3,494,224</u>	<u>505,260</u>
-	83	2,826	1,440
<u>33,018</u>	<u>194,806</u>	<u>3,497,050</u>	<u>506,700</u>
<u>47,069</u>	<u>226,697</u>	<u>4,176,550</u>	<u>739,864</u>
-	-	-	-
-	1,349	44,541	23,224
-	1,349	44,541	23,224
<u>\$ 47,069</u>	<u>\$ 228,046</u>	<u>\$ 4,221,091</u>	<u>\$ 763,088</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF NET POSITION
SEPTEMBER 30, 2016**

ASSETS	Panther Creek WWTP	Sabine Creek WWTP
CURRENT ASSETS:		
Unrestricted assets:		
Cash and cash equivalents	\$ 599,840	\$ (22,485)
Accounts receivable	-	90,778
Due from other funds	71	46,424
Prepaid expenses	109,876	2,048
Unbilled receivable	59,126	12,970
Total unrestricted assets	768,913	129,735
Restricted assets:		
Cash and cash equivalents	1,516,908	563,544
Investments	3,568,420	691,614
Interest and accounts receivable	1,565	3,488
Total restricted assets	5,086,893	1,258,646
TOTAL CURRENT ASSETS	5,855,806	1,388,381
LONG-TERM ASSETS:		
Nondepreciable:		
Land	-	375,774
Easements	19,042	-
Construction-in-progress	25,937	1,069,792
Total nondepreciable assets	44,979	1,445,566
Depreciable:		
Land improvements	-	-
Water treatment, storage, and transmission facilities	-	-
Wastewater treatment and disposal facilities	51,820,475	7,803,906
Buildings	-	-
Automobiles and trucks	99,805	42,190
Other equipment	170,241	343,461
Total depreciable assets	52,090,521	8,189,557
Less accumulated depreciation	(9,165,316)	(2,312,927)
Net capital assets	42,970,184	7,322,196
Accrued OPEB asset	21,112	1,977
TOTAL LONG-TERM ASSETS	42,991,296	7,324,173
TOTAL ASSETS	48,847,102	8,712,554
DEFERRED OUTFLOWS OF RESOURCES:		
Deferred loss on refunding	733,475	154,924
Deferred pension outflow	233,792	29,049
TOTAL DEFERRED OUTFLOWS OF RESOURCES	967,267	183,973
TOTAL ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	\$ 49,814,369	\$ 8,896,527

<u>Stewart Creek WWTP</u>	<u>Muddy Creek WWTP</u>	<u>Seis Lagos WWTP</u>	<u>Royse City WWTP</u>
\$ 1,381,770	\$ 433,688	\$ 34,878	\$ 9,203
5,887	262,654	-	-
249	3,246	542	126
39,122	43,979	1,138	2
50,183	55,173	48	-
<u>1,477,211</u>	<u>798,740</u>	<u>36,606</u>	<u>9,331</u>
22,477,787	926,636	9,737	9,939
26,319,830	1,403,220	-	-
36,415	894	-	-
<u>48,834,032</u>	<u>2,330,750</u>	<u>9,737</u>	<u>9,939</u>
<u>50,311,243</u>	<u>3,129,490</u>	<u>46,343</u>	<u>19,270</u>
-	-	-	-
-	9,421	-	-
<u>29,029,642</u>	<u>115,405</u>	<u>-</u>	<u>-</u>
<u>29,029,642</u>	<u>124,826</u>	<u>-</u>	<u>-</u>
-	417,138	-	-
-	-	-	-
6,896,732	28,265,888	-	-
9,698	-	-	-
68,551	55,677	27,155	1,225
589,719	173,573	38,124	7,324
<u>7,564,700</u>	<u>28,912,276</u>	<u>65,279</u>	<u>8,549</u>
<u>(3,800,573)</u>	<u>(9,267,882)</u>	<u>(34,867)</u>	<u>(7,346)</u>
<u>32,793,769</u>	<u>19,769,220</u>	<u>30,412</u>	<u>1,203</u>
<u>10,200</u>	<u>20,678</u>	<u>634</u>	<u>83</u>
<u>32,803,969</u>	<u>19,789,898</u>	<u>31,046</u>	<u>1,286</u>
<u>83,115,212</u>	<u>22,919,388</u>	<u>77,389</u>	<u>20,556</u>
8,228	353,490	-	-
<u>122,209</u>	<u>266,817</u>	<u>9,681</u>	<u>1,334</u>
<u>130,437</u>	<u>620,307</u>	<u>9,681</u>	<u>1,334</u>
<u>\$ 83,245,649</u>	<u>\$ 23,539,695</u>	<u>\$ 87,070</u>	<u>\$ 21,890</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF NET POSITION
SEPTEMBER 30, 2016**

ASSETS	Farmersville WWTP	Frisco Cottonwood Creek WWTP
CURRENT ASSETS:		
Unrestricted assets:		
Cash and cash equivalents	\$ 31,389	\$ 28,315
Accounts receivable	2,371	-
Due from other funds	485	24
Prepaid expenses	3,121	805
Unbilled receivable	241	-
Total unrestricted assets	<u>37,607</u>	<u>29,144</u>
Restricted assets:		
Cash and cash equivalents	19,752	12,477
Investments	-	-
Interest and accounts receivable	-	-
Total restricted assets	<u>19,752</u>	<u>12,477</u>
TOTAL CURRENT ASSETS	<u>57,359</u>	<u>41,621</u>
LONG-TERM ASSETS:		
Nondepreciable:		
Land	-	-
Easements	-	-
Construction-in-progress	-	-
Total nondepreciable assets	<u>-</u>	<u>-</u>
Depreciable:		
Land improvements	-	-
Water treatment, storage, and transmission facilities	-	-
Wastewater treatment and disposal facilities	-	-
Buildings	16,225	-
Automobiles and trucks	30,830	-
Other equipment	399,655	-
Total depreciable assets	<u>446,710</u>	<u>-</u>
Less accumulated depreciation	(408,086)	-
Net capital assets	<u>38,624</u>	<u>-</u>
Accrued OPEB asset	906	1,202
TOTAL LONG-TERM ASSETS	<u>39,530</u>	<u>1,202</u>
TOTAL ASSETS	<u>96,889</u>	<u>42,823</u>
DEFERRED OUTFLOWS OF RESOURCES:		
Deferred loss on refunding	-	-
Deferred pension outflow	14,518	-
TOTAL DEFERRED OUTFLOWS OF RESOURCES	<u>14,518</u>	<u>-</u>
TOTAL ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	<u>\$ 111,407</u>	<u>\$ 42,823</u>

<u>Lavon WWTP</u>	<u>Crandall WWTP</u>	<u>Forney Interceptor</u>	<u>Lower East Fork Interceptor</u>
\$ 21,855	\$ 586	\$ 7,072	\$ 106,245
5,696	-	-	-
1	-	145	745
958	-	9,252	4,019
-	-	-	30,292
<u>28,510</u>	<u>586</u>	<u>16,469</u>	<u>141,301</u>
4,516	-	21,530	545,310
-	-	-	1,328,313
-	-	-	36
<u>4,516</u>	<u>-</u>	<u>21,530</u>	<u>1,873,659</u>
<u>33,026</u>	<u>586</u>	<u>37,999</u>	<u>2,014,960</u>
-	-	-	-
-	-	48,877	193,687
-	-	-	-
<u>-</u>	<u>-</u>	<u>48,877</u>	<u>193,687</u>
-	-	-	-
-	-	-	-
-	-	1,856,524	15,137,967
-	-	-	-
27,156	-	-	-
37,769	-	189,025	-
<u>64,925</u>	<u>-</u>	<u>2,045,549</u>	<u>15,137,967</u>
<u>(24,287)</u>	<u>-</u>	<u>(1,239,822)</u>	<u>(2,497,735)</u>
<u>40,638</u>	<u>-</u>	<u>854,604</u>	<u>12,833,919</u>
632	-	-	245
<u>41,270</u>	<u>-</u>	<u>854,604</u>	<u>12,834,164</u>
<u>74,296</u>	<u>586</u>	<u>892,603</u>	<u>14,849,124</u>
-	-	-	204,934
<u>9,681</u>	<u>-</u>	<u>3,023</u>	<u>3,023</u>
<u>9,681</u>	<u>-</u>	<u>3,023</u>	<u>207,957</u>
<u>\$ 83,977</u>	<u>\$ 586</u>	<u>\$ 895,626</u>	<u>\$ 15,057,081</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF NET POSITION
SEPTEMBER 30, 2016**

ASSETS	Muddy Creek Interceptor	Parker Creek Interceptor
CURRENT ASSETS:		
Unrestricted assets:		
Cash and cash equivalents	\$ 30,650	\$ 7,696
Accounts receivable	-	9,580
Due from other funds	-	-
Prepaid expenses	5,741	-
Unbilled receivable	-	-
Total unrestricted assets	<u>36,391</u>	<u>17,276</u>
Restricted assets:		
Cash and cash equivalents	139,598	101,284
Investments	237,592	204,510
Interest and accounts receivable	7	6
Total restricted assets	<u>377,197</u>	<u>305,800</u>
TOTAL CURRENT ASSETS	<u>413,588</u>	<u>323,076</u>
LONG-TERM ASSETS:		
Nondepreciable:		
Land	-	-
Easements	49,232	104,204
Construction-in-progress	-	-
Total nondepreciable assets	<u>49,232</u>	<u>104,204</u>
Depreciable:		
Land improvements	-	-
Water treatment, storage, and transmission facilities	-	-
Wastewater treatment and disposal facilities	3,411,083	2,465,984
Buildings	-	-
Automobiles and trucks	-	-
Other equipment	-	-
Total depreciable assets	<u>3,411,083</u>	<u>2,465,984</u>
Less accumulated depreciation	<u>(1,181,556)</u>	<u>(476,757)</u>
Net capital assets	<u>2,278,759</u>	<u>2,093,431</u>
Accrued OPEB asset	-	-
TOTAL LONG-TERM ASSETS	<u>2,278,759</u>	<u>2,093,431</u>
TOTAL ASSETS	<u>2,692,347</u>	<u>2,416,507</u>
DEFERRED OUTFLOWS OF RESOURCES:		
Deferred loss on refunding	(12,040)	-
Deferred pension outflow	-	-
TOTAL DEFERRED OUTFLOWS OF RESOURCES	<u>(12,040)</u>	<u>-</u>
TOTAL ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	<u>\$ 2,680,307</u>	<u>\$ 2,416,507</u>

<u>Sabine Creek Interceptor</u>	<u>Buffalo Creek Interceptor</u>	<u>McKinney Interceptor</u>	<u>Mustang Creek Interceptor</u>
\$ 5,915	\$ 62,681	\$ 7,190	\$ 9,869
361	239,865	-	-
-	300	-	-
-	6,953	-	-
-	-	-	-
<u>6,276</u>	<u>309,799</u>	<u>7,190</u>	<u>9,869</u>
70,640	843,367	5,142	1,369,315
176,440	1,002,300	-	-
5	639	-	-
<u>247,085</u>	<u>1,846,306</u>	<u>5,142</u>	<u>1,369,315</u>
<u>253,361</u>	<u>2,156,105</u>	<u>12,332</u>	<u>1,379,184</u>
-	-	-	-
70,341	1,253,590	16,150	915,950
-	-	-	-
<u>70,341</u>	<u>1,253,590</u>	<u>16,150</u>	<u>915,950</u>
-	-	-	-
-	-	-	-
1,697,812	18,008,418	1,551,439	8,567,121
-	-	-	-
-	-	-	-
-	-	-	-
<u>1,697,812</u>	<u>18,008,418</u>	<u>1,551,439</u>	<u>8,567,121</u>
<u>(305,609)</u>	<u>(5,853,850)</u>	<u>(1,061,545)</u>	<u>(185,603)</u>
<u>1,462,544</u>	<u>13,408,158</u>	<u>506,044</u>	<u>9,297,468</u>
-	-	-	-
<u>1,462,544</u>	<u>13,408,158</u>	<u>506,044</u>	<u>9,297,468</u>
<u>1,715,905</u>	<u>15,564,263</u>	<u>518,376</u>	<u>10,676,652</u>
-	433,013	-	-
-	3,023	-	-
-	436,036	-	-
<u>\$ 1,715,905</u>	<u>\$ 16,000,299</u>	<u>\$ 518,376</u>	<u>\$ 10,676,652</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF NET POSITION
SEPTEMBER 30, 2016**

ASSETS	Parker Creek Parallel WW Interceptor	Small Plants Clearing
CURRENT ASSETS:		
Unrestricted assets:		
Cash and cash equivalents	\$ -	\$ 385,926
Accounts receivable	-	-
Due from other funds	-	34,830
Prepaid expenses	-	4,615
Unbilled receivable	-	-
Total unrestricted assets	<u>-</u>	<u>425,371</u>
Restricted assets:		
Cash and cash equivalents	3,115,895	-
Investments	-	-
Interest and accounts receivable	-	-
Total restricted assets	<u>3,115,895</u>	<u>-</u>
TOTAL CURRENT ASSETS	<u>3,115,895</u>	<u>425,371</u>
LONG-TERM ASSETS:		
Nondepreciable:		
Land	-	-
Easements	-	-
Construction-in-progress	284,823	-
Total nondepreciable assets	<u>284,823</u>	<u>-</u>
Depreciable:		
Land improvements	-	-
Water treatment, storage, and transmission facilities	-	-
Wastewater treatment and disposal facilities	-	-
Buildings	-	-
Automobiles and trucks	-	-
Other equipment	-	-
Total depreciable assets	<u>-</u>	<u>-</u>
Less accumulated depreciation	-	-
Net capital assets	<u>284,823</u>	<u>-</u>
Accrued OPEB asset	-	-
TOTAL LONG-TERM ASSETS	<u>284,823</u>	<u>-</u>
TOTAL ASSETS	<u>3,400,718</u>	<u>425,371</u>
DEFERRED OUTFLOWS OF RESOURCES:		
Deferred loss on refunding	-	-
Deferred pension outflow	-	-
TOTAL DEFERRED OUTFLOWS OF RESOURCES	<u>-</u>	<u>-</u>
TOTAL ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	<u>\$ 3,400,718</u>	<u>\$ 425,371</u>

<u>Dewatering Operations</u>	<u>Wastewater Pretreatment Program</u>	<u>Total Sewer System</u>
\$ 18,300	\$ 186,154	\$ 3,874,109
-	-	650,748
-	-	88,791
-	6,750	257,552
-	-	249,477
<u>18,300</u>	<u>192,904</u>	<u>5,120,677</u>
176,798	-	33,267,280
-	-	37,167,457
-	-	54,329
<u>176,798</u>	<u>-</u>	<u>70,489,066</u>
<u>195,098</u>	<u>192,904</u>	<u>75,609,743</u>
-	-	469,516
-	-	4,072,113
-	-	30,525,599
<u>-</u>	<u>-</u>	<u>35,067,228</u>
-	-	417,138
-	-	29,946,174
-	-	159,499,011
-	-	25,923
-	44,753	490,684
-	18,726	2,488,607
<u>-</u>	<u>63,479</u>	<u>192,867,537</u>
<u>-</u>	<u>(60,782)</u>	<u>(54,769,293)</u>
<u>-</u>	<u>2,697</u>	<u>173,165,472</u>
<u>-</u>	<u>10,818</u>	<u>72,836</u>
<u>-</u>	<u>13,515</u>	<u>173,238,308</u>
<u>195,098</u>	<u>206,419</u>	<u>248,848,051</u>
-	-	2,109,084
-	133,965	899,229
<u>-</u>	<u>133,965</u>	<u>3,008,313</u>
<u>\$ 195,098</u>	<u>\$ 340,384</u>	<u>\$ 251,856,364</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF NET POSITION
SEPTEMBER 30, 2016**

LIABILITIES	Little Elm Water Transmission Facilities	Plano Water Transmission Facilities
CURRENT LIABILITIES:		
Payable from unrestricted assets:		
Accounts payable and accrued liabilities	\$ -	\$ -
Due to other funds	-	-
Customers' advance payments	3,057	4,086
Total payable from unrestricted assets	3,057	4,086
Payable from restricted assets:		
Accounts payable and accrued liabilities	41,434	75,485
Accrued interest payable on revenue bonds	15,780	12,216
Current portion of note payable	-	-
Current portion of revenue bonds	335,000	800,000
Total payable from restricted assets	392,214	887,701
TOTAL CURRENT LIABILITIES	395,271	891,787
LONG-TERM LIABILITIES:		
Accrued vacation—less current portion	-	-
Accrued sick—less current portion	-	-
Net pension liability	-	-
Long-term debt—less current portion	2,265,840	220,974
TOTAL LONG-TERM LIABILITIES	2,265,840	220,974
TOTAL LIABILITIES	2,661,111	1,112,761
DEFERRED INFLOWS OF RESOURCES:		
Deferred pension inflow	-	-
TOTAL DEFERRED INFLOWS OF RESOURCES	-	-
TOTAL LIABILITIES AND DEFERRED INFLOWS OF RESOURCES	2,661,111	1,112,761
NET POSITION:		
Net investment in capital assets	1,861,019	4,514,935
Restricted for debt service	528,111	812,875
Unrestricted	-	-
TOTAL NET POSITION	\$ 2,389,130	\$ 5,327,810

<u>Kaufman 4-1 Water Distribution Facilities</u>	<u>Rockwall-Heath Water Storage Facilities</u>
\$ 2,853	\$ -
400	-
<u>20,388</u>	<u>1,100</u>
<u>23,641</u>	<u>1,100</u>
54,308	-
-	22,996
-	-
<u>-</u>	<u>155,000</u>
<u>54,308</u>	<u>177,996</u>
<u>77,949</u>	<u>179,096</u>
-	-
-	-
<u>-</u>	<u>1,535,000</u>
<u>-</u>	<u>1,535,000</u>
<u>77,949</u>	<u>1,714,096</u>
<u>-</u>	<u>-</u>
<u>-</u>	<u>-</u>
<u>77,949</u>	<u>1,714,096</u>
-	429,211
-	286,751
<u>-</u>	<u>-</u>
<u>\$ -</u>	<u>\$ 715,962</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF NET POSITION
SEPTEMBER 30, 2016**

LIABILITIES	Terrell Water Transmission Facilities	Rockwall Water Pump Station Facilities
CURRENT LIABILITIES:		
Payable from unrestricted assets:		
Accounts payable and accrued liabilities	\$ -	\$ -
Due to other funds	-	-
Customers' advance payments	119,340	28
Total payable from unrestricted assets	119,340	28
Payable from restricted assets:		
Accounts payable and accrued liabilities	-	-
Accrued interest payable on revenue bonds	116,760	20,082
Current portion of note payable	-	-
Current portion of revenue bonds	375,000	105,000
Total payable from restricted assets	491,760	125,082
TOTAL CURRENT LIABILITIES	611,100	125,110
LONG-TERM LIABILITIES:		
Accrued vacation—less current portion	-	-
Accrued sick—less current portion	-	-
Net pension liability	-	-
Long-term debt—less current portion	9,937,068	1,231,881
TOTAL LONG-TERM LIABILITIES	9,937,068	1,231,881
TOTAL LIABILITIES	10,548,168	1,356,991
DEFERRED INFLOWS OF RESOURCES:		
Deferred pension inflow	-	-
TOTAL DEFERRED INFLOWS OF RESOURCES	-	-
TOTAL LIABILITIES AND DEFERRED INFLOWS OF RESOURCES	10,548,168	1,356,991
NET POSITION:		
Net investment in capital assets	(743,912)	160,598
Restricted for debt service	902,021	208,068
Unrestricted	-	-
TOTAL NET POSITION	\$ 158,109	\$ 368,666

<u>Murphy WWTP/ Interceptor</u>	<u>Wylie WWTP</u>	<u>South Rockwall (Buffalo Creek) WWTP</u>	<u>North Rockwall (Squabble Creek) WWTP</u>
\$ 8	\$ 1,470	\$ 162,450	\$ 67,508
-	383	28,106	9,355
-	7,956	135,937	90,918
<u>8</u>	<u>9,809</u>	<u>326,493</u>	<u>167,781</u>
13,844	23,597	40,116	71,725
-	-	39,712	-
-	-	-	-
-	-	130,000	-
<u>13,844</u>	<u>23,597</u>	<u>209,828</u>	<u>71,725</u>
<u>13,852</u>	<u>33,406</u>	<u>536,321</u>	<u>239,506</u>
-	144	5,997	3,132
-	-	215	126
-	2,389	79,410	41,399
-	-	1,963,085	-
-	2,533	2,048,707	44,657
<u>13,852</u>	<u>35,939</u>	<u>2,585,028</u>	<u>284,163</u>
-	757	25,087	13,079
-	757	25,087	13,079
<u>13,852</u>	<u>36,696</u>	<u>2,610,115</u>	<u>297,242</u>
33,018	194,723	1,401,139	505,260
-	-	297,717	-
199	(3,373)	(87,880)	(39,414)
<u>\$ 33,217</u>	<u>\$ 191,350</u>	<u>\$ 1,610,976</u>	<u>\$ 465,846</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF NET POSITION
SEPTEMBER 30, 2016**

LIABILITIES	Panther Creek WWTP	Sabine Creek WWTP
CURRENT LIABILITIES:		
Payable from unrestricted assets:		
Accounts payable and accrued liabilities	\$ 565,080	\$ 96,996
Due to other funds	41,262	63,704
Customers' advance payments	52,913	45,423
Total payable from unrestricted assets	659,255	206,123
Payable from restricted assets:		
Accounts payable and accrued liabilities	26,120	794,835
Accrued interest payable on revenue bonds	546,938	37,850
Current portion of note payable	-	367,715
Current portion of revenue bonds	2,515,000	580,000
Total payable from restricted assets	3,088,058	1,780,400
TOTAL CURRENT LIABILITIES	3,747,313	1,986,523
LONG-TERM LIABILITIES:		
Accrued vacation—less current portion	45,328	4,526
Accrued sick—less current portion	14,308	215
Net pension liability	429,087	51,802
Long-term debt—less current portion	34,604,252	3,851,826
TOTAL LONG-TERM LIABILITIES	35,092,975	3,908,369
TOTAL LIABILITIES	38,840,288	5,894,892
DEFERRED INFLOWS OF RESOURCES:		
Deferred pension inflow	133,452	16,364
TOTAL DEFERRED INFLOWS OF RESOURCES	133,452	16,364
TOTAL LIABILITIES AND DEFERRED INFLOWS OF RESOURCES	38,973,740	5,911,256
NET POSITION:		
Net investment in capital assets	6,584,407	2,485,549
Restricted for debt service	4,513,835	1,080,651
Unrestricted	(257,613)	(580,929)
TOTAL NET POSITION	\$ 10,840,629	\$ 2,985,271

<u>Stewart Creek WWTP</u>	<u>Muddy Creek WWTP</u>	<u>Seis Lagos WWTP</u>	<u>Royse City WWTP</u>
\$ 296,165	\$ 528,071	\$ 10,773	\$ 1,311
983,024	18,812	3,894	383
229,761	247,633	14,375	9,155
<u>1,508,950</u>	<u>794,516</u>	<u>29,042</u>	<u>10,849</u>
4,418,621	17,867	9,737	9,939
849,130	156,783	-	-
-	-	-	-
2,695,000	1,385,000	-	-
<u>7,962,751</u>	<u>1,559,650</u>	<u>9,737</u>	<u>9,939</u>
<u>9,471,701</u>	<u>2,354,166</u>	<u>38,779</u>	<u>20,788</u>
28,380	38,024	1,299	144
517	73,686	-	-
258,750	502,670	17,257	2,380
66,032,059	12,078,191	-	-
<u>66,319,706</u>	<u>12,692,571</u>	<u>18,556</u>	<u>2,524</u>
<u>75,791,407</u>	<u>15,046,737</u>	<u>57,335</u>	<u>23,312</u>
74,727	154,174	5,453	751
<u>74,727</u>	<u>154,174</u>	<u>5,453</u>	<u>751</u>
<u>75,866,134</u>	<u>15,200,911</u>	<u>62,788</u>	<u>24,063</u>
1,401,027	6,659,519	30,412	1,203
6,265,085	2,156,099	-	-
(286,597)	(476,834)	(6,130)	(3,376)
<u>\$ 7,379,515</u>	<u>\$ 8,338,784</u>	<u>\$ 24,282</u>	<u>\$ (2,173)</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF NET POSITION
SEPTEMBER 30, 2016**

LIABILITIES	Farmersville WWTP	Frisco Cottonwood Creek WWTP
CURRENT LIABILITIES:		
Payable from unrestricted assets:		
Accounts payable and accrued liabilities	\$ 35,582	\$ 5,328
Due to other funds	5,853	404
Customers' advance payments	-	24,614
Total payable from unrestricted assets	41,435	30,346
Payable from restricted assets:		
Accounts payable and accrued liabilities	19,752	12,477
Accrued interest payable on revenue bonds	-	-
Current portion of note payable	-	-
Current portion of revenue bonds	-	-
Total payable from restricted assets	19,752	12,477
TOTAL CURRENT LIABILITIES	61,187	42,823
LONG-TERM LIABILITIES:		
Accrued vacation—less current portion	1,897	-
Accrued sick—less current portion	-	-
Net pension liability	25,896	-
Long-term debt—less current portion	-	-
TOTAL LONG-TERM LIABILITIES	27,793	-
TOTAL LIABILITIES	88,980	42,823
DEFERRED INFLOWS OF RESOURCES:		
Deferred pension inflow	8,178	-
TOTAL DEFERRED INFLOWS OF RESOURCES	8,178	-
TOTAL LIABILITIES AND DEFERRED INFLOWS OF RESOURCES	97,158	42,823
NET POSITION:		
Net investment in capital assets	38,624	-
Restricted for debt service	-	-
Unrestricted	(24,375)	-
TOTAL NET POSITION	\$ 14,249	\$ -

<u>Lavon WWTP</u>	<u>Crandall WWTP</u>	<u>Forney Interceptor</u>	<u>Lower East Fork Interceptor</u>
\$ 12,895	\$ 101	\$ 14,486	\$ 66,526
8,066	-	1,134	3,609
-	-	1,310	72,856
<u>20,961</u>	<u>101</u>	<u>16,930</u>	<u>142,991</u>
4,516	-	21,530	23,958
-	-	-	145,992
-	-	-	-
-	-	-	895,000
<u>4,516</u>	<u>-</u>	<u>21,530</u>	<u>1,064,950</u>
<u>25,477</u>	<u>101</u>	<u>38,460</u>	<u>1,207,941</u>
1,281	-	-	-
-	-	-	-
17,258	-	8,212	8,212
-	-	-	10,894,894
<u>18,539</u>	<u>-</u>	<u>8,212</u>	<u>10,903,106</u>
<u>44,016</u>	<u>101</u>	<u>46,672</u>	<u>12,111,047</u>
5,452	-	2,110	2,110
5,452	-	2,110	2,110
<u>49,468</u>	<u>101</u>	<u>48,782</u>	<u>12,113,157</u>
40,638	-	854,604	1,248,959
-	-	-	1,703,709
(6,129)	485	(7,760)	(8,744)
<u>\$ 34,509</u>	<u>\$ 485</u>	<u>\$ 846,844</u>	<u>\$ 2,943,924</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF NET POSITION
SEPTEMBER 30, 2016**

LIABILITIES	Muddy Creek Interceptor	Parker Creek Interceptor
CURRENT LIABILITIES:		
Payable from unrestricted assets:		
Accounts payable and accrued liabilities	\$ 6,257	\$ 13,063
Due to other funds	1,394	4,214
Customers' advance payments	28,740	-
Total payable from unrestricted assets	36,391	17,277
Payable from restricted assets:		
Accounts payable and accrued liabilities	22,366	4,013
Accrued interest payable on revenue bonds	18,400	21,430
Current portion of note payable	-	-
Current portion of revenue bonds	190,000	155,000
Total payable from restricted assets	230,766	180,443
TOTAL CURRENT LIABILITIES	267,157	197,720
LONG-TERM LIABILITIES:		
Accrued vacation—less current portion	-	-
Accrued sick—less current portion	-	-
Net pension liability	-	-
Long-term debt—less current portion	1,652,806	1,115,000
TOTAL LONG-TERM LIABILITIES	1,652,806	1,115,000
TOTAL LIABILITIES	1,919,963	1,312,720
DEFERRED INFLOWS OF RESOURCES:		
Deferred pension inflow	-	-
TOTAL DEFERRED INFLOWS OF RESOURCES	-	-
TOTAL LIABILITIES AND DEFERRED INFLOWS OF RESOURCES	1,919,963	1,312,720
NET POSITION:		
Net investment in capital assets	423,913	823,431
Restricted for debt service	336,431	280,357
Unrestricted	-	(1)
TOTAL NET POSITION	\$ 760,344	\$ 1,103,787

<u>Sabine Creek Interceptor</u>	<u>Buffalo Creek Interceptor</u>	<u>McKinney Interceptor</u>	<u>Mustang Creek Interceptor</u>
\$ -	\$ 67,950	\$ 43	\$ 553
251	6,503	-	1,760
<u>6,025</u>	<u>236,790</u>	<u>6,294</u>	<u>7,555</u>
<u>6,276</u>	<u>311,243</u>	<u>6,337</u>	<u>9,868</u>
5,142	152,487	5,142	10,026
17,299	155,016	-	123,656
-	-	-	-
<u>125,000</u>	<u>1,010,000</u>	<u>-</u>	<u>190,000</u>
<u>147,441</u>	<u>1,317,503</u>	<u>5,142</u>	<u>323,682</u>
<u>153,717</u>	<u>1,628,746</u>	<u>11,479</u>	<u>333,550</u>
-	-	-	-
-	-	-	-
-	8,212	-	-
<u>900,000</u>	<u>9,996,151</u>	<u>-</u>	<u>9,960,898</u>
<u>900,000</u>	<u>10,004,363</u>	<u>-</u>	<u>9,960,898</u>
<u>1,053,717</u>	<u>11,633,109</u>	<u>11,479</u>	<u>10,294,448</u>
-	2,110	-	-
-	2,110	-	-
<u>1,053,717</u>	<u>11,635,219</u>	<u>11,479</u>	<u>10,294,448</u>
437,544	2,835,020	506,044	(289,285)
224,644	1,538,803	-	671,488
-	(8,743)	853	1
<u>\$ 662,188</u>	<u>\$ 4,365,080</u>	<u>\$ 506,897</u>	<u>\$ 382,204</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF NET POSITION
SEPTEMBER 30, 2016**

LIABILITIES	Parker Creek Parallel WW Interceptor	Small Plants Clearing
CURRENT LIABILITIES:		
Payable from unrestricted assets:		
Accounts payable and accrued liabilities	\$ -	\$ 5,547
Due to other funds	-	501
Customers' advance payments	-	-
Total payable from unrestricted assets	<u>-</u>	<u>6,048</u>
Payable from restricted assets:		
Accounts payable and accrued liabilities	371,198	-
Accrued interest payable on revenue bonds	-	-
Current portion of note payable	-	-
Current portion of revenue bonds	140,000	-
Total payable from restricted assets	<u>511,198</u>	<u>-</u>
TOTAL CURRENT LIABILITIES	<u>511,198</u>	<u>6,048</u>
LONG-TERM LIABILITIES:		
Accrued vacation—less current portion	-	-
Accrued sick—less current portion	-	-
Net pension liability	-	-
Long-term debt—less current portion	2,953,051	-
TOTAL LONG-TERM LIABILITIES	<u>2,953,051</u>	<u>-</u>
TOTAL LIABILITIES	<u>3,464,249</u>	<u>6,048</u>
DEFERRED INFLOWS OF RESOURCES:		
Deferred pension inflow	-	-
TOTAL DEFERRED INFLOWS OF RESOURCES	<u>-</u>	<u>-</u>
TOTAL LIABILITIES AND DEFERRED INFLOWS OF RESOURCES	<u>3,464,249</u>	<u>6,048</u>
NET POSITION:		
Net investment in capital assets	(341,262)	-
Restricted for debt service	277,731	-
Unrestricted	-	419,323
TOTAL NET POSITION	<u>\$ (63,531)</u>	<u>\$ 419,323</u>

<u>Dewatering Operations</u>	<u>Wastewater Pretreatment Program</u>	<u>Total Sewer System</u>
\$ -	\$ 89,702	\$ 2,050,718
-	4,577	1,187,589
-	154,063	1,520,317
-	248,342	4,758,624
176,798	-	6,427,033
-	-	2,300,040
-	-	367,715
-	-	11,780,000
176,798	-	20,874,788
176,798	248,342	25,633,412
-	12,052	142,204
-	-	89,067
-	331,846	1,784,780
-	-	171,192,976
-	343,898	173,209,027
176,798	592,240	198,842,439
-	88,867	532,671
-	88,867	532,671
176,798	681,107	199,375,110
-	2,697	32,099,035
-	-	22,084,376
18,300	(343,420)	(1,702,157)
<u>\$ 18,300</u>	<u>\$ (340,723)</u>	<u>\$ 52,481,254</u>
		(Concluded)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
YEAR ENDED SEPTEMBER 30, 2016**

	<u>Little Elm Water Transmission Facilities</u>	<u>Plano Water Transmission Facilities</u>
OPERATING REVENUES:		
Wastewater service fees	\$ 378,913	\$ 745,234
Other operating revenues	-	-
Total operating revenues	<u>378,913</u>	<u>745,234</u>
OPERATING EXPENSES:		
Personnel	-	-
Operating Supplies:		
Chemicals	-	-
Other supplies	-	-
Operating Services:		
Electric power	-	-
Other services	4,975	4,335
Depreciation	103,519	231,467
Total operating expenses	<u>108,494</u>	<u>235,802</u>
OPERATING INCOME (LOSS)	<u>270,419</u>	<u>509,432</u>
NONOPERATING REVENUES (EXPENSES):		
Investment income	2,827	4,356
Gain (loss) on sale of capital assets	-	-
Interest expense	(57,998)	(43,304)
Total nonoperating revenues (expenses)	<u>(55,171)</u>	<u>(38,948)</u>
CHANGE IN NET POSITION	215,248	470,484
NET POSITION AT OCTOBER 1, 2015	<u>2,173,882</u>	<u>4,857,326</u>
NET POSITION AT SEPTEMBER 30, 2016	<u>\$ 2,389,130</u>	<u>\$ 5,327,810</u>

Kaufman 4-1 Water Distribution Facilities	Rockwall-Heath Water Storage Facilities
\$ 50,398	\$ 227,895
5	-
<u>50,403</u>	<u>227,895</u>
-	-
-	-
8,257	-
28,501	-
33,657	3,597
-	52,005
<u>70,415</u>	<u>55,602</u>
<u>(20,012)</u>	<u>172,293</u>
12	1,580
-	-
-	(72,739)
<u>12</u>	<u>(71,159)</u>
(20,000)	101,134
<u>20,000</u>	<u>614,828</u>
<u>\$ -</u>	<u>\$ 715,962</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
YEAR ENDED SEPTEMBER 30, 2016**

	Terrell Water Transmission Facilities	Rockwall Water Pump Station Facilities
OPERATING REVENUES:		
Wastewater service fees	\$ 712,180	\$ 170,467
Other operating revenues	-	-
Total operating revenues	712,180	170,467
OPERATING EXPENSES:		
Personnel	-	-
Operating Supplies:		
Chemicals	-	-
Other supplies	-	-
Operating Services:		
Electric power	-	-
Other services	4,494	5,554
Depreciation	300,978	48,306
Total operating expenses	305,472	53,860
OPERATING INCOME (LOSS)	406,708	116,607
NONOPERATING REVENUES (EXPENSES):		
Investment income	5,240	1,148
Gain (loss) on sale of capital assets	-	-
Interest expense	(333,273)	(62,160)
Total nonoperating revenues (expenses)	(328,033)	(61,012)
CHANGE IN NET POSITION	78,675	55,595
NET POSITION AT OCTOBER 1, 2015	79,434	313,071
NET POSITION AT SEPTEMBER 30, 2016	\$ 158,109	\$ 368,666

Murphy WWTP/ Interceptor	Wylie WWTP	South Rockwall (Buffalo Creek) WWTP	North Rockwall (Squabble Creek) WWTP
\$ 11,515	\$ 35,797	\$ 1,301,680	\$ 513,717
33	1	20,690	1,171
<u>11,548</u>	<u>35,798</u>	<u>1,322,370</u>	<u>514,888</u>
-	5,072	176,858	90,313
-	-	38,303	85,426
11,959	925	132,695	112,807
326	580	175,795	43,590
(735)	29,485	444,362	156,671
-	78,496	181,129	44,797
<u>11,550</u>	<u>114,558</u>	<u>1,149,142</u>	<u>533,604</u>
(2)	(78,760)	173,228	(18,716)
2	22	3,038	519
-	225	263	263
-	-	(131,580)	-
<u>2</u>	<u>247</u>	<u>(128,279)</u>	<u>782</u>
-	(78,513)	44,949	(17,934)
<u>33,217</u>	<u>269,863</u>	<u>1,566,027</u>	<u>483,780</u>
<u>\$ 33,217</u>	<u>\$ 191,350</u>	<u>\$ 1,610,976</u>	<u>\$ 465,846</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
YEAR ENDED SEPTEMBER 30, 2016**

	<u>Panther Creek WWTP</u>	<u>Sabine Creek WWTP</u>
OPERATING REVENUES:		
Wastewater service fees	\$ 8,258,803	\$ 1,654,679
Other operating revenues	25,408	3,279
Total operating revenues	<u>8,284,211</u>	<u>1,657,958</u>
OPERATING EXPENSES:		
Personnel	1,278,665	124,265
Operating Supplies:		
Chemicals	624,040	18,885
Other supplies	407,857	132,484
Operating Services:		
Electric power	423,659	156,819
Other services	1,204,011	358,449
Depreciation	1,316,860	279,087
Total operating expenses	<u>5,255,092</u>	<u>1,069,989</u>
OPERATING INCOME (LOSS)	<u>3,029,119</u>	<u>587,969</u>
NONOPERATING REVENUES (EXPENSES):		
Investment income	28,939	8,375
Gain (loss) on sale of capital assets	-	263
Interest expense	(1,393,045)	(128,532)
Total nonoperating revenues (expenses)	<u>(1,364,106)</u>	<u>(119,894)</u>
CHANGE IN NET POSITION	1,665,013	468,075
NET POSITION AT OCTOBER 1, 2015	<u>9,175,616</u>	<u>2,517,196</u>
NET POSITION AT SEPTEMBER 30, 2016	<u>\$ 10,840,629</u>	<u>\$ 2,985,271</u>

<u>Stewart Creek WWTP</u>	<u>Muddy Creek WWTP</u>	<u>Seis Lagos WWTP</u>	<u>Royse City WWTP</u>
\$ 8,002,361	\$ 5,478,006	\$ 164,498	\$ 18,534
11,584	355,093	192	-
<u>8,013,945</u>	<u>5,833,099</u>	<u>164,690</u>	<u>18,534</u>
660,723	1,240,622	39,694	5,056
394,528	262,508	1,869	-
138,713	430,828	17,208	910
281,430	305,291	13,677	114
1,482,079	1,640,857	57,460	12,517
267,330	970,050	4,694	22
<u>3,224,803</u>	<u>4,850,156</u>	<u>134,602</u>	<u>18,619</u>
<u>4,789,142</u>	<u>982,943</u>	<u>30,088</u>	<u>(85)</u>
277,090	13,682	143	45
-	-	263	-
<u>(1,620,559)</u>	<u>(308,061)</u>	<u>-</u>	<u>-</u>
<u>(1,343,469)</u>	<u>(294,379)</u>	<u>406</u>	<u>45</u>
3,445,673	688,564	30,494	(40)
3,933,842	7,650,220	(6,212)	(2,133)
<u>\$ 7,379,515</u>	<u>\$ 8,338,784</u>	<u>\$ 24,282</u>	<u>\$ (2,173)</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
YEAR ENDED SEPTEMBER 30, 2016**

	Farmersville WWTP	Frisco Cottonwood Creek WWTP
OPERATING REVENUES:		
Wastewater service fees	\$ 273,397	\$ 128,798
Other operating revenues	334	34
Total operating revenues	273,731	128,832
OPERATING EXPENSES:		
Personnel	57,111	44,382
Operating Supplies:		
Chemicals	10,174	3,577
Other supplies	36,453	7,349
Operating Services:		
Electric power	48,743	27,788
Other services	87,077	45,859
Depreciation	5,308	-
Total operating expenses	244,866	128,955
OPERATING INCOME (LOSS)	28,865	(123)
NONOPERATING REVENUES (EXPENSES):		
Investment income	154	122
Gain (loss) on sale of capital assets	263	-
Interest expense	-	-
Total nonoperating revenues (expenses)	417	122
CHANGE IN NET POSITION	29,282	(1)
NET POSITION AT OCTOBER 1, 2015	(15,033)	1
NET POSITION AT SEPTEMBER 30, 2016	\$ 14,249	\$ -

<u>Lavon WWTP</u>	<u>Crandall WWTP</u>	<u>Forney Interceptor</u>	<u>Lower East Fork Interceptor</u>
\$ 164,661	\$ -	\$ 168,772	\$ 1,592,232
177	-	826	775
<u>164,838</u>	<u>-</u>	<u>169,598</u>	<u>1,593,007</u>
39,495	-	(1,583)	8,639
1,714	-	61,207	77,223
18,059	-	15,132	7,601
-	-	45,091	33,632
79,860	-	49,852	411,534
7,711	-	65,157	302,760
<u>146,839</u>	<u>-</u>	<u>234,856</u>	<u>841,389</u>
17,999	-	(65,258)	751,618
123	2	65	9,227
263	-	-	-
-	-	-	(108,049)
<u>386</u>	<u>2</u>	<u>65</u>	<u>(98,822)</u>
18,385	2	(65,193)	652,796
<u>16,124</u>	<u>483</u>	<u>912,037</u>	<u>2,291,128</u>
<u>\$ 34,509</u>	<u>\$ 485</u>	<u>\$ 846,844</u>	<u>\$ 2,943,924</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
YEAR ENDED SEPTEMBER 30, 2016**

	<u>Muddy Creek Interceptor</u>	<u>Parker Creek Interceptor</u>
OPERATING REVENUES:		
Wastewater service fees	\$ 277,589	\$ 256,895
Other operating revenues	<u>382</u>	<u>5</u>
Total operating revenues	<u>277,971</u>	<u>256,900</u>
OPERATING EXPENSES:		
Personnel	-	-
Operating Supplies:		
Chemicals	24,794	-
Other supplies	555	14,156
Operating Services:		
Electric power	-	251
Other services	11,711	21,559
Depreciation	<u>111,943</u>	<u>49,320</u>
Total operating expenses	<u>149,003</u>	<u>85,286</u>
OPERATING INCOME (LOSS)	<u>128,968</u>	<u>171,614</u>
NONOPERATING REVENUES (EXPENSES):		
Investment income	1,742	1,465
Gain (loss) on sale of capital assets	-	-
Interest expense	<u>(39,098)</u>	<u>(69,040)</u>
Total nonoperating revenues (expenses)	<u>(37,356)</u>	<u>(67,575)</u>
CHANGE IN NET POSITION	91,612	104,039
NET POSITION AT OCTOBER 1, 2015	<u>668,732</u>	<u>999,748</u>
NET POSITION AT SEPTEMBER 30, 2016	<u>\$ 760,344</u>	<u>\$ 1,103,787</u>

<u>Sabine Creek Interceptor</u>	<u>Buffalo Creek Interceptor</u>	<u>McKinney Interceptor</u>	<u>Mustang Creek Interceptor</u>
\$ 183,530	\$ 1,665,789	\$ 751	\$ 579,075
-	462	8	-
<u>183,530</u>	<u>1,666,251</u>	<u>759</u>	<u>579,075</u>
-	(1,635)	-	-
-	25,180	-	-
38	21,858	-	-
-	54,906	315	-
6,271	136,401	462	14,189
<u>33,956</u>	<u>610,271</u>	<u>54,941</u>	<u>171,329</u>
<u>40,265</u>	<u>846,981</u>	<u>55,718</u>	<u>185,518</u>
<u>143,265</u>	<u>819,270</u>	<u>(54,959)</u>	<u>393,557</u>
1,166	8,737	16	5,021
-	-	-	-
<u>(55,695)</u>	<u>(395,499)</u>	<u>-</u>	<u>(358,469)</u>
<u>(54,529)</u>	<u>(386,762)</u>	<u>16</u>	<u>(353,448)</u>
88,736	432,508	(54,943)	40,109
<u>573,452</u>	<u>3,932,572</u>	<u>561,840</u>	<u>342,095</u>
<u>\$ 662,188</u>	<u>\$ 4,365,080</u>	<u>\$ 506,897</u>	<u>\$ 382,204</u>

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
YEAR ENDED SEPTEMBER 30, 2016**

	<u>Parker Creek Parallel WW Interceptor</u>	<u>Small Plants Clearing</u>
OPERATING REVENUES:		
Wastewater service fees	\$ 77,000	\$ -
Other operating revenues	-	-
	<u>77,000</u>	<u>-</u>
OPERATING EXPENSES:		
Personnel	-	-
Operating Supplies:		
Chemicals	-	8
Other supplies	-	(9)
Operating Services:		
Electric power	-	-
Other services	141,023	1
Depreciation	-	-
	<u>141,023</u>	<u>-</u>
OPERATING INCOME (LOSS)	<u>(64,023)</u>	<u>-</u>
NONOPERATING REVENUES (EXPENSES):		
Investment income	492	-
Gain (loss) on sale of capital assets	-	-
Interest expense	-	-
	<u>492</u>	<u>-</u>
CHANGE IN NET POSITION	(63,531)	-
NET POSITION AT OCTOBER 1, 2015	<u>-</u>	<u>419,323</u>
NET POSITION AT SEPTEMBER 30, 2016	<u>\$ (63,531)</u>	<u>\$ 419,323</u>

<u>Dewatering Operations</u>	<u>Wastewater Pretreatment Program</u>	<u>Total Sewer System</u>
\$ -	\$ 743,340	\$ 33,836,506
-	19,191	439,650
-	762,531	34,276,156
-	558,515	4,326,192
-	-	1,629,436
-	46,656	1,562,491
-	-	1,640,508
-	159,511	6,607,078
-	1,407	5,292,843
-	766,089	21,058,548
-	(3,558)	13,217,608
55	576	375,981
-	-	1,803
-	-	(5,177,101)
55	576	(4,799,317)
55	(2,982)	8,418,291
18,245	(337,741)	44,062,963
<u>\$ 18,300</u>	<u>\$ (340,723)</u>	<u>\$ 52,481,254</u>

(Concluded)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF CASH FLOWS
YEAR ENDED SEPTEMBER 30, 2016**

	Little Elm Water Transmission Facilities	Plano Water Transmission Facilities
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 378,714	\$ 745,302
Cash received from other funds		
Cash received from (paid to) others		
Cash paid to suppliers for goods and services	(4,258)	(15,338)
Cash paid for employee services		-
Cash paid to other funds	(715)	-
Net cash provided by (used for) operating activities	<u>373,741</u>	<u>729,964</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds	-	-
Cash paid for capital assets	-	-
Interest paid	(51,400)	(59,600)
Principal payments on long-term debt and capital leases	(325,000)	(765,000)
Payments for bond issue costs	-	-
Miscellaneous receipts	-	-
Net cash provided by (used for) capital and related financing activities	<u>(376,400)</u>	<u>(824,600)</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments	-	-
Purchases of investments	-	-
Interest received	7,104	10,124
Net cash provided by (used for) investing activities	<u>7,104</u>	<u>10,124</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	4,445	(84,512)
CASH AND CASH EQUIVALENTS—Beginning of year	191,052	465,328
CASH AND CASH EQUIVALENTS—End of year	<u>\$ 195,497</u>	<u>\$ 380,816</u>
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET POSITION		
Unrestricted cash and cash equivalents	\$ 3,057	\$ 4,086
Restricted cash and cash equivalents	192,440	376,730
	<u>\$ 195,497</u>	<u>\$ 380,816</u>
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	\$ 270,419	\$ 509,432
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	103,519	231,467
Change in current assets and liabilities:		
Accounts receivable and deferred billings	-	-
Prepaid expenses	-	-
Net pension liability	-	-
Due to/from other funds	-	(11,000)
Accounts payable, accrued liabilities, and developers' deposits	2	(2)
Accrued vacation and Accrued sick	-	-
Accrued OPEB	-	-
Customers' advance payments	(199)	67
Total adjustments	<u>103,322</u>	<u>220,532</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	<u>\$ 373,741</u>	<u>\$ 729,964</u>
NONCASH TRANSACTION DISCLOSURES		
Gain (loss) on disposal of capital assets	-	-
Interest capitalized on construction	-	-
Amortization of bond-related items	7,951	(8,645)
Change in fair value of investments	726	968
Change in actuarial value of net pension liability	-	-
Refunding bonds issued	-	-
Refunding proceeds deposited in escrow	-	-

Kaufman 4-1 Water Distribution Facilities	Rockwall-Heath Water Storage Facilities
\$ 64,885	\$ 230,052
5	
(66,536)	(4,308)
<u>(12,336)</u>	<u>(345)</u>
<u>(13,982)</u>	<u>225,399</u>
20,000	
	(74,616)
	(150,000)
<u>-</u>	<u>-</u>
<u>20,000</u>	<u>(224,616)</u>
-	-
176	3,922
<u>176</u>	<u>3,922</u>
6,194	4,705
<u>60,357</u>	<u>84,515</u>
<u>\$ 66,551</u>	<u>\$ 89,220</u>
\$ 12,243	\$ 1,100
<u>54,308</u>	<u>88,120</u>
<u>\$ 66,551</u>	<u>\$ 89,220</u>
<u>\$ (20,012)</u>	<u>\$ 172,293</u>
-	52,005
(5,900)	1,057
(26)	-
-	-
5,006	-
(3,012)	(1,056)
-	-
-	-
<u>9,962</u>	<u>1,100</u>
<u>6,030</u>	<u>53,106</u>
<u>\$ (13,982)</u>	<u>\$ 225,399</u>
-	-
-	-
-	409
-	-
-	-
-	-

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF CASH FLOWS
YEAR ENDED SEPTEMBER 30, 2016**

	Terrell Water Transmission Facilities	Rockwall Water Pump Station Facilities
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 832,364	\$ 170,493
Cash received from other funds		
Cash received from (paid to) others		
Cash paid to suppliers for goods and services	(4,156)	(5,231)
Cash paid for employee services		
Cash paid to other funds	(335)	(325)
Net cash provided by (used for) operating activities	<u>827,873</u>	<u>164,937</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds	-	-
Cash paid for capital assets	-	-
Interest paid	(357,582)	(64,996)
Principal payments on long-term debt and capital leases	(365,000)	(100,000)
Payments for bond issue costs	-	-
Miscellaneous receipts	-	-
Net cash provided by (used for) capital and related financing activities	<u>(722,582)</u>	<u>(164,996)</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments	-	-
Purchases of investments	-	-
Interest received	12,694	2,855
Net cash provided by (used for) investing activities	<u>12,694</u>	<u>2,855</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	117,985	2,796
CASH AND CASH EQUIVALENTS—Beginning of year	314,960	64,199
CASH AND CASH EQUIVALENTS—End of year	<u>\$ 432,945</u>	<u>\$ 66,995</u>
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET POSITION		
Unrestricted cash and cash equivalents	\$ 119,340	\$ 28
Restricted cash and cash equivalents	313,605	66,967
	<u>\$ 432,945</u>	<u>\$ 66,995</u>
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	<u>\$ 406,708</u>	<u>\$ 116,607</u>
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	300,978	48,306
Change in current assets and liabilities:		
Accounts receivable and deferred billings	844	-
Prepaid expenses	-	-
Net pension liability	-	-
Due to/from other funds	-	-
Accounts payable, accrued liabilities, and developers' deposits	3	(2)
Accrued vacation and Accrued sick	-	-
Accrued OPEB	-	-
Customers' advance payments	119,340	26
Total adjustments	<u>421,165</u>	<u>48,330</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	<u>\$ 827,873</u>	<u>\$ 164,937</u>
NONCASH TRANSACTION DISCLOSURES		
Gain (loss) on disposal of capital assets	-	-
Interest capitalized on construction	-	-
Amortization of bond-related items	(21,875)	(1,252)
Change in fair value of investments	1,303	298
Change in actuarial value of net pension liability	-	-
Refunding bonds issued	-	-
Refunding proceeds deposited in escrow	-	-

Murphy WWTP/ Interceptor	Wylie WWTP	South Rockwall (Buffalo Creek) WWTP	North Rockwall (Squabble Creek) WWTP
\$ 86,708	\$ 32,212	\$ 1,261,221	\$ 539,194
34	1	516	1,028
(81,582)	(24,051)	(486,114)	(279,916)
(3,995)	(3,995)	(133,793)	(67,641)
(10,311)	(7,204)	(227,804)	(116,001)
(5,151)	(3,037)	414,026	76,664
5,000	(1,000)	(118,620)	(21,391)
-	-	(132,928)	-
-	-	(270,000)	-
-	-	-	-
5,000	(1,000)	(521,548)	(21,391)
-	-	-	-
-	-	-	-
38	94	5,708	731
38	94	5,708	731
(113)	(3,943)	(101,814)	56,004
11,960	35,618	475,182	159,559
<u>\$ 11,847</u>	<u>\$ 31,675</u>	<u>\$ 373,368</u>	<u>\$ 215,563</u>
\$ (1,996)	\$ 8,078	\$ 237,598	\$ 143,838
13,843	23,597	135,770	71,725
<u>\$ 11,847</u>	<u>\$ 31,675</u>	<u>\$ 373,368</u>	<u>\$ 215,563</u>
\$ (2)	\$ (78,760)	\$ 173,228	\$ (18,716)
-	78,496	181,129	44,797
(2,204)	(19)	(50,376)	(10,899)
-	78	(5,221)	(1,462)
-	18	599	312
(340)	361	17,329	4,122
1	607	101,732	20,395
-	(54)	(403)	(193)
-	(37)	(1,299)	(644)
(2,606)	(3,727)	(2,692)	38,952
(5,149)	75,723	240,798	95,380
<u>\$ (5,151)</u>	<u>\$ (3,037)</u>	<u>\$ 414,026</u>	<u>\$ 76,664</u>
-	-	-	-
-	-	-	-
-	-	3,249	-
-	-	447	-
-	(18)	(599)	(312)
-	-	-	-
-	-	-	-

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF CASH FLOWS
YEAR ENDED SEPTEMBER 30, 2016**

	Panther Creek WWTP	Sabine Creek WWTP
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 8,192,773	\$ 1,533,341
Cash received from other funds	-	-
Cash received from (paid to) others	15,150	3,138
Cash paid to suppliers for goods and services	(1,967,887)	(427,924)
Cash paid for employee services	(866,524)	(92,055)
Cash paid to other funds	(813,760)	(254,310)
Net cash provided by (used for) operating activities	<u>4,559,752</u>	<u>762,190</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds	-	9,500
Cash paid for capital assets	(141,808)	(692,245)
Interest paid	(1,741,288)	(124,050)
Principal payments on long-term debt and capital leases	(2,515,000)	(525,000)
Payments for bond issue costs	-	(9,500)
Miscellaneous receipts	-	367,715
Net cash provided by (used for) capital and related financing activities	<u>(4,398,096)</u>	<u>(973,580)</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments	-	-
Purchases of investments	-	-
Interest received	44,310	15,762
Net cash provided by (used for) investing activities	<u>44,310</u>	<u>15,762</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	205,966	(195,628)
CASH AND CASH EQUIVALENTS—Beginning of year	1,910,782	736,687
CASH AND CASH EQUIVALENTS—End of year	<u>\$ 2,116,748</u>	<u>\$ 541,059</u>
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET POSITION		
Unrestricted cash and cash equivalents	\$ 599,840	\$ (22,485)
Restricted cash and cash equivalents	1,516,908	563,544
	<u>\$ 2,116,748</u>	<u>\$ 541,059</u>
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	\$ 3,029,119	\$ 587,969
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	1,316,860	279,087
Change in current assets and liabilities:		
Accounts receivable and deferred billings	(40,983)	334,075
Prepaid expenses	(23,608)	946
Net pension liability	3,112	390
Due to/from other funds	13,531	(6,386)
Accounts payable, accrued liabilities, and developers' deposits	283,814	(416,879)
Accrued vacation and Accrued sick	(4,287)	426
Accrued OPEB	(13,597)	(982)
Customers' advance payments	(4,209)	(16,456)
Total adjustments	<u>1,530,633</u>	<u>174,221</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	<u>\$ 4,559,752</u>	<u>\$ 762,190</u>
NONCASH TRANSACTION DISCLOSURES		
Gain (loss) on disposal of capital assets	-	-
Interest capitalized on construction	958	-
Amortization of bond-related items	(313,793)	7,982
Change in fair value of investments	12,491	1,284
Change in actuarial value of net pension liability	(3,112)	(390)
Refunding bonds issued	-	-
Refunding proceeds deposited in escrow	-	-

Stewart Creek WWTP	Muddy Creek WWTP	Seis Lagos WWTP	Royse City WWTP
\$ 6,805,558	\$ 5,474,769	\$ 160,068	\$ 13,730
-	-	-	-
11,231	488	52	-
(5,643,050)	(1,636,195)	(47,205)	(13,441)
(460,810)	(918,574)	(30,310)	(3,996)
(524,209)	(739,730)	(48,664)	(851)
<u>188,720</u>	<u>2,180,758</u>	<u>33,941</u>	<u>(4,558)</u>
71,633,752	357,378	-	-
(21,513,672)	(277,492)	(23,015)	(1,225)
(1,563,902)	(488,524)	-	-
(3,790,000)	(1,370,000)	-	-
(709,483)	(178,689)	-	-
-	-	-	-
<u>44,056,695</u>	<u>(1,957,327)</u>	<u>(23,015)</u>	<u>(1,225)</u>
15,015,036	-	-	-
(41,326,883)	-	-	-
269,410	19,420	170	75
<u>(26,042,437)</u>	<u>19,420</u>	<u>170</u>	<u>75</u>
18,202,978	242,851	11,096	(5,708)
<u>5,656,579</u>	<u>1,117,473</u>	<u>33,519</u>	<u>24,850</u>
<u>\$ 23,859,557</u>	<u>\$ 1,360,324</u>	<u>\$ 44,615</u>	<u>\$ 19,142</u>
\$ 1,381,770	\$ 433,688	\$ 34,878	\$ 9,203
22,477,787	926,636	9,737	9,939
<u>\$ 23,859,557</u>	<u>\$ 1,360,324</u>	<u>\$ 44,615</u>	<u>\$ 19,142</u>
<u>\$ 4,789,142</u>	<u>\$ 982,943</u>	<u>\$ 30,088</u>	<u>\$ (85)</u>
267,330	970,050	4,694	22
(121,730)	(118,424)	(253)	(19)
4,333	(11,741)	290	75
1,545	3,521	130	18
958,343	(1,977)	878	325
(3,638,735)	242,579	2,643	143
12,777	5,133	(139)	(54)
(7,116)	(12,672)	(303)	(37)
(2,077,169)	121,346	(4,087)	(4,946)
<u>(4,600,422)</u>	<u>1,197,815</u>	<u>3,853</u>	<u>(4,473)</u>
<u>\$ 188,720</u>	<u>\$ 2,180,758</u>	<u>\$ 33,941</u>	<u>\$ (4,558)</u>
-	-	-	-
352,340	-	-	-
(429,467)	(138,393)	-	-
(17,370)	5,822	-	-
(1,545)	(3,521)	(130)	(18)
-	5,645,000	-	-
-	5,878,181	-	-

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF CASH FLOWS
YEAR ENDED SEPTEMBER 30, 2016**

	Farmersville WWTP	Frisco Cottonwood Creek WWTP
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 276,907	\$ 133,171
Cash received from other funds	-	-
Cash received from (paid to) others	194	33
Cash paid to suppliers for goods and services	(132,342)	(98,990)
Cash paid for employee services	(43,279)	-
Cash paid to other funds	(59,469)	(30,276)
Net cash provided by (used for) operating activities	<u>42,011</u>	<u>3,938</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds		
Cash paid for capital assets	(26,658)	1,000
Interest paid	-	-
Principal payments on long-term debt and capital leases	-	-
Payments for bond issue costs	-	-
Miscellaneous receipts	-	-
Net cash provided by (used for) capital and related financing activities	<u>(26,658)</u>	<u>1,000</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments	-	-
Purchases of investments	-	-
Interest received	212	158
Net cash provided by (used for) investing activities	<u>212</u>	<u>158</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	15,565	5,096
CASH AND CASH EQUIVALENTS—Beginning of year	35,576	35,696
CASH AND CASH EQUIVALENTS—End of year	\$ 51,141	\$ 40,792
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET POSITION		
Unrestricted cash and cash equivalents	\$ 31,389	\$ 28,315
Restricted cash and cash equivalents	19,752	12,477
	<u>\$ 51,141</u>	<u>\$ 40,792</u>
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	\$ 28,865	\$ (123)
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	5,308	-
Change in current assets and liabilities:		
Accounts receivable and deferred billings	8,383	34
Prepaid expenses	736	(354)
Net pension liability	195	-
Due to/from other funds	777	322
Accounts payable, accrued liabilities, and developers' deposits	3,289	567
Accrued vacation and Accrued sick	(260)	-
Accrued OPEB	(409)	(618)
Customers' advance payments	(4,873)	4,110
Total adjustments	<u>13,146</u>	<u>4,061</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	\$ 42,011	\$ 3,938
NONCASH TRANSACTION DISCLOSURES		
Gain (loss) on disposal of capital assets	-	-
Interest capitalized on construction	-	-
Amortization of bond-related items	-	-
Change in fair value of investments	-	-
Change in actuarial value of net pension liability	(195)	-
Refunding bonds issued	-	-
Refunding proceeds deposited in escrow	-	-

	Lavon WWTP	Crandall WWTP	Forney Interceptor	Lower East Fork Interceptor
\$	163,500	\$ -	\$ 224,113	\$ 1,670,862
	-	-	-	-
	37	-	826	774
	(38,378)	1	(169,184)	(422,072)
	(30,237)	-	-	(9,623)
	(57,424)	-	(39,356)	(69,503)
	<u>37,498</u>	<u>1</u>	<u>16,399</u>	<u>1,170,438</u>
				308,781
	(15,424)	-	2,000	2,000
	-	-	-	(327,854)
	-	-	-	(960,000)
	-	-	-	(229,390)
	-	-	-	-
	<u>(15,424)</u>	<u>-</u>	<u>2,000</u>	<u>(1,206,463)</u>
	-	-	-	-
	-	-	-	-
	135	-	128	15,640
	<u>135</u>	<u>-</u>	<u>128</u>	<u>15,640</u>
	22,209	1	18,527	(20,385)
	<u>4,162</u>	<u>585</u>	<u>10,075</u>	<u>671,940</u>
\$	<u>26,371</u>	<u>\$ 586</u>	<u>\$ 28,602</u>	<u>\$ 651,555</u>
\$	21,855	\$ 586	\$ 7,072	\$ 106,245
	4,516	-	21,530	545,310
\$	<u>26,371</u>	<u>\$ 586</u>	<u>\$ 28,602</u>	<u>\$ 651,555</u>
\$	17,999	\$ -	\$ (65,258)	\$ 751,618
	7,711	-	65,157	302,760
	(1,250)	-	42,241	(2,904)
	470	-	10,394	8,926
	130	-	34	34
	5,506	-	(3,291)	479
	7,390	1	(32,867)	38,231
	(157)	-	(1,503)	(1,503)
	(301)	-	182	(59)
	-	-	1,310	72,856
	<u>19,499</u>	<u>1</u>	<u>81,657</u>	<u>418,820</u>
\$	<u>37,498</u>	<u>\$ 1</u>	<u>\$ 16,399</u>	<u>\$ 1,170,438</u>
	-	-	-	-
	-	-	-	-
	-	-	-	(186,087)
	-	-	-	2,867
	(130)	-	(34)	(34)
	-	-	-	10,745,000
	-	-	-	11,966,668

(Continued)

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF CASH FLOWS
YEAR ENDED SEPTEMBER 30, 2016**

	Muddy Creek Interceptor	Parker Creek Interceptor
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 298,717	\$ 246,593
Cash received from other funds	-	-
Cash received from (paid to) others	382	5
Cash paid to suppliers for goods and services	(40,603)	(23,655)
Cash paid for employee services	-	-
Cash paid to other funds	(5,542)	(11,982)
Net cash provided by (used for) operating activities	<u>252,954</u>	<u>210,961</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds	-	1,000
Cash paid for capital assets	-	-
Interest paid	(60,750)	(71,416)
Principal payments on long-term debt and capital leases	(185,000)	(150,000)
Payments for bond issue costs	-	-
Miscellaneous receipts	-	-
Net cash provided by (used for) capital and related financing activities	<u>(245,750)</u>	<u>(220,416)</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments	-	-
Purchases of investments	-	-
Interest received	2,946	2,451
Net cash provided by (used for) investing activities	<u>2,946</u>	<u>2,451</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	10,150	(7,004)
CASH AND CASH EQUIVALENTS—Beginning of year	160,098	115,984
CASH AND CASH EQUIVALENTS—End of year	<u>\$ 170,248</u>	<u>\$ 108,980</u>
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET POSITION		
Unrestricted cash and cash equivalents	\$ 30,650	\$ 7,696
Restricted cash and cash equivalents	139,598	101,284
	<u>\$ 170,248</u>	<u>\$ 108,980</u>
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	\$ 128,968	\$ 171,614
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	111,943	49,320
Change in current assets and liabilities:		
Accounts receivable and deferred billings	(1)	(24,792)
Prepaid expenses	2,541	-
Net pension liability	-	-
Due to/from other funds	1,394	4,067
Accounts payable, accrued liabilities, and developers' deposits	(10,478)	11,474
Accrued vacation and Accrued sick	-	-
Accrued OPEB	-	-
Customers' advance payments	18,587	(722)
Total adjustments	<u>123,986</u>	<u>39,347</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	<u>\$ 252,954</u>	<u>\$ 210,961</u>
NONCASH TRANSACTION DISCLOSURES		
Gain (loss) on disposal of capital assets	-	-
Interest capitalized on construction	-	-
Amortization of bond-related items	(19,802)	-
Change in fair value of investments	513	441
Change in actuarial value of net pension liability	-	-
Refunding bonds issued	-	-
Refunding proceeds deposited in escrow	-	-

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SEWER SYSTEM SUPPLEMENTAL
SCHEDULES OF CASH FLOWS
YEAR ENDED SEPTEMBER 30, 2016**

	Parker Creek Parallel WW Interceptor	Small Plants Clearing
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 77,000	
Cash received from other funds	-	-
Cash received from (paid to) others	15	386
Cash paid to suppliers for goods and services	(139,532)	(28,206)
Cash paid for employee services	-	18,590
Cash paid to other funds	(1,505)	(4,294)
Net cash provided by (used for) operating activities	<u>(64,022)</u>	<u>(13,524)</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds	3,231,874	
Cash paid for capital assets	86,375	
Interest paid		
Principal payments on long-term debt and capital leases		
Payments for bond issue costs	(138,823)	
Miscellaneous receipts	-	-
Net cash provided by (used for) capital and related financing activities	<u>3,179,426</u>	<u>-</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments		
Purchases of investments		
Interest received	491	
Net cash provided by (used for) investing activities	<u>491</u>	<u>-</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	3,115,895	(13,524)
CASH AND CASH EQUIVALENTS—Beginning of year	-	399,450
CASH AND CASH EQUIVALENTS—End of year	<u>\$ 3,115,895</u>	<u>\$ 385,926</u>
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET POSITION		
Unrestricted cash and cash equivalents	\$ -	\$ 385,926
Restricted cash and cash equivalents	3,115,895	-
	<u>\$ 3,115,895</u>	<u>\$ 385,926</u>
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	\$ (64,023)	\$ -
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	-	-
Change in current assets and liabilities:		
Accounts receivable and unbilled receivable	-	-
Prepaid expenses	-	(4,089)
Net pension liability	-	-
Due to/from other funds	-	(13,996)
Accounts payable, accrued liabilities, and developers' deposits	1	4,561
Accrued vacation and Accrued sick	-	-
Accrued OPEB	-	-
Customers' advance payments	-	-
Total adjustments	<u>1</u>	<u>(13,524)</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	<u>\$ (64,022)</u>	<u>\$ (13,524)</u>
NONCASH TRANSACTION DISCLOSURES		
Gain (loss) on disposal of capital assets	-	-
Interest capitalized on construction	-	-
Amortization of bond-related items	-	-
Change in fair value of investments	-	-
Change in actuarial value of net pension liability	-	-
Refunding bonds issued	-	-
Refunding proceeds deposited in escrow	-	-

<u>Dewatering Operations</u>	<u>Wastewater Pretreatment Program</u>	<u>Total Sewer System</u>
\$ -	\$ 840,998	\$ 32,870,732
-	-	-
2	151	34,919
-	(225,500)	(12,156,845)
-	(416,358)	(3,058,605)
-	(126,023)	(3,229,591)
<u>2</u>	<u>73,268</u>	<u>14,460,610</u>
-	-	75,541,285
-	-	(22,712,953)
-	-	(6,054,862)
-	-	(12,740,000)
-	-	(1,265,885)
-	-	<u>367,715</u>
-	-	33,135,300
-	-	15,015,036
-	-	(41,326,883)
588	580	436,285
588	580	(25,875,562)
590	73,848	21,720,348
194,508	112,306	15,421,041
<u>\$ 195,098</u>	<u>\$ 186,154</u>	<u>\$ 37,141,389</u>
\$ 18,300	\$ 186,154	3,874,109
176,798	-	33,267,280
<u>\$ 195,098</u>	<u>\$ 186,154</u>	<u>\$ 37,141,389</u>
\$ -	\$ (3,558)	13,217,608
-	1,407	5,292,843
-	27,642	(113,193)
-	(355)	(15,831)
-	1,577	11,649
-	4,385	986,091
2	(16,159)	(3,360,268)
-	(7,377)	858
-	(6,448)	(44,157)
-	72,154	(1,514,990)
<u>2</u>	<u>76,826</u>	<u>1,243,002</u>
<u>\$ 2</u>	<u>\$ 73,268</u>	<u>\$ 14,460,610</u>
-	-	-
-	-	353,298
-	-	(1,210,411)
-	-	14,853
-	(1,577)	(11,649)
-	-	16,390,000
-	-	17,844,849
		(Concluded)

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STATISTICAL SECTION

This part of the North Texas Municipal Water District's comprehensive annual financial report presents detailed information as a context for understanding what the information in the financial statements, note disclosures, and required supplementary information says about the District's overall financial health. This information has not been audited by the independent auditor.

<u>Contents</u>	<u>Schedule #s</u>
Financial Trends These tables contain trend information to help the reader understand how the District's financial performance and well-being have changed over time.	1 thru 9
Revenue Capacity These tables contain information to help the reader assess the District's various revenue sources.	10 thru 15
Debt Capacity These tables present information to help the reader assess the affordability of the District's current levels of outstanding debt and the District's ability to issue additional debt in the future.	16 & 17
Economic and Demographic Information These tables offer economic and demographic indicators to help the reader understand the environment within which the District's financial activities take place.	18 thru 20
Operating Information These tables contain service and infrastructure data to help the reader understand how the information in the District's financial report relates to the services the District provides.	21 thru 23

Source: Unless otherwise noted, the information in these tables is derived from the comprehensive annual financial reports for the relevant year.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 1
NET POSITION BY COMPONENT (UNAUDITED)
LAST TEN FISCAL YEARS**

	<u>2007</u>	<u>2008</u>	<u>2009</u>
Net investment in capital assets	\$ 521,050,336	\$ 563,070,109	\$ 600,921,714
Restricted for debt service	67,639,424	84,276,605	95,516,877
Unrestricted	125,347,868	126,874,912	104,395,902
Total	<u>\$ 714,037,628</u>	<u>\$ 774,221,626</u>	<u>\$ 800,834,493</u>
	<u>2010</u>	<u>2011</u>	<u>2012</u>
Net investment in capital assets	\$ 642,592,189	\$ 655,040,848	\$ 687,317,597
Restricted for debt service	98,617,167	102,802,273	129,622,913
Unrestricted	86,328,779	108,197,769	102,807,227
Total	<u>\$ 827,538,135</u>	<u>\$ 866,040,890</u>	<u>\$ 919,747,737</u>
	<u>2013</u>	<u>2014</u>	<u>2015</u>
Net investment in capital assets	\$ 747,192,747	\$ 794,854,341	\$ 864,338,873
Restricted for debt service	134,554,194	138,297,302	142,275,759
Unrestricted	83,782,522	89,311,734	77,655,896
Total	<u>\$ 965,529,463</u>	<u>\$ 1,022,463,377</u>	<u>\$ 1,084,270,528</u>
	<u>2016</u>		
Net investment in capital assets	\$ 942,119,408		
Restricted for debt service	141,312,557		
Unrestricted	126,729,695		
Total	<u>\$ 1,210,161,660</u>		

Source: Statement of Revenues, Expenses and Changes in Net Position for the NTMWD

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 2
CHANGES IN NET POSITION (UNAUDITED)
LAST TEN FISCAL YEARS**

Fiscal Year	Operating Revenues	Operating Expenses	Operating Income	Nonoperating Revenues/ (Expenses)	Change in Net Position	Prior Period Adjustment
2007	\$ 180,723,392	\$ 112,404,186	\$ 68,319,206	\$ 561,584	\$ 68,880,790	\$ -
2008	200,461,423	135,201,435	65,259,988	(5,075,990)	60,183,998	-
2009	220,001,152	174,371,455	45,629,697	(19,016,830)	26,612,867	-
2010	230,990,723	169,457,931	61,532,792	(31,244,507)	30,288,285	(3,584,643)
2011	247,247,717	168,185,081	79,062,636	(40,559,881)	38,502,755	-
2012	266,482,345	172,604,883	93,877,462	(40,170,615)	53,706,847	-
2013	294,318,335	185,544,056	108,774,279	(49,877,698)	58,896,581	(13,114,855)
2014	310,571,544	206,640,634	103,930,910	(46,996,996)	56,933,914	-
2015	338,513,458	208,587,026	129,926,432	(43,095,097)	86,831,335	(25,024,184)
2016	398,068,222	224,688,538	173,379,684	(47,488,552)	125,891,132	-

Source: Statement of Revenues, Expenses and Changes in Net Position for the NTMWD

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 3
TOTAL REVENUES BY SOURCE (UNAUDITED)
LAST TEN FISCAL YEARS**

Year	Water Sales	Wastewater Service Fees	Solid Waste Service Fees	Investment Income	(1) Miscellaneous	Total
2007	\$ 100,901,474	\$ 58,988,815	\$ 19,263,463	\$ 29,045,305	\$ 1,801,388	\$ 210,000,445
2008	110,771,168	65,714,584	22,435,070	12,266,911	1,909,808	213,097,541
2009	122,135,437	73,823,795	22,146,863	6,874,381	5,535,297	230,515,773
2010	129,079,671	77,238,181	23,154,120	1,626,312	5,966,568	237,064,852
2011	148,712,453	73,550,031	23,526,336	2,039,519	6,734,417	254,562,756
2012	161,588,387	78,762,862	24,257,060	1,864,517	9,411,393	275,884,219
2013	184,641,152	83,357,407	24,553,966	1,261,442	6,686,736	300,500,703
2014	197,954,585	86,758,613	23,460,042	842,516	9,471,508	318,487,264
2015	215,871,181	93,754,382	27,603,397	2,034,940	5,685,793	344,949,693
2016	252,591,522	113,132,055	30,760,383	3,059,347	6,465,868	406,009,175

Source: Statement of Revenues, Expenses and Changes in Net Position for the NTMWD

(1) Miscellaneous revenues includes federal grant program revenues and other operating and nonoperating revenue.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 4
TOTAL EXPENSES BY FUNCTION (UNAUDITED)
LAST TEN FISCAL YEARS**

Year	Operating and Maintenance Expenses	Interest Expense	Depreciation	Amortization	Miscellaneous	Total
2007	\$ 89,407,742	\$ 28,707,108	\$ 22,429,175	\$ 567,269	\$ 8,361	\$ 141,119,655
2008	109,643,334	17,683,227	24,968,068	590,033	28,881	152,913,543
2009	139,032,903	29,525,984	34,678,755	659,797	5,467	203,902,906
2010	130,142,166	36,311,906	38,315,439	1,000,326	1,006,730	206,776,567
2011	127,804,481	47,874,920	39,262,832	1,117,768	-	216,060,001
2012	129,796,674	49,572,489	41,661,976	1,146,233	-	222,177,372
2013	140,151,618	56,060,066	45,392,438	-	-	241,604,122
2014	157,424,943	53,416,490	49,215,691	-	1,496,226	261,553,350
2015	158,078,403	49,531,332	50,508,623	-	-	258,118,358
2016	171,021,459	54,997,252	54,099,332	-	-	280,118,043

Source: Statement of Revenues, Expenses and Changes in Net Position for the NTMWD

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 5
TOTAL REVENUES BY SYSTEM (UNAUDITED)
LAST TEN FISCAL YEARS**

Year	Water System	Regional Wastewater System	Sewer System	Solid Waste System	Interceptor System	Total
2007	\$ 122,957,373	\$ 29,888,091	\$ 22,399,276	\$ 20,612,617	\$ 14,143,088	\$ 210,000,445
2008	119,482,896	33,263,176	21,650,281	23,441,552	15,259,636	213,097,541
2009	128,499,761	38,483,393	22,297,706	23,448,502	17,786,411	230,515,773
2010	134,628,838	38,459,665	20,417,285	23,982,504	19,576,560	237,064,852
2011	155,773,667	38,475,101	18,866,637	24,196,146	17,251,205	254,562,756
2012	170,969,532	37,966,678	23,759,739	25,089,308	18,098,962	275,884,219
2013	189,952,267	41,092,579	25,238,821	25,893,780	18,323,256	300,500,703
2014	205,567,790	43,985,499	24,534,984	25,009,414	19,389,577	318,487,264
2015	221,944,473	45,406,393	27,623,302	28,193,176	21,782,349	344,949,693
2016	258,967,069	55,054,270	34,653,940	32,223,631	25,110,265	406,009,175

Source: Statement of Revenues, Expenses and Changes in Net Position for the NTMWD

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 6
TOTAL EXPENSES BY SYSTEM (UNAUDITED)
LAST TEN FISCAL YEARS**

<u>Year</u>	<u>Water System</u>	<u>Regional Wastewater System</u>	<u>Sewer System</u>	<u>Solid Waste System</u>	<u>Interceptor System</u>	<u>Total</u>
2007	\$ 75,810,118	\$ 25,728,557	\$ 13,957,739	\$ 17,724,536	\$ 7,898,705	\$ 141,119,655
2008	79,896,481	27,860,710	16,290,315	20,611,697	8,254,340	152,913,543
2009	120,636,425	32,916,158	20,362,370	20,481,786	9,506,167	203,902,906
2010	122,239,215	32,413,410	20,568,052	20,826,161	10,729,729	206,776,567
2011	131,111,892	32,066,017	20,190,437	21,740,087	10,951,568	216,060,001
2012	134,466,963	31,584,482	21,232,537	22,384,482	12,508,908	222,177,372
2013	145,776,078	36,087,104	21,926,891	23,261,880	14,552,169	241,604,122
2014	161,004,668	40,719,243	22,049,092	22,730,220	15,050,127	261,553,350
2015	153,916,103	41,678,405	22,319,175	23,317,420	16,887,255	258,118,358
2016	159,971,880	48,772,951	26,235,649	26,015,728	19,121,835	280,118,043

Source: Statement of Revenues, Expenses and Changes in Net Position for the NTMWD

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 7
OPERATING REVENUES (UNAUDITED)
LAST TEN FISCAL YEARS**

Fiscal Year	Water Sales	Wastewater Service Fees	Solid Waste Service Fees	Other Operating Revenues	Total
2007	\$ 100,901,474	\$ 58,988,815	\$ 19,263,463	\$ 1,569,640	\$ 180,723,392
2008	110,771,168	65,714,584	22,435,070	1,540,601	200,461,423
2009	122,135,437	73,823,795	22,146,863	1,895,057	220,001,152
2010	129,079,671	77,238,181	23,154,120	1,518,751	230,990,723
2011	148,712,453	73,550,031	23,526,336	1,458,897	247,247,717
2012	161,588,387	78,762,862	24,257,060	1,874,036	266,482,345
2013	184,641,152	83,357,407	24,553,966	1,765,810	294,318,335
2014	197,954,585	86,758,613	23,460,042	2,398,304	310,571,544
2015	215,871,181	93,754,382	27,603,397	1,284,498	338,513,458
2016	252,591,522	113,132,055	30,760,383	1,584,262	398,068,222

Source: Statement of Revenues, Expenses and Changes in Net Position for the NTMWD

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 8
OPERATING EXPENSES (UNAUDITED)
LAST TEN FISCAL YEARS**

Fiscal Year	Personnel	Electric Power	Chemicals	Operating Supplies and Services	Depreciation and Amortization	Total
2007	\$ 31,185,659	\$ 20,654,688	\$ 18,980,400	\$ 18,586,995	\$ 22,996,444	\$ 112,404,186
2008	35,174,646	25,504,019	21,266,391	27,698,278	25,558,101	135,201,435
2009	41,148,956	36,452,486	31,559,396	29,872,065	35,338,552	174,371,455
2010	43,373,126	31,396,882	26,431,408	28,940,750	39,315,765	169,457,931
2011	44,509,650	29,454,026	22,741,133	31,099,672	40,380,600	168,185,081
2012	46,772,079	24,705,243	23,490,278	34,829,074	42,808,209	172,604,883
2013	48,000,657	28,667,812	23,398,387	40,084,762	45,392,438	185,544,056
2014	53,252,470	26,628,105	24,178,928	53,365,440	49,215,691	206,640,634
2015	53,098,135	23,997,861	25,325,219	55,657,188	50,508,623	208,587,026
2016	65,389,176	19,187,942	28,283,012	57,729,076	54,099,332	224,688,538

Source: Statement of Revenues, Expenses and Changes in Net Position for the NTMWD

NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 9
NONOPERATING REVENUES AND EXPENSES (UNAUDITED)
LAST TEN FISCAL YEARS

<u>Fiscal Year</u>	<u>Investment Income</u>	<u>Miscellaneous Revenue</u>	<u>Gain (Loss) on Sale of Capital Assets</u>	<u>Interest Expense</u>	<u>Total</u>
2007	\$ 29,045,305	\$ 162,150	\$ 61,237	\$ (28,707,108)	\$ 561,584
2008	12,266,911	360,509	(20,183)	(17,683,227)	(5,075,990)
2009	6,874,381	3,607,677	27,096	(29,525,984)	(19,016,830)
2010	1,626,312	4,395,324	(954,237)	(36,311,906)	(31,244,507)
2011	2,039,519	5,275,520	-	(47,874,920)	(40,559,881)
2012	1,864,517	7,372,696	164,661	(49,572,489)	(40,170,615)
2013	1,261,442	4,740,486	180,440	(56,060,066)	(49,877,698)
2014	842,516	6,748,435	(1,171,457)	(53,416,490)	(46,996,996)
2015	2,034,940	4,401,295	-	(49,531,332)	(43,095,097)
2016	3,059,347	3,573,729	875,624	(54,997,252)	(47,488,552)

Source: Statement of Revenues, Expenses and Changes in Net Position for the NTMWD

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 10
NET ADDITIONS TO CAPITAL ASSETS EXCLUDING CONSTRUCTION IN PROGRESS
(UNAUDITED)
LAST TEN FISCAL YEARS**

<u>Year</u>	<u>Water System</u>	<u>Regional Wastewater System</u>	<u>Sewer System</u>	<u>Solid Waste System</u>	<u>Interceptor System</u>	<u>Total</u>
2007	\$ 59,125,009	\$ 1,096,433	\$ 5,040,376	\$ 1,183,109	\$ 4,996,816	\$ 71,441,743
2008	217,271,666	915,563	53,426,921	9,861,935	26,790,287	308,266,372
2009	284,522,680	14,101,945	34,804,787	24,952,092	16,341,285	374,722,789
2010	59,428,177	787,189	904,541	4,048,279	2,739,993	67,908,179
2011	37,945,874	3,504,095	23,018,671	4,503,898	30,415,197	99,387,735
2012	97,175,728	900,820	610,798	1,708,150	17,550,394	117,945,890
2013	103,316,959	90,768,086	320,947	5,979,869	30,382,947	230,768,808
2014	25,269,744	7,857,071	(2,207,403)	1,450,082	2,557,388	34,926,882
2015	31,937,890	10,403,531	9,796,189	6,712,023	16,248,750	75,098,383
2016	398,312,927	11,077,703	721,164	4,078,101	29,053,254	443,243,149

Source: Based on information provided in the schedule of capital assets in Note 4.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 11
WATER PRODUCED AND CONSUMED, WASTEWATER TREATED AND SOLID WASTE
DISPOSED (UNAUDITED)
LAST TEN FISCAL YEARS**

Water Year	Gallons of Water Produced	Gallons of Water Consumed	Gallons of Water Unbilled	Percent Unbilled	Water Rates (per 1,000 gallons)	
					Members	Customer
2007	80,288,000,000	77,502,272,000	2,785,728,000	3.5%	\$ 1.02	\$ 1.07
2008	93,501,966,897	90,254,296,000	3,247,670,897	3.5%	\$ 1.08	\$ 1.13
2009	96,036,110,124	93,224,065,000	2,812,045,124	2.9%	\$ 1.18	\$ 1.23
2010	90,683,355,747	88,163,732,000	2,519,623,747	2.8%	\$ 1.25	\$ 1.30
2011	104,965,486,000	102,097,794,000	2,867,692,000	2.7%	\$ 1.37	\$ 1.42
2012	98,209,915,613	96,846,812,000	1,363,103,613	1.4%	\$ 1.49	\$ 1.54
2013	98,031,722,000	93,366,805,000	4,664,917,000	4.8%	\$ 1.70	\$ 1.75
2014	88,512,901,000	83,633,749,000	4,879,152,000	5.5%	\$ 1.87	\$ 1.92
2015	83,288,227,957	80,027,915,000	3,260,312,957	3.9%	\$ 2.06	\$ 2.11
2016	100,282,548,000	97,345,239,000	2,937,309,000	2.9%	\$ 2.29	\$ 2.34

Note: Water production and consumption is based on the NTMWD Water Year (August 1 through July 31).

Fiscal Year	Gallons of Wastewater Treated	Tons of Solid Waste Disposed
2007	34,164,515,000	791,773
2008	32,065,925,000	816,994
2009	31,348,246,000	750,018
2010	36,263,799,000	743,171
2011	30,875,276,000	751,787
2012	32,789,293,000	722,813
2013	32,919,670,000	786,441
2014	32,546,937,000	835,224
2015	39,364,325,000	877,072
2016	42,949,703,000	950,220

Source: Based on information provided in NTMWD Operations Report.

Note: Wastewater treated and solid waste disposed is based on the NTMWD Fiscal Year (October 1 through September 30).

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 12
HISTORIC SERVICE USE (UNAUDITED)
LAST TEN YEARS**

	<u>2006-2007</u>	<u>2007-2008</u>	<u>2008-2009</u>	<u>2009-2010</u>
WATER CONSUMPTION (GALLONS IN THOUSANDS):				
Member cities	67,359,017	77,535,389	79,197,589	74,574,835
Customer cities	10,136,235	12,713,053	14,019,682	13,583,041
Individual meters	<u>7,020</u>	<u>5,854</u>	<u>6,794</u>	<u>5,856</u>
Total	<u>77,502,272</u>	<u>90,254,296</u>	<u>93,224,065</u>	<u>88,163,732</u>
Total rainfall (in inches)	<u>54.10</u>	<u>34.89</u>	<u>39.02</u>	<u>41.45</u>
WASTEWATER VOLUME TREATED (GALLONS IN THOUSANDS):				
Regional system	27,602,153	26,159,510	25,254,348	29,189,205
Small plant system	<u>6,562,362</u>	<u>5,906,415</u>	<u>6,093,898</u>	<u>7,074,594</u>
Total	<u>34,164,515</u>	<u>32,065,925</u>	<u>31,348,246</u>	<u>36,263,799</u>
SOLID WASTE VOLUME (IN TONS):				
Transfer stations	480,424	490,400	465,440	473,322
Landfill	<u>311,349</u>	<u>326,594</u>	<u>284,578</u>	<u>269,849</u>
Total	<u>791,773</u>	<u>816,994</u>	<u>750,018</u>	<u>743,171</u>

Source: Based on information provided in NTMWD Operations Report.

Note: Data for water consumption is based on the NTMWD water year (August 1 through July 31). Data for wastewater volume treated and solid waste volume is reported on the NTMWD fiscal year (October 1 through September 30).

2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
85,966,816	81,019,601	78,407,137	69,155,408	66,632,698	80,685,320
16,126,637	15,822,993	14,956,602	14,477,895	13,390,178	16,655,941
<u>4,341</u>	<u>4,218</u>	<u>3,066</u>	<u>3,216</u>	<u>5,039</u>	<u>3,978</u>
<u>102,097,794</u>	<u>96,846,812</u>	<u>93,366,805</u>	<u>83,636,519</u>	<u>80,027,915</u>	<u>97,345,239</u>
<u>31.18</u>	<u>35.16</u>	<u>29.17</u>	<u>29.08</u>	<u>44.54</u>	<u>53.71</u>
24,721,535	26,347,832	26,734,851	26,468,520	32,164,465	34,983,736
<u>6,153,841</u>	<u>6,441,461</u>	<u>6,184,819</u>	<u>6,078,417</u>	<u>7,199,860</u>	<u>7,965,967</u>
<u>30,875,376</u>	<u>32,789,293</u>	<u>32,919,670</u>	<u>32,546,937</u>	<u>39,364,325</u>	<u>42,949,703</u>
471,825	459,167	475,072	495,756	533,545	566,601
<u>279,962</u>	<u>263,646</u>	<u>311,369</u>	<u>339,468</u>	<u>343,527</u>	<u>383,619</u>
<u>751,787</u>	<u>722,813</u>	<u>786,441</u>	<u>835,224</u>	<u>877,072</u>	<u>950,220</u>

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 13
NUMBER OF WATER, WASTEWATER AND SOLID WASTE CUSTOMERS (UNAUDITED)
LAST TEN FISCAL YEARS**

Fiscal Year	Water			Wastewater Member Cities	Solid Waste Member Cities
	Member Cities	Customer Cities	Total Cities		
2007	13	30	43	11	5
2008	13	31	44	12	5
2009	13	32	45	12	5
2010	13	32	45	12	5
2011	13	32	45	12	5
2012	13	32	45	12	5
2013	13	33	46	12	5
2014	13	33	46	12	5
2015	13	33	46	12	5
2016	13	33	46	12	5

Source: Based on information provided in NTMWD Operations Report.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
 SCHEDULE 14
 WATER RATES (UNAUDITED)
 LAST TEN FISCAL YEARS**

	2007	2008	2009	2010	2011	2012	2013
Water Rates (per 1,000 gallons)							
Member Cities	\$ 1.02	\$ 1.08	\$ 1.18	\$ 1.25	\$ 1.37	\$ 1.49	\$ 1.70
Customer Cities	\$ 1.07	\$ 1.13	\$ 1.23	\$ 1.30	\$ 1.42	\$ 1.54	\$ 1.75

	2014	2015	2016
Water Rates (per 1,000 gallons)			
Member Cities	\$ 1.87	\$ 2.06	\$ 2.29
Customer Cities	\$ 1.92	\$ 2.11	\$ 2.34

Source: Based on information provided in NTMWD Budget Resolution.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 15
LARGEST CUSTOMERS (UNAUDITED)
CURRENT YEAR AND NINE YEARS AGO**

Customer	Fiscal Year 2007					
	Water Sales		Wastewater Service Fees		Solid Waste Service Fees	
	Amount	%	Amount	%	Amount	%
Frisco	\$ 7,970,709	7.90%	\$ 6,089,718	10.32%	\$ 2,183,597	11.34%
Garland	13,347,344	13.23%	-	0.00%	-	0.00%
McKinney	9,097,050	9.02%	8,675,261	14.71%	3,786,961	19.66%
Mesquite	7,977,344	7.91%	5,693,942	9.65%	-	0.00%
Plano	24,941,475	24.72%	17,134,045	29.05%	6,425,396	33.36%
Richardson	10,284,831	10.19%	3,691,450	6.26%	3,197,002	16.60%
Subtotal	73,618,753	72.96%	41,284,416	69.99%	15,592,956	80.95%
Other Customers	27,282,721	27.04%	17,704,399	30.01%	3,670,507	19.05%
Grand Total	\$ 100,901,474	100.00%	\$ 58,988,815	100.00%	\$ 19,263,463	100.00%

Customer	Fiscal Year 2016					
	Water Sales		Wastewater Service Fees		Solid Waste Service Fees	
	Amount	%	Amount	%	Amount	%
Frisco	\$ 22,950,293	9.09%	\$ 19,531,076	17.26%	\$ 3,846,652	12.51%
Garland	30,160,876	11.94%	-	0.00%	-	0.00%
McKinney	23,496,122	9.30%	15,600,637	13.79%	4,958,918	16.12%
Mesquite	18,078,150	7.16%	9,383,900	8.29%	-	0.00%
Plano	59,032,037	23.36%	27,540,186	24.34%	8,310,401	27.02%
Richardson	24,219,789	9.59%	8,153,672	7.21%	3,926,383	12.76%
Subtotal	177,937,267	70.44%	80,209,471	70.90%	21,042,354	68.41%
Other Customers	74,654,255	29.56%	32,922,584	29.10%	9,718,029	31.59%
Grand Total	\$ 252,591,522	100.00%	\$ 113,132,055	100.00%	\$ 30,760,383	100.00%

Source: Based on information provided in NTMWD Operations Report.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 16
OUTSTANDING DEBT BY TYPE (UNAUDITED)
LAST TEN FISCAL YEARS**

Fiscal Year	Revenue Bonds	U.S Government Notes	Capital Leases	Total	District Population	Per Capita Debt
2007	\$ 786,435,000	\$ 42,236,354	\$ -	\$ 828,671,354	724,900	1,143
2008	950,630,000	41,145,477	-	991,775,477	748,500	1,325
2009	1,102,650,000	40,019,360	-	1,142,669,360	764,500	1,495
2010	1,181,140,000	75,497,946	-	1,256,637,946	786,250	1,598
2011	1,276,795,000	37,656,812	-	1,314,451,812	791,470	1,661
2012	1,617,810,000	36,417,993	-	1,654,227,993	834,642	1,982
2013	1,580,770,000	35,139,154	-	1,615,909,154	854,778	1,890
2014	1,580,030,000	33,819,003	-	1,613,849,003	885,241	1,823
2015	1,686,930,000	32,456,205	-	1,719,386,205	914,127	1,881
2016	1,756,760,000	31,049,381	-	1,787,809,381	n/a	n/a

Source: Notes to the Basic Financial Statements for the North Texas Municipal Water District.

Note: The District provides service to portions of Collin, Hunt, Rockwall, Dallas, Kaufman, Ellis, Rains, Fannin, Grayson, and Denton Counties. The majority of the District's population served resides in Collin County. Therefore, this schedule reflects data for Collin County only.

The District was unable to obtain the 2016 "District Population" and the "Per Capita Debt" information at the time of publication of this report.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 17
REVENUE COVERAGE (UNAUDITED)
LAST TEN FISCAL YEARS**

Fiscal Year	{a} Total Revenues	Less Operating Expenses (excluding depreciation)	Net Available Revenues	Debt Service			Coverage Ratio	
				Principal	Adjustment {b}	Interest Paid		
2007	\$ 210,000,445	\$ 89,407,742	\$120,592,703	\$36,141,740	\$ -	\$37,476,257	\$73,617,997	1.64
2008	213,097,541	109,643,334	103,454,207	32,840,877	-	38,357,048	71,197,925	1.45
2009	230,515,773	139,032,903	91,482,870	36,471,117	-	48,520,843	84,991,960	1.08
2010	237,064,852	130,142,166	106,922,686	46,021,961	-	56,034,581	102,056,542	1.05
2011	254,562,756	127,804,481	126,758,275	83,806,133	(36,641,083)	61,388,483	108,553,533	1.17
2012	275,884,219	129,796,674	146,087,545	49,873,819	-	61,388,483	111,262,302	1.31
2013	300,500,703	140,151,618	160,349,085	62,918,838	-	79,055,732	141,974,570	1.13
2014	318,487,264	157,424,943	161,062,321	63,480,151	-	71,448,310	134,928,461	1.19
2015	344,949,693	158,078,403	186,871,290	72,317,798	-	74,903,222	147,221,020	1.27
2016	406,009,175	170,589,206	235,419,969	79,006,824	-	80,521,078	159,527,902	1.48

Source: Statement of Revenues, Expenses and Changes in Net Position and Statement of Cash Flows for the NTMWD

{a} Amount represents operating revenue plus nonoperating revenues excluding interest expense and loss on disposal of capital assets.

{b} Advance payment of debt.

Note: The District currently does not maintain any debt covenants requiring a coverage ratio of greater than 1.00.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 18
DEMOGRAPHIC STATISTICS (UNAUDITED)
LAST TEN CALENDAR YEARS**

Calendar Year	District Population	Personal Income (thousand dollars)	Per Capita Personal Income	Unemployment Rate
2006	690,500	\$ 24,788,079	\$ 35,899	5.6%
2007	724,900	26,345,030	36,343	6.0%
2008	748,500	27,539,359	36,793	6.4%
2009	764,500	28,476,127	37,248	6.9%
2010	786,250	29,648,689	37,709	7.3%
2011	791,470	30,214,869	38,176	7.3%
2012	834,642	30,941,848	37,072	4.5%
2013	854,778	32,401,215	37,906	5.2%
2014	885,241	34,148,172	38,575	5.5%
2015	914,127	36,154,637	39,551	3.7%

Source: Years 2006 - 2011 were based on information provided by North Central Texas Council of Governments. Years 2012 - 2015 were based on information provided by the U.S. Census Bureau; however, the District was unable to obtain this information for 2016 at the time of publication of this report.

Note: The District provides service to portions of Collin, Hunt, Rockwall, Dallas, Kaufman, Ellis, Rains, Fannin, Grayson and Denton Counties. The majority of the District's population served resides in Collin County. Therefore, this schedule reflects data for Collin County only.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 19
PRINCIPAL EMPLOYERS (UNAUDITED)
CURRENT YEAR AND NINE YEARS AGO**

Employer	2015	
	Employees	Percentage of Total
HP Enterprise Svc Llc	10,000	2.22%
Plano ISD	6,538	1.45%
Bank of America Home Loans-Corporate Dr.	4,646	1.03%
Toyota	4,000	0.89%
JC Penny (Corporate HQ)	3,800	0.84%
Capital One	3,683	0.82%
University of Texas at Dallas	3,500	0.78%
Blue Cross and Blue shield of Texas	3,100	0.69%
Medical Center of Plano (HCA Inc)	3,000	0.67%
GE Energy	2,300	0.51%
Lineage Power Holdings Inc	2,300	0.51%
Alctel-Lucent	2,000	0.44%
Total	48,867	10.85%
Total Employed in the County	450,277	

Employer	2006	
	Employees	Percentage of Total
Countrywide Home Loans	4,402	1.13%
EDS	4,310	1.11%
JC Penney	4,300	1.10%
University of Texas at Dallas	3,058	0.78%
Raytheon	2,850	0.73%
Perot Systems	2,732	0.70%
Raytheon Corp	2,400	0.62%
Alcatel	2,280	0.58%
AT&T Inc	2,140	0.55%
Total	28,472	7.30%

Source: Years 2006 and 2015 are based on information provided by North Central Texas Council of Governments; however, the District was unable to obtain this information for 2016 at the time of publication of this report.

Note 1: The District provides service to portions of Collin, Hunt, Rockwall, Dallas, Kaufman, Ellis, Rains, Fannin, Grayson and Denton Counties. The majority of the District's population served resides in Collin County. Therefore, this schedule reflects data for Collin County only.

Note 2: Data prior to 2006 is not available

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 20
NUMBER OF EMPLOYEES BY FUNCTION (UNAUDITED)
LAST TEN FISCAL YEARS**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Water:										
General	13.0	14.0	18.0	18.0	29.0	29.0	31.0	31.0	30.0	8.0
Public Information	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0
Planning	8.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information Technology										20.4
Administration	20.0	22.0	22.0	23.0	21.0	21.0	21.0	25.0	28.0	36.0
Plant Operations	29.0	34.0	40.0	45.0	47.0	66.0	78.0	64.0	66.0	77.0
Tawakoni Raw Water Pump St	0.0	0.0	0.0	5.0	10.0	11.0	11.0	11.0	11.0	12.0
East Fork Raw Water Supply	0.0	5.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Bonham Water Treatment	0.0	8.0	10.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Facilities Service	29.0	31.0	40.0	40.5	40.5	43.5	46.5	48.5	55.0	61.0
Technical Service	46.0	50.0	53.0	56.5	55.5	56.5	58.5	80.5	85.0	91.0
Laboratory	18.0	23.3	24.3	25.3	25.3	25.3	27.3	27.3	26.9	27.8
Engineering	34.0	35.0	40.0	40.0	40.0	43.0	44.0	50.0	62.0	74.0
Environmental Service	5.0	4.5	5.5	5.7	7.7	7.7	7.7	9.2	11.4	11.0
Permitting										4.2
Regulatory Compliance										3.3
Total	203.0	236.8	261.8	279.0	296.0	323.0	345.0	366.5	396.3	445.6
Wastewater:										
Willson Creek WWTP	50.0	51.8	52.8	52.8	52.8	55.8	55.8	56.1	56.4	58.8
Floyd Branch WWTP	6.0	6.3	6.3	6.3	6.3	6.3	6.3	6.4	6.5	7.5
Rowlett Creek WWTP	21.0	20.8	21.8	21.8	21.8	21.8	21.8	23.1	23.4	25.5
Mesquite WWTP	24.5	27.8	29.8	29.8	29.8	32.8	32.8	34.1	35.4	34.1
Panther Creek WWTP	0.0	6.1	6.1	6.1	12.1	12.1	12.1	12.1	12.6	17.8
Muddy Creek WWTP	6.0	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	18.4
Stewart Creek WWTP	6.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.6	10.6
Seagoville WWTP	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Small WWTPs	6.5	6.5	6.5	5.5	5.5	5.5	5.5	5.5	7.5	7.0
Pretreatment	4.0	5.2	5.2	5.0	5.0	5.0	5.0	5.5	6.7	6.8
Dewatering	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0
Lower East Fork Interceptor										0.1
Upper East Fork Interceptor	6.0	5.9	6.9	6.9	6.9	7.9	8.9	8.9	11.9	19.9
Total	135.0	150.2	155.2	154.0	160.0	167.0	168.0	171.6	178.7	206.3
Solid Waste:										
Transfer Station	46.0	49.5	52.8	52.8	50.8	48.8	47.8	47.3	46.3	46.4
Landfills	36.0	8.3	8.3	2.5	0.0	0.0	0.0	0.0	0.0	0.0
Disposal Facility	0.0	30.3	33.0	37.8	39.3	40.3	39.3	36.8	32.8	33.9
Fleet Maintenance Shop	11.0	11.0	13.0	13.0	13.0	12.0	12.0	15.0	16.0	18.7
Total	93.0	99.0	107.0	106.1	103.0	101.0	99.0	99.0	95.0	99.0
Total Employees	431	486	524	539	559	591	612	637	670	751

Source: Based on information provided in NTMWD Annual Budget.

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 21
MISCELLANEOUS STATISTICAL DATA (UNAUDITED)
YEAR ENDED SEPTEMBER 30, 2016**

Authority created under Chapter 62, Acts of 1951, 52nd Legislature of Texas, Regular Session

Year of creation	1951
Domicile	Wylie, Texas
District population	1,600,000+
District service area	2,200 square miles
Water Treatment Plant	420 acres
Rain received at Lavon Lake during fiscal year	53.71
Total employees	751

REGIONAL WATER SYSTEM

RAW WATER SUPPLY—SAFE YIELD:

Lavon Lake	102.6	MGD
Lake Texoma	82.8	
Jim Chapman Lake	44.6	
Lake Bonham	4.8	
Lake Tawakoni	45.7	
Wilson Creek Reuse	44.0	
East Fork Raw Water Supply	27.0	
Lake Ray Hubbard Pass Through	18.8	
	<hr/>	
Total	370.3	MGD
	<hr/> <hr/>	

WATER TREATMENT PLANTS:

Wylie—WTP I	70.0	MGD
Wylie—WTP II	280.0	
Wylie—WTP III	280.0	
Wylie—WTP IV	140.0	
Bonham WTP	6.6	
Tawakoni WTP	30.0	
	<hr/>	
Total	806.6	MGD
	<hr/> <hr/>	

TRANSMISSION PIPELINES:

12" to 24" diameter	116.0	Miles
30" to 54" diameter	171.0	
60" to 96" diameter	286.0	
	<hr/>	
Total	573.0	Miles
	<hr/> <hr/>	

RAW WATER PUMP STATIONS:

Lake Lavon—3 sites:		
Total water pumps	17	
Total raw water pumping capacity	940	MGD

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 21
MISCELLANEOUS STATISTICAL DATA (UNAUDITED)
YEAR ENDED SEPTEMBER 30, 2016**

Lake Texoma—1 site:			
Total water pumps		4	
Total raw water pumping capacity		125	MGD
Jim Chapman Lake—1 site:			
Total water pumps		3	
Total raw water pumping capacity		165	MGD
East Fork Raw Water Supply—2 sites:			
Total water pumps		8	
Total raw water pumping capacity		270	MGD
Lake Tawakoni—2 sites:			
Total water pumps		7	MGD
Total raw water pumping capacity		168	
Wylie Water Plant - Treated Water Pump Stations		7	
Wylie Water Plant - Treated Water Pumping Capacity		953.5	MGD
TREATED WATER STORAGE RESERVOIRS:			
NTMWD Treatment plant storage		42.0	Million gallons
NTMWD Transmission system storage		368.0	
		<u>410.0</u>	Million gallons
TOTAL CITY DELIVERY POINTS			
		82	

WASTEWATER SYSTEM

Permitted Capacity

REGIONAL SYSTEM:

Regional wastewater plants:

Floyd Branch RWWTP	*	4.750	MGD
South Mesquite RWWTP	*	33.000	
Rowlett Creek RWWTP	*	24.000	
Wilson Creek RWWTP	*	56.000	

SEWER SYSTEM:

City:

Farmersville	Farmersville No. 1 Plant	0.225	^a
	Farmersville No. 2 Plant	0.530	^a
Frisco	Cottonwood Creek Plant	0.300	
	Panther Creek Plant	* 10.000	
	Stewart Creek West Plant	* 5.000	
Lavon	Bear Creek Plant	0.250	
Rockwall	North Rockwall Plant	* 1.200	
	South Rockwall Plant	* 2.250	

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 21
MISCELLANEOUS STATISTICAL DATA (UNAUDITED)
YEAR ENDED SEPTEMBER 30, 2016**

Royce City	Royse City Plant	0.500	^b
Royce City and Fate	Sabine Creek Plant	*	1.500
Seis Lagos MUD	Seis Lagos Plant		0.250
Wylie and Murphy	Muddy Creek Plant	*	10.000
Wylie	Wylie Plant	*	2.000 ^b
			<hr/>
Total treatment capacity		151.755	MGD
			<hr/>
Total number of plants		17	
*Number of plants owned by NTMWD		11	
INTERCEPTOR SYSTEMS			
		<u>Pipeline Length</u>	
Upper East Fork Interceptor System		194.2	Miles
Lakeside Interceptor (Rockwall)		4.3	
Muddy Creek Interceptor		4.1	
Forney Interceptor		14.4	
Sabine Creek Interceptor		3.2	
Parker Creek Interceptor		5.1	
Buffalo Creek Interceptor		16.2	
Lower East Fork Interceptor System		9.2	
			<hr/>
Total		250.7	Miles
			<hr/>
SOLID WASTE SYSTEM			
		<u>Permitted Capacity</u>	
TRANSFER STATIONS (3):			
Lookout Drive Transfer Station		625	Tons/day
Parkway Transfer Station		770	
Custer Road Transfer Station		1,900	
			<hr/>
Total transfer capacity		3,295	Tons/day
			<hr/>
LANDFILLS (3):			
121 Regional Disposal Facility			
Permit Boundary		673	Acres
Landfillable		433	Acres
Permitted Airspace		135	M yd3
Maxwell Creek Landfill*			
Permit Boundary		193	Acres
Landfillable		139	Acres
Permitted Airspace		6	M yd3
McKinney Landfill**			
Permit Boundary		169	Acres
Landfillable		94	Acres
Permitted Airspace		13	M yd3

* Closed in 2006.

**Ceased waste acceptance on December 31, 2008 and closed in 2014

a) operates as a single plant

b) not in operation

**NORTH TEXAS MUNICIPAL WATER DISTRICT, TEXAS
SCHEDULE 22
OPERATING AND CAPITAL INDICATORS (UNAUDITED)
LAST TEN FISCAL YEARS**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Water:										
Size of Service Area (square miles)	1,976	1,985	1,985	1,985	1,985	2,200	2,200	2,200	2,200	2,200
Water Supply (MGD)	276	298	333	369	369	369	370	370	370	370
Treatment Capacity (MGD)	630	777	777	777	777	807	807	807	807	807
Miles of Transmission Pipelines	408	482	482	482	487	518	518	566	573	573
Water Storage Capacity (MG)	387	443	314	400	400	400	403	403	410	410
City Delivery Points	59	59	78	78	78	78	77	77	77	82
Total Rainfall (Inches)	54	35	39	41	31	35	29	29	45	54
Annual Consumption (BG)	78	90	93	88	102	97	93	84	80	97
Wastewater:										
Miles of Interceptor Lines	165	188	210	210	226	243	243	250	250	251
Number of Treatment Plants	18	16	18	18	18	18	17	17	17	17
Treatment Capacity (MGD)	122	121	132	132	137	145	152	152	152	152
Annual Volume Treated (BG)	34	32	31	36	31	33	33	33	39	43
Solid Waste:										
Number of Transfer Stations	3	3	3	3	3	3	3	3	3	3
Number of Landfills	3	3	3	3	3	3	3	3	3	3
Annual Volume (thousand tons)	792	817	750	743	752	723	786	835	877	950

Source: Based on information provided in NTMWD Operation Report.

This page is a placeholder for information submitted with the application that may contain confidential information. Please contact Cindy DePrato, Executive Assistant at (512) 463-8420 to request reviewing this information.

Management's Discussion and Analysis (Unaudited)

As management of the North Texas Municipal Water District, we offer readers of the District's financial statements this narrative overview and analysis of the financial activities of the District as of and for the fiscal year ended September 30, 2016.

Financial Highlights

- Total assets at the end of the year were approximately \$3.2 billion and exceeded liabilities by approximately \$1.21 billion.
- The District's total net position increased by approximately \$126 million, or 12 percent.
- During the year the District's operating revenues increased by approximately \$60 million, or 18 percent, and operating expenses increased by approximately \$16 million, or 8 percent.
- Construction of the Wylie Water Treatment Plant Ozonation Project, the Lower Bois D'Arc Creek Reservoir Project, and the Lake Texoma to Wylie Pipeline Project led the way in capital expenditures totaling \$244 million.
- The District issued \$238 million in revenue bonds for various projects and to refinance outstanding debt to take advantage of favorable interest rates.

Overview of the Financial Statements

This discussion and analysis are intended to serve as an introduction to the District's basic financial statements which are comprised of fund financial statements and notes to the financial statements. This report also contains other supplementary information in addition to the basic financial statements themselves.

Financial Statements. The financial statements are designed to provide readers with an overview of the District's finances, in a manner similar to private-sector business.

The *Statement of Net Position* presents information on all of the District's assets and liabilities, with the difference between the two reported as *net position*. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position of the District is improving or deteriorating.

The *Statement of Revenues, Expenses and Changes in Net Position* presents information showing how the District's net position changed during the most recent fiscal year. All changes in net position are reported as soon as the underlying event giving rise to the change occurs, regardless of the timing of related cash flows. Thus revenues and expenses are reported in this statement for some items that will only result in cash flows in future fiscal periods (e.g., earned but unused vacation leave).

The *Statement of Cash Flows* presents cash receipts, cash payments, and net changes in cash resulting from operating activities, capital and related financing activities, and investing activities for the year presented.

Enterprise Funds. A fund is a grouping of related accounts that is used to maintain control over resources that have been segregated for specific activities or objectives. The District uses fund accounting to ensure and demonstrate compliance with finance-related legal requirements. All of the funds of the District are categorized as enterprise funds. The District reports five major enterprise funds: Water, Regional Wastewater, Sewer, Solid Waste and Interceptor.

The basic enterprise fund financial statements can be found on pages 10 through 17 of this report.

Notes to the Financial Statements. The notes provide additional information that is essential to a full understanding of the data provided in the fund financial statements. The notes to the financial statements can be found starting on page 18 of this report.

Other Information. In addition to the basic financial statements and accompanying notes, this report also presents certain required supplementary information concerning the District's progress in funding its obligation to provide pension and other postemployment benefits to its employees. Required supplemental information can be found beginning on page 51 of this report.

Financial Analysis

As noted earlier, net position may serve over time as a useful indicator of the District's financial position. In the case of the District, assets and deferred outflows of resources exceeded liabilities and deferred inflows of resources by \$1,210,161,660 at the close of the most recent fiscal year.

North Texas Municipal Water District's Net Position

	As of September 30		Increase/ (Decrease)	Percent Change
	2016	2015		
ASSETS:				
Current and other assets	\$ 733,122,854	\$ 667,541,124	\$ 65,581,730	9.8 %
Capital assets—net	2,510,962,344	2,355,048,633	155,913,711	6.6
Total assets	3,244,085,198	3,022,589,757	221,495,441	7.3
Total deferred outflows of resources	41,081,323	26,665,685	14,415,638	54.1
Total assets and deferred outflows of resources	3,285,166,521	3,049,255,442	235,911,079	7.7
LIABILITIES:				
Current and other liabilities	173,894,028	156,712,119	17,181,909	11.0
Long-term liabilities outstanding	1,891,046,277	1,804,438,409	86,607,868	4.8
Total liabilities	2,064,940,305	1,961,150,528	103,789,777	5.3
Total deferred inflows of resources	10,064,556	3,834,386	6,230,170	100.0
Total liabilities and deferred inflows of resources	2,075,004,861	1,964,984,914	110,019,947	5.6
NET POSITION:				
Net investment in capital assets	942,119,408	864,338,873	77,780,535	9.0
Restricted	141,312,557	142,275,759	(963,202)	(0.7)
Unrestricted	126,729,695	77,655,896	49,073,799	63.2
Total net position	\$ 1,210,161,660	\$ 1,084,270,528	\$ 125,891,132	11.6 %

The largest portion of the District's net position (78 percent) reflects its investment in capital assets (e.g., land, reservoir facilities, water treatment facilities and wastewater disposal facilities) less any related debt used to acquire those assets that is still outstanding. The District uses these capital assets to provide services to its member and customer cities; consequently, these assets are not available for future spending. Although the District's investment in its capital assets is reported net of related debt, it should be noted that the resources needed to repay this debt must be provided from other resources, since the capital assets themselves are not intended to be used to liquidate these liabilities.

An additional portion of the District's net position (12 percent) represents resources that are subject to external restrictions on how they may be used. The District's restricted net position consists primarily of the reserve funds required by bond resolutions.

The remaining balance of the District's net position represents unrestricted net position (10 percent) and may be used to meet the District's ongoing obligations.

The increase in net position of \$125,891,132, or 11.6%, during the current fiscal year indicates an improved financial position.

While the Statement of Net Position provides the components of the District's assets, deferred outflows of resources, liabilities, deferred inflows of resources and net position at year-end, the Statement of Revenues, Expenses and Changes in Net Position provides information on the source of the change during the year. The primary sources of the increase in net position of \$125,891,132 were operating income of \$173,379,684 offset by interest expense of \$54,997,252.

North Texas Municipal Water District's Changes in Net Position

	<u>Year Ended September 30</u>		<u>Increase (Decrease)</u>	<u>Percent Change</u>
	<u>2016</u>	<u>2015</u>		
Operating Revenues:				
Water sales	\$ 252,591,522	\$ 215,871,181	\$ 36,720,341	17.0 %
Wastewater service fees	113,132,055	93,754,382	19,377,673	20.7
Solid waste service fees	30,760,383	27,603,397	3,156,986	11.4
Other operating revenues	1,584,262	1,284,498	299,764	23.3
Total Operating Revenues	<u>398,068,222</u>	<u>338,513,458</u>	<u>59,554,764</u>	<u>17.6</u>
Operating Expenses:				
Personnel	65,389,176	53,098,135	12,291,041	23.1
Operating Supplies:				
Chemicals	28,283,012	25,325,219	2,957,793	11.7
Other supplies	14,560,209	10,964,239	3,595,970	32.8
Operating Services:				
Electric power	19,187,942	23,997,861	(4,809,919)	(20.0)
Wholesale water purchases	2,662,651	6,909,337	(4,246,686)	(61.5)
Other services	40,506,216	37,783,612	2,722,604	7.2
Depreciation and amortization	54,099,332	50,508,623	3,590,709	7.1
Total Operating Expenses	<u>224,688,538</u>	<u>208,587,026</u>	<u>16,101,512</u>	<u>7.7</u>
Operating Income	<u>173,379,684</u>	<u>129,926,432</u>	<u>43,453,252</u>	<u>33.4</u>
Investment Income	3,059,347	2,034,940	1,024,407	50.3
Miscellaneous Revenue (Expense)	(432,253)	325,064	(757,317)	(233.0)
Grant Income	-	62,233	(62,233)	(100.0)
Federal Program Revenues	4,005,982	4,013,998	(8,016)	(0.2)
Gain (Loss) on Sale of Capital Assets	875,624	-	875,624	100.0
Interest Expense	<u>(54,997,252)</u>	<u>(49,531,332)</u>	<u>(5,465,920)</u>	<u>11.0</u>
Net Nonoperating Expense	<u>(47,488,552)</u>	<u>(43,095,097)</u>	<u>(4,393,455)</u>	<u>10.2</u>
Change in Net Position	125,891,132	86,831,335	39,059,797	45.0
Net Position, Beginning of Year (As Previously Stated)	<u>1,084,270,528</u>	<u>1,022,463,377</u>	<u>61,807,151</u>	<u>6.0</u>
Change in Reporting	<u>-</u>	<u>(25,024,184)</u>	<u>25,024,184</u>	
Net Position, Beginning of Year	<u>1,084,270,528</u>	<u>997,439,193</u>	<u>86,831,335</u>	<u>8.7</u>
Net Position, End of Year	<u>\$ 1,210,161,660</u>	<u>\$ 1,084,270,528</u>	<u>\$ 125,891,132</u>	<u>11.6%</u>

Total operating revenues for the District for the years ended September 30, 2016 and 2015 were \$398,068,222 and \$338,513,458, respectively. The \$59,554,764 increase in total operating revenues was primarily due to an 11% increase in the member cities water rate, a 20% increase in wastewater charges, and an 11% increase in solid waste service fees to fund capital projects and operating costs. Other operating revenues increased 23.3% due to additional miscellaneous operating revenues, including Mastercard and miscellaneous rebates.

Total operating expenses for the District for the years ended September 30, 2016 and 2015 were \$224,688,538 and \$208,587,026, respectively. Several key factors account for the \$16,101,512 increase in total operating expenses including increased staffing levels (a total increase of 77 employees across all funds) resulting in increased personnel expenses of \$12.3 million, increased operating supplies and services expenses of \$9.3 million primarily as a result of increased chemical expenses, mechanical supplies and pipeline supplies, and an increase in depreciation of \$3.6 million. These increases were offset by decreases in power costs of \$4.9 million and decreased water purchases of \$4.2 million.

Net non-operating expense increased by \$4,393,455 primarily due to an increase in interest expense.

Capital Asset and Debt Administration

Capital Assets

The District's capital assets as of September 30, 2016, amounted to \$2,510,962,344 (net of accumulated depreciation). These capital assets include land and land improvements, reservoir facilities, water treatment and transmission facilities, wastewater treatment and disposal facilities, buildings and other equipment and water rights. The total increase in the District's investment in capital assets for the current year was 6.6%.

Major capital asset events during the current fiscal year included the following:

- Development of the Lower Bois D'Arc Creek Reservoir Project continued; construction in progress at the end of the fiscal year totaled \$80,912,942.
- Construction of the Wylie Water Treatment Plant Ozonation Project continued; construction in progress at the end of the fiscal year totaled \$143,007,506.
- Lake Texoma to Wylie Water Treatment Plant Raw Water Pipeline placed in service totaling \$330,494,153.
- Capitalized improvements at the South Mesquite Regional Wastewater Treatment Plant including the expansion of the plant, electrical improvements and the operations building totaling \$6,546,732. Phases of these improvements were capitalized during the fiscal year for a total of \$4,438,650.
- Lift station generators capitalized in the interceptor system for a total of \$7,849,728.

North Texas Municipal Water District's Capital Assets

(net of accumulated depreciation)

	As of September 30		Increase (Decrease)	Percent Change
	2016	2015		
Land	\$ 71,771,379	\$ 69,129,011	\$ 2,642,368	3.8 %
Easements	58,131,259	47,759,846	10,371,413	21.7 %
Land improvements	3,257,883	3,532,175	(274,292)	(7.8)%
Water treatment, storage and transmission facilities	1,009,252,966	670,329,096	338,923,870	50.6
Wastewater treatment and disposal facilities	487,099,005	465,361,577	21,737,428	4.7
Solid waste transfer and disposal facilities	34,282,199	33,543,714	738,485	2.2
Reservoir facilities and water rights	288,385,014	287,558,416	826,598	0.3
Buildings	36,927,728	26,353,801	10,573,927	40.1
Automobiles and trucks	4,531,603	2,573,516	1,958,087	76.1
Office furniture and fixtures	679,314	221,541	457,773	206.6
Other equipment	22,027,970	20,029,771	1,998,199	10.0
Construction in progress	494,616,024	728,656,169	(234,040,145)	(32.1)
Total	<u>\$ 2,510,962,344</u>	<u>\$ 2,355,048,633</u>	<u>\$ 155,913,711</u>	<u>6.6 %</u>

Additional information on the District's capital assets can be found in Note 4 of this report.

Debt Administration

At the end of the current fiscal year, the District had total outstanding debt of \$1,787,809,381. Of this amount 66% is reflected in the Water System and 12% is reflected in the Regional Wastewater System.

North Texas Municipal Water District's Outstanding Debt

	As of September 30		Increase (Decrease)	Percent Change
	2016	2015		
U.S. government contracts payable	\$ 31,049,381	\$ 32,456,205	\$ (1,406,824)	(4.3)%
Revenue bonds	1,756,760,000	1,686,930,000	69,830,000	4.1
Total	\$ 1,787,809,381	\$ 1,719,386,205	\$ 68,423,176	4.0 %

During the current fiscal year, the District refinanced a portion of the existing debt in order to take advantage of favorable interest rates. The result is expected to decrease future debt service payments by \$6,970,801 in the Wastewater System, \$2,441,896 in the Sewer System, \$484,888 in the Solid Waste System and \$5,254,880 in the Interceptor System.

The District's revenue bonds have been rated as follows:

	Moody's	S&P
Water System	Aa2	AAA
Wastewater System	Aa2	AAA
Solid Waste System	Aa3	AA-
Interceptor System	Aa1	AAA

Additional information on the District's long-term debt can be found in Note 8 of this report.

Economic Factors and Next Year's Budgets and Rates

The Annual Budget outlines the District's plans to continue to provide high quality, cost-effective service to its member and customer cities. As a result of the continued growth in the District's service area, the need for the development of raw water resources and capital expenditures to fund system expansions and improvements continues to increase. Such growth has been considered in developing the District's budget for the 2017 fiscal year.

The 2017 Water System budget provides funding for debt service for \$284 million of bonds to be issued for the construction of the Trinity River Main Stem Pump Station, the Wylie Water Treatment Plant 70 MGD expansion and other system improvements. In order to fund these debt service requirements and the additional operations and maintenance costs, the budget requires a \$.24 per 1,000 gallons rate adjustment. Additional rate adjustments can be expected in the future as the District continues to develop additional raw water supplies and construct treatment and transmission system improvements to meet system demands.

Requests for Information

This financial report is designed to provide a general overview of the District's finances and to demonstrate the District's accountability for the funds it receives. Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to the office of the Accounting Manager, P.O. Box 2408, Wylie, Texas 75098.

North Texas Municipal
Water District

Part C.47 - Interim
Financials

NORTH TEXAS MUNICIPAL WATER DISTRICT
WATER SYSTEM
COMPARATIVE STATEMENT OF NET POSITION
FEBRUARY 28, 2017

	February 28 2017	September 30 2016	Increase (Decrease)
ASSETS:			
CURRENT ASSETS:			
Unrestricted Assets:			
Cash and cash equivalents	\$ 79,129,345	\$ 77,727,425	\$ 1,401,920
Investments	76,998,720	66,075,060	10,923,660
Interest receivable	-	-	-
Accounts receivable	24,141,209	20,391,106	3,750,103
Due from other funds	147,871	1,198,537	(1,050,666)
Prepaid expenses	2,477,088	2,752,930	(275,842)
Unbilled receivables	227,852	254,252	(26,400)
Total unrestricted assets	<u>183,122,085</u>	<u>168,399,310</u>	<u>14,722,775</u>
Restricted Assets:			
Cash and cash equivalents	240,196,533	89,785,998	150,410,535
Investments	275,367,039	147,327,878	128,039,161
Contracts receivable	26,400	26,400	-
Interest receivable	609,910	672,701	(62,791)
Accounts receivable	-	-	-
Due from other funds	126,680	118,339	8,341
Total restricted assets	<u>516,326,562</u>	<u>237,931,316</u>	<u>278,395,246</u>
LONG-TERM ASSETS:			
Net capital assets	<u>1,852,367,079</u>	<u>1,817,637,771</u>	<u>34,729,308</u>
Accrued OPEB asset	<u>663,140</u>	<u>663,140</u>	<u>-</u>
TOTAL ASSETS	<u>2,552,478,866</u>	<u>2,224,631,537</u>	<u>327,847,329</u>
DEFERRED OUTFLOWS OF RESOURCES			
Deferred pension outflow	9,304,772	9,304,772	-
Deferred loss on refunding	22,450,108	17,420,595	5,029,513
TOTAL DEFERRED OUTFLOWS OF RESOURCES	<u>31,754,880</u>	<u>26,725,367</u>	<u>5,029,513</u>
TOTAL ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	<u>2,584,233,746</u>	<u>2,251,356,904</u>	<u>332,876,842</u>
LIABILITIES:			
CURRENT LIABILITIES:			
Payable from Unrestricted Assets:			
Accounts payable and other liabilities	6,691,283	17,578,180	(10,886,897)
Due to other funds	3,229	48,603	(45,374)
Customer Advance Payments	-	175,411	(175,411)
Accrued interest - notes	310,581	820,215	(509,634)
Accrued interest capital lease	-	-	-
Current portion of notes	1,497,624	1,452,272	45,352
Current portion of capital lease obligation	-	-	-
Total payable from unrestricted assets	<u>8,502,717</u>	<u>20,074,681</u>	<u>(11,571,964)</u>
Payable from Restricted Assets:			
Accounts payable	5,893,103	16,839,419	(10,946,316)
Due to other funds	-	61,216	(61,216)
Accrued interest - revenue bonds	29,241,644	4,616,774	24,624,870
Current portion of revenue bonds	49,410,000	42,225,000	7,185,000
Total payable from restricted assets	<u>84,544,747</u>	<u>63,742,409</u>	<u>20,802,338</u>
LONG-TERM LIABILITIES			
Accrued vacation and sick - less current portion	2,571,338	2,571,338	-
Net pension liability	17,233,385	17,233,385	-
Deferred compensation	335,000	347,500	(12,500)
Capital lease obligation - less current portion	-	-	-
Long-term debt - less current portion	1,511,646,374	1,236,720,811	274,925,563
Total long-term liabilities	<u>1,531,786,097</u>	<u>1,256,873,034</u>	<u>274,913,063</u>
TOTAL LIABILITIES	<u>1,624,833,561</u>	<u>1,340,690,124</u>	<u>284,143,437</u>
DEFERRED INFLOWS OF RESOURCES			
Deferred pension inflow	5,333,791	5,333,791	-
Deferred insurance proceeds	-	1,289,915	(1,289,915)
TOTAL DEFERRED INFLOW OF RESOURCES	<u>5,333,791</u>	<u>6,623,706</u>	<u>(1,289,915)</u>
TOTAL LIABILITIES AND DEFERRED INFLOWS OF RESOURCES	<u>1,630,167,352</u>	<u>1,347,313,830</u>	<u>282,853,522</u>
NET POSITION:			
Net investment in capital assets	685,065,767	688,869,056	(3,803,289)
Restricted for debt service	109,236,402	83,827,441	25,408,961
Unrestricted	159,764,225	131,346,577	28,417,648
TOTAL NET POSITION	<u>\$ 954,066,394</u>	<u>\$ 904,043,074</u>	<u>\$ 50,023,320</u>

**NORTH TEXAS MUNICIPAL WATER DISTRICT
WATER SYSTEM
STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION
FOR THE FIVE MONTHS ENDED FEBRUARY 28, 2017**

	Current Month	Year to Date
	<u> </u>	<u> </u>
OPERATING REVENUES:		
Water sales	\$ 24,124,326	\$ 120,619,835
Deferred charges for services	-	-
Other operating revenues	207,180	466,918
Total operating revenues	<u>24,331,506</u>	<u>121,086,753</u>
OPERATING EXPENSES:		
Personnel	3,223,937	17,347,835
Electric power	1,090,805	4,692,547
Chemicals	965,207	5,854,172
Other operating supplies and services	2,442,382	8,688,888
Total operating expenses excluding depreciation	<u>7,722,331</u>	<u>36,583,442</u>
EXCESS OF REVENUES OVER EXPENSES BEFORE DEPRECIATION	16,609,175	84,503,311
Depreciation expense	3,216,896	16,045,266
Total depreciation	<u>3,216,896</u>	<u>16,045,266</u>
OPERATING INCOME (LOSS)	<u>13,392,279</u>	<u>68,458,045</u>
NONOPERATING REVENUES (EXPENSES):		
Investment income	399,128	1,611,065
Miscellaneous revenue/expense	(71,609)	(427,086)
Federal programs revenues	2,000,919	2,000,919
Gain (loss) on sale of capital assets	-	12,368
Interest expenses - long term debt	(4,296,798)	(21,631,991)
Total nonoperating revenues (expenses)	<u>(1,968,360)</u>	<u>(18,434,725)</u>
CHANGE IN NET POSITION	11,423,919	50,023,320
NET POSITION, BEGINNING BALANCE	<u>942,642,475</u>	<u>904,043,074</u>
NET POSITION, ENDING BALANCE	<u>\$ 954,066,394</u>	<u>\$ 954,066,394</u>

**NORTH TEXAS MUNICIPAL WATER DISTRICT
WATER SYSTEM
STATEMENT OF CASH FLOWS
FOR THE FIVE MONTHS ENDED FEBRUARY 28, 2017**

	Current Month	Year to Date
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash received from customers	\$ 24,299,221	\$ 115,927,677
Cash received from other funds	924,958	4,638,701
Cash received from (paid to) others	256,671	990,315
Cash paid to suppliers for goods and services	(6,390,580)	(37,160,440)
Cash paid for employees for services	(2,291,338)	(12,443,307)
Cash paid to other funds	(2,568)	(13,376)
Net cash provided by operating activities	<u>16,796,364</u>	<u>71,939,570</u>
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:		
Proceeds from the issuance of bonds	-	283,758,296
Cash paid for capital assets	(12,954,798)	(64,662,723)
Interest paid on long-term debt	-	-
Interest paid on U.S. government contracts	-	(915,679)
Principal payments on long-term debt	-	-
Payments on U.S. government contracts	-	(1,403,951)
Payments for bond issue costs	-	(1,552,569)
Federal Program Revenues	2,000,919	2,000,919
Net cash used for capital and related financing activities	<u>(10,953,879)</u>	<u>217,224,293</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Sale and maturity of investments	-	72,518,613
Purchase of investments	-	(211,372,988)
Interest received	467,647	1,502,967
Net cash provided by (used for) investing activities	<u>467,647</u>	<u>(137,351,408)</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	6,310,132	151,812,455
CASH AND CASH EQUIVALENTS - Beginning of year	313,015,746	167,513,423
CASH AND CASH EQUIVALENTS - End of year	<u>\$ 319,325,878</u>	<u>\$ 319,325,878</u>
RECONCILIATION OF TOTAL CASH TO THE STATEMENT OF NET POSITION		
Unrestricted cash and cash equivalents	79,129,345	79,129,345
Restricted cash and cash equivalents	240,196,533	240,196,533
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Operating income	13,392,279	68,458,045
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation	3,216,896	16,045,266
Change in current assets and liabilities:		
Accounts receivable and deferred billings	71,776	(4,364,331)
Prepaid expenses	5,003	275,842
Net pension liability	-	-
Due to/from other funds	69,803	1,026,019
Accounts payable, accrued liabilities and developers' deposit	40,607	(9,325,860)
Accrued vacation and Accrued sick	-	-
Accrued OPEB	-	-
Customer advance payments	-	(175,411)
Total adjustments	<u>3,404,085</u>	<u>3,481,525</u>
NET CASH PROVIDED BY OPERATING ACTIVITIES	<u>\$ 16,796,364</u>	<u>\$ 71,939,570</u>
NONCASH TRANSACTION DISCLOSURES		
Gain on disposal of capital assets	-	12,368
Interest capitalized on construction	-	-
Amortization of bond-related items	(969,014)	(3,675,374)
Change in fair value of investments	60,667	234,665
Change in actuarial value of net pension assets	-	-
Refunding bonds issued	-	83,115,000
Refunding proceeds deposited in escrow	-	98,818,916

North Texas Municipal Water District

2017 SWIFT Application

Response - Question 49-B

Publicly Held Debt

<u>Dated Date</u>	<u>Issue Amount</u>	<u>Outstanding Bonds ⁽¹⁾</u>	<u>Issue Description</u>
6/15/2008	\$ 111,780,000	\$ 5,065,000	Water System Revenue Bonds, Series 2008
3/1/2009	9,930,000	9,930,000	Water System Revenue Bonds, Series 2009A
7/15/2009	43,980,000	25,750,000	Water System Revenue Bonds, Series 2009B
11/15/2009	34,330,000	13,575,000	Water System Revenue Refunding & Improvement Bonds, Series 2009C
11/15/2009	109,520,000	103,740,000	Water System Revenue Bonds, Taxable Series 2009D-Build America Bonds
10/15/2010	31,720,000	14,250,000	Water System Revenue Bonds, Series 2010
10/15/2010	108,345,000	108,345,000	Water System Revenue Bonds Taxable, Series 2010A-Build America Bonds
6/15/2012	358,835,000	312,720,000	Water System Revenue Refunding & Improvement Bonds, Series 2012
6/15/2014	171,430,000	167,230,000	Water System Revenue Refunding & Improvement Bonds, Series 2014
4/15/2015	302,125,000	296,120,000	Water System Revenue Refunding & Improvement Bonds, Series 2015
10/15/2016	330,560,000	330,560,000	Water System Revenue Refunding & Improvement Bonds, Series 2016
		<u><u>\$ 1,387,285,000</u></u>	

(1) As of March 31, 2017

North Texas Municipal Water District
 2017 SWIFT Applications
 Response - Question 49-B
 Publicly Held Debt

Fiscal Year Ending 9/30	Outstanding Debt		
	Principal	Interest	Total
2017	\$ 49,410,000	\$ 62,253,365	\$ 111,663,365
2018	48,025,000	63,736,892	111,761,892
2019	50,965,000	61,604,329	112,569,329
2020	53,150,000	59,295,877	112,445,877
2021	54,605,000	56,740,712	111,345,712
2022	54,000,000	54,084,448	108,084,448
2023	57,370,000	51,441,186	108,811,186
2024	60,005,000	48,611,495	108,616,495
2025	58,035,000	45,666,301	103,701,301
2026	60,740,000	42,808,511	103,548,511
2027	63,655,000	39,792,757	103,447,757
2028	63,975,000	36,986,612	100,961,612
2029	65,910,000	33,842,123	99,752,123
2030	68,130,000	30,536,952	98,666,952
2031	72,420,000	27,665,179	100,085,179
2032	75,955,000	24,232,771	100,187,771
2033	53,535,000	20,757,933	74,292,933
2034	56,020,000	18,030,379	74,050,379
2035	53,365,000	15,176,528	68,541,528
2036	38,880,000	12,381,507	51,261,507
2037	33,850,000	10,305,678	44,155,678
2038	35,420,000	8,526,336	43,946,336
2039	30,380,000	6,833,265	37,213,265
2040	24,725,000	5,330,954	30,055,954
2041	17,930,000	4,190,400	22,120,400
2042	18,705,000	3,473,200	22,178,200
2043	19,520,000	2,725,000	22,245,000
2044	20,365,000	1,944,200	22,309,200
2045	13,845,000	1,129,600	14,974,600
2046	14,395,000	575,800	14,970,800
	<u>\$1,387,285,000</u>	<u>\$ 850,680,292</u>	<u>\$ 2,237,965,292</u>

COLLIN COUNTY, TEXAS
TABLE 4.2 - PRINCIPAL EMPLOYERS
CURRENT YEAR AND TEN YEARS AGO
(amounts expressed in thousands)

Employer	2016		2007	
	Employees	Percentage of Total County Employees	Employees	Percentage of Total County Employees
Hp Enterprise Svc Llc	10,000	2.06%	-	-
JP Morgan Chase & Co.	6,000	1.24%	-	-
Bank of America Home Loans	4,646	0.96%	-	-
Liberty Mutual Insurance	4,000	0.82%	-	-
Toyota	4,000	0.82%	-	-
JC Penney Corporate	3,800	0.78%	4,850	1.27%
Capital One	3,683	0.76%	-	-
University of Texas at Dallas	3,500	0.72%	3,058	0.80%
Blue Cross and Blue Shield of Texas	3,100	0.64%	-	-
Medical Center of Plano	3,000	0.62%	-	-
No longer eligible for listing	<u>6,600</u>	1.36%	<u>29,415</u>	7.72%
Total	52,329	10.78%	37,323	9.80%
Total Employed in the County ⁽¹⁾	485,601		380,804	

Source: North Central Texas Council of Governments
(1) Texas A&M University

North Texas Municipal
Water District

Part C 52

NORTH TEXAS MUNICIPAL WATER DISTRICT
REGIONAL WATER SUPPLY FACILITIES AMENDATORY CONTRACT

THE STATE OF TEXAS :

NORTH TEXAS MUNICIPAL WATER DISTRICT :

THIS AMENDATORY CONTRACT (the "Contract") made and entered into as of the 1st day of AUGUST, 1988 (the "Contract Date"), by and between NORTH TEXAS MUNICIPAL WATER DISTRICT (the "District"), a conservation and reclamation district and political subdivision of the State of Texas, created and functioning under Article 16, Section 59, of the Texas Constitution, pursuant to Chapter 62, Acts of the 52nd Legislature, Regular Session, 1951, as amended (the "District Act"), and the following:

CITY OF FARMERSVILLE, IN COLLIN COUNTY, TEXAS,
CITY OF FORNEY, IN KAUFMAN COUNTY, TEXAS,
CITY OF GARLAND, IN DALLAS COUNTY, TEXAS
CITY OF MCKINNEY, IN COLLIN COUNTY, TEXAS,
CITY OF MESQUITE, IN DALLAS COUNTY, TEXAS,
CITY OF PLANO, IN COLLIN AND DENTON COUNTIES, TEXAS,
CITY OF PRINCETON, IN COLLIN COUNTY, TEXAS,
CITY OF RICHARDSON, IN DALLAS AND COLLIN COUNTIES, TEXAS,
CITY OF ROCKWALL, IN ROCKWALL COUNTY, TEXAS,
CITY OF ROYSE CITY, IN ROCKWALL AND COLLIN COUNTIES, TEXAS, and
CITY OF WYLIE, IN COLLIN COUNTY, TEXAS

(collectively the "Initial Contracting Parties").

W I T N E S S E T H

WHEREAS, each of the Initial Contracting Parties is a duly incorporated city and political subdivision of the State of Texas operating under the Constitution and laws of the State of Texas; and

WHEREAS, the District and the Initial Contracting Parties are authorized to enter into this Contract pursuant to the District Act, Vernon's Ann. Tex. Civ. St. Article 4413(32c) (the "Interlocal Cooperation Act"), and other applicable laws; and

WHEREAS, the District presently owns water rights in Lavon Reservoir on the East Fork of the Trinity River in Collin County, Texas, and owns and operates other water supply and treatment facilities which serve the Initial Contracting Parties (the "Existing System"); and

WHEREAS, the District has duly issued and delivered the following described bonds (the "Outstanding Bonds") which were issued to acquire and construct, and to refund bonds issued to acquire and construct, the Existing System:

North Texas Municipal Water District Water System Revenue Bonds, Series 1985, dated August 1, 1985, now outstanding in the aggregate principal amount of \$78,967,321.45; and

North Texas Municipal Water District Water System Revenue Bonds, Series 1987, dated March 1, 1987, now outstanding in the aggregate principal amount of \$24,565,000; and

WHEREAS, the District presently supplies and sells treated water from the Existing System to the Initial Contracting Parties under eleven separate treated water supply contracts, including various amendments thereto, now in effect; and it is acknowledged and agreed that the Existing System is inadequate to provide known future treated water requirements of the Initial Contracting Parties, thus making this Contract

necessary to enable the District to acquire and construct additional treated water supply and treatment facilities and make it possible for the District to supply such requirements; and

WHEREAS, the existing treated water supply contracts recognize that the District has assumed the responsibility for supplying all treated water needs of the Initial Contracting Parties; and

WHEREAS, each of said existing treated water supply contracts originally was dated as of December 12, 1953, except for the City of Richardson contract originally dated as of April 7, 1965, and each is similar in form and substance, and such contracts, including all amendments thereto, collectively presently provide the principal source and security for the payment of the District's Outstanding Bonds; and

WHEREAS the District proposes to acquire, construct, and complete additional surface water supply and treatment facilities from the following additional sources: Lake Texoma on the Red River, Cooper Dam and Reservoir in Hopkins and Delta Counties, Texas, a proposed new Bonham Dam and Reservoir in Fannin County, Texas, and other facilities wherever located to enable the District to supply treated water as needed to Contracting Parties and others (the "Projects"); and

WHEREAS, it is deemed necessary and advisable by the parties hereto that each of the eleven separate existing

treated water supply contracts, and amendments thereto, between the District and each Initial Contracting Party be amended and completely replaced with this single Contract so that the entire relationship between the District and all of the Initial Contracting Parties with respect to the System and the Bonds (as such terms are hereinafter defined) will be set forth in this Contract; and

WHEREAS, it is specifically represented, certified, and covenanted by the District that none of the amendments or modifications to the aforesaid existing treated water supply contracts with the Initial Contracting Parties which will occur as a result of entering into this Contract will in any way have an adverse affect on the operation of the System or the rights of the owners of any Bonds; and that this Contract will provide security for the owners of all Bonds and obligate the Initial Contracting Parties to make and assume unconditional specific payments with respect to the System and the Bonds; and

WHEREAS, the provisions of this Contract are similar in concept, essence, and intent to the provisions of the aforesaid existing treated water supply contracts and basically restate, reorganize, and expand same, including certain clarifications and updating, and establishing certain billing procedures and adjustments between the parties with respect to the use of, and payments with respect to, treated water from the System, which billing procedures and adjustments are solely between the

Initial Contracting Parties and do not affect the unconditional obligations of such parties with respect to the System and Bonds; and

WHEREAS, it is expected by the parties hereto that after the execution of this Contract, Bonds for parts of the Projects will be issued as soon as deemed advisable and necessary by the District.

NOW, THEREFORE, in consideration of the mutual covenants and agreements herein contained, the District agrees to use its best efforts to acquire, construct, and complete the Projects and other System facilities, when and as the District deems it advisable, and to supply treated water to Contracting Parties and others from the System, upon and subject to the terms and conditions hereinafter set forth, and, subject to the provisions of Section 13(b) and (c) hereof, the District and the Initial Contracting Parties agree that each of the eleven presently existing treated water supply contracts described above between the District and the Initial Contracting Parties are hereby amended, modified, combined, and consolidated so as henceforth to be in their entirety and for all purposes as follows, to-wit:

Section 1. DEFINITION OF TERMS. The following terms and expressions as used in this Contract, unless the context clearly shows otherwise, shall have the following meanings:

(a) "Additional Contracting Party" means any party not defined as one of the Initial Contracting Parties with which the District makes a contract similar to this Contract for supplying treated water from the System, provided that after execution of any such contract such party shall become one of the Contracting Parties for all purposes of this Contract.

(b) "Annual Payment" means the amount of money to be paid to the District by each of the Contracting Parties during each Annual Payment Period as its proportionate share of the Annual Requirement.

(c) "Annual Payment Period" means the District's fiscal year, which currently begins on October 1 of each calendar year and ends on September 30 of the next following calendar year, but which may be any twelve consecutive month period fixed by the District; and the first Annual Payment Period under this Contract shall be the period of October 1, 1988, through September 30, 1989.

(d) "Annual Requirement" means the total amount of money required for District to pay all Operation and Maintenance Expenses of the System, and to pay the Bond Service Component of the Annual Requirement as described in Section 9(a) hereof, including debt service on its Bonds, and any sums required to pay or restore any amounts required to be deposited in any special or reserve funds required to be established and/or maintained by the provisions of the Bond Resolutions.

(e) "Bond Resolution" means any resolution of the District which authorizes any Bonds.

(f) "Bonds" means the Outstanding Bonds listed in the preamble to this Contract, and all bonds hereafter issued by the District, whether in one or more series or issues, and the interest thereon, to acquire, construct, complete, improve, and/or extend the System or any System facilities, including the Projects, and/or otherwise to improve or extend the System, and any bonds issued to refund any Bonds or to refund any such refunding bonds.

(g) "Contracting Parties" means the "Initial Contracting Parties", as defined in the first paragraph of this Contract, together with any other party or parties which hereafter becomes one of the Contracting Parties by becoming an Additional Contracting Party.

(h) "Contracting Party" means any one of the Contracting Parties.

(i) "District" means the "District" as defined in the preamble to this Contract.

(j) "Existing System" means the "Existing System" as defined in the preamble to this Contract.

(k) "MGD" is an abbreviation for "million gallons of water per day" and means a quantity of water during a period of time expressed for convenience in terms of an average annual daily quantity during an Annual Payment Period. The value of 2

MGD, for example, is calculated as follows: two million gallons multiplied by the number of days in an Annual Payment Period.

(l) "Operation and Maintenance Expenses" means all reasonable costs and expenses of operation and maintenance of the System, including (for greater certainty but without limiting the generality of the foregoing) repairs and replacements, operating personnel, the cost of utilities, the amounts required to pay the U.S. Army Corps of Engineers or any other federal, state, or local agency for water storage rights or other interests in water in any reservoir, or for the purchase of water, or for the use or operation of any property or facilities, the costs of supervision, engineering, accounting, auditing, legal services, insurance premiums, supplies, services, administration of the System, and equipment necessary for proper operation and maintenance of the System, and payments made by District in satisfaction of judgments resulting from claims not covered by District's insurance arising in connection with the acquisition, construction, operation, and maintenance of the System. The term also includes the charges of the bank or banks acting as paying agents and/or registrars for any Bonds. The term does not include depreciation.

(m) "Outstanding Bonds" means the Outstanding Bonds, as defined in the preamble to this Contract.

(n) "Projects" means the "Projects" as defined in the preamble to this Contract.

(o) "System" means collectively the Existing System and the Projects, and all of the District's existing water rights, and water storage, treatment, transportation, distribution, and supply facilities, including all dams, reservoirs, and other properties or interests therein wherever located, which heretofore have been acquired or constructed with the proceeds from the sale of the Outstanding Bonds, or the bonds refunded by same, or with any other bonds or other obligations of the District payable from and secured by a lien on and pledge of any part of the revenues of the System, or with revenues from said System, together with all future improvements, enlargements, extensions, and additions to any of the foregoing, and all future new facilities and/or water rights, which are acquired or constructed with the proceeds from the sale of any Bonds or revenues from the System, and any water supply or treatment facilities which are deliberately and specifically, at the option of the District, made a part of the System by resolution of the Board of Directors of the District, and all repairs to or replacements of the System. Said terms do not include any District facilities which provide wastewater treatment or disposal services, or solid waste disposal services, of any kind. Said terms do not include any facilities acquired or constructed by the District with the proceeds from

the issuance of "Special Facilities Bonds", which are hereby defined as being revenue obligations of the District which are not issued as Bonds (as hereinbefore defined), and which are payable from any source, contract, or revenues whatsoever other than revenues from the System.

(p) "treated water" means potable water treated to the standards of quality specified in Section 5 of this Contract. Such term does not include non-potable water such as wastewater or other non-potable water derived, treated, or produced from any source by any Contracting Party.

(q) "Water Year" means the period of August 1 of each calendar year through July 31 of the next following calendar year.

Section 2. CONSTRUCTION OF PROJECTS. The District agrees to use its best efforts to issue its Bonds, payable from Annual Payments under this Contract, to acquire and construct the Projects and other System facilities when and as needed, as determined by the District, to supply treated water to all Contracting Parties. It is anticipated that such acquisition and construction will be in phases and that each phase will be financed by the District through the issuance of one or more series or issues of its Bonds; and the District agrees to use its best efforts to issue its Bonds for such purpose. Bonds also may, at the discretion of the District, be issued to refund any Bonds, and be issued to improve and/or extend

any System facilities. The proceeds from the sale and delivery of the Bonds may be used to fund debt service reserve funds or contingency funds and interest during construction to the extent deemed advisable by the District, and for the payment of all of the District's expenses and costs in connection with any Projects or other System facilities and the Bonds, including, without limitation, all financing, legal, printing, and other expenses and costs related to the Bonds and the Projects and other System facilities.

Section 3. QUANTITY. (a) The District agrees to sell and to deliver treated water under this Contract to each Initial Contracting Party, respectively, at its Point or Points of Delivery as described in Section 6 hereof, and each Initial Contracting Party agrees to take at its Point or Points of Delivery all treated water required for use by such Initial Contracting Party during the term of this Contract, including all treated water for such Initial Contracting Party's own use and for distribution to all customers served by such Initial Contracting Party's treated water distribution system, whether inside or outside its boundaries. It is specifically provided, however, that after the Contract Date, no Contracting Party shall enter into, renew, or amend with regard to volume of water to be supplied, any agreement to supply any such treated water for use outside its boundaries or the area of its statutory extraterritorial jurisdiction unless each such agreement

is approved by the Board of Directors of the District (which approval shall not be unreasonably withheld) and made subject and subordinate in all respects to the water requirements of all of the Contracting Parties collectively. No Contracting Party shall become a party to any contract for the sale of treated water which would violate or be inconsistent with the provisions of this Contract, and all such contracts shall recognize the priority of treated water use as provided in this Contract. It is the intention of the parties hereto that the System shall be the sole and exclusive source of all treated water supply for each of the Contracting Parties. However, notwithstanding the foregoing provisions of this subsection (a), if, after the Contract Date, any Contracting Party should legally and finally annex or consolidate with any territory which has a source of treated water supply other than from such Contracting Party, then the District and such Contracting Party are authorized to, and may, negotiate and enter into agreements which would allow the continued use of such other source within such annexed territory upon such terms and conditions as are mutually agreeable to the District and such Contracting Party, and as an exception to the foregoing requirements with respect to exclusivity. The District will use its best efforts to furnish and remain in position to furnish treated water sufficient for all reasonable treated water requirements of each Contracting Party, but its obligation shall be limited to the

amount of treated water available to it from the System; and provided that the maximum rate of delivery shall be consistent with the capacities and abilities of System facilities, and shall not exceed the amounts fixed on an equitable and uniform basis by the Board of Directors of the District. The District agrees to use its best efforts to issue its Bonds in amounts necessary to acquire, construct, maintain, improve, and extend the entire System, including the Projects and other System facilities, so as to enable the District to furnish such treated water. As between the Contracting Parties, if treated water from the System must be rationed such rationing shall, within the limits permitted by law, be done by the District on the basis of the relative actual total amount of all treated water from the entire System taken by each such Contracting Party, respectively, during the last preceding Annual Payment Period in which rationing among said parties was not necessary.

(b) If the District is at any time during the term of this Contract unable to supply all the treated water requirements of the Contracting Parties for any reason, or if it should become apparent that the District will become unable to supply the Contracting Parties with their water requirements, and any Contracting Party determines that it is necessary to procure treated water from sources other than the District, then such Contracting Party shall give written notice to the District of its intention and desire to procure treated water

from sources other than the District, and its reasons therefor. Unless, within sixty (60) days from the receipt by the District of such written notice, the District shall object to such procurement (such objection to be evidenced by a resolution adopted by a vote of a majority of all members of the District's Board of Directors), then such Contracting Party may proceed to procure such treated water from other sources at its sole cost, and without any liability for damages accruing in favor of or against the District by reason thereof. However, such Contracting Party shall nevertheless continue to be obligated to take from the District and pay for all treated water at any time available to such Contracting Party from the District's System up to the full treated water requirements of such Contracting Party. In no event shall the taking of treated water from a source other than the District relieve any Contracting Party from making all payments due the District under this Contract. Further, all Contracting Parties shall at all times have the right to secure treated water from any possible source (i) in any emergency when the District is unable to deliver treated water from the System because of any "Force Majeure" as defined in this Contract, or (ii) in any other emergency situation, as determined by a Contracting Party for a period not to exceed thirty days, or for any longer period approved in writing by the District. Notwithstanding the foregoing provisions of this Contract, any Contracting

Party also may purchase treated water from a source other than the System, if the District determines that such purchase is in the best interests of the District and the Contracting Parties and gives written approval to such purchase; and in such case, for the purposes of this Contract, the District shall be deemed to be the constructive purchaser of such water and such water shall be deemed to be System water, and the District shall either pay for said water on behalf of such Contracting Party or reimburse such Contracting Party for the cost of such water, and such Contracting Party shall pay the District for such water the same as if it were regular System water.

Section 4. OTHER CONTRACTS. (a) The District reserves the right to supply treated water from the System to Additional Contracting Parties under contracts similar to this Contract, subject to the requirements concerning "minimums" as provided in Section 9(c) hereof. Each contract with any Additional Contracting Party shall comply with the requirements of this Contract, shall substantially restate the essential provisions of this Contract, and shall be structured to be similar hereto to the fullest extent applicable and practicable, with such additions or changes as are necessary to meet the actual circumstances, with the effect that each Additional Contracting Party will in effect adopt the provisions of this Contract, as supplemented and necessarily changed by its contract.

(b) It is recognized and agreed that the District now has many System water supply contracts with entities other than the Initial Contracting Parties, which contracts will remain in full force and effect, in accordance with their terms and provisions, after the Contract Date. The District shall enforce the aforesaid existing water supply contracts during the entire terms thereof, unless any such contract is replaced by a contract with an Additional Contracting Party hereunder. Upon the expiration of each such contract with any party the District thereafter may sell water to such party only on the basis that it is a new customer with respect to System water.

(c) It is further recognized and agreed that in the future the District may sell any water from the System to parties which are not Additional Contracting Parties, provided that all such future sales of water from the System to parties which are not Additional Contracting Parties shall, within the limits permitted by law, in all respects be subordinate to the prior rights of the Contracting Parties to water from the System, and all such sales and contracts relating thereto shall recognize, and be made subordinate to, such prior rights.

(d) It is recognized and agreed that concurrently with the execution of this Contract the District and the City of Garland will execute a separate agreement with respect to raw industrial water to be taken directly by Garland from Lavon Reservoir for use as cooling water for its steam electric

generating plant. Such agreement will substantially restate and completely replace the rights and obligations of the parties with respect to raw industrial water from Lavon Reservoir under the presently existing additions and modifications dated November 6, 1964, and August 7, 1973, respectively, to the original treated water contract dated December 12, 1953, between the District and Garland. After the execution of said separate agreement, it will constitute the sole agreement between said parties with respect to raw industrial water in Lavon Reservoir, and this Contract will constitute the sole agreement between said parties with respect to treated water from the System.

Section 5. QUALITY. The water to be delivered by the District and received by each Contracting Party shall be treated water from the System. Each Initial Contracting Party has satisfied itself that such water will be suitable for its needs, but the District is obligated to treat such water so as to meet the standards of all State and Federal agencies having jurisdiction over water quality. The District and the Contracting Parties shall cooperate, each within its legal powers, in preventing, to the extent practicable, the pollution and contamination of the reservoirs and watersheds from which System water is obtained.

Section 6. POINTS OF DELIVERY. The Point or Points of Delivery for each Initial Contracting Party shall be the Point

or Points of Delivery applicable to it under its present treated water supply contract with the District, or at any other Point or Points of Delivery mutually agreed upon between the District and such Initial Contracting Party. Each Contracting Party shall construct, maintain, and operate, at its own cost and expense, all facilities and equipment necessary to receive and take all treated water delivered to it under this Contract.

Section 7. MEASURING EQUIPMENT.

(a) District shall furnish, install, operate, and maintain at its own expense at each Point of Delivery of each Contracting Party the necessary equipment and devices of standard type for measuring properly the quantity of treated water delivered under this agreement. Such meter or meters and other equipment so installed shall remain the property of District. Each Contracting Party shall have access to such metering equipment at all reasonable times, but the reading, calibration, and adjustment thereof shall be done only by the employees or agents of the District. For the purpose of this agreement the original record or reading of the meter or meters shall be the journal or other record book of District in its office in which the records of the employees or agents of District who take the reading are or may be transcribed. Upon written request of any Contracting Party, District will send it a copy of such journal or record book, or permit it to have

access to the same in the office of District during reasonable business hours.

Not more than once in each calendar month, on a date as near the end of such calendar month as practical, District shall calibrate its meters if requested in writing by a Contracting Party to do so, in the presence of a representative of the Contracting Party, and the parties shall jointly observe any adjustments which are made to the meters in case any adjustments shall be necessary, and if the check meters hereinafter provided for have been installed, the same shall also be calibrated by Contracting Party in the presence of a representative of District and the parties shall jointly observe any adjustment in case any adjustment is necessary. If any Contracting Party shall in writing request District to calibrate its meters and District shall give the Contracting Party notice of the time when any such calibration is to be made and a representative of the Contracting Party is not present at the time set, District may proceed with calibration and adjustment in the absence of any representative of the Contracting Party.

If a Contracting Party or the District at any time observes a variation between the delivery meter or meters and the check meter or meters at that Contracting Party's Point or Points of Delivery, if any such check meter or meters shall be installed, such party will promptly notify the other party, and the District and such Contracting Party shall then cooperate to

procure an immediate calibration test and joint observation of any adjustment and the same meter or meters shall then be adjusted to accuracy. The party performing the test shall give the other party forty-eight (48) hours' notice of the time of all tests of meters so that the other party may conveniently have a representative present.

If upon any test, the percentage of inaccuracy of any metering equipment is found to be in excess of two per cent (2%), registration thereof shall be corrected for a period extending back to the time when such inaccuracy began, if such time is ascertainable, and if such time is not ascertainable, then for a period extending back one-half ($\frac{1}{2}$) of the time elapsed since the last date of calibration, but in no event further back than a period of six (6) months. If for any reason any meters are out of repair so that the amount of water delivered to a Contracting Party cannot be ascertained or computed from the reading thereof, the water delivered through the period such meters are out of service or out of repair shall be estimated and agreed upon by the District and such Contracting Party upon the basis of the best data available. For such purpose, the best data available shall be deemed to be the registration of any check meter or meters if the same have been installed and are accurately registering. Otherwise, the amount of water delivered during such period may be estimated (i) by correcting the error if the percentage of the error is

ascertainable by calibration tests or mathematical calculation, or (ii) estimating the quantity of delivery by deliveries during the preceding periods under similar conditions when the meter or meters were registering accurately.

Any Contracting Party may, at its option and its own expense, install and operate a check meter to check each meter installed by District, but the measurement of water for the purpose of this agreement shall be solely by District's meters, except in the cases hereinabove specifically provided to the contrary. All such check meters shall be of standard make and shall be subject at all reasonable times to inspection and examination by any employee or agent of District, but the reading, calibration and adjustment thereof shall be made only by the Contracting Party, except during any period when a check meter may be used under the provisions hereof for measuring the amount of water delivered, in which case the reading, calibration, and adjustment thereof shall be made by District with like effect as if such check meter or meters had been furnished or installed by District.

Section 8. UNIT OF MEASUREMENT. The unit of measurement for treated water delivered under this Contract shall be 1,000 gallons of water, U.S. Standard Liquid Measure.

Section 9. PRICES AND TERMS; PAYMENTS BY CONTRACTING PARTIES. (a) Annual Requirement and Proportionate Payment.

It is acknowledged and agreed that payments to be made under this Contract and any similar contracts with Additional Contracting Parties will be the primary source available to the District to provide the Annual Requirement, and that, in compliance with the District's duty to fix and from time to time revise the rates of compensation or charges for water sold and services rendered and made available by the District, the Annual Requirement will change from time to time, and that each such Annual Requirement shall be allocated among the Contracting Parties as hereinafter provided, and that the Annual Requirement for each Annual Payment Period shall at all times be not less than an amount sufficient to pay or provide for the payment of:

- (A) An "Operation and Maintenance Component" equal to the amount paid or payable for all Operation and Maintenance Expenses of the System; and
- (B) A "Bond Service Component" equal to:
 - (1) the principal of, redemption premium, if any, and interest on, its Bonds, as such principal, redemption premium, if any, and interest become due, less interest to be paid out of Bond proceeds or from other sources if permitted by any Bond Resolution, and all amounts required to redeem any Bonds prior to maturity when and as provided in

- any Bond Resolution; and
- (2) the proportionate amount of any special, reserve, or contingency funds required to be accumulated and maintained by the provisions of any Bond Resolution; and
 - (3) any amount in addition thereto sufficient to restore any deficiency in any of such funds required to be accumulated and maintained by the provisions of any Bond Resolution.

It is agreed that for the treated water supply to be provided to Contracting Parties under this Contract and similar contracts, each of the Contracting Parties shall pay, at the time and in the manner hereinafter provided, its proportionate share of the Annual Requirement, which shall be determined as hereafter described and shall constitute a Contracting Party's Annual Payment. Each of the Contracting Parties shall pay its proportionate share of the Annual Requirement for each Annual Payment Period directly to the District, in approximately equal monthly installments, or before the 10th day of each month.

(b) Calculation of Proportionate Payments; Rates. For each Annual Payment Period each Contracting Party's proportionate share of the Annual Requirement shall be a percentage obtained by dividing the minimum amount specified and calculated for it for such period, in accordance with sub-section (c)

of this Section 9, by the aggregate minimum amounts specified and calculated for all Contracting Parties for such period in accordance with said sub-section (c). Thus the base "rate" per 1,000 gallons of treated water which each Contracting Party must pay for treated water during any Annual Payment Period may be calculated and expressed by dividing the dollar amount of such Contracting Party's proportionate share of the Annual Requirement by the number of 1,000 gallons contained within its specified minimum amount for such Annual Payment Period. All such payments for each Annual Payment Period shall be made in accordance with a schedule of payments for the appropriate Annual Payment Period which will be supplied to each of the Contracting Parties by the District.

(c) Minimums. For the purpose of calculating the minimum amount of each Annual Requirement for which each Initial Contracting Party is unconditionally liable, without offset or deduction (also see Section 10(g)), each Initial Contracting Party, during each Annual Payment Period, shall be deemed to have taken and used the minimum annual average daily amount of System treated water (regardless of whether or not such amount is or was actually taken or used) specified for such Initial Contracting Party as follows:

for each of the Initial Contracting Parties, respectively, a minimum amount, expressed in MGD, during each Annual Payment Period, equal to the greater of:

- (1) .898 MGD for the City of Farmersville
1.159 MGD for the City of Forney
32.476 MGD for the City of Garland
4.433 MGD for the City of McKinney
15.806 MGD for the City of Mesquite
28.688 MGD for the City of Plano
.634 MGD for the City of Princeton
19.760 MGD for the City of Richardson
2.633 MGD for the City of Rockwall
.523 MGD for the City of Royse City
1.186 MGD for the City of Wylie, or
- (2) the maximum number of MGD actually taken from the System by such Initial Contracting Party during any previous Water Year (as hereinbefore defined) during the term of this Contract; it being agreed and understood that any use of System water in any Water Year by any Initial Contracting Party in excess of (i) the minimum amount specified for it in clause (1), above, or (ii) as determined in accordance with this clause (2), will establish a new minimum amount to be effective for the next following Annual Payment Period and thereafter until any previously increased minimum amount is further

exceeded in any subsequent Water Year, with each such increase in minimums to be effective for the next following Annual Payment Period and thereafter until further increased in accordance with this clause (2) .

Notwithstanding the foregoing provisions of this subsection (c), if any portion of an Initial Contracting Party's minimum amount is attributable to treated water sold or delivered to an entity outside of its boundaries, pursuant to a treated water supply contract, and (i) if such entity should become an Additional Contracting Party and such treated water supply contract be terminated, or (ii) if such treated water supply contract with such Initial Contracting Party otherwise should be terminated and in lieu thereof such entity should enter into a treated water supply contract with the District as permitted in Section 4 hereof, then such Initial Contracting Party's minimum amount for the next Annual Payment Period and thereafter shall be reduced by the maximum MGD previously taken by said entity from such Initial Contracting Party during any previous Water Year pursuant to such terminated treated water supply contract with such Initial Contracting Party.

All contracts with Additional Contracting Parties shall provide for equitable minimums similar to those provided for above. Such minimums shall be fixed in amounts at least sufficient, as determined by the District, to assure an initial

Annual Payment by each Additional Contracting Party for not less than the amount of its estimated use of treated water during the first year of service under such contract.

(d) Excess Water Charges. It is further agreed that, in addition to the amounts required to be paid by Contracting Parties pursuant to sub-sections (a), (b), (c), and (e) of this Section 9, if any Contracting Party during any Water Year uses System treated water in excess of the minimum amount applicable to it for the Annual Payment Period which commenced during such Water Year, then such Contracting Party shall pay an "Excess Water Charge" equal to that part of the Operation and Maintenance Expenses (electric power, chemicals, and other similar costs) directly attributable to supplying such excess treated water to such Contracting Party, all as determined by the District. Such Excess Water Charge shall be billed by the District to such Contracting Party as soon as practicable after the end of such Water Year and shall be paid to the District as soon as practicable thereafter, and in all events prior to the beginning of the next Annual Payment Period. Such Excess Water Charges shall be credited to and be used for paying part of the Operation and Maintenance Expenses for the then current Annual Payment Period and reduce to the extent of such credits the amounts which otherwise would be payable by the Contracting Parties during such then current Annual Payment Period.

(e) Redetermination of Annual Requirement. Each Contracting Party's share of the Annual Requirement shall be redetermined, after consultation with each of the Contracting Parties, at any time during any Annual Payment Period, to the extent deemed necessary or advisable by the District, if:

- (i) The District commences supplying System treated water to an Additional Contracting Party or Parties;
- (ii) Unusual, extraordinary, or unexpected expenditures for Operation and Maintenance Expenses are required which are not provided for in the District's Annual Budget for the System or in any Bond Resolution;
- (iii) Operation and Maintenance Expenses are substantially less than estimated;
- (iv) The District issues Bonds which require an increase in the Bond Service Component of the Annual Payment; or
- (v) The District receives either significantly more or significantly less revenues or other amounts than those anticipated.

(f) Other Revenues. During each Annual Payment Period the revenues derived from sales of System water, other than sales of treated water to Contracting Parties, shall be credited to and be used for paying part of the Annual Requirement in the manner determined by the District, with the result that

such credits shall reduce, to the extent of such credits, the amounts which otherwise would be payable by the Contracting Parties pursuant to the methods prescribed in sub-sections (a) (b), (c), and (e), above. The District shall estimate all such credits which it expects to make during each Annual Payment Period in calculating each Annual Payment.

(g) Annual Budget. On or before the first day of the fourth calendar month prior to the beginning of each Annual Payment Period hereafter the District shall furnish each Contracting Party with a tentative or preliminary estimated schedule of the monthly payments to be made by such party to the District for the ensuing Annual Payment Period. On or before the first day of the second calendar month prior to the beginning of each Annual Payment Period hereafter the District shall furnish each Contracting Party with an updated estimated schedule of the monthly payments to be made by such Party to the District for the next ensuing Annual Payment Period. Prior to the first day of each Annual Payment Period hereafter the District shall furnish each Contracting Party with a final estimated schedule of the monthly payments to be made by such Party to the District for the next ensuing Annual Payment Period, together with the supporting budgetary data showing the basis for arriving at such schedule. Any surplus budgeted funds remaining on hand at the end of any Annual Payment Period shall be used during the following Annual Payment Period and

reduce in the manner determined by the District, to the extent of any such surplus funds, the amounts which otherwise would be payable by the Contracting Parties under sub-sections (a), (b), (c), and (e), above. Each Contracting Party hereby agrees that it will make such payments to the District on or before the 10th day of each month of such Annual Payment Period. If any Contracting Party at any time disputes the amount to be paid by it to the District, such complaining party shall nevertheless promptly make such payment or payments, but if it is subsequently determined by agreement or court decision that such disputed payments made by such complaining party should have been less, or more, the District shall promptly revise and reallocate the charges among all Contracting Parties in such manner that such complaining party will recover its overpayment or the District will recover the amount due it.

(h) Delinquencies. All amounts due and owing to the District by each Contracting Party or due and owing to any Contracting Party by the District shall, if not paid when due, bear interest at the rate of ten (10) percent per annum from the date when due until paid. The District shall, to the extent permitted by law, suspend delivery of water from the System to any Contracting Party which remains delinquent in any payments due hereunder for a period of sixty days, and shall not resume delivery of water while such Contracting Party is so delinquent. It is further provided and agreed that if any

Contracting Party should remain delinquent in any payments due hereunder for a period of one hundred twenty days, and if such delinquency continues during any period thereafter, such Contracting Party's minimum amount of MGD as described in sub-section (c), above, shall be deemed to have been zero MGD during all periods of such delinquency, for the purpose of calculating and redetermining the percentage of each Annual Payment to be paid by the non-delinquent Contracting Parties. However, the District shall promptly pursue all legal remedies against any such delinquent Contracting Party to enforce and protect the rights of the District, the other Contracting Parties, and the owners of the Bonds, and such delinquent Contracting Party shall not be relieved of the liability to the District for the payment of all amounts which would have been due hereunder, in the absence of the next preceding sentence. It is understood that the foregoing provisions are for the benefit of the owners of the Bonds so as to insure that all of each Annual Requirement will be paid by the non-delinquent Contracting Parties during each Annual Payment Period regardless of the delinquency of a Contracting Party. If any amount due and owing by any Contracting Party to the District is placed with an attorney for collection, such Contracting Party shall pay to the District all attorneys fees, in addition to all other payments provided for herein, including interest.

(i) Updated Schedules of Payment. If, during any Annual Payment Period, any Contracting Party's Annual Payment is redetermined as provided in this Section, the District will promptly furnish such Contracting Party with an updated schedule of monthly payments reflecting such redetermination.

Section 10. SPECIAL CONDITIONS AND PROVISIONS. (a) Operation and Maintenance of System. The District will continuously operate and maintain the System in an efficient manner and in accordance with good business and engineering practices, and at reasonable cost and expense. By executing this Contract the Initial Contracting Parties waive any and all claims, as against each other, to any preferential right or entitlement to the capacity or use of specific water sources of the District. The District recognizes its right and duty to operate the various facilities of the System in the most prudent and economical manner for the benefit of all the Contracting Parties. The District shall exercise loyalty, good faith, and fair dealing relating to all System activities undertaken by the District as between the District and the Contracting Parties.

(b) Permits, Financing, and Applicable Laws. It is understood that any obligations on the part of the District to acquire, construct, and complete the Projects and other System facilities and to provide treated water from the Projects and other System facilities to the Contracting Parties shall be (i) conditioned upon the District's ability to obtain all necessary

permits, material, labor, and equipment, and upon the ability of the District to finance the cost of the Projects and other System facilities through the actual sale of the District's Bonds and (ii) subject to all present and future valid laws, orders, rules, and regulations of the United States of America, the State of Texas, and any regulatory body having jurisdiction.

(c) Title to Water; Indemnification. Title to all treated water supplied to each Contracting Party shall be in the District up to each Point of Delivery, at which point title shall pass to the receiving Contracting Party. The District and each of the Contracting Parties shall save and hold each other party harmless from all claims, demands, and causes of action which may be asserted by anyone on account of the transportation and delivery of said water while title remains in such party. Notwithstanding any other provision of this Contract, it is specifically provided that water obtained or resulting from the wastewater treatment operations of any Contracting Party shall be under the sole and exclusive dominion, control, and ownership of such Contracting Party and the District shall have no right, title, or interest in or claim against such water of any nature whatsoever.

(d) Payments Solely From Revenues. The District shall never have the right to demand payment by any Initial Contracting Party of any obligations assumed by it or imposed on it under and by virtue of this Contract from funds raised or to be raised by taxes, and the obligations under this Contract shall

never be construed to be a debt of such kind as to require any of the Initial Contracting Parties to levy and collect a tax to discharge such obligation.

(e) Operating Expenses of Initial Contracting Parties.

Each of the Initial Contracting Parties represents and covenants that all payments to be made by it under this Contract shall constitute reasonable and necessary "operating expenses" of its waterworks system, in accordance with Vernon's Ann. Tex. Civ. St. Articles 1113 and 4413(32c). It is further recognized that the waterworks system of each Initial Contracting Party is presently combined with its sewer system in accordance with law for operating and financing purposes. Each of the Initial Contracting Parties, respectively, represents and has determined that the treated water supply to be obtained from the System, including the Projects and other System facilities, is absolutely necessary and essential to the present and future operation of its waterworks system and is the only available and adequate source of supply of treated water therefor. Accordingly, the payments required by this Contract to be made by each Initial Contracting Party shall constitute reasonable and necessary operating expenses of its waterworks system and shall be made as provided by law, including the aforesaid Articles 1113 and 4413(32c). In accordance with said Article 1113, such payments shall have priority over the payment of principal of and interest on all bonds and other

similar obligations heretofore or hereafter issued by any Initial Contracting Party.

(f) Initial Contracting Parties' Rates For Water and Sewer System Services. Each of the Initial Contracting Parties agrees throughout the term of this Contract to continuously operate and maintain its combined waterworks and sewer system, and to fix and collect such rates and charges for water and sewer services to be supplied by its combined waterworks and sewer system as aforesaid as will produce revenues in an amount equal to at least (i) all of its payments under this Contract and (ii) all other amounts required to be paid from said revenues by law and the provisions of the ordinances or resolutions authorizing its revenue bonds or other obligations now or hereafter outstanding.

(g) Initial Contracting Parties' Unconditional Obligations. Recognizing the fact that the Initial Contracting Parties urgently require the facilities and services of the System, and that such facilities and services are essential and necessary for actual use and for standby purposes, and recognizing the fact that the District will use payments received from the Initial Contracting Parties to pay and secure the Bonds, it is hereby agreed that each of the Initial Contracting Parties shall be unconditionally obligated to pay, without

offset or deduction, its proportionate share of each Annual Requirement, as provided and determined by this Contract (including the obligations for paying for "minimums" as described in Section 9 (c) hereof), regardless of whether or not the District actually acquires, constructs, or completes the Projects or other System facilities or is actually delivering water from the System to any Contracting Party, or whether or not any Contracting Party actually receives or uses water from the System whether due to Force Majeure or otherwise, and regardless of any other provisions of this or any other contract or agreement between any of the parties hereto. This covenant by the Initial Contracting Parties shall be for the benefit of, and enforceable by, the owners of the Bonds as well as the District.

Section 11. FORCE MAJEURE. If by reason of force majeure any party hereto shall be rendered unable wholly or in part to carry out its obligations under this Contract, other than the obligation of each Contracting Party to make the payments required under Section 9 of this Contract, then if such party shall give notice and full particulars of such force majeure in writing to the other parties within a reasonable time after occurrence of the event or cause relied on, the obligation of the party giving such notice, so far as it is affected by such force majeure, shall be suspended during the continuance of the inability then claimed, but for no longer period, and any such

party shall endeavor to remove or overcome such inability with all reasonable dispatch. The term "Force Majeure" as employed herein shall mean acts of God, strikes, lockouts, or other industrial disturbances, acts of public enemy, orders of any kind of the Government of the United States or the State of Texas, or any Civil or military authority, insurrection, riots, epidemics, landslides, lightning, earthquake, fires, hurricanes, storms, floods, washouts, droughts, arrests, restraint of government and people, civil disturbances, explosions, breakage or accidents to machinery, pipelines or canals, partial or entire failure of water supply, or on account of any other causes not reasonably within the control of the party claiming such inability.

Section 12. INSURANCE. The District agrees to carry and arrange for fire, casualty, public liability, and/or other insurance, including self insurance, on the System for purposes and in amounts which, as determined by the District, ordinarily would be carried by a privately owned utility company owning and operating such facilities, except that the District shall not be required to provide liability insurance except to insure itself against risk of loss due to claims for which it can, in the opinion of the District's legal counsel, be liable under the Texas Tort Claims Act or any similar law or judicial decision. Such insurance will provide, to the extent feasible and practicable, for the restoration of damaged or destroyed

properties and equipment, to minimize the interruption of the services of such facilities. All premiums for such insurance shall constitute an Operation and Maintenance Expense of the System.

Section 13. TERM AND EFFECT OF CONTRACT. (a) This Contract shall, upon execution by the District and all of the Initial Contracting Parties, be effective as of the Contract Date, and this Contract shall continue in force and effect until all Bonds and all interest thereon shall have been paid or provided for, and thereafter shall continue in force and effect during the entire useful life of the System. The requirement for making the Annual Payments as prescribed in Section 9 of this Contract shall commence as of October 1, 1988. Until October 1, 1988, payments for treated water shall continue to be made to the District by the Initial Contracting Parties in accordance with the eleven separate existing treated water supply contracts, and amendments thereto, between the District and the Initial Contracting Parties.

(b) It is specifically agreed and understood that this Contract, as of the Contract Date, will supersede all of the contracts, agreements, and arrangements between each of the parties hereto with respect to the System and treated water from the System and the Bonds, and that this Contract, as of the Contract Date, will completely amend and supersede all such contracts, agreements, and arrangements with respect to the

System and treated water from the System and the Bonds, and will constitute the sole agreement between the parties hereto or any of them with respect to the System and treated water from the System and the Bonds; and all such previous contracts, agreements, and arrangements shall be void and shall be of no force or effect, except for payments due and liabilities accrued thereunder prior to October 1, 1988, and except as provided in subsections (a) and (c), of this Section 13, and except that the "AGREEMENT BETWEEN THE NORTH TEXAS MUNICIPAL WATER DISTRICT AND THE CITY OF MCKINNEY FOR AN ADDITIONAL POINT OF DELIVERY", authorized by said City's resolution adopted September 2, 1986, and the District's resolution adopted December 18, 1986, shall be and remain in full force and effect until its expiration, and said City shall make payments to the District thereunder in addition to those required under this Contract, with such additional payments to be treated and applied as "other revenues" in accordance with Section 9(b) of this Contract.

(c) It is recognized by the parties to this Contract that the eleven previous treated water supply contracts, and amendments thereto, between the District and the Initial Contracting Parties, respectively, which are being amended hereby, together with the proceedings relating thereto, previously have been submitted to an Attorney General of Texas, along with bonds of the District heretofore issued, as provided in the District

Act, and that an Attorney General, in his certificates and opinions relating to such bonds, found that such contracts were made in accordance with the Constitution and laws of the State of Texas, and that they are valid and enforceable in accordance with their terms and provisions. Further, an Attorney General approved each of such contracts, with the effect that pursuant to the provisions of the District Act such contracts "shall be valid and binding and shall be incontestable for any cause". In order to protect the rights of the owners of the Bonds and the parties to this Contract, it is specifically agreed and understood by the parties to this Contract that, any provisions of this Contract to the contrary notwithstanding, if for any reason whatsoever this Contract, or any part of this Contract significantly affecting the rights of the owners of the Bonds, should be held to be invalid or unconstitutional, or in contravention of any law or any constitutional provisions, then the foregoing contracts shall be construed and deemed to be and to have been in full force and effect at all times to the extent required to protect the rights of the owners of the Bonds and the parties to such contracts. It is further agreed and understood by the parties to this Contract that this Contract is amendatory in nature and is not intended to, and does not, abrogate the rights of the owners of any Bonds, and is not intended to, and does not, affect adversely in any way the security therefor, but is intended to and does confirm the

security therefor, substantially restate, clarify, carry forward, update, improve, and extend the provisions of the previous contracts.

Section 14. MODIFICATION. No change or modification of this Contract shall be made which will affect adversely the prompt payment when due of all moneys required to be paid by any Contracting Party under the terms of this Contract or any similar contract, and no such change shall be effective which would cause a violation of any provisions of any Bond Resolution. No change or modification of this Contract shall be made without the written consent of all parties hereto.

Section 15. REGULATORY BODIES AND LAWS. This Contract is subject to all applicable Federal and State laws and any applicable permits, ordinances, rules, orders, and regulations of any local, state, or federal governmental authority having or asserting jurisdiction, but nothing contained herein shall be construed as a waiver of any right to question or contest any such law, ordinance, order, rule, or regulation in any forum having jurisdiction.

Section 16. NOTICES. Unless otherwise provided herein, any notice, communication, request, reply, or advice (herein severally and collectively, for convenience, called "Notice") herein provided or permitted to be given, made, or accepted by any party to any other party must be in writing and may be

given or be served by depositing the same in the United States mail postpaid and registered or certified and addressed to the party to be notified, with return receipt requested, or by delivering the same to an officer of such party, or by prepaid telegram when appropriate, addressed to the party to be notified. Notice deposited in the mail in the manner hereinabove described shall be conclusively deemed to be effective, unless otherwise stated herein, from and after the expiration of three days after it is so deposited. Notice given in any other manner shall be effective only if and when received by the party to be notified. For the purposes of notice, the addresses of the parties shall, until changed as hereinafter provided, be as follows:

If to the District, to:

North Texas Municipal Water District
P. O. Drawer C
Wylie, Texas 75098

If to the Initial Contracting Parties, as follows:

City of Farmersville
303 S. Main
Farmersville, Texas 75031

City of Forney
101 E. Main Street
Forney, Texas 75126

City of Garland
200 N. Fifth Street
P. O. Box 469002
Garland, Texas 75040

City of McKinney
P. O. Box 517
McKinney, Texas 75069

City of Mesquite
711 N. Galloway
Mesquite, Texas 75149

City of Plano
P. O. Box 860358
Plano, Texas 75086-0358

City of Princeton
306 N. Front Street
Princeton, Texas 75077

City of Richardson
411 W. Arapaho Road
Richardson, Texas 75080

City of Rockwall
205 W. Rusk
Rockwall, Texas 75087

City of Royse City
P. O. Drawer A
Royse City, Texas 75089

City of Wylie
P. O. Box 428
Wylie, Texas 75098

The parties hereto shall have the right from time to time and at any time to change their respective addresses and each shall have the right to specify as its address any other address by at least fifteen (15) days' written notice to the other parties hereto.

Section 17. SEVERABILITY. The parties hereto specifically agree that in case any one or more of the sections, subsections, provisions, clauses, or words of this Contract or the application of such sections, subsections, provisions, clauses, or words to any situation or circumstance should be, or should be held to be, for any reason, invalid or unconstitutional,

under the laws or constitutions of the State of Texas or the United States of America, or in contravention of any such laws or constitutions, such invalidity, unconstitutionality, or contravention shall not affect any other sections, subsections, provisions, clauses, or words of this Contract or the application of such sections, subsections, provisions, clauses, or words to any other situation or circumstance, and it is intended that this Contract shall be severable and shall be construed and applied as if any such invalid or unconstitutional section, subsection, provision, clause, or word had not been included herein, and the rights and obligations of the parties hereto shall be construed and remain in force accordingly.

Section 18. REMEDIES UPON DEFAULT. It is not intended hereby to specify (and this Contract shall not be considered as specifying) an exclusive remedy for any default, but all such other remedies (other than termination) existing at law or in equity may be availed of by any party hereto and shall be cumulative. Recognizing however, that the District's undertaking to provide and maintain a supply of water hereunder is an obligation, failure in the performance of which cannot be adequately compensated in money damages alone, the District agrees, in the event of any default on its part, that each Contracting Party shall have available to it the equitable remedy of mandamus and specific performance in addition to any

other legal or equitable remedies (other than termination) which may also be available. Recognizing that failure in the performance of any Initial Contracting Party's obligations hereunder could not be adequately compensated in money damages alone, each Initial Contracting Party agrees in the event of any default on its part that the District shall have available to it the equitable remedy of mandamus and specific performance in addition to any other legal or equitable remedies (other than termination) which may also be available to the District. No waiver or waivers of any breach or default (or any breaches or defaults) by any party hereto or of performance by any other party of any duty or obligation hereunder shall be deemed a waiver thereof in the future, nor shall any such waiver or waivers be deemed or construed to be waiver of subsequent breaches or defaults of any kind, character, or description, under any circumstances.

Section 19. VENUE. All amounts due under this Contract, including, but not limited to, payments due under this Contract or damages for the breach of this Contract, shall be paid and be due in Collin County, Texas, which is the County in which the principal administrative offices of the District are located. It is specifically agreed among the parties to this Contract that Collin County, Texas, is a principal place of performance of this Contract; and in the event that any legal

proceeding is brought to enforce this Contract or any provision hereof, the same shall be brought in Collin County, Texas.

IN WITNESS WHEREOF, the parties hereto acting under authority of their respective governing bodies have caused this Contract to be duly executed in several counterparts, each of which shall constitute an original, all as of the day and year first above written, which is the date of this Contract.

NORTH TEXAS MUNICIPAL WATER DISTRICT

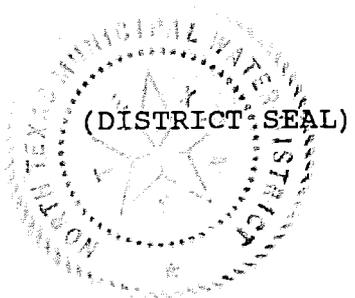
BY *James W. White*
President, Board of Directors.

ATTEST:

B. D. [unclear]
Secretary, Board of Directors

APPROVED AS TO FORM AND LEGALITY:

McCall, Parkhurst + Horton
Attorneys for the District



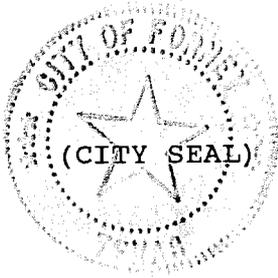
CITY OF FARMERSVILLE, TEXAS

BY *R. L. Zedford*
Mayor

ATTEST:

Ann Bridges
City Secretary





APPROVED AS TO FORM AND LEGALITY:

Joe Acosta
City Attorney

CITY OF FORNEY, TEXAS

W. T. Cates
Mayor

ATTEST:

Shelly Green
City Secretary

APPROVED AS TO FORM AND LEGALITY:

Robert L. Dillard
City Attorney

(CITY SEAL)

CITY OF GARLAND, TEXAS

Ruth Nicholson
Mayor

ATTEST:

Mica Church
City Secretary

APPROVED AS TO FORM AND LEGALITY:

Clark H. [Signature]
City Attorney



CITY OF MCKINNEY, TEXAS

BY *[Signature]*
Mayor

ATTEST:

Jennifer B. Smith
City Secretary

APPROVED AS TO FORM AND LEGALITY:

[Signature]
City Attorney



CITY OF MESQUITE, TEXAS

BY *George L. Penner, Sr.*
Mayor

ATTEST:

Lynne Krueger
City Secretary

APPROVED AS TO FORM AND LEGALITY:

[Signature]
City Attorney



CITY OF PLANO, TEXAS

BY *Jack Hawman*
Mayor

ATTEST:

Jackie Blakely
City Secretary



APPROVED AS TO FORM AND LEGALITY:

Larry Chatham
City Attorney

CITY OF PRINCETON, TEXAS

BY Mary K. Edwards
Mayor

ATTEST:

Ann Marie Price
City Secretary



APPROVED AS TO FORM AND LEGALITY:

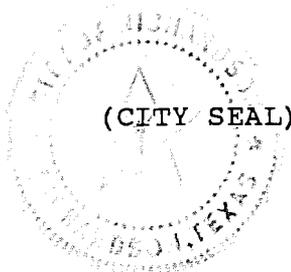
Mark S. [Signature]
City Attorney

CITY OF RICHARDSON, TEXAS

BY Charles Spann
Mayor

ATTEST:

Paula Miller
City Secretary

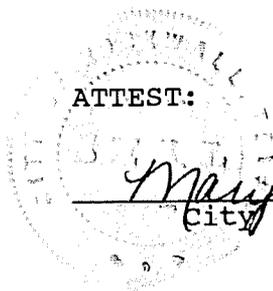


APPROVED AS TO FORM AND LEGALITY

Peter D. Smith
City Attorney

CITY OF ROCKWALL, TEXAS

BY *John R. Mollen*
Mayor



ATTEST:

Mary A. Nichols
City Secretary

APPROVED AS TO FORM AND LEGALITY

[Signature]
City Attorney

(CITY SEAL)

CITY OF ROYSE CITY, TEXAS

Andy Bucher
Mayor

ATTEST:

Donie Williams
City Secretary

APPROVED AS TO FORM AND LEGALITY:

[Signature]
City Attorney



(CITY SEAL)

CITY OF WYLIE, TEXAS

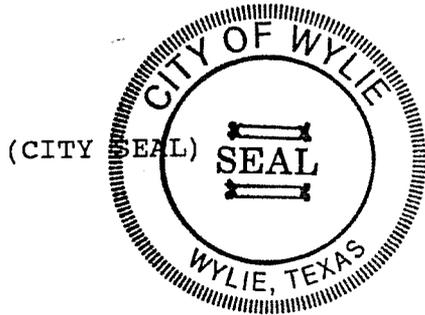
[Signature]
Mayor

ATTEST:

Carolyn Jones
City Secretary

APPROVED AS TO FORM AND LEGALITY

Robert L. Dillard III
City Attorney *RD*



SWIFT Funding Information

North Texas Municipal Water District

Lower Bois D'Arc Creek Reservoir
Project No. 317

Vol. 1

- Part D #53 - Narrative
- Part D #53 & #54 Revised DEIS - (pt. A)
through Appendix F-1

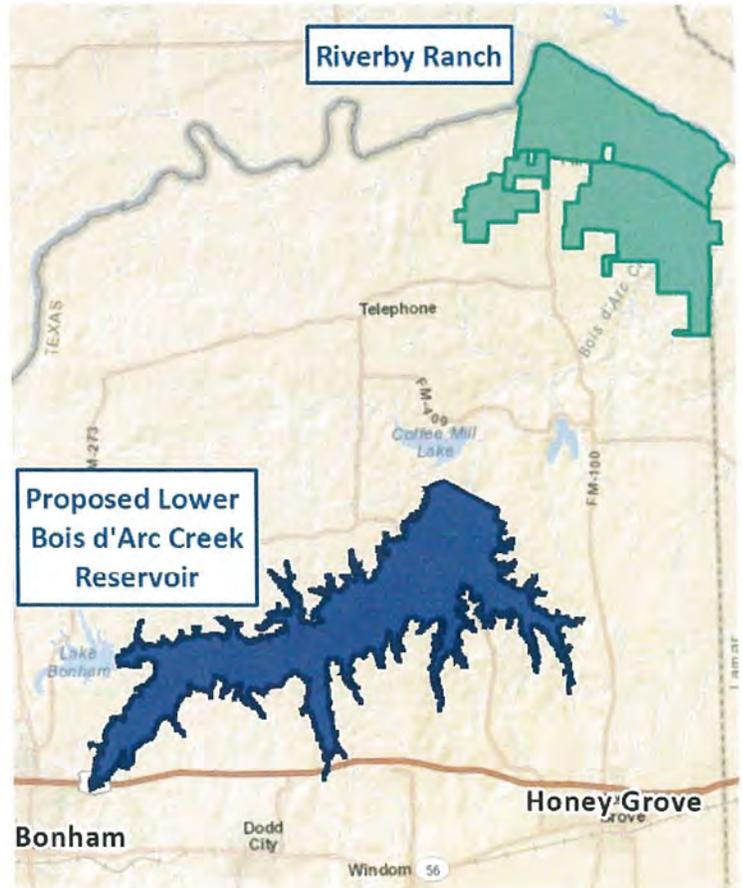
53. Description of Project Need – Please Reference the Draft Environmental Impact Statement (DEIS) issued by the U.S. Army Corps of Engineers and dated March 2017. The “Purpose Need” section on Page ES-2 of the Executive Summary (Page 8 of 602 of the PDF File Titled “LBCR Revised DEIS 3-21-17 PRINT READY”) discusses the need for the LBCR project. The LBCR project detailed in the DEIS terminates at the proposed Leonard Water Treatment Plant (LWTP). In addition to this description, the NTMWD has a separate Capital Improvements Program (CIP) pipeline that will allow the new water supply to enter the existing NTMWD distribution system. This 84” pipeline from Leonard to McKinney is being executed under the overall NTMWD LBCR Program.



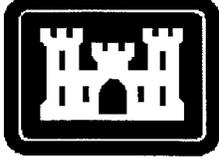
LOWER BOIS D'ARC CREEK RESERVOIR
Fannin County, Texas
SECTION 404 PERMIT APPLICATION

Revised Draft Environmental Impact Statement
Volume I – Revised DEIS

U.S. Army Corps of Engineers
Tulsa District



March 2017



LOWER BOIS D'ARC CREEK RESERVOIR
Fannin County, Texas
SECTION 404 PERMIT APPLICATION

Revised Draft Environmental Impact Statement
Volume I – Revised DEIS

U.S. Army Corps of Engineers
Tulsa District Regulatory Office

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LOWER BOIS D'ARC CREEK RESERVOIR

Fannin County, Texas

SECTION 404 PERMIT APPLICATION

U.S. Army Corps of Engineers

Tulsa District

Revised Draft Environmental Impact Statement

March 2017

ABSTRACT

The Tulsa District of the U.S. Army Corps of Engineers (USACE) received an application for a Department of the Army Permit under Section 404 of the Clean Water Act (CWA) from the North Texas Municipal Water District (NTMWD) to construct Lower Bois d'Arc Creek Reservoir (LBCR) and related facilities (e.g., pipeline, water treatment plant, terminal storage reservoir) in Fannin County, Texas. The Proposed Action consists of a regional water supply project intended to provide up to 175,000 acre-feet/year (AFY) of new water, with an estimated firm yield of 120,665 AFY, for NTMWD's member cities and direct customers in all or portions of nine counties in northern Texas. A dam approximately 10,400 feet (about two miles) long and up to 90 feet high would be constructed, and much of the reservoir footprint would be cleared of trees and built structures. The total "footprint" of the proposed project site, including the dam, is 17,068 acres, and the reservoir, with a surface area of 16,641 acres at normal pool, would have a total storage capacity of approximately 367,609 acre-feet.

In accordance with the National Environmental Policy Act (NEPA), the USACE determined that issuance of such a permit may have a significant impact on the quality of the human environment and therefore prepared a Draft Environmental Impact Statement (DEIS). The DEIS examined the Proposed Action and the No Action Alternative in detail. The DEIS was issued in February 2015. The DEIS public and agency comment period extended for 60 days and closed on April 21, 2015. During the comment period, the USACE received nearly 600 comments on the DEIS. The comments ranged from questions regarding the technical analysis to the NEPA process including development of the proposed action, purpose and need, and alternatives.

Based on careful consideration of the issues raised during the DEIS public and agency comment period and new information developed since the release of the DEIS, the USACE has decided to revise the DEIS and recirculate it for review. The Revised Draft Environmental Impact Statement (RDEIS) includes an additional action alternative (Alternative 2) as well as revisions based on comments received on the DEIS.

In the RDEIS, the original Applicant's Proposed Action is called Alternative 1, while a downsized version of the dam and reservoir at the same site is called Alternative 2. The footprint of the Alternative 2 reservoir falls entirely within the footprint of the Alternative 1 reservoir. The smaller dam and reservoir of Alternative 2 would encompass a combined area of 9,305 acres (slightly more than half the size of the Alternative 1 dam and reservoir footprint), of which the reservoir itself would comprise approximately 8,600 acres, with a storage capacity of 135,200 acre-feet and a firm yield of 86,100 AFY. Under Alternative 2, in order to meet the purpose and need of the proposed action – at least 105,804 AFY of new

water supply by 2025 – 28,700 AFY of water from Lake Texoma, to which NTMWD already has permit rights, would be blended with LBCR water at a new water treatment plant near Leonard, Texas for a combined reliable supply of 114,800 AFY from Alternative 2.

The proposed LBCR site is located in an area of largely rural countryside with scattered residences. Approximately 38 percent of the larger reservoir footprint is cropland and 37 percent consists of bottomland hardwoods and riparian woodlands, with the remaining 25 percent mostly upland deciduous forest. Under Alternative 1, construction of the reservoir and related facilities would result in permanent impacts to approximately 4,602 acres of forested wetlands, 1,223 acres of emergent wetlands, 49 acres of scrub shrub wetlands, 78 acres of open waters, and 123.3 miles of intermittent and ephemeral streams, in addition to impacts on upland habitats. Under Alternative 2, construction of the reservoir and related facilities would result in permanent impacts to approximately 2,909 acres of forested wetlands, 684 acres of emergent wetlands, 27 acres of scrub shrub wetlands, 78 acres of open waters, and 66.1 miles of intermittent and ephemeral streams, in addition to impacts on upland habitats.

The applicant (NTMWD) has prepared a mitigation plan to compensate for impacts to aquatic and terrestrial resources associated with the proposed LBCR project. Specific plan objectives are to mitigate for unavoidable adverse impacts to waters of the United States in the project area, which include forested wetlands, emergent wetlands, scrub shrub wetlands, open water, and streams, that would occur as a result of constructing the proposed LBCR. This mitigation would be achieved through wetland restoration and enhancement and stream restoration and enhancement at the nearby mitigation sites, Riverby Ranch and the Upper Bois d' Arc Creek (BDC) Mitigation Site. On the reservoir site, the creation of the lake would offset impacts to open waters and some of the stream impacts, and it would allow for establishment of emergent wetlands in shallow areas around the lake (littoral wetlands). The development of the reservoir also would enhance Bois d' Arc Creek downstream of the proposed reservoir site through reductions in the frequency of destructive high flow events and the passage of sustainable environmental flows to maintain and enhance existing downstream habitats.

USACE's decision whether to issue a Section 404 permit will be based on an evaluation of the probable impacts, including cumulative impacts, of Alternative 1 and Alternative 2 on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits that reasonably may be expected to accrue from the proposal must be balanced against the reasonably foreseeable detriments. All factors that may be relevant to the proposal will be considered, including the cumulative effects thereof; among those are conservation, economics, aesthetics, wetlands, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people. In addition, the evaluation of the impact of the work on the public interest will include application of the guidelines promulgated by the Administrator, Environmental Protection Agency, under authority of Section 404(b) of the Clean Water Act (40 C.F.R. Part 230).

Comments on the RDEIS may be sent to:

Andrew R. Commer
Chief, Regulatory Office, Tulsa District
United States Army Corps of Engineers
1645 South 101st East Avenue, Tulsa, OK 74128-4609
or via e-mail: ceswt-ro@usace.army.mil

Comments must be received within 45 days of publication of the Notice of Availability in the *Federal Register*.

Revised Draft Environmental Impact Statement Proposed Lower Bois d'Arc Creek Reservoir

Executive Summary

Introduction

The U.S. Army Corps of Engineers, Tulsa District (USACE) has received an application for a Department of the Army Permit under Section 404 of the Clean Water Act (CWA) from the North Texas Municipal Water District (NTMWD) to construct Lower Bois d'Arc Creek Reservoir (LBCR). NTMWD is a conservation and reclamation district and political subdivision of the state of Texas. A 1975 amendment to the State Legislature Act, which created the NTMWD, authorizes it to acquire, treat, and distribute potable water, and to collect, treat and dispose of wastes, both liquid and solid, in order to reduce pollution, conserve, and develop the natural resources of Texas.

In accordance with the National Environmental Policy Act (NEPA), the USACE determined that issuance of such a permit may have a significant impact on the quality of the human environment and therefore prepared a Draft Environmental Impact Statement (DEIS). The DEIS examined the Proposed Action and the No Action Alternative in detail. It was issued in February 2015. The DEIS public and agency comment period extended for 60 days and closed on April 21, 2015. During the comment period, the USACE received nearly 600 comments on the DEIS. Comments were provided related to the technical analysis and the NEPA process, including development of the Proposed Action, purpose and need, and alternatives.

Based on careful consideration of the comments provided during the DEIS public and agency comment period and new information developed since the release of the DEIS, the USACE has decided to revise the DEIS and recirculate the revised document for review. This Revised Draft Environmental Impact Statement (RDEIS) includes an additional action alternative as well as revisions based on comments received on the DEIS.

Cooperating Agencies

A number of federal, state, and tribal agencies have cooperated or participated in studies, surveys, investigations and meetings related to the preparation of the DEIS and RDEIS. These agencies include:

- U.S. Environmental Protection Agency (Region 6, Dallas, TX) – cooperating agency
- U.S. Forest Service (Caddo National Grasslands) – cooperating agency
- U.S. Fish and Wildlife Service (Ecological Services) – cooperating agency
- USDA Natural Resources Conservation Service
- Texas Commission on Environmental Quality (TCEQ)
- Texas Water Development Board
- Texas Parks and Wildlife Department – cooperating agency
- Texas Historical Commission (THC)
- Red River Authority of Texas

- Native American Tribes (in particular the Caddo Nation of Oklahoma, signatory to a Programmatic Agreement on Archeological Resources with USACE, NTMWD, and the THC)

Purpose and Need

The purpose of the Proposed Action is to develop an additional supply of water to address the growing demand of NTMWD's customers. State population projections show the NTMWD service area population increasing from about 1.75 million in 2020 to 3.7 million by 2070. The LBCR would provide a new water supply to help meet this increasing demand. Even with aggressive efforts by NTMWD to promote water conservation, encourage efficiency, and develop water reuse projects, aggregate demand for new potable water supply will grow substantially over the coming 50 years.

NTMWD provides wholesale treated water, wastewater treatment, and regional solid waste services to member cities and customers in a service area covering parts of nine counties in North Central Texas. This service area is one of the fastest growing in the state of Texas. The growing population and the location of the growth are the impetus behind increased demands for water and the need to develop new sources of water supply. To meet these projected needs, the NTMWD will have to construct a new northern water treatment plant by 2020 to serve the fast-growing northern sectors of its service area. The LBCR would provide new supply to the proposed northern plant to help meet this increasing demand.

The USACE Tulsa District is responsible for defining the basic purpose of the proposed project. Under the guidelines governing the USACE's evaluation of a CWA Section 404 permit application, the basic purpose must be identified to determine if the proposed project in question is "water dependent" and requires access or proximity to or siting within a special aquatic site such as wetlands in order to fulfill its basic purpose. The USACE has determined that the basic project purpose in the present case is to develop an additional, reliable water supply for the applicant (NTMWD) and its member cities and customers. Access or proximity to or siting within special aquatic sites is not required to fulfill the basic project purpose in this case; therefore, the basic purpose is not water dependent.

Proposed Action – Alternative 1

The proposed dam and reservoir would be located on Bois d'Arc Creek, in the Red River watershed, approximately 15 miles northeast of the City of Bonham, between Farm-to-Market (FM) Road 1396 and FM Road 409, in Fannin County, Texas. The total "footprint" of the proposed project site, or the area it encompasses, is 17,068 acres. The project site is in an area of largely rural countryside with scattered residences. Approximately 38 percent is cropland and 37 percent consists of bottomland hardwoods and riparian woodlands, with the remaining 25 percent consisting of mostly upland deciduous forest.

The purpose of the proposed project is to impound the waters of Bois d'Arc Creek and its tributaries to create a new 16,641-acre (26-square mile) water supply reservoir for the NTMWD. An additional 427 acres would be required for the construction of the dam and spillways, for a total project footprint of 17,068 acres. NTMWD has requested the right to impound up to 367,609 acre-feet of water and divert up to 175,000 acre-feet/year, with an estimated firm yield of 126,200 acre-feet of water per year (AFY). State population projections show the population of the NTMWD service area increasing from 1.75 million in 2020 to 3.7 million by 2070. The LBCR would provide a new source of supply to help meet the increasing water demands of this growing population. It could be available by 2020-2021.

The LBCR dam would be approximately 10,400 feet (about two miles) in length and would have a maximum height of approximately 90 feet. The design top elevation of the embankment would be at 553.5 feet above mean sea level (MSL) with a conservation pool elevation of 534.0 feet MSL, controlled by a service spillway at elevation 534.0 feet MSL with a crest length of 150 feet. The service spillway

would be located at the right abutment of the dam. Required low-flow releases would be made through a 36-inch diameter low-flow outlet. An emergency spillway would also be located in the right abutment of the dam. The emergency spillway would be a 1,400-foot wide uncontrolled broad crested weir structure with a crest elevation of 541 feet MSL. This elevation was selected to contain the 100-year storm such that no flows pass through the emergency spillway during this event.

Raw water from the reservoir would then be transported by approximately 35 miles of new pipeline 90 to 96 inches in diameter to a proposed new terminal storage reservoir and water treatment plant – the “North Water Treatment Plant” – just west of the City of Leonard in southwest Fannin County. A number of rural roads within the footprint and in the vicinity of the proposed reservoir would have to be closed or relocated; the most significant of these is FM 1396, which would be relocated to cross the reservoir in a different alignment on an entirely new bridge that would need to be constructed.

Construction of the dam and impoundment of water within the normal pool elevation of 534 feet MSL would result in direct fill impact or inundation of waters of the United States, including wetlands. Approximately 120 acres (54.2 linear miles) of existing intermittent streams, 99 acres (69.1 miles) of intermittent/ephemeral streams, 78 acres of open water, 4,602 acres of forested wetlands, 1,223 acres of emergent (herbaceous) wetlands, and 49 acres of scrub shrub (shrub) wetlands would be impacted. Additionally, construction of the raw water pipeline, new terminal storage reservoir, and water treatment plant, in combination, would temporarily impact 0.44 acre (4,335 linear feet) of streams and 0.1 acre of open waters. The impacts of constructing and operating the Proposed Action are summarized below.

Alternative 2 – Downsized LBCR with Blending

Alternative 2 consists of a smaller reservoir constructed within the footprint of the Proposed Action. The smaller LBCR would produce an estimated yield of 86,100 AFY. Water from the smaller reservoir would then be blended with water supplied from Lake Texoma. The combination of the water from the smaller LBCR with water from Lake Texoma would be of sufficient quantity to meet the purpose and need. The NTMWD estimates that 2025 would be the earliest that the water would be available from Alternative 2.

The alternative would consist of the following primary elements: 1) a smaller dam and reservoir at the LBCR site; 2) a 25-mile long raw water pipeline from Lake Texoma to an existing 96-inch pipeline, and an 8-mile segment from that pipeline to the WTP; 3) new raw water pipeline from the smaller LBCR to the WTP, and 4) the WTP and TSR. The reservoir would have a conservation pool elevation of 515 feet MSL and maximum storage capacity of 135,200 AF. The reservoir would have a maximum surface area of 8,600 acres.

The dam’s footprint would be about the same size as that required for the Proposed Action. However, the construction footprint of the dam and reservoir would total approximately 9,390 acres, about half the size of the construction footprint of the Proposed Action. Other facilities, including the service spillway, outlet works, emergency spillway, and pumping station would be similar, but slightly smaller than the Proposed Action.

Operation of the smaller reservoir would be controlled by the terms specified in a modified version of the Texas water rights permit already held by NTMWD for Alternative 1. It is assumed that these terms would be similar to those specified in the water rights permit for the Proposed Action and would include Bois d’Arc Creek flow requirements.

Construction of the reservoir and associated facilities would result in impacts similar to the Proposed Action. Impacts to waters of the U.S. would include loss of perennial streams, intermittent streams,

forested wetlands, herbaceous wetlands, and shrub wetlands. The impacts of constructing and operating Alternative 2 are summarized below.

No Action Alternative

NEPA requires the consideration of a No Action Alternative. In this case, “no action” consists of not building the proposed dam and reservoir, pipelines, and WTP, eliminating the need for a Section 404 permit. For purposes of comparison of impacts in the EIS and as summarized below, it was assumed that NTMWD would not move forward with an alternative water supply project as they do not have a viable back-up plan to the proposed reservoir. The USACE has also assumed that the environmental conditions under the No Action Alternative would be broadly similar to existing conditions.

Mitigation Plan

An aquatic resources mitigation plan has been prepared by the NTMWD to comply with the federal policy of “no overall net loss of wetlands” and to provide compensatory mitigation, to the extent practicable, for impacts to other waters of the United States from construction of the proposed reservoir. This mitigation would be achieved through restoration actions planned for sites near the location of the proposed project. Mitigation would occur on-site and off-site at the 15,000-acre Riverby Ranch and the 1,900-acre Upper Bois d'Arc Creek site. The mitigation plan includes site protection, management, and financial assurances.

NTMWD has purchased the Riverby Ranch, which borders the Red River. This working ranch is located downstream of the proposed project within both the same watershed (Bois d'Arc Creek) and the same county (Fannin). NTMWD acquired the Riverby Ranch specifically because its biophysical features have the potential to provide appropriate mitigation for the proposed project. Additional mitigation would be provided upstream of the proposed reservoir within the Bois d'Arc Creek floodplain, within the reservoir itself, and on Bois d'Arc Creek downstream of the reservoir as a result of an operations plan and flow regime established in consultation with the TCEQ, and stipulated in the Water Use Permit issued by TCEQ to NTMWD in June 2015. Appendix C of the RDEIS contains the detailed Revised Mitigation Plan and Appendix D, the Reservoir Operation Plan, also includes additional mitigation measures.

Section 404 Permit

This RDEIS furnishes important information about the Tulsa District Regulatory Office’s decision-making process. The USACE’s decision whether to issue a Section 404 permit will be based on an evaluation of the probable impacts including cumulative impacts of the Proposed Action on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the described activity must be balanced against the reasonably foreseeable detriments. All factors that may be relevant to the described activity will be considered, including the cumulative effects; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people. The activity’s impact on the public interest will include application of the Section 404(b)(1) guidelines promulgated by the Administrator, Environmental Protection Agency (40 CFR Part 230).

Alternatives Dismissed From Detailed Consideration

Other alternatives were evaluated, but were not carried forward for detailed consideration in the RDEIS. These include alternatives that do not require a Section 404 permit, alternatives that were not available to the applicant, and other alternatives available to the applicant. Details of each alternative and the reasons for not carrying these alternatives forward for assessment in the EIS are included in Appendix O.

Alternatives that Do Not Require a Section 404 Permit

The alternatives considered that would not require a Section 404 permit included developing new groundwater supplies, constructing and operating desalination facilities, or implementing additional water conservation measures. Developing new groundwater supplies was not carried forward for detailed consideration because quantities potentially available are insufficient to meet the purpose and need, these quantities may be subject to reduction to conform with Managed Available Groundwater (MAG) values, and there is growing competition among users for these constrained groundwater supplies. Developing a desalination project at the scale needed to meet NTMWD needs is expected to be cost-prohibitive, face limitations on disposal of brine, and have prohibitively high energy requirements resulting from the desalination process and transporting product water.

Alternatives Unavailable to the Applicant

Potential alternatives that were identified, but determined to be not available to the applicant included importing water from Oklahoma and additional water supply provided by Lake O' the Pines. These alternatives were not carried for detailed consideration in the EIS because the current moratorium on water exported from Oklahoma may not be resolved in time to meet the NTMWD supply demand, and because water from Lake O' the Pines may not be accessible to NTMWD due to contracting issues with existing water rights holders.

Other Alternatives Available to the Applicant

Alternatives that may be available to the applicant include water supplied from new (undeveloped) reservoirs, including Upper Bois d'Arc Creek Reservoir, Marvin Nichols Reservoir, Marvin Nichols Reservoir (Site 1A), George Parkhouse Lake South, and George Parkhouse Lake North; transporting water from existing reservoirs including Lake Lavon and Lake Jim Chapman; reallocation of storage at other reservoirs in the region including Ray Hubbard, Ray Roberts, Lewisville, Tawakoni, and Fork Lakes; securing supplies from Lake Texoma, Toledo Bend Reservoir, Wright Patman Lake, and Sam Rayburn Reservoir; and purchase of water from the City of Texarkana. These potential alternatives were not carried forward for detailed consideration in the EIS because of the inability to meet purpose and need, unacceptable environmental impacts, poor water quality, reliability, cost, and/or institutional constraints including the need to secure agreements with other wholesale water providers.

Environmental Consequences of Alternative 1, Alternative 2, and No Action Alternative

This section provides a summary of the environmental consequences of Alternative 1 (Applicant's Proposed Action), Alternative 2, and the No Action Alternative which are evaluated in detail in this RDEIS. A more detailed discussion of the impacts can be found in Chapter 4.

Land Use

Construction of the dam and reservoir under Alternative 1 would permanently affect approximately 17,000 acres of land primarily classified as agricultural and open space. Alternative 2 would result in the

conversion of approximately 9,300 acres or about 42 percent of the area converted under Alternative 1. Although loss of open space and agricultural lands under Alternative 2 would be less than under Alternative 1, the amount of land converted under each alternative is considered substantial and adverse.

Although changes in land may occur under the No Action Alternative, none of those changes would be attributable to the construction and operation of LBCR (because it would not be built under this alternative). Changes in land use may occur as the result of other planned developments due to projected population growth in Fannin County.

Topography, Geology, and Soils

Construction of the dam and reservoir and the water transmission and treatment facilities under Alternative 1 would permanently affect approximately 17,000 acres of land with resulting loss or disturbance to soils and geological resources. Alternative 2 would result in the conversion of approximately 9,300 acres or about 42 percent of the area converted under Alternative 1. Although loss of or disturbance to soils under Alternative 2 would be less than under Alternative 1, the loss of soils and disturbance to geological resources under both alternatives is considered to be moderate.

Under the No Action Alternative, there would be no short- or long-term effects on geology. Ongoing erosion and downcutting associated with channelization of Bois d'Arc Creek would continue to cause slight to moderate long-term changes to topography and soils. None of those changes would be attributable to the construction and operation of LBCR because it would not be built under this alternative.

Water Resources

Constructing and operating the dam, reservoir, water transmission, water treatment, and other ancillary facilities would result in changes in surface water hydrology, stream channels, water quality, existing reservoirs, and groundwater. Effects on these resources were assessed for both the construction (3 to 4 years) and operational (100+ years) phases for both Alternatives 1 and 2. Impacts on water resources were also assessed for the No Action Alternative.

Surface Hydrology

Constructing Alternatives 1 and 2 would result in the loss of less than one mile of Bois d'Arc Creek and Honey Grove Creek stream channels. Both streams would be affected by the footprint of the dam embankment and spillway. Because the footprint of these facilities would be essentially the same for both Alternatives 1 and 2, the resulting impacts on surface hydrology would also be the same. This loss would be permanent and is considered severe.

Reservoir operations under Alternatives 1 and 2 are not expected to result in an adverse effect on navigation occurring on the Red River. Changes in discharges from Bois d'Arc Creek to the Red River under both Alternatives would not be of the magnitude to have an appreciable effect on the flows required to support navigation.

Existing water rights within the Red River watershed would not be affected by operation of either Alternative 1 or 2. The TCEQ water use permit issued for the full-scale LBCR determined that existing water rights holders that could be affected by project operations would not be injured.

Long-term operation of the LBCR under both Alternatives 1 and 2 would be affected by sediments deposited in the reservoirs that originate from upstream sources. Sedimentation would reduce the storage capacity of the LBCR of Alternative 1 by approximately 7.5 percent after a century of operation. The

storage capacity of the smaller LBCR (Alternative 2) would be reduced by about 21 percent after a century. The effect on the reservoir storage capacity from sedimentation is considered moderate under both alternatives.

The characteristics of the surface hydrology within the Bois d'Arc Creek watershed are not expected to change under the No Action Alternative.

Stream Channels

Constructing Alternative 1 and 2 would result in the loss of less than one-mile of stream channel in Bois d'Arc Creek and Honey Grove Creek. Both streams would be affected by the footprint of the dam embankment and spillway. Because the footprint of these facilities would be essentially the same for both Alternatives 1 and 2, the resulting impacts on surface hydrology would be similar. The loss would be permanent and is considered severe.

Operation of both Alternatives 1 and 2 would result in the loss of stream channels within the reservoir inundation zone. These channels are classified as intermittent and intermittent/ephemeral. Operation of Alternative 1 would result in the loss of approximately 123 miles of stream channels. Operation of Alternative 2 would result in the loss of approximately 66 miles of stream channels, reflecting the smaller size of the reservoir. The loss of stream channels is considered a moderate adverse effect under both alternatives.

The existing characteristics of stream channels within the Bois d'Arc Creek watershed are not expected to change under the No Action Alternative.

Surface Water Quality

The quality of surface waters is not expected to be adversely affected during the construction phase of either Alternative 1 or 2. The quality of surface water stored in and discharged from LBCR would be influenced by the quality of surface water entering the reservoir in combination with reservoir storage and climatic conditions. The primary impact on water quality that would result from building the proposed reservoir would be a reduction in the variability of water quality in Bois d'Arc Creek downstream from the reservoir. The expected chloride, sulfate, and total dissolved solids concentrations in the LBCR would be amenable to conventional water treatment processes to produce drinking water that meets state and federal standards.

The quality of surface water within the project area might be adversely affected under the No Action Alternative. The magnitude of this effect would be driven by the extent of development occurring within the project area as a result of projected population growth in Fannin County and resulting impacts to water quality.

Existing Reservoirs

Existing reservoirs in the Bois d'Arc Creek watershed would not be affected by the construction phase of Alternatives 1 or 2. The Lake Bonham reservoir would be impacted by the operation phase of Alternative 1 because the Lake Bonham dam would be partially submerged by the LBCR at its normal pool elevation. However, mitigation measures would be implemented to protect the Lake Bonham dam, spillways, and outlet works so that no adverse impacts would occur. There would be no adverse impacts to the Lake Bonham dam from operation of Alternative 2 because the Lake Bonham dam would not be submerged by the downsized reservoir of Alternative 2. Under Alternative 2, up to 28,700 AFY of water would be withdrawn from Lake Texoma for blending with water from the downsized reservoir, but NTMWD already has a water right to withdraw this water, so Alternative 2 would not have any impact on Lake Texoma.

Groundwater

Groundwater resources are not expected to be adversely affected during the construction phases for either Alternatives 1 or 2. Operation of Alternative 1 or 2 would also not affect groundwater resources as groundwater extraction is not an element of either alternative.

Under the No Action Alternative, groundwater resources may be affected as a result of increased demand for water supplies associated with new development within the project area that may occur as a result of projected population growth in Fannin County. The magnitude of this effect would be driven by the rate of development occurring within the project area and the amount of water demand met by groundwater resources.

Biological Resources

Constructing and operating the LBCR dam, reservoir, water transmission, water treatment, and other ancillary facilities may result in impacts on wetlands, aquatic habitat, upland habitat, terrestrial wildlife, threatened and endangered species, and invasive species. These impacts were assessed for both the construction (3 to 4 years) and operational (100+ years) phases for Alternatives 1 and 2. Impacts on biological resources were also assessed for the No Action Alternative, which would be primarily driven by future development occurring within the project area due to projected population growth or ongoing fluvial processes. The impacts of each alternative on biological resources are summarized below.

Wetlands

Constructing Alternatives 1 and 2 would result in the loss of forested wetlands, emergent wetlands, and shrub scrub wetlands. The loss of these wetland types would be greater under Alternative 1 (5,874 acres) than Alternative 2 (3,620 acres). Forested wetlands would account for the greatest loss under both Alternatives 1 (4,602 acres) and 2 (2,909 acres) followed by emergent wetlands, and shrub scrub wetlands. The loss of these wetland types was also reported as functional capacity units (FCUs) for forested wetlands and habitat units (HUs) for emergent wetlands and shrub scrub wetlands (refer to Section 3.4 of the RDEIS for more information related to this topic). The assessments applying these classification systems also indicated that impacts on wetland resources would be greater under Alternative 1 than Alternative 2.

The operation phase of Alternatives 1 and 2 would result in the long-term loss of the forested wetlands, emergent wetlands, and shrub scrub wetlands discussed above. The loss of wetland resources during the construction phase would continue through the operation phase of each alternative and the acreage totals for each wetland type would remain the same.

The loss of forested wetlands, emergent wetlands, and scrub wetlands is considered a moderate adverse effect under both Alternatives 1 and 2. Under Alternative 1, the loss of these wetland types would be compensated through the mitigation plan. Although the mitigation plan was developed to offset the effects of Alternative 1, it is expected that the plan would be scaled down to compensate for the adverse effects on wetlands that would occur if Alternative 2 was selected.

Loss of wetlands would also occur under the No Action Alternative although not to the level indicated under Alternatives 1 or 2. These losses would be attributable to the continued channelization of streambeds within the project area.

Aquatic Habitats and Biota

The effects of dam and reservoir construction activities under Alternatives 1 and 2 to open water, streams, and associated aquatic life would be both adverse and beneficial. Overall effects of construction and

operation under Alternatives 1 and 2 would be long-term (more than 50 to over 100 years) in duration with a high likelihood of occurrence and slight to moderate severity. Impounding Bois d'Arc Creek and converting riparian bottomland hardwood forests and stream habitats to open water, marsh, and mudflats would have both beneficial and adverse indirect effects on aquatic species.

In general, diversity and relative abundance of aquatic fauna (both vertebrates and invertebrates) within the reaches that would be permanently inundated are expected to change as a result of the reservoir, which would provide a permanent water source and create both shallow and deep water lentic habitat for a variety of aquatic species. The effect of reservoir impoundment on many fish species would likely be beneficial due to the increased acreage of deep open water for foraging and reproducing. Aquatic species more adapted to lacustrine or lentic environments would benefit while those with a preference for stream habitats would be disadvantaged. The abundance of species that are more generalist or versatile are expected to experience little change.

Effect to the aquatic biota downstream of the dam would be mitigated through periodic, regulated releases of reservoir water to Bois d'Arc Creek below the dam (environmental flow releases). These releases would be performed to compensate for losses of stream function and wildlife habitat, and are expected to enhance instream uses below the dam.

Under the No Action Alternative, no direct and immediate impacts would occur to aquatic habitat or biota. However, continued downcutting and channelization of Bois d'Arc Creek would continue to support generalist species leading to low overall diversity.

Upland Habitats, Terrestrial Wildlife, and Threatened and Endangered Species

Constructing Alternatives 1 or 2 would result in the loss of upland habitats supporting terrestrial wildlife and threatened and endangered species. The loss of upland habitat and potential adverse effects on terrestrial wildlife and threatened and endangered species would occur on approximately 11,440 acres under Alternative 1 and approximately 6,390 acres under Alternative 2. As with other biological resources, the effects of Alternative 1 would be greater than Alternative 2 because of the larger construction footprint.

Loss of upland and terrestrial wildlife habitats would continue through the operation phase for both Alternatives 1 and 2. Approximately 11,230 acres would be adversely affected under Alternative 1 and 5,975 acres under Alternative 2. The difference in acreages between the construction and operation phases of each alternative represents recovery of upland habitats initially disturbed during construction of the water transmission pipelines and other temporary construction-related sites. The loss of upland habitat and resulting impacts on terrestrial wildlife are considered moderate for Alternatives 1 and 2.

The effect on threatened and endangered species in both aquatic and upland habitats is considered slight to moderate for Alternatives 1 and 2, reflecting the low presence of these species within the study area.

Loss of upland and terrestrial wildlife habitats would also occur under the No Action Alternative, although not to the level indicated under Alternatives 1 or 2. These losses would be attributable to future development within the project area that could result in the loss of the terrestrial wildlife and threatened and endangered species habitats. These effects are considered none to slight as development within the study area would not be of the scale or intensity expected under Alternatives 1 or 2.

Invasive Species

Land and ground surface disturbing activities associated with constructing Alternatives 1 and 2 may result in the spread of invasive species during the construction and operation phases. The potential for spread of

invasive species would be greater under Alternative 1 because a larger land area would be disturbed. The severity of these effects would be considered moderate during the construction phase for both alternatives and slight to moderate during the operation phase. This change in severity is reflective of the expected recovery of disturbed lands to more natural states occurring over the operation phase.

For the No Action Alternative, future development within the project area could result in the spread of invasive species in disturbed areas. These effects are considered slight to moderate as development within the study area would not be of the scale or intensity expected under Alternatives 1 or 2.

Air Quality and Greenhouse Gas Emissions

Construction of the dam and reservoir and the water transmission and treatment facilities under Alternative 1 would affect air quality within Air Quality Control Region (AQCR) 215 as a result of air emissions occurring during construction (e.g., operation of heavy equipment, worker trips, land clearing). These emissions would be short-term and slight and would not substantially change AQCR 215 air quality. Air quality effects would be lower under Alternative 2 because the reservoir would be smaller, resulting in lower air emissions to complete construction.

Long-term negligible adverse and long-term minor beneficial impacts on air quality would occur from operation of the dam and reservoir. Long-term negligible adverse impacts would occur from recreational visitors (personal vehicles and watersport engines), increased development around the lake which could result in additional vehicles on roadways, and generators. Long-term minor beneficial impacts would be primarily due to the elimination of existing sources of air emissions (agricultural operations and biomass burning). Similar to the construction-related air quality effects, these impacts on air quality would be less under Alternative 2 because the reservoir is smaller, requiring less maintenance and supporting less development and fewer recreation-related visits.

The No Action Alternative is not expected to appreciably affect air quality within AQCR 215 because land uses at and within the vicinity of the proposed LBCR site are not expected to substantially change. However, due to overall expected population growth in the region and a commensurate increase in traffic and tailpipe emissions of criteria pollutants from vehicles, there may be a slight decrease in air quality in the region.

Both Alternative 1 and Alternative 2 would generate relatively small amounts of greenhouse gas (GHG) emissions during construction and operation (primarily from pumping raw water to the treatment plant), and would constitute incremental, but overall negligible, contributions to climate change. The No Action Alternative would not directly contribute to climate change.

Acoustic Environment (Noise)

Implementation of Alternatives 1 and 2 would have short-term slight adverse and long-term slight beneficial and adverse effects on the noise environment. Short-term slight increases in noise would result from the temporary use of heavy equipment during land clearing and construction, estimated to last 3 to 4 years. Beneficial effects would result from most of the existing sources of noise within the reservoir footprint, such as agricultural equipment, automobile traffic, and lawn maintenance equipment ending with acquisition of the land for the proposed dam and reservoir. However, there are likely to be long-term noise impacts from the increase in traffic associated with recreational and real estate development at and in the vicinity of the reservoir. Other long-term noise impacts would result from traffic passing over the new bridge, operation of the water pumping stations, and operation of the WTP.

Under the No Action Alternative, land use changes within the region are expected to occur as a result of long-term population growth. These changes would result in an increase in noise, although not to the degree attributable to the construction or operation of Alternatives 1 or 2.

Recreation

Under Alternative 1, construction of the reservoir would have slight to moderate, short-term adverse impacts. Recreational opportunities at the project site after construction are likely to be moderately beneficial, long term and medium to large in extent. Existing recreation on private lands within the reservoir footprint would be impacted by construction, but new recreation opportunities would arise once the new reservoir was in operation. Alternative 2 would result in the same impacts as Alternative 1, although the impacts would be somewhat less because of the smaller size of the reservoir in Alternative 2.

Under the No Action Alternative, there would be little to no direct impacts on existing recreation facilities. Private recreation and public recreation in the Caddo National Grasslands and other nearby public recreation lands would continue in their current state. It is likely that as the population of the region grows, demand for outdoor recreation would also increase, and this demand would increase use of recreational facilities within the region which could degrade the quality of the facilities and of the recreation experience.

Visual Resources

Construction of the dam and water transmission and treatment facilities and clearing of the reservoir inundation zone would alter the visual characteristics of the landscape at and near the project site. For both Alternatives 1 and 2, construction is expected to result in moderate alteration of the landscape as the dam embankment would be shielded from views by existing vegetation. Visual impacts from clearing of the reservoir footprint would be less for Alternative 2 than for Alternative 1 because of the smaller amount of land that would be cleared.

Due to its size and prominence, Alternative 1 (in particular, the dam and reservoir) would have a severe, long-term impact on visual resources; however, whether this impact would be regarded as adverse or beneficial would depend on the values of each individual observer. Compared to Alternative 1, the long-term adverse effect on the visual landscape occurring under Alternative 2 would be slightly less because the reservoir and embankment would be smaller.

Under the No Action Alternative, land use changes within the region are expected to occur as a result of long-term population growth and associated development pressure. This growth may result in a change in the visual character of the landscape, although not to the degree that is expected to occur under Alternatives 1 or 2.

Utilities

Under Alternative 1, construction activities would cause short-term, slight adverse impacts to utilities. Overhead power lines within the vicinity of the reservoir footprint would need to be raised or relocated. Electrical transmission lines, gas/petroleum pipelines, and other minor utilities within the footprint of the raw water pipeline would need to be crossed or bypassed. The impacts would end upon completion of construction. Operation of the proposed reservoir would cause moderate impacts to utilities for over 30 years. The demand for publicly-provided utilities would likely increase as a result of the potential increase in development that would be caused by operation of the proposed reservoir. The new LBCR would help to meet the water needs of the NTMWD service area.

Construction of Alternative 2 would also cause short-term, slight adverse impacts to utilities. The overhead power lines within the vicinity of the Alternative 1 reservoir footprint would be located almost entirely outside of the footprint of the Alternative 2 reservoir, so they would not need to be relocated. Alternative 2 includes two pipelines, so there would be additional impacts to utilities resulting from pipeline construction. The smaller reservoir of Alternative 2, with a smaller footprint and shorter length of developable shoreline, would lead to development at a reduced scope from that which may be anticipated for the larger reservoir, with a corresponding decrease in utility demands. Therefore, the impacts to utilities from operation of Alternative 2 would be slightly less than the impacts for Alternative 1.

Demand for utility services during construction is expected to increase but would be minimized because most construction activities would be accomplished through the use of fueled equipment or portable electric generators.

Demand on local or regional utility services as a result of operating Alternatives 1 or 2 would increase to meet pumping and water treatment needs. These moderate increases in electrical power demands are expected to be offset by the construction of new infrastructure sized to meet the water conveyance and treatment needs of each alternative.

Under the No Action Alternative, land use changes within the region are expected to occur as a result of long-term population growth and associated development pressure. This projected growth may result in an increase in demand for local and regional utility services. These future demands are expected to be met by local and regional utility providers.

Transportation

Constructing the LBCR dam, reservoir, water transmission, water treatment, and other ancillary facilities would result a moderate adverse impact on the local transportation network during the construction phase (3 to 4 years). These impacts would occur as materials and equipment are transported to the construction site along with construction workers commuting to and from the sites. These effects would be compounded since constructing the reservoir would require the permanent closure of some roadways that cross the reservoir inundation zone. However, these adverse effects would be offset by improving some existing roadways, which would enhance travel times and safety.

Because of the larger scale of the proposed project, Alternative 1 would result in slightly greater effects on the local transportation network including (permanent closure of five roadways) when compared to Alternative 2 (permanent closure of four roadways) and because more construction-related trips to and from the dam site are expected to occur. The scale of Alternatives 1 and 2 are such that transportation-related effects would be considered moderately severe under both. In addition, improvements to the local roadway system would occur under both Alternatives 1 and 2.

Under the No Action Alternative, land use changes within the region are expected to occur as a result of long-term population growth and associated development pressure. This growth would result in an increase in traffic on the local and regional transportation network. The existing roadway network is expected to be able to accommodate increases in traffic resulting from this long-term growth.

Environmental Contaminants and Toxic Wastes

The footprint of the proposed reservoir was assessed for environmental contaminants and toxic wastes because of concerns that contaminants and wastes could impact the water of the reservoir once the area was inundated. The assessment of the potential for such releases was based on a review of published data supplemented by information provided by the public.

An illegal dump site, primarily used for the disposal of tires, was located within the reservoir footprint on land owned by NTMWD. NTMWD remediated the site by collecting and properly disposing of tires along with soils mixed with debris. The Bonham County landfill was also identified as a potential source of contaminants in the Bois d' Arc Creek watershed. Upon additional investigation, the landfill was determined not be a source of contaminants and was not found to be adversely affecting water quality within the watershed.

The release of environmental contaminants and toxic wastes is not expected to occur during construction of either Alternative 1 or 2. In addition, releases of contaminants during operation of either Alternative 1 or 2 are considered slight. In the event a release did occur, it would be identified and addressed through periodic water quality testing.

Under the No Action Alternative, land use changes within the region are expected to occur as a result of long-term population growth and associated development pressure. No releases of environmental contaminants or toxic wastes are expected from this development.

Socioeconomics

Overall socioeconomic impacts of Alternative 1 on Fannin County and the region are multi-faceted and would be both short-term and long-term as well as adverse and beneficial. Both the adverse and beneficial impacts would be considered severe. Adverse fiscal and social impacts are more weighted toward the short-term and the fiscal impacts are largely mitigated through NTMWD's payments in lieu of taxes (PILT) to the county; at the same time, there would also be a major short-term economic stimulus associated with construction of the dam, reservoir and related facilities. Over time, socioeconomic impacts associated with Alternative 1 would become more positive or beneficial.

On net, over the long-term and the life of the proposed facility (50-100 years or more), socioeconomic effects would be positive for Fannin County. Most but not all Fannin County residents would welcome the short- and long-term economic stimulus provided by the project, in terms of direct added jobs, income, and induced economic activity. As a result of the project, in the future, Fannin County would be more populated, developed, and less rural than it is today (constituting a change in its existing predominantly rural character) or than it would be in the absence of the project. Residents would also enjoy a wider range of recreational and commercial opportunities than at present. Whether or not one sees this tradeoff as good or bad is a question of one's personal values and interests.

Overall, socioeconomic impacts of Alternative 2 on Fannin County and the region would be similar to those discussed under Alternative 1. Impacts would be both short- and long-term as well as adverse and beneficial. As under Alternative 1, Alternative 2 would result in a more populated, developed, and less rural Fannin County. The local economy would benefit from direct added jobs, income, and induced economic activity. A wider range of recreational and commercial opportunities would be available to residents, though economic benefits are not assumed to outweigh adverse impacts to the social or rural character of Fannin County; ultimately, this weighting is a question of one's personal values and interests.

Compared to Alternative 1, beneficial impacts from the additional short-term stimulus to construct the pipeline and transmission facilities would be greater under this alternative due to additional job creation, spending of those wages, and related increases in economic activity. Annual debt payments and operating and maintenance costs would increase the unit cost of water to NTMWD customers (before amortization) by 12 percent. In the long-term, impacts to economic resources would be beneficial since the price will drop drastically once the debt is paid off – and the cost per 1,000 gallons would ultimately be almost the same as under Alternative 1.

Under the No Action Alternative, land use changes within the region are expected to occur as a result of long-term population growth and associated development pressure. This growth may result an increase in regional economic activity which could benefit long-term employment, income, and tax revenues.

Environmental Justice and Protection of Children

Alternative 1 would not result in environmental justice impacts in the overall region. Census data identified Honey Grove, Ladonia, and Bonham as “pockets” of minority populations and Bonham as a “pocket” low-income population. Alternative 1 could create indirect, slightly adverse impacts for at least a portion of the construction phase, though not during the operational phase. Low-income populations could experience intermittent and temporary impacts on commuting from traffic or time delays. Youth minority populations living in Honey Grove could experience slightly disproportionate adverse impacts as they relate to noise disturbances and mobile source air pollutant emissions during the construction of the 35-mile pipeline to the North WTP. However, impacts would be temporary and intermittent and depend on the location and timing of specific construction activities. The size or physical extent of such impacts would be small (localized) and could affect the aforementioned “pockets” of environmental justice populations. The likelihood of all noise and air-quality related adverse impacts on environmental justice populations would be low given their distance(s) to the project area.

Beneficial impacts in the form of jobs would not impact low-income or minority populations disproportionately in the short-term or long-term. Long-term impacts of Alternative 1 on environmental justice populations would be moderately beneficial due to the replacement of FM 1396 with FM 897 and a major new recreational facility. Long-term impacts would last as long as the dam and reservoir’s lifetime (50-100 years); impacts would occur throughout Fannin County and therefore the size or physical extent of impacts would be medium and localized; and the likelihood of beneficial impacts would be high.

Impacts from Alternative 2 would be similar to those described under Alternative 1, and would not create environmental justice impacts in the overall ROI because neither Fannin nor Grayson counties meet the regulatory definition of minority or low-income populations.

Under the No Action Alternative, land use changes within the region are expected to occur as a result of long-term population growth and associated development pressure. This projected growth is not expected to result in a disproportionate effect on minority or low income communities.

Cultural Resources

Construction of the dam, reservoir, water transmission, water treatment, and other ancillary facilities would result in adverse effects on cultural resources during the construction and operation phases for both Alternatives 1 and 2. The assessment of impacts on these resources under Alternative 1 was determined by the Area of Potential Effects (APE) as defined in the Programmatic Agreement (PA) and other areas that might be affected by construction of either alternative. Generally, the APE included the footprint of the proposed LBCR up to the top of the flood pool (elevation 541 ft. MSL), the planned location of the dam and all associated construction and staging areas, the new water treatment facility, and water transmission pipelines. Although outside the APE, potential effects were evaluated for the area that could be inundated by 545-foot flowage easement. The assessment of effects under Alternative 2 was established by an APE reduced in scale to reflect the smaller proposed reservoir.

Alternatives 1 and 2 would result in severe adverse effects on sites listed or potentially eligible for listing on the National Register of Historic Places (NRHP). Under Alternative 1, 61 sites have been identified within the APE. Of these sites, 39 have been determined not to be eligible for listing on the NRHP. The remaining 22 sites require further testing to determine eligibility for listing. Under Alternative 2, 32 sites

have been identified within the reduced APE. Of these sites, 24 have been determined not to be eligible for listing on the NRHP. The remaining eight sites require further testing to determine eligibility for listing.

The PA establishes a process for treating cultural resources that are discovered as part of the construction of the water storage, water conveyance, and treatment facilities. This process is applicable to both Alternatives 1 and 2. The terms and conditions of the PA include ceasing work in the vicinity of a newly discovered site, conducting an assessment, and developing and implementing a treatment plan.

Under the No Action Alternative, land use changes within the study area are expected to occur as a result of long-term population growth and resulting development. This growth may result in adversely affecting unknown, but potentially significant cultural resources.

ACRONYMS AND ABBREVIATIONS

ABB	American burying beetle
ACHP	Advisory Council on Historic Preservation
AF	Acre-foot or acre-feet
AFY	Acre-feet per year
AIRFA	American Indian Religious Freedom Act
AJD	Approved Jurisdictional Determination
ANSI	American National Standard Institute
APE	Area of Potential Effects
AQCR	Air Quality Control Region
AQCR 215	Metropolitan Dallas Fort Worth Intrastate Air Quality Control Region
ARC	AR Consultants
ARPA	Archeological Resources Protection Act
ARRP	Aquatic Resource Relocation Plan
BEG	Bureau of Economic Geology
BLM	Bureau of Land Management
BMP	Best Management Practice
°C	Degrees Celsius or Centigrade
CAA	Clean Air Act
CADSWES	Center for Advanced Decision Support for Water and Environmental Systems
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second (volumetric flow rate of water)
CIP	Capital Improvement Plan
cmbs	Centimeters below the surface
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
COCs	Chemicals of concern
CRP	Conservation Reserve Program
CSA	Confederate States of America
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted decibel
dbh	diameter at breast height
DEIS	Draft Environmental Impact Statement
<i>de minimus</i>	of minimal importance
DFCs	Desired Future Conditions
DFW	Dallas-Fort Worth International Airport
DNL	Day-Night Sound Level
DOI	U.S. Department of the Interior
DWU	Dallas Water Utilities
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency

ERDC	Environmental Research and Development Center, U.S. Army Corps of Engineers
ESA	Endangered Species Act
ESA	Environmental Site Assessment
°F	Degrees Fahrenheit
FCAD	Fannin County Appraisal District
FCI	Functional Capacity Index
FCR	Fire-cracked rock
FCU	Functional Capacity Unit
FM	Farm-to-Market Road
FNI	Freese and Nichols, Inc.
Ft	Foot or feet
FTE	Full Time Equivalent
GHG	Greenhouse Gas
GIS	Geographic Information System
GCD	Groundwater Conservation District
GMA	Groundwater Management Area
GPCD	Gallons Per Capita Per Day
GTUA	Greater Texoma Utility Authority
GYI	North Texas Regional Airport
HAP	Hazardous Air Pollutant
HC	Hydrocarbon
HEP	Habitat Evaluation Procedure
HGM	Hydrogeomorphic
HPA	High Potential Area
HSI	Habitat Suitability Index
HUC	Hydrologic Unit Code
Hz	Hertz
I	Interstate
IBI	Index of Biological Integrity
IBT	Inter-Basin Transfer
ICEM	Incised Channel Evolution Model
IO	Isolated Object
IP	International Paper
IPCC	Intergovernmental Panel on Climate Change
kg	kilogram
km	kilometer
kWh	kilowatt hour
lbs	Pounds
LBCR	Lower Bois d'Arc Creek Reservoir
LBJ	Lyndon B Johnson
LEDPA	Least Environmentally Damaging Practical Alternative
LiDAR	Light Detection and Ranging
LOI	Limits of Investigation
LRH	Lake Ralph Hall

L _{eq}	Equivalent Sound Level
m	Meter
MAG	Managed Available Groundwater
MCLs	Maximum Contaminant Levels
mgd	million gallons per day
mg/L	milligrams per liter (equals parts per million)
mm	Millimeter
MOA	Memorandum of Agreement
MSA	Metropolitan Statistical Area
MSL	mean sea level (elevation in feet above mean sea level)
MSPS	Main Stem Pump Station
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAIP	National Agriculture Imagery Program
NCTCOG	North Central Texas Council of Governments
NEPA	National Environmental Policy Act of 1969
NETMWD	Northeast Texas Municipal Water District
NGO	Non-Governmental Organization
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NO _x	Nitrogen Oxides
N ₂ O	Nitrous Oxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	National Resources Inventory
NTMWD	North Texas Municipal Water District
NWI	National Wetlands Inventory
O ₃	Ozone
OHWM	Ordinary High Water Mark
OSD	Office of the State Demographer
PA	Programmatic Agreement
PAH	polycyclic aromatic hydrocarbon
PET	Potential Evapotranspiration
PGMA	Priority Groundwater Management Area
PHDI	Palmer Hydrological Drought Index
PILT	Payment in Lieu of Taxes
PJD	Preliminary Jurisdictional Determination
PM	Particulate Matter
PM ₁₀	Particulate Matter under 10 microns in diameter (fine)
PM _{2.5}	Particulate Matter under 2.5 microns in diameter (very fine)
PMF	Probable Maximum Flood
PSA	Public Service Announcement
RCRA	Resource Conservation and Recovery Act
RGA	Rapid Geomorphic Assessment

RGL	Regulatory Guidance Letter
ROD	Record of Decision
ROI	Region of Influence
RPW	Relatively Permanent Water
RRA	Red River Authority
RRC	Railroad Commission of Texas
RWPG	Regional Water Planning Group
SAL	State Antiquities Landmark
SB	Senate Bill
SCA	Sun-colored amethyst
SCS	Soil Conservation Service
SFASU	Stephen F. Austin State University
SH	State Highway
SHPO	State Historic Preservation Office
SQF	Stream Quality Factor
SQRU	Scenic Quality Rating Unit
SQU	Stream Quality Unit
SRA	Sabine River Authority
SRBA	Sulphur River Basin Authority
SUD	Special Utility District
TAC	Texas Administrative Code
TARL	Texas Archeological Research Laboratory
TAS	Texas Archeological Society
TASA	Texas Archeological Sites Atlas
T&E	Threatened and Endangered (species)
T&PR	Texas and Pacific Railroad
TCEQ	Texas Commission on Environmental Quality
TDA	Texas Department of Agriculture
TDS	Total Dissolved Solids
TRF	Total Fertility Rate
THC	Texas Historical Commission
THPO	Tribal Historic Preservation Officer
THSA	Texas Historic Sites Atlas
TPWD	Texas Parks and Wildlife Department
tpy	tons per year
TRA	Trinity River Authority
TRWD	Tarrant River Water District
TSR	Terminal Storage Reservoir
TWC	Texas Water Code
TWC	Texas Water Commission
TWDB	Texas Water Development Board
TX	Texas
TXRAM	Texas Rapid Assessment Method
TNW	Traditional Navigable Water

TRWD	Tarrant Regional Water District
TxDOT	Texas Department of Transportation
TXNDD	Texas Natural Diversity Database
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTRWD	Upper Trinity Regional Water District
VOC	Volatile Organic Compound
Vpd	vehicle trips per day
VRM	Visual Resource Management
VSI	variable subindex
WAA	wetlands assessment area
WAM	Water Availability Model
WCAC	Water Conservation Advisory Council
WCP	Water Conservation Plan
WMA	Wildlife Management Area
WOCMA	White Oak Creek Mitigation Area
WRP	Wetlands Reserve Program
WRPI	Water Resources Planning and Information
WTF	Water Treatment Facility
WTP	Water Treatment Plant
WUG	Water User Group
WWP	Wholesale Water Provider
WWTP	Wastewater Treatment Plant
ZPG	zero population growth

GLOSSARY AND TERMS

5-year floodplain: An area of low-lying ground adjacent to a river, formed mainly of river sediments and subject to flooding over a 5-year period.

3rd Order Streams: Stream order is a measure relative to the size of streams. An increase in stream order is an order of magnitude increase in size. 3rd order streams are formed by the confluence of two second order streams, or of a second order stream and a third order stream.

4th Order Streams: Stream order is a measure relative to the size of streams. An increase in stream order is an order of magnitude increase in size. 4th order streams are formed by the confluence of two third order streams.

Amortization: The paying off of debt in regular installments over a period of time.

Amortization: The paying off of debt in regular installments over a period of time.

Backwater flow: The backing up of water through a conduit or channel in the direction opposite to normal flow.

Basal area: Common term to describe the average amount of an area that is occupied by tree stems and is defined as the total cross-sectional areas of all stems in a stand measured at breast height, and is typically expressed as per unit of land area (typically square feet per acre).

Benthic: Of or pertaining to the bottom of a body of water.

Benthic macroinvertebrate: Organisms without backbones that inhabit the bottom substrates for at least part of their lifecycle.

Biotic diversity: A metric of how many calories from bacteria and plants are distributed among plants, bacteria, fungus, and animals.

Channelization: The act of straightening a stream, typically widening and deepening the stream as well as to improve the flow of water.

Channel Morphology: Form and structure that describes the shape of a stream or river bed.

Collector-gatherers: Macroinvertebrate functional feeding group which collect fine particulate organic matter from the stream bottom.

Colonizer species: Species that successfully spreads to new area and completes successful immigration where the population becomes integrated into a community, resisting initial local extinction.

Cost Synergy: A cost synergy refers to the opportunity of a combined corporate entity to reduce or eliminate expenses associated with running a business. Cost synergies are realized by eliminating positions that are viewed as duplicate within the merged entity.

Decibel: A unit used to measure the intensity of a sound.

Deciduous: Referring to a plant (usually a tree or shrub) that sheds its leaves at the end of the growing season.

Diameter at breast height: Standard method of expressing the diameter of the trunk or bole of a standing tree.

Easement: The right of a person, government, agency, or public utility company to use or restrict public or private land owned by another for a specific purpose.

Economies of Scale: Reductions in unit cost as the size of a facility and the usage levels of other inputs increase.

Eminent Domain: A power reserved by a government agency, usually at the state or local level, to use its legislatively-granted police power to condemn a piece of property for the public use.

Erosion: The removal of sediment or rock from a point in the landscape.

Facultative: Wetland indicator category equally likely to occur in wetlands or non-wetlands.

Facultative upland: Wetland indicator category that usually occurs in non-wetlands (estimated probability of 67% - 99%), but occasionally found in wetlands (estimated probability of 1% - 3%).

Filter feeders: An aquatic animal that feeds on particles or small organisms strained out of water by circulating them through its system.

Firm Yield: The maximum amount of water that can be diverted from a reservoir on an annual basis during a repeat of the historical drought of record without shortage, assuming that all of the water in the reservoir is available for use.

Geomorphic: Relating to the form of the landscape and other natural features of the earth's surface.

Geomorphological processes: Landscape altering system, such as water runoff or erosion that influences the movement and shape of the physical landscape.

Generalist species: A species that lives on a wide variety of food and can live in variety habitats.

Genetic Distribution: The total number of genetic characteristics in the genetic makeup of a species.

Herbivores: Animal that feeds on plants.

Hydrogeomorphic: Relating to the interaction and linkage of hydrologic processes with landforms or earth materials and the interaction of geomorphic processes with surface and subsurface water in temporal and spatial dimensions.

Interflow: The lateral movement of water in the unsaturated zone, or vadose zone, that first returns to the surface or enters a stream prior to becoming groundwater.

Knapping: The shaping of flint, chert, obsidian or other appropriate rocks to manufacture stone tools.

Lacustrine: Any large body of water that is greater than 8 hectares. Found in a topographic depression or is a dammed river channel.

Lateral migration: Streambank erosion process where the side-to-side movement of meander migration undercuts the streambank.

Leakage: A non-consumption use of income, including saving, taxes, and imports. The notion of leakage is best viewed through the circular flow, in which saving, taxes, and imports are "leaked" out of the main flow between output, factor payments, national income, and consumption.

Leaseback: An arrangement where the seller of an asset leases back the same asset from the purchaser. In a leaseback arrangement, the specifics of the arrangement are made immediately after the sale of

the asset, with the amount of the payments and the time period specified. Essentially, the seller of the asset becomes the lessee and the purchaser becomes the lessor in this arrangement.

Lien: An official claim of debt against something, where the asset will be in hands of lender and the lender himself can adjust the sale value of the asset to the debt without prior notice to the borrower.

Lithic Scatter: A scatter on the ground surface of cultural artifacts and debris consisting entirely of lithic – that is, rock – tools and chipped stone debris.

Market Saturation: A situation in which a product has become diffused (distributed) within a market; the actual level of saturation can depend on consumer purchasing power; as well as competition, prices, and technology.

Mainstem: The primary, and generally largest, branch of a river.

Mesohabitats: Medium sized habitats.

Overbanking: Flooding over the bank of a stream or river.

Overland flow: The flow of rainwater or snowmelt over the land surface toward stream channels. After it enters a watercourse it becomes runoff.

Parity Debt: Bonds and other debt securities that have an equal and ratable claim on the same underlying asset as collateral.

Particulate organic material: Soil organic matter between 0.052 millimeters (mm) and 2 mm in size.

Perennial: Lasting or existing for a long or apparently finite time; enduring or continually reoccurring.

Permitted diversion: The amount of water that can be legally withdrawn from a water source in accordance with a Texas water right.

Photosynthesis: Process by which green plants and some other organisms use sunlight to make food from carbon dioxide and water.

Planktivores: Aquatic organisms that feed on planktonic food.

Pledge: Transferring property as collateral for a debt. The lender cannot adjust the secured asset without having given prior notice and until the due date.

Polyphilic spawner: A type of spawning regarding eggs of a spawner such as bivalve, fish, or amphibians.

Pro-rata: Assigning an amount to a fraction, or a proportionate allocation, according to its share of the whole. For example, a pro-rata dividend means that every shareholder gets an equal proportion for each share he or she owns. Pro-rating also refers to the practice of applying interest rates to different time frames. If the interest rate was 12% per annum, you could pro-rate this number to be 1% a month (12percent/12 months).

Reliable Supply: Amount of water that is considered available 100 percent of the time during a repeat of the historical drought of record. This is commonly based on the firm yield of the water source and may differ from permitted diversions or contract amounts.

Riparian: Areas adjacent to rivers and streams. These areas often have a high density, diversity, and productivity of plants and animal species relative to nearby uplands.

Run and riffle habitats: Runs refer to an area where the water is flowing rapidly, generally located downstream from riffles. Riffle is an area of a stream where the water breaks over cobbles, boulders and ravel or where the water surface is visibly broken. Runs are typically deeper than riffles.

Scrapers: Macroinvertebrate functional feeding group which consume algae and associated materials.

Sherd: A fragment of broken ceramic material, especially one found at an archaeological site.

Shredder species: Macroinvertebrate functional feeding group which consumer leaf litter or coarse particulate organic matter.

Speleophilic: Species preferentially or exclusively inhabiting caves.

Step-up provision: The readjustment of the value of an appreciated asset for tax purposes upon inheritance. The value of the asset is determined to be the higher market value of the asset at the time of inheritance, not the value at which the original party purchased the asset.

Stratification: When water forms layers because of differences in salinity, oxygen levels, density, or temperature. These layers often act as a barrier to water mixing.

Tax Roll: A breakdown of all taxable property that can be taxed within a given jurisdiction, such as a city or county. The tax roll lists each property separately in addition to its assessed value, and is usually created by the taxing assessor or other authority within the jurisdiction.

Texas water right (Certificate of Adjudication or Permit): Legal instrument issued by the State of Texas to divert, use and/or store waters of the state.

Thermocline: A sudden temperature gradient in a body of water such as a lake, this area is marked by a layer above and below with waters of different temperatures.

Tributary: Stream or river that flows into a larger stream or main stem river or a lake.

Trophic structure: Referring to the way in which organisms use food resources to get energy for their growth and reproduction and is often referred to in simple terms as the food web or food chain.

Wetland obligates: Wetland indicator category that almost always occurs in wetlands under natural conditions.

**Revised Draft Environmental Impact Statement
Lower Bois d’Arc Creek Reservoir**

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- Appendix A: List of Persons and Agencies Consulted (formerly Appendix C in original DEIS)
- Appendix B: Scoping Report (formerly Appendix D in original DEIS)
- Appendix C: Revised Mitigation Plan (original DEIS contained Draft Mitigation Plan as Appendix E)
- Appendix D: Reservoir Operation Plan (original DEIS contained Draft Reservoir Operation Plan as Appendix F)
- Appendix E: Economic Studies (formerly Appendix G in original DEIS)
- Appendix F: Water Use Permit for Lower Bois d'Arc Creek Reservoir and Supporting Documents
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- Appendix G: Programmatic Agreement on Cultural Resources Management between North Texas Municipal Water District, U.S. Army Corps of Engineers – Tulsa District, Texas Historical Commission, and the Caddo Nation
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- Appendix J: Habitat Evaluation Procedure (HEP) Report for the Proposed Lower Bois d'Arc Creek Reservoir Site
- Appendix K: Application of the East Texas Hydrogeomorphic Approach (HGM) to the LBCR Project
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Appendix M: Instream Flow Study

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Appendix N: North Texas Municipal Water District Water Supply Planning Process

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(AD-1006)

Appendix Q: Environmental Report Supporting an Application for a 404 Permit for Lower Bois d'Arc
Creek Reservoir.

Appendix R: Report Supporting an Application for Texas Water Right for Lower Bois d'Arc Creek
Reservoir.

Appendix S: Archeological Sites Identified in Surveys – Individual Site Descriptions

Appendix T: Lower Bois d'Arc Creek Reservoir Conceptual Clearing Plan

1.0 INTRODUCTION

In June 2008, the U.S. Army Corps of Engineers (USACE), Tulsa District received an application for a Department of the Army Permit under Section 404 of the Clean Water Act (CWA) from the North Texas Municipal Water District (NTMWD) to construct Lower Bois d'Arc Creek Reservoir (LBCR). In accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*), the USACE determined that issuance of such a permit may have a significant impact on the quality of the human environment and, therefore, required the preparation of an Environmental Impact Statement (EIS). Accordingly, the USACE prepared a Draft EIS (DEIS) which was released to the public in February 2015 (USACE, 2015a). The USACE decided to prepare this Revised DEIS (RDEIS) as the best way to address substantive agency and public comments received on the original DEIS, disclose refinements to the project design, and provide updates to the analysis of environmental effects. Section 1.4 *NEPA Process* provides additional information on the steps the USACE will follow to complete the NEPA compliance process.

1.1 THE PROPOSED ACTION

1.1.1 New Reservoir, Raw Water Pipeline, and Water Treatment Plant

The proposed dam and reservoir for the LBCR project would be located in Fannin County, Texas, on Bois d'Arc Creek (Figure 1.1-1), in the Red River basin (Figure 1.1-2), approximately 15 miles northeast of the City of Bonham, between Farm-to-Market (FM) Road 1396 and FM Road 409. The total land area or "footprint" of the proposed project site is 17,068 acres. The project site is in an area of largely rural countryside with scattered residences. Approximately 38 percent is cropland and 37 percent consists of bottomland hardwoods and riparian woodlands, with the remaining 25 percent mostly upland deciduous forest.



**Figure 1.1-1. Bois d'Arc Creek Within the Footprint of the Proposed Reservoir
(Looking Upstream from Bridge at FM 1396 Crossing)**

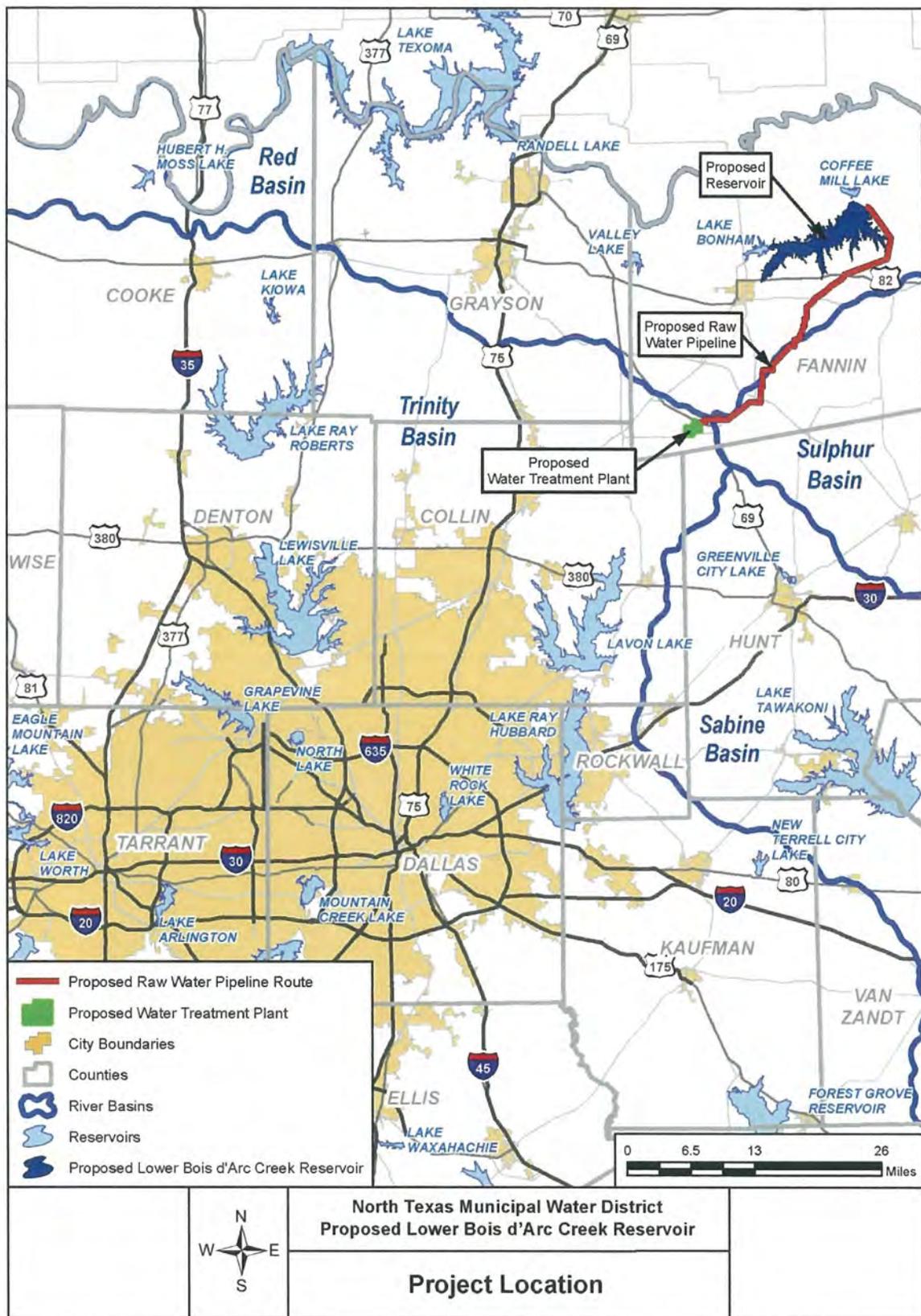


Figure 1.1-2. Project Location (Upper Right) Within North Texas Watersheds (Basins)

As will be explained further in Section 1.5, the purpose of the proposed project is to ensure that NTMWD has an additional, reliable supply of water to meet its near-term needs through 2025. The proposed project would also provide for a portion of the NTMWD long-term water supply needs. NTMWD's long-term water supply planning process, which includes estimated demands and supplies from 2020 through 2060, is described in Appendix N. To accomplish the purpose of meeting their near-term water supply needs through 2025, NTMWD is proposing to impound the waters of Bois d'Arc Creek and its tributaries to create a new 16,641-acre (26-square mile) water supply reservoir. An additional 427 acres would be required for the construction of the dam and spillways, for a total project footprint of 17,068 acres. NTMWD has received a state water right to impound up to 367,609 acre-feet of water and divert up to 175,000 acre-feet per year (AFY), with an estimated firm yield of 120,665 acre-feet of water per year.

NTMWD serves one of the fastest-growing areas of Texas (Kiel and Gooch, 2015), and indeed, the entire country (Potter and Hoque, 2014). Demographic projections show the population of the NTMWD service area more than doubling from about 1.75 million in 2020 to 3.7 million by 2070 (Region C Water Planning Group, 2015). The LBCR would provide a new source of supply to help meet the increasing water demands of this growing population.

The dam for LBCR would be approximately 10,400 feet (about two miles) in length and would have a maximum height of approximately 90 feet. The top of the embankment would be at a design elevation of 553.5 feet above mean sea level (MSL) with a conservation pool elevation of 534.0 feet MSL, controlled by a service spillway at an elevation of 534.0 feet MSL with a crest length of 150 feet. The service spillway would be located at the east abutment of the dam. Required low-flow releases would be made through a 27-inch diameter low-flow outlet. An emergency spillway would also be located in the east dam abutment. The emergency spillway would be a 1,400-foot wide uncontrolled broad crested weir structure with a crest elevation of 541 feet MSL. This elevation was selected to contain a 100-year storm (one which statistically has a one percent chance of occurring in any given year) such that no flows pass through the emergency spillway during this event.

Raw water from the reservoir would be transported by a new pipeline to a proposed new terminal storage reservoir (TSR) and water treatment plant (WTP) – the “North WTP” – west of the City of Leonard in southwest Fannin County (Freese and Nichols, 2013a). The pipeline would be 90 to 96 inches in diameter and 35 miles long.

In order to provide the ability to treat additional water from LBCR at its existing facilities in Wylie, Texas, NTMWD initially proposed to construct 14 miles of 66-inch diameter pipeline that would have extended from the North WTP to an outfall on Pilot Grove Creek. This creek is a tributary of the East Fork of the Trinity River which flows into Lavon Lake. However, upon further evaluation, NTMWD decided not to transfer water from the LBCR to Lavon Lake via this 14-mile section of pipeline and Pilot Grove Creek. In a February 2011 letter to the USACE, NTMWD requested that the transmission pipeline from the proposed North WTP to Pilot Grove Creek and the associated discharge structure be removed from the Section 404 permit application and EIS (NTMWD, 2011).

Construction of the dam and impoundment of water within the normal pool elevation of 534 feet MSL would result in direct fill impact or inundation of waters of the United States, including wetlands. Approximately 120 acres (286,139 linear feet) of existing intermittent streams, 99 acres (365,002 linear feet) of intermittent/ephemeral streams, 78 acres of open water, 4,602 acres of forested wetlands, 1,223 acres of herbaceous wetlands, and 49 acres of shrub wetlands would be impacted.

1.1.2 Applicant

NTMWD is a conservation and reclamation district and political subdivision of the State of Texas (see service area in Figure 1.1-3). It was created by and functions under Article XVI, Section 59, of the Texas Constitution, pursuant to Chapter 62, Acts of 1951, 52nd Legislature of Texas, Regular Session, as amended. A 1975 amendment to the State Legislature Act, which created the NTMWD, authorizes it to acquire, treat, and distribute potable water, and to collect, treat and dispose of wastes, both liquid and solid, in order to reduce pollution, conserve, and develop the natural resources of Texas (TEX REV CIV STAT ANN art. 8280-141).

The primary mission of the NTMWD is to meet the needs of its member cities and customers for drinking water, wastewater treatment, and solid waste disposal. Table 1.1-1 lists NTMWD's member cities and customers, not including prospective future customers. NTMWD acts as a regional wholesale water provider to its member cities and other wholesale customers. Unit costs for services are lower because the services are regional, so the NTMWD can realize economies of scale. Rates for NTMWD services are set at cost, without profits or taxes.

Table 1.1-1. NTMWD Water System

Member Cities (including 10 which originally formed the district and three added later)			
Allen	Garland	Princeton	Wylie
Farmersville	McKinney	Richardson	
Forney	Mesquite	Rockwall	
Frisco	Plano	Royse City	
Direct Customers			
Ables Springs WSC	Fate	Lucas	Rose Hill SUD
Bonham	Forney Lake WSC	Melissa	Rowlett
Caddo Basin SUD	Gastonia-Scurry SUD	Milligan WSC	Sachse
Cash SUD	Greater Texoma Utility Authority	Mt. Zion WSC	Seis Lagos UD
College Mound WSC	Josephine	Murphy	Sunnyvale
Copeville SUD	Kaufman	Nevada WSC	Terrell
Crandall (Kaufman Four-One)	Kaufman Four-one	North Collin WSC	Wylie Northeast SUD
East Fork SUD	Lavon WSC	Parker	
Fairview	Little Elm	Prosper	

SUD = Special Utility District; UD = Utility District; WSC = Water Supply Corporation

Source: NTMWD, no date-a

NTMWD contracts are issued on a "take-or-pay" basis, in which customers agree to pay for the capital costs associated with capacity in NTMWD's water supply system required to provide for the customers' historic maximum use of water. The contracts also include provisions requiring customers to pay for the operation and maintenance costs associated with the water services they receive from NTMWD. The "take-or-pay" rate structure of the current contract (last amended in 1988) with the 13 member cities may discourage conservation by not rewarding cities for using less water, but the structure recognizes that the capital costs assumed by NTMWD in order to satisfy the cities' historic maximum demand for water has to be paid for regardless of a member city's current usage.

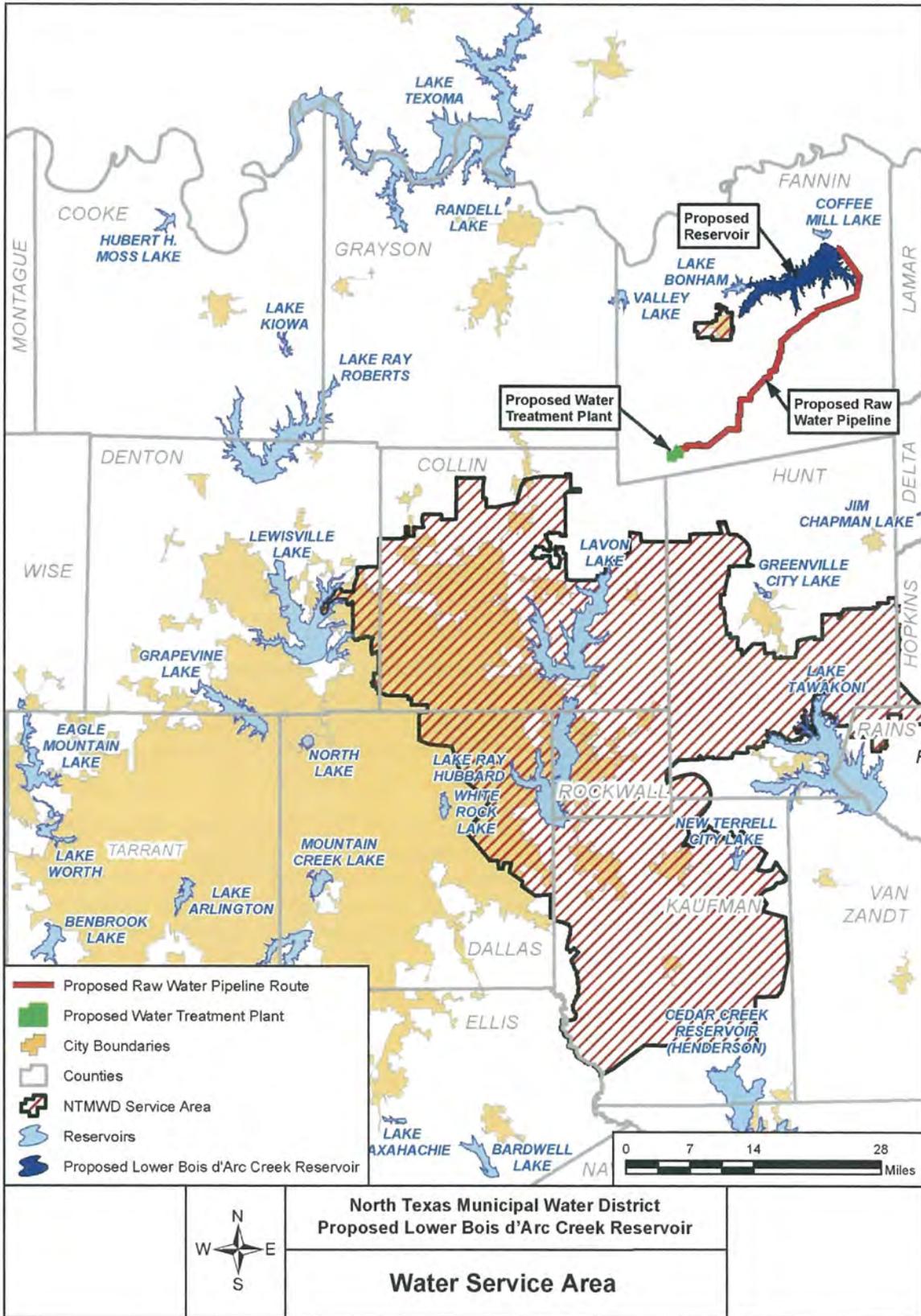


Figure 1.1-3. NTMWD Water Service Area

This rate structure is being reviewed and reconsidered by NTMWD and the member cities, and may be revised if the parties can agree on a different means for allocating costs among member cities while addressing NTMWD's revenue requirements for infrastructure that was built as a result of the cities' historic demands for water (Crimmins, 2016). It is in the interest of NTMWD to incentivize water conservation because this obviates or postpones the need for developing expensive new water supplies and constructing new facilities. With that interest in mind, NTMWD has spent over \$11.2 million over the last decade for the development and implementation of the Water IQ campaign. The Water IQ campaign encourages water conservation by NTMWD's customers and the 1.6 million people served by its customers. In addition to Water IQ, NTMWD has also funded several other programs that contribute to public education and outreach. NTMWD has implemented a program to rebate to member cities the portion of NTMWD's operations and maintenance costs (power costs and chemical costs) not incurred when a city reduces its water usage.

NTMWD currently provides treated water to more than 1.6 million citizens in portions of nine counties in northern Texas – Collin, Dallas, Denton, Fannin, Hopkins, Hunt, Kaufman, Rains and Rockwall (Figure 1.1-3). Lavon Lake (see Figure 1.1-3) serves as NTMWD's main raw water supply source. Lavon Lake also serves as a terminal reservoir for additional supplies that are transferred from other sources. NTMWD holds water rights for raw water supplies from Lavon Lake, Lake Texoma, Jim Chapman Lake, Lake Bonham, and the Wetland (East Fork Raw Water Supply Project). Additional temporary supplies are available through a contract with the Sabine River Authority (SRA) providing for water transfer to Lavon Lake from Lake Tawakoni. The 20-year contract with SRA was signed in 2005 and has provisions for two, 10- year extensions. NTMWD has begun serving residents of the City of Bonham in Fannin County, near the proposed reservoir site, with water from Lake Bonham that is treated at the newly constructed, state-of-the-art Bonham WTP.

In May 2013, in response to the ongoing drought and the loss of 28 percent of NTMWD's total water supplies from Lake Texoma due to the presence of an invasive species, the zebra mussel, NTMWD entered into a temporary contract with Dallas Water Utilities to purchase up to 60 million gallons per day (mgd) of raw water. This contract expired in April 2016 and Dallas Water Utilities informed NTMWD that it will not be renewing or extending the contract.

During the 2013-2014 Water Year (August 2013 - July 2014), NTMWD treated and delivered 83.6 billion gallons of water for its member cities and direct customers (Figure 1.1-4 and Figure 1.1-5). Member cities of the NTMWD water system received 83 percent of the total supply delivered, and the direct customers listed in Table 1.1-1 received the remaining 17 percent. Water consumption declined in the last two years (2012-2013 and 2013-2014) because of mandatory conservation measures due to the drought.

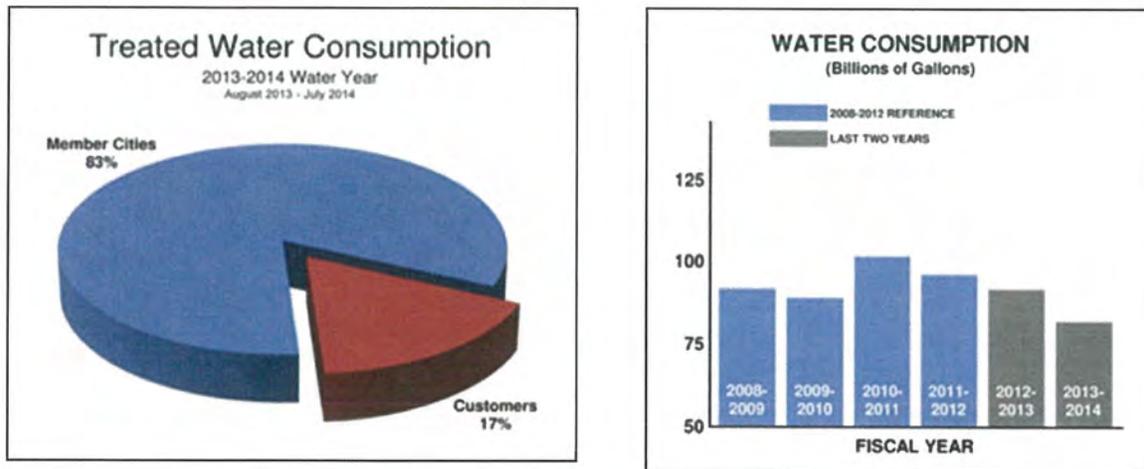


Figure 1.1-4. Treated Water Consumption by Member Cities and Customers of the NTMWD, 2008-2014

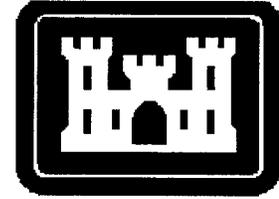


Figure 1.1-5. View of Facilities at NTMWD Raw Water Treatment Plant in Wylie, TX

1.2 KEY AGENCY ROLES, RESPONSIBILITIES AND DECISIONS

1.2.1 U.S. Army Corps of Engineers

Section 404 of the CWA established a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities affecting waters of the U.S. regulated under this program include discharging fill for development and infrastructure, water resource projects such as dams and reservoirs, and mining. Section 404 requires the USACE Regulatory Program to issue a permit before dredged or fill material may be discharged into waters of the U.S. (USEPA, 2004).



The overall mission of the USACE Regulatory Program is to protect America's aquatic resources, while allowing reasonable development through a system of fair, flexible and balanced permitting decisions. The USACE evaluates permit applications for essentially all construction activities that occur in the nation's waters, including wetlands. USACE permits under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act of 1899 are also necessary for any work in navigable waters, including construction and dredging. In evaluating permit applications, the USACE balances the reasonably foreseeable beneficial and adverse effects of proposed projects, and makes permit decisions that recognize the essential values of the nation's aquatic ecosystems to the general public, as well as the property rights of private citizens who wish to use their land (USACE, 2010a).

The USACE considers the views of stakeholders, including other federal, state and local agencies, interest groups, and the general public in evaluating permit applications. The result of this careful public interest review is fair and equitable decisions that allow for reasonable use of private property, infrastructure development, and growth of the economy, while offsetting the authorized impacts to the waters of the U.S. Adverse impacts to the aquatic environment are offset by mitigation requirements, which may include restoring, enhancing, creating and preserving aquatic functions and values (USACE, 2010a).

The proposed LBCR project is located within the USACE's Tulsa District, headquartered in Tulsa, Oklahoma. The USACE is the lead agency in preparing this revised DEIS. Several federal and state agencies (identified below) are acting as cooperating agencies for the NEPA process: U.S. Environmental Protection Agency (EPA), U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (USFWS), and the Texas Parks and Wildlife Department (TPWD).

1.2.2 U.S. Environmental Protection Agency

The mission of the EPA is to protect human health and the environment. To accomplish this mission, the EPA develops and enforces regulations, provides grants, studies environmental issues, sponsors partnerships, educates people and publishes information about the environment (USEPA, 2010a).



The EPA also has roles and responsibilities specified under Section 404 of the CWA with regard to protection of the nation's waters and wetlands. Under Section 404, the EPA:

- Develops and interprets policy, guidance and environmental criteria used in evaluating permit applications;
- Determines the scope of geographic jurisdiction and applicability of exemptions;
- Approves and oversees State and Tribal assumption of permitting authority;

- Reviews and comments on individual permit applications;
- Has authority to prohibit, deny, or restrict the use of any defined area as a disposal site;
- Can elevate specific cases; and
- Enforces Section 404 provisions (USEPA, 2004).

In addition, with regard to NEPA, the EPA reviews and comments on EISs prepared by other federal agencies, maintains a national filing system for all EISs, and ensures that its own actions comply with NEPA (USEPA, 2010b). The Region 6 Office of the EPA, located in Dallas, Texas, is participating in this EIS for the LBCR project as a cooperating agency. The EPA assisted with Habitat Evaluation Procedures (HEP, see Appendix J) analysis of the proposed reservoir and mitigation sites and also participated in the inter-agency instream flow studies associated with the project. In 2015 and 2016, the EPA Region 6 participated in several workshops and field data collection efforts to evaluate alternatives to the proposed Lower Bois d'Arc Reservoir. The EPA also participated in field data collection on the hydrogeomorphic (HGM) approach to the functional assessment of forested wetlands in East Texas, and fluvial geomorphology and rapid geomorphic assessment (RGA), with expertise provided by Stephen F. Austin State University and Baylor University.

1.2.3 U.S. Forest Service

Established in 1905, the USFS is an agency within the U.S. Department of Agriculture (USDA). Nationally, the USFS manages approximately 193 million acres of public lands in national forests and grasslands, an area equivalent in size to the State of Texas. Its mission is to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations (USFS, 2010). The USFS manages Caddo National Grasslands near the proposed project site.



The USFS is participating in this EIS for the LBCR project as a cooperating agency and also assisted in conducting the HEP analysis and the instream flow study for the proposed reservoir and mitigation sites.

1.2.4 U.S. Fish and Wildlife Service

The USFWS is the primary federal agency responsible for conserving, protecting, and enhancing America's fish and wildlife resources and their habitats. The mission of the USFWS is "working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people" (USFWS, 2009).



While the USFWS shares responsibilities for wildlife conservation with other federal, state, tribal, and local entities, it has specific and primary responsibilities for endangered species, migratory birds, inter-jurisdictional fish, and certain marine mammals, as well as for lands and waters administered by the agency for the management and protection of these resources (e.g., national wildlife refuges). It also operates national fish hatcheries, fishery resource offices, and ecological services field stations. The USFWS enforces federal wildlife laws; administers the Endangered Species Act; manages migratory bird populations; restores nationally significant fisheries; conserves and restores wildlife habitat, such as wetlands; and helps foreign governments with their conservation efforts (USFWS, 2009).

The USFWS is participating in this EIS for the LBCR project as a cooperating agency. Its Ecological Services staff participated actively in applying the USFWS-developed HEP analysis (described in Chapter 3 and Appendix J of this EIS) to both the proposed LBCR site and the proposed Riverby Ranch

mitigation site. USFWS staff also participated in other environmental studies at the project site, including the instream flow and HGM studies. As the agency charged with protecting federally threatened and endangered species, USFWS evaluates potential impacts to any federally threatened and endangered species that might occur on the project site.

1.2.5 Natural Resources Conservation Service

Established in 1935 by Congress as the Soil Conservation Service (SCS), the Natural Resources Conservation Service (NRCS) of the USDA has expanded to ensure conservation of all natural resources on the nation's private lands. Seventy percent of U.S. lands are privately owned, making appropriate stewardship by private landowners crucial to environmental conservation efforts. The NRCS works directly with large and small landowners through conservation planning and assistance to benefit soils, water, air quality, plants, and animals.



NRCS also works through partnerships, collaborating closely with individual farmers and ranchers, landowners, local conservation districts, government agencies, Tribes, and many other people and groups concerned about the quality of America's natural resources. NRCS operates at the local level in field offices at USDA Service Centers in nearly every county in the U.S. (NRCS, no date-a). NRCS serves Fannin County, TX with an office in Bonham, TX.

NRCS has published a soil survey for Fannin County (NRCS, 2001) used in this EIS. NRCS also conducts the National Resources Inventory (NRI), a statistical survey of land use and natural resource conditions and trends on U.S. non-federal lands (NRCS, 2010). Through the Wetlands Reserve Program (WRP), which was repealed as of February 7, 2014, NRCS provided technical and financial support to help landowners with their long-term wetlands conservation and restoration efforts (NRCS, no date-c). Although repealed, contracts, agreements, and easements established through the WRP remain valid. The WRP offered permanent easements to private landowners who meet certain conditions. Through this program, NRCS aimed to optimize wetland functions and values as well as wildlife habitat. As of 2013, a cumulative total of 2,723,100 acres had been enrolled nationally in the WRP, of which 96,350 acres were in Texas (NRCS, 2015). There are at least two WRP properties on or near the proposed Riverby Ranch mitigation site.

1.2.6 Texas Commission on Environmental Quality

The Texas Commission on Environmental Quality (TCEQ) is the environmental agency for the state. TCEQ's aim is to protect Texas' human and natural resources in a manner consistent with sustainable economic development. Its goal is clean air and water and the safe management of waste. While receiving its current name only in 2002, TCEQ is actually descended from a number of predecessor state agencies concerned with protecting air and water quality in Texas, dating back to the formation of the Texas Board of Water Engineers in 1913 (TCEQ, 2010a).



The Office of Water is one of six offices within TCEQ. It is responsible for water supply, water planning, and water quality. The TCEQ Office of Water conducts CWA Section 401 water quality certification reviews of projects, such as the proposed LBCR, requiring a Section 404 permit from the USACE for the discharge of dredged or fill material into waters of the U.S., including wetlands (TCEQ, 2009a). The purpose of these certification reviews is to determine whether a proposed discharge will comply with state water quality standards.

Like every other state, Texas sets its own water quality standards with the EPA's approval. These standards ensure that the quality of each water body in the state is maintained at a level sufficient to perpetuate the aquatic life and human uses that have historically existed there. In permitting a broad range of substances, including pollutants or contaminants, to be discharged into state waters, both the federal and the state governments are required to ensure that these discharges will not create conditions that impair the ability of life existing in or depending on the water to survive and reproduce. The 401 certification reviews ensure that Texas is involved in decisions made by the federal government that affect the quality of the water resources of the state (TCEQ, 2004).

There are two types of 401 certifications in Texas – Tier I and Tier II. Tier II projects are those which affect ecologically significant wetlands of any size, are greater than 1,500 linear feet of stream, are greater than three acres of waters of the U.S., or are otherwise not appropriate for Tier I reviews (TCEQ, 2010b). The proposed LBCR is a Tier II project.

After the USACE declares a Section 404 application complete, a joint public notice is issued. Any water quality issues or concerns identified during the 401 review are outlined in a letter from the TCEQ to the USACE following comment deadlines established in the joint public notice. Once the USACE resolves all issues to its satisfaction, the USACE issues a Statement of Findings or a Decision Document. The TCEQ has 10 working days to make a Section 401 certification decision. On December 8, 2009, in Bonham, TX, the TCEQ conducted a public meeting for the 401 certification concurrent with the USACE's Lower Bois d'Arc Creek Reservoir EIS scoping meeting.

In addition to its responsibilities for Section 401 water quality certification, TCEQ administers water rights permitting in Texas. Rivers, streams, underflow, creeks, tides, and/or lakes in Texas are considered state water. The right to use state water may be acquired through appropriation via the permitting process established in Texas Water Code, Chapter 11, and Title 30, Texas Administrative Code. Chapter 11 of the Texas Water Code describes water uses that require a permit and the specific criteria to be used by the TCEQ in its review and action on a permit application (TCEQ, 2009b). NTMWD submitted an application to TCEQ for a Texas Water Right for the proposed LBCR in December 2006 (Freese and Nichols, 2006). TCEQ issued NTMWD a final Water Right ("Water Use Permit") for the LBCR on June 26, 2015, the first uncontested water rights permit issued for a major reservoir in the last half century, and one of the first uncontested interbasin transfers of water (NTMWD, 2015a). The water rights permit for LBCR is included in this EIS as Appendix F.

TCEQ staff also assisted in conducting the HEP analysis, the instream flow study, and HGM studies for the proposed reservoir and mitigation sites.

1.2.7 Texas Water Development Board

Created in 1957, the Texas Water Development Board (TWDB) furnishes leadership, planning, financial assistance, information, and education for the conservation and responsible development of water for Texas and Texans. TWDB provides water planning, data collection and dissemination, and financial and technical assistance services to the citizens of Texas to accomplish its goals of planning for the state's water resources and for providing affordable water and wastewater services (TWDB, no date-a).



In 1997, Governor George W. Bush signed into law Senate Bill 1 (SB 1), comprehensive water legislation enacted by the 75th Texas Legislature. SB 1 was an outgrowth of increased awareness of the vulnerability of Texas to drought and to the limits of existing water supplies to meet increasing demands as the state's population grows. SB 1 specifies that individuals representing 11 interest groups may serve as members

of Regional Water Planning Groups (RWPGs) to prepare the regional water plans for their respective areas. These plans specify how to conserve water supplies, meet future water supply needs, and respond to future droughts.

SB 1 designated TWDB as the lead state agency for coordinating the regional water planning process and developing a comprehensive statewide water plan that incorporates each of the regional plans. TWDB developed planning guidance documents to guide preparation of regional water plans, delineated the state's water planning areas, and designated the planning group representatives (TWDB, 2010b). There are 16 regional water planning areas in the state as shown in Figure 1.2-1. The proposed LBCR project is located within Region C

Working within TWDB guidelines, each regional planning group reviews water use projections and water availability volumes in dry or drought-of-record conditions. When a water need is identified, the planning group recommends water management strategies to meet the need. Once the planning group adopts the regional water plan, it is sent to TWDB for approval. The TWDB then compiles the 16 regional water plans and information from other sources to prepare the state water plan (TWDB, 2010a).

The 2016 Region C Water Plan was finalized and submitted to the TWDB in November 2015 (Region C Water Planning Group, 2015). The corresponding, current 5-year state plan – the 2017 State Water Plan – was adopted by the TWDB on May 19, 2016. The previous 2012 State Water Plan, cited extensively in the February 2015 DEIS, had been adopted by the TWDB on December 15, 2011, and sent to the Texas Governor on January 5, 2012 (TWDB, 2012). TWDB personnel assisted with conducting the HEP analysis of the proposed reservoir and mitigation sites and participated with the instream flow study team.

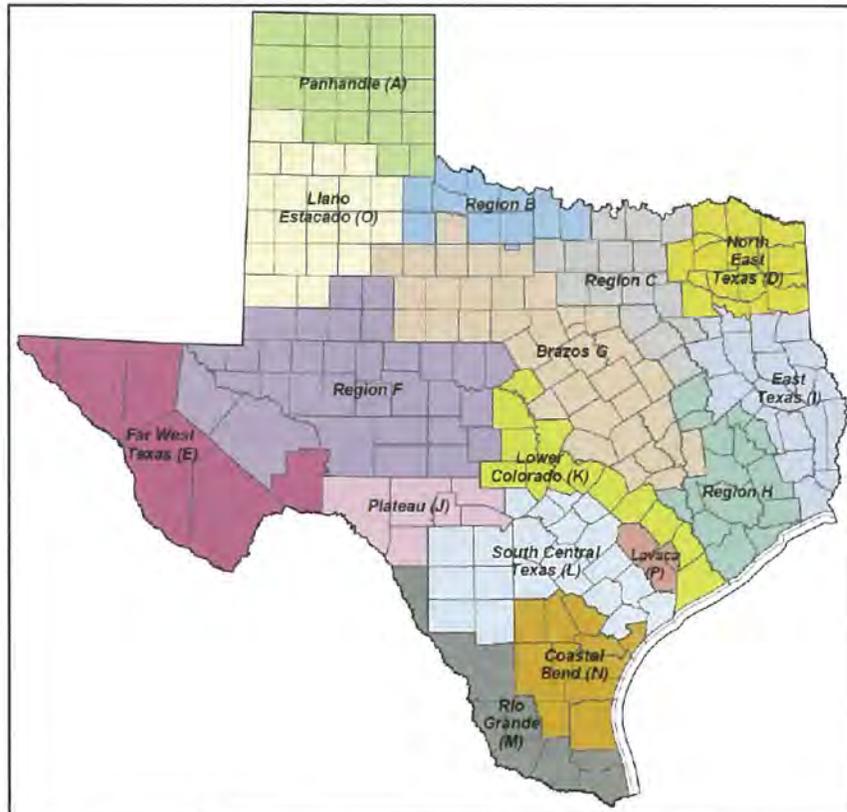


Figure 1.2-1. Regional Water Planning Areas in Texas

1.2.8 Texas Parks and Wildlife Department

The mission of the TPWD is to “manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations” (TPWD, 2010a). TPWD administers the Texas state park system and manages hunting and fishing in the state, among other functions. TPWD was established by the 58th State Legislature in 1963, consolidating operations of the Texas Game and Fish Commission and the State Parks Board. The department is governed by the Texas Parks and Wildlife Commission, appointed by the governor, and headed by an executive director, named by the commissioners (Smyrl, 2010).



TPWD is the state agency with the primary responsibility for protecting the state's fish and wildlife resources as prescribed by Texas Parks and Wildlife Code §12.0011. In accordance with §12.0011, TPWD provides recommendations that will protect fish and wildlife resources to local, state, and federal agencies that approve, permit, license, or construct development projects; TPWD provides recommendations to any local, state, and federal agencies or private organizations that make decisions affecting those resources. TPWD also provides recommendations on scheduling of instream flows and freshwater inflows to Texas estuaries for the management of fish and wildlife resources (TPWD, 2007).

TPWD annually conducts about 2,100 wildlife population surveys, provides recommendations concerning the management of about 1,200 vertebrate wildlife species, and performs about 75 wildlife research studies. TPWD also manages 51 wildlife management areas totaling about 755,000 acres, holds public hunts on more than 200 tracts of land totaling more than 1.4 million acres, informs the public about wildlife, and issues about 1,500 permits of various kinds to take or hold wildlife (Bengston, et al., 2003).

TPWD is acting as a cooperating agency with the USACE for the preparation of this EIS. TPWD assisted with HEP analysis of the proposed reservoir and mitigation sites as well as participating in the inter-agency instream flow and HGM studies associated with the project. In 2015 and 2016, TPWD participated in workshops organized by EPA Region 6 and USACE's Tulsa District on HGM and RGA along with other federal and state agencies, as well as experts and academics from Freese and Nichols, Inc., the Arthur Temple College of Forestry and Agriculture at Stephen F. Austin State University (Dr. Hans M. Williams), and the Department of Geology at Baylor University (Dr. Peter Allen).

1.2.9 Texas Historical Commission

The Texas Historical Commission (THC) is the state's agency for historic preservation. Among other responsibilities, it administers the Antiquities Code of Texas (THC, 2010a; THC, no date-a). THC has 17 commissioners, who are all governor-appointed citizen members with staggered six-year terms. Its staff of 220 employees consults with citizens and organizations to preserve Texas' architectural, archeological and cultural landmarks. THC staff work in various fields, including archeology, architecture, history, economic development, heritage tourism, and urban planning.



TEXAS HISTORICAL COMMISSION
real places telling real stories

THC maintains nearly 12,000 historical markers along the state's roads and other sites. It also manages and promotes 20 state historic sites and conducts a comprehensive program for maintenance, promotion, and restoration of historic county courthouse buildings. THC facilitates federal preservation programs, including the National Register of Historic Places (NRHP) and the Certified Local Government program (THC, 2010a).

In response to growing public concern about increasing threats to the nation's historic sites, the U.S. Congress passed the National Historic Preservation Act (NHPA) in 1966. This law established a national policy for the protection of important historic buildings and archeological sites, and outlined responsibilities for federal and state governments to preserve our country's heritage.

The NHPA created the NRHP, a list of sites, districts, buildings, structures and objects of national, regional or local significance. Section 106 of the NHPA requires federal agencies to consider the effects of their actions on cultural resources eligible for inclusion in the NRHP. Listing in the NRHP is a lengthy process requiring substantial documentation, which is initially reviewed by the State Historic Preservation Officer (SHPO). In Texas, the SHPO is the executive director of the THC. The SHPO's role in the Section 106 process is to determine whether a cultural resource meets the criteria for listing in the NRHP, not to approve the nomination (THC, no date-b).

The NHPA mandates the SHPO to represent the interests of the state when consulting with federal agencies under Section 106 of the NHPA and to maintain a database of historic properties. The NHPA also created the Advisory Council on Historic Preservation (ACHP), an independent federal agency in the executive branch that oversees the Section 106 review process. In addition to the views of the agency, the SHPO and the ACHP, input from the general public and Native American tribes is also required. The NHPA requires any agency issuing a federal permit or license, providing federal funds, or otherwise providing assistance or approval to comply with Section 106 (THC, no date-b).

The USACE must comply with its obligations under Section 106 of the NHPA both in considering the Section 404 permit application from the NTMWD for the proposed LBCR and in preparing this EIS. The USACE and the THC are two of the signatories in a Programmatic Agreement (PA) for conducting a cultural resources survey of the proposed reservoir site (THC, 2010b). The PA is included in this EIS as Appendix G.

1.2.10 Red River Authority of Texas

The Red River Authority of Texas (RRA) was created in 1959 by acts of the 56th Texas Legislature as a political subdivision of the State. The RRA's territorial jurisdiction includes all or part of 43 Texas counties lying within the watershed of the Red River and its tributaries upstream from the northeast corner of Bowie County (RRA, 2009).



The RRA's mission is the conservation, reclamation, protection, and development of water resources in the Red River Basin for the benefit of the public. The Texas Legislature has directed the RRA to:

- Prepare and maintain a basin-wide inventory and assessment of the available water resources to meet present and long-range water use planning, management, and protection needs for the public;
- Provide administrative and technical assistance to public entities in the areas of development, operation, and maintenance to meet the water resource needs to support economic growth of communities within the basin;
- Provide financial assistance to aid in the control of pollution, conservation of water, resource management and development, development of public facilities, navigation, recreation, flood control, and solid waste disposal;

- Provide legal sponsorship of any feasible public works project where the intent is to reclaim, improve or develop water resources of the basin (RRA, 2009).

A large portion of Fannin County, the proposed LBCR, and the proposed Riverby Ranch mitigation site lie within the Red River Basin and are thus within the RRA's territorial jurisdiction.

1.2.11 Native American Tribes

The United States has a unique legal and political relationship with Native American tribes as provided in the U.S. Constitution, various treaties, the federal trust doctrine, and federal statutes. These relationships extend to the federal government's historic preservation activities, mandating that federal consultation with Native American tribes be meaningful, in good faith, and conducted on a government-to-government basis (GSA, 2010).

On September 23, 2004, President George W. Bush issued Executive Memorandum Government-to-Government Relationship with Tribal Governments, recommitting the federal government to work with federally-recognized Native American tribal governments on a government-to-government basis, and strongly supporting and respecting tribal sovereignty and self-determination.

Mandates for the federal government's unique policies and relationship with Native American tribal governments are also codified in various Executive Orders and statutes, the most relevant of which are cited below:

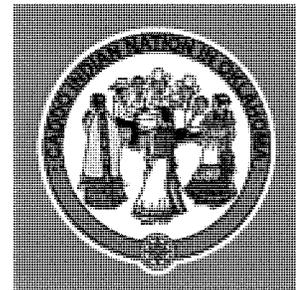
- Executive Order 13175 Consultation and Coordination with Indian Tribal Governments: issued by President Bill Clinton in 2000; recognizes tribal rights of self-government and tribal sovereignty, and affirms and commits the federal government to work with Native American tribal governments on a government-to-government basis.
- Native American Graves Protection and Repatriation Act (NAGPRA): provides a process for museums and federal agencies to return certain Native American cultural items – human remains, funerary objects, sacred objects, and objects of cultural patrimony – to lineal descendants, culturally-affiliated Native American tribes, and Native Hawaiian organizations.
- Archeological Resources Protection Act (ARPA): requires federal agencies to consult with tribal authorities before permitting archeological excavations on tribal lands and mandates the confidentiality of information concerning the nature and location of archeological resources, including tribal archeological resources.
- American Indian Religious Freedom Act (AIRFA): passed in 1978, affirms a national policy to protect and preserve Native Americans' inherent right of freedom to believe, express, and exercise the traditional religions of indigenous America, including protecting and preserving access to sacred sites.
- NEPA: calls for the federal government to invite the participation of any affected Native American tribe in the environmental review process.
- NHPA: enhances Native American tribal roles in historic preservation through the Tribal Historic Preservation Officer (THPO) program. Obligates federal agencies to consult with Native American tribal governments under Section 106 of NHPA (GSA, 2010).

The USACE has a growing Tribal Nations program that has expanded since its inception in 1996 in terms of staffing, improved relations with tribes, accomplishments, and recognition (USACE, 2010b). The program is an outgrowth of the 1994 Presidential Memorandum that called on federal agencies to work more closely with tribes. There is now a Tribal Liaison or point of contact in every District and Division office. The USACE adopted its Tribal Policy Principles in 1998. These Principles direct the USACE to:

- Meet the Trust responsibility;
- Honor the government-to-government relationship;
- Acknowledge the inherent sovereignty of Tribes;
- Engage in pre-decisional consultation;
- Protect natural and cultural resources when possible; and
- Find opportunities to use existing authorities to encourage economic capacity building and growth.

The following 33 Native American Tribes plus the Bureau of Indian Affairs (BIA) in the Department of the Interior were included in public notice mailings for this proposed project:

- Alabama and Coushatta Tribes of Texas
- Apache Tribe of Oklahoma
- Caddo Indian Tribe of Oklahoma
- Cherokee Nation of Oklahoma
- Cheyenne and Arapahoe Tribes of Oklahoma
- Chickasaw Nation of Oklahoma
- Choctaw Nation of Oklahoma
- Comanche Tribal Business Committee
- Delaware Tribe of Indians
- Fort Sill Apache Tribe
- Iowa Tribe of Oklahoma
- Jicarilla Apache Tribe
- Kaw Nation
- Kickapoo Traditional Tribe of Texas
- Kickapoo Tribe of Oklahoma
- Kiowa Indian Tribe of Oklahoma
- Mescalero Apache Tribe
- Modoc Tribe of Oklahoma
- Muscogee (Creek) Nation of Oklahoma
- Osage Tribe
- Otoe-Missouria Tribe of Indians
- Ottawa Tribe of Oklahoma
- Peoria Tribe of Indians of Oklahoma
- Ponca Tribe of Indians of Oklahoma
- Quapaw Tribal Business Committee
- Seminole Nation of Oklahoma
- Seneca-Cayuga Tribe of Oklahoma
- Thlopthlocco Tribal Town
- Tonkawa Indian Tribe
- United Keetowah Band of Cherokee
- White Mountain Apache Tribal Council
- Wichita Affiliated Tribal Executive Committee
- Ysleta del Sur Pueblo



Additional coordination occurred during the development of the PA for Archeological Resources, with four tribal governments, specifically the Caddo Nation of Oklahoma, Comanche Nation of Oklahoma,

Kiowa Tribe of Oklahoma, and Wichita and Affiliated Tribes of Oklahoma. Only the Caddo Nation of Oklahoma is a signatory on the PA.

1.3 SECTION 404 PERMIT APPLICATION PROCESS

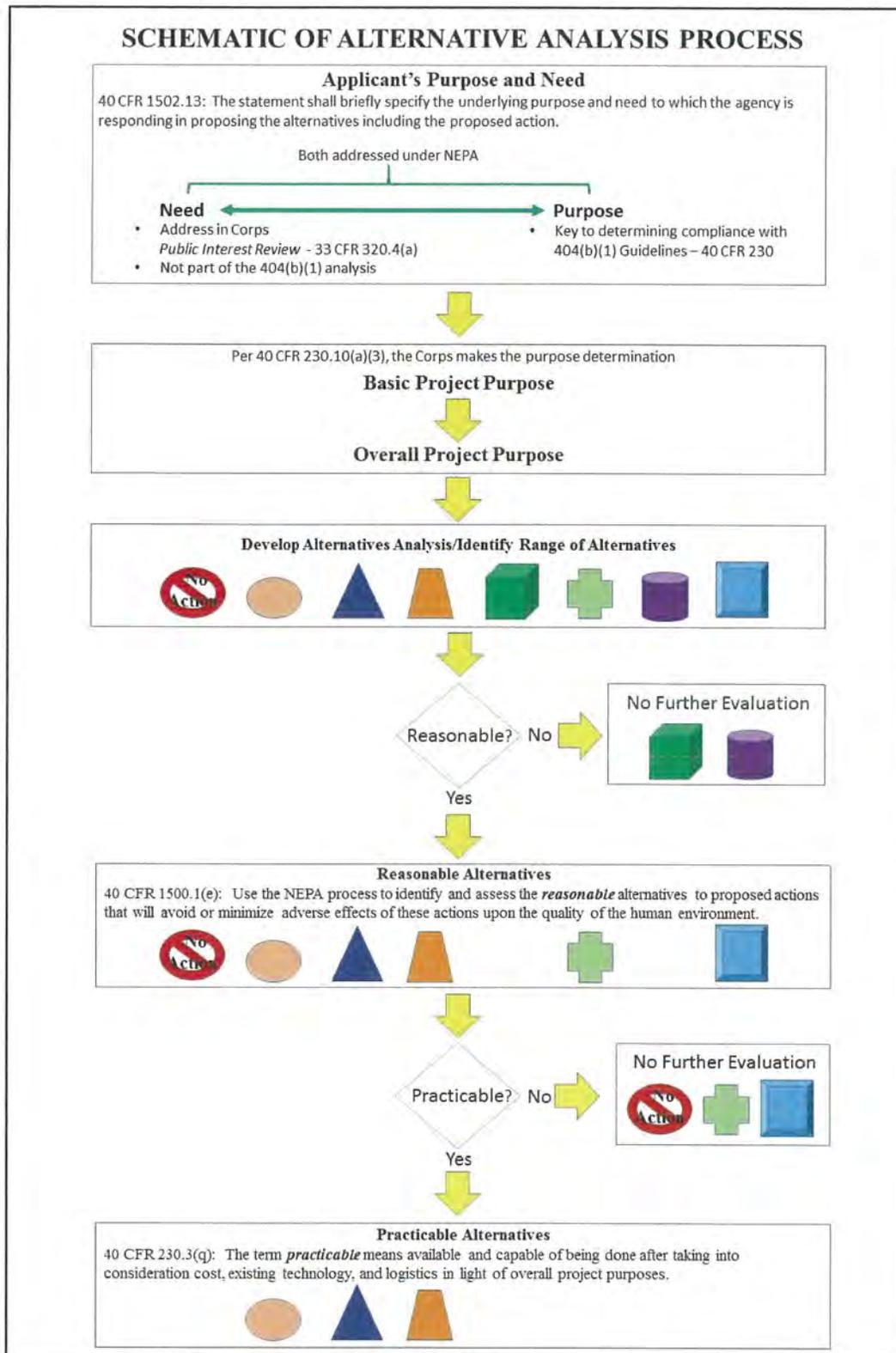
In 1972, the Federal Water Pollution Control Act was amended and became commonly known as the CWA. Section 404 of the CWA added authority to the Department of the Army's existing regulatory program under Section 10 of the Rivers and Harbors Act of 1899. Under Section 404 of the CWA, the Secretary of the Army, acting through the Chief of Engineers, is authorized to issue permits, after appropriate notice and the opportunity for public hearings, for the discharge of dredged or fill material into waters of the United States at specified disposal sites. The selection of such sites must be in accordance with guidelines developed by the EPA in conjunction with the Secretary of the Army; these guidelines are known as the 404(b)(1) Guidelines (USACE, no date-a).

The basic form of authorization used by USACE districts is the individual permit. Processing such permits involves evaluation of project-specific applications in what can be considered three steps: 1) pre-application consultation (for major projects), 2) formal project review, and 3) decision making.

Pre-application consultation usually involves one or several meetings between an applicant, USACE district (e.g., Tulsa District) staff, interested resource agencies (federal, state, and local), and sometimes the interested public. The main purpose of such meetings is to provide for informal discussions about the pros and cons of a proposal before an applicant makes irreversible commitments of resources (funds, detailed designs, etc.). The process is designed to provide the applicant with an assessment of the viability of alternatives available to accomplish the project purpose, to discuss measures for reducing the impacts of the project, and to inform the applicant of the factors the USACE must consider in its decision-making process.

In its evaluation of Section 404 permit applications, the USACE must analyze alternatives to the proposed project that achieve its purpose. USACE conducts this analysis according to two main requirements: the 404(b)(1) Guidelines (Guidelines) and NEPA. USACE also considers alternatives as part of its public interest review evaluation. USACE must evaluate alternatives that are practicable and reasonable (see Figure 1.3-1). In keeping with the Guidelines at 40 Code of Federal Regulations (CFR) 230.10(a), a permit cannot be issued if a practicable alternative exists that would have a less adverse impact on the aquatic ecosystem – known as the Least Environmentally Damaging Practicable Alternative (LEDPA) – provided that the LEDPA does not have other significant adverse environmental consequences to other natural ecosystem components. Therefore, the alternatives screening process is designed to provide information regarding Purpose and Need and impacts to the natural environment in general and the aquatic ecosystem in particular. With regard to NTMWD's Section 404 permit application to build the LBCR, the USACE decision on the LEDPA will be announced in the Record of Decision (ROD), not in the EIS.

The USACE must consider reasonable alternatives to comply with NEPA. Evaluations to address the Guidelines and NEPA normally satisfy the requirements of the public interest review. The Guidelines include two "rebuttable presumptions" for projects with discharges into waters of the U.S. that are special aquatic sites (including wetlands, riffle pool complexes, and other specific aquatic resources) that do not require access to or siting within the special aquatic site(s) to achieve their basic essence (basic project purpose). The first presumption states that alternatives that do not affect special aquatic sites are presumed to be available. The second states that practicable alternatives located in non-special aquatic sites (e.g., other waters, uplands) have less adverse impact on the aquatic ecosystem. It is up to the applicants to clearly demonstrate to the USACE that both of these presumptions have been rebutted in order to pass the alternatives portion of the Guidelines.



USACE districts operate under a project manager system, where one individual is responsible for handling an application from receipt to final decision. The project manager prepares a public notice, evaluates the impacts of the project and all comments received, negotiates necessary modifications of the project if required, and drafts or oversees drafting of appropriate documentation to support a recommended permit decision. The permit decision is based upon compliance with the Section 404(b)(1) guidelines and a public interest review. The decision document includes a discussion of the environmental impacts of the project, the findings of the public interest review process, and any special evaluation required by the type of activity (USACE, no date-a).

The USACE supports a strong partnership with states in regulating development of water resources. This is achieved with joint permit processing procedures (e.g., joint public notices and hearings), programmatic general permits founded on effective state programs, transfer of the Section 404 program in non-navigable waters, joint EISs, special area management planning, and regional conditioning of nationwide permits.

The USACE's public interest balancing process is of great importance to the project evaluation. The public benefits and detriments of each case are carefully evaluated and balanced. Relevant factors considered may include conservation, economics, aesthetics, wetlands, cultural values, navigation, fish and wildlife values, water supply, water quality, and any other factors judged important to the needs and welfare of the people (33 C.F.R. § 320.4(a)(1)). The following general criteria are considered in evaluating all applications:

- The relevant extent of public and private needs;
- The practicability of using reasonable alternative locations and methods to accomplish project purposes where unresolved conflicts of resource use exist; and
- The extent and permanence of the beneficial and/or detrimental effects the proposed project may have on public and private uses to which the area is suited (33 C.F.R. § 320.4(a)(2)).

The major tools used to interact with the public are the public notice and public hearing. The public notice is the primary method of advising all interested parties of a proposed activity for which a permit is sought and of soliciting comments and information necessary to evaluate the probable beneficial and detrimental impacts according to the public. Public notices on proposed projects always contain a statement that anyone commenting may request a public hearing. Public hearings are held if comments raise substantial issues which cannot be resolved informally and the USACE decision maker determines that information from such a hearing is needed to make a decision. Public notices are used to announce hearings. The public is also informed by monthly notices of permit decisions.

The permit evaluation process contains a number of safeguards designed to ensure objectivity in the evaluation process. Probably the single most important safeguard of the program is the public interest review. This review requires the careful weighing of all public interest factors relevant to each particular case. Thus, one specific factor (e.g., economic benefits) cannot by itself force a decision, but rather the decision represents the net effect of balancing all relevant factors, which frequently may conflict with each other (USACE, no date-a).

There are also external safeguards to maintain objectivity of the Section 404 permitting process. One is the EPA's Section 404(c) or so-called "veto" authority. The EPA may prohibit or withdraw the use of an area as a disposal site for dredged or fill material if the EPA Administrator determines that discharges to the site will have unacceptable adverse effects on municipal water supplies, shellfish beds and fishery areas, wildlife, or recreational areas. This authority also carries with it the requirement for notice and opportunity for public hearing. The EPA may invoke this authority at any time.

Individual state permitting and water quality certification requirements provide another form of objective safeguard for the USACE's regulatory program. As noted above in the discussion of the TCEQ's role and responsibilities, Section 401 of the CWA requires state certification or waiver of certification prior to issuance of a Section 404 permit (USACE, no date-a).

The USACE applies the 404 (b) (1) Guidelines in its evaluation of the Section 404 permit application. Dredged or fill material may not be discharged into the aquatic ecosystem unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern, including bottomland hardwood forests and flowing open water [Part 230, § 230.1 (c)]. Either the public interest review or the 404 (b) (1) Guidelines can be the basis for denial of a permit, while neither can be the sole basis for permit issuance. Subject to compliance with the EPA 404(b) (1) Guidelines and other applicable laws, the USACE Tulsa District Engineer will grant a permit to the NTMWD unless it is determined that granting the permit would be contrary to the public interest [Part 320.4(a)(1)].

If the USACE denies a Section 404 permit, an applicant can apply for another Section 404 permit provided the project is substantially different, that is, a project of different size, location, and potential impacts. However, applying for an altogether new Section 404 permit is a costly and time-consuming endeavor.

1.4 NEPA PROCESS

In evaluating the Section 404 permit application from the NTMWD, USACE must comply with NEPA and its implementing regulations from the Council on Environmental Quality (CEQ) (40 CFR 1500-1508). NEPA requires that the responsible agency:

- Identify the purpose and need to be met;
- Identify the available courses of action to meet that need, including no action;
- Identify, evaluate and compare the impacts on the environment that could arise from each of the reasonable alternatives;
- Publish this information in an EIS for review by the public and other agencies;
- Consider the impacts, ways to lessen or avoid them, and public and agency comments, before making its decision on the proposal.

1.4.1 Draft Environmental Impact Statement

The first stage of EIS development is the scoping process, which is the means by which substantive issues are identified for further study in the EIS. The NEPA scoping process begins with the publication of a Notice of Intent (NOI) to prepare an EIS in the *Federal Register*. The NOI for the LBCR EIS was published in the *Federal Register* on November 13, 2009 (Vol. 74, No. 218, p. 58616-58617). The scoping process often involves face-to-face meetings with the interested public. The USACE then investigates substantive issues raised in scoping, conducts research and analysis, and drafts an EIS.

Availability of the DEIS is announced through public notice, including a Notice of Availability (NOA) in the *Federal Register*, letters to interested parties, and notices in the print and broadcast news media. It is the notice which is intended to solicit comments not only on the NEPA document but substantive comments on the Proposed Action. Again, with complex projects the public may request a public hearing (USACE, no date-a).

Sometimes the USACE decision maker will independently decide to hold a public hearing and the meeting announcement will be incorporated into the NOA of the NEPA document. The public is also informed through NOA of the public release of the final EIS, any EIS supplement, and the decision maker's ROD. Thus, five or more notices to the public may occur during the review of a permit application requiring preparation of an EIS (USACE, no date-a).

The DEIS was completed by the USACE in early 2015. The document was made available for public and agency review and comment for a 60-day period ending on April 21, 2015. The USACE also received oral and written comments on the DEIS at a public meeting held on March 24, 2015 in Bonham, Texas. Comments on the DEIS were submitted by the US EPA Region 6, TCEQ, Texas Conservation Alliance, Natural Resource Defense Council, Audubon Texas, local landowners, and other stakeholders. The USACE has decided to prepare a Revised DEIS after carefully reviewing a broad range of comments considering how best to meet the provisions of NEPA.

1.4.2 Revised Draft Environmental Impact Statement

The Revised DEIS was prepared based on revised project information provided by the applicant (NTMWD) and to address comments raised during the DEIS public and agency review period. The Revised DEIS discloses the environmental effects of constructing and operating a second action alternative and incorporates modifications to the project description, affected environment, and impact analysis to address comments raised during the DEIS public and agency review period. The Revised DEIS also provides a refined mitigation plan developed by the applicant designed to offset impacts on waters of the U.S.

As with the DEIS, the Revised DEIS is being circulated for public and agency review. Comments on the RDEIS will be accepted by the USACE until May 8, 2017.

1.4.3 Final Environmental Impact Statement

Upon completion of the Revised DEIS public and agency comment period, the USACE will prepare a Final Environmental Impact Statement (FEIS). As part of preparing the FEIS, the USACE will respond

ABOUT ENVIRONMENTAL IMPACT STATEMENTS

An EIS is intended to help federal agencies make environmentally well-informed decisions about major actions. It focuses on providing specific information on the Proposed Action, alternatives, and impacts that is relevant to the agency's decision making.

The EIS answers major questions such as:

- What is the need to be met?
- In what ways could the need be addressed?
- How would these courses of action affect the environment?
- What could be done about those effects?
- What do others think about these alternatives and their impacts?

Preparing an EIS involves several steps, including a "scoping" process at the outset. In scoping, the responsible agency asks other agencies, organizations and the public for input concerning the planned EIS. When the EIS is published as a draft, the agency again invites outside comments, which are reflected in the final EIS; this FEIS is published prior to the agency's final decision, which is documented in a ROD. The public may again comment on the final EIS under NEPA.

to the comments received on the DEIS and the Revised DEIS. The FEIS is expected to be completed in the third quarter of 2017. Once the FEIS is completed, the USACE will prepare the ROD for the project.

1.5 PURPOSE AND NEED OF THE PROPOSED ACTION

Defining the purpose of a project is crucial to enabling the USACE to evaluate the project's compliance with the Section 404(b)(1) Guidelines. The USACE must define both the basic project purpose and the overall project purpose. Defining the basic project purpose enables the USACE to determine whether the activity is water-dependent and may affect a special aquatic site as described in 40 CFR 230.10(a)(3):

“Where the activity associated with a discharge which is proposed for a special aquatic site [such as a wetland] does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not 'water dependent'), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise.”

The overall project purpose, which is more specific than the basic project purpose, is used to identify and assess practicable alternatives. According to 40 CFR 230.10(a)(2):

“An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered.”

1.5.1 Basic Purpose of the Applicant's Proposed Action

The USACE Tulsa District is responsible for defining the basic purpose of the proposed project. As described above, under the guidelines governing the USACE's evaluation of a Section 404 permit application, the basic purpose must be identified to determine if the proposed project in question is “water dependent” and requires access or proximity to or siting within a special aquatic site such as wetlands in order to fulfill its basic purpose. The USACE has determined that the basic project purpose in the present case is to develop an additional, reliable water supply for the applicant (NTMWD) and its member cities and customers. Access or proximity to or siting within special aquatic sites is not required to fulfill the basic project purpose in this case; therefore, the basic purpose is not water dependent.

1.5.2 Overall Purpose of the Applicant's Proposed Action

The USACE uses the overall project purpose to assess less environmentally damaging practicable alternatives. The 404(b)(1) Guidelines state that an alternative is practicable if it is available and capable of being accomplished “after taking into consideration cost, existing technology, and logistics in light of overall project purposes” (40 CFR 230.10(a)(2)). This evaluation applies to all waters of the United States, not just special aquatic sites such as wetlands.

The USACE Tulsa District considers the overall purpose of NTMWD's Proposed Action to be developing an additional and reliable water supply of at least 105,804 AFY by 2025, including under drought and other reduced-availability situations. The estimated 105,804-AFY water supply requirement consists of the 58,694 AFY “supply deficient” plus the reserve requirements identified by NTMWD

(“recommended reserve supply”). The proposed project would also help meet a portion of the current estimated NTMWD long-term water supply needs through 2060.

Table 1.5-1 provides a summary of the estimated NTMWD water supply and estimated water demands through 2060. This information is used for NTMWD’s long-term water supply planning purposes. The gap between NTMWD’s existing water supplies and projected demand is expected to widen considerably beginning in about 2020. By 2030, the supply deficit is predicted to be approximately 107,000 AFY, for a net water need of 157,000 AFY with the recommended reserve supply included. By 2060 the water supply demand is estimated to reach approximately 626,000 AFY.

Table 1.5-1. Summary of NTMWD Water Supply and Demand for 2020 to 2060 (AFY)

	2020	2025	2030	2035	2040	2050	2060
Current Supplies	360,831	352,872	344,468	353,782	363,113	381,675	390,738
Main Stem Pump Station ¹	53,135	45,490	37,913	31,660	25,366	13,599	3,235
Total Supplies	413,966	398,362	382,381	385,442	388,479	395,274	393,973
Demands (2013 CIP²)							
Customer Conservation	8,044	10,440	12,805	14,310	15,816	18,955	22,305
NTMWD Water Loss Reduction	2,151	3,611	5,069	6,844	8,615	12,348	16,634
Net Demand	419,998	457,056	489,030	519,682	549,935	586,090	626,436
Supply Deficit							
Supply Deficit	6,031	58,694	106,649	134,240	161,456	190,815	232,464
Recommended Reserve Supply	43,020	47,110	50,690	54,080	57,440	61,740	66,540
Total Supply Needed	49,051	105,804	157,339	188,320	218,896	252,555	299,004

AFY = acre-feet per year.

¹ See Section 2.2.5.1 for a description of the Main Stem Pump Station.

² Capital Improvement Plan (CIP) for NTMWD.

Source: Table 1 in Kiel and Gooch, 2015.

The water supply and demand totals shown in Table 1.5-1 were developed based on information compiled and assessed through NTMWD’s long-term water supply planning process. The water supply planning process is described in detail in Appendix N, “NTMWD Water Supply Planning Process.”

1.6 PUBLIC PARTICIPATION

The Section 404 permitting process and the NEPA process provide several opportunities for public involvement. At these times, interested and affected parties (stakeholders) may express their concerns and provide their views about: 1) the Proposed Action and its possible impacts on aquatic resources and the environment, 2) what should be addressed in the analysis and evaluation of the Proposed Action, and 3) the adequacy of the NEPA analysis and documentation of potential impacts in the EIS.

1.6.1 Public Notice for Section 404 Permit Application

On October 14, 2008, the USACE-Tulsa District issued Public Notice No. SWT-0-14659, notifying interested parties that the District Engineer had received an application for a Department of the Army Permit under Section 404 of the CWA. The application was to construct a dam on Bois d’Arc Creek in

Fannin County, Texas in order to impound a water supply reservoir. The stated purpose of the work was to expand water supply resources of the NTMWD (USACE, 2008b).

Originally, the expiration date of the 30-day comment period for Public Notice No. SWT-0-14659 was set at November 12, 2008. At the request of the EPA, the comment period was extended by one month to December 12, 2008 (Parrish, 2008).

USACE received comments from approximately 70 individuals and agencies during the extended comment period on Public Notice No. SWT-0-14659. USACE reviewed all comments and conducted an evaluation of the proposed project and its anticipated environmental effects relative to NEPA and Section 404 of the CWA. After careful consideration, in March 2009, USACE determined that the LBCR project constituted a major federal action with the potential to significantly affect the quality of the human environment and that preparation of an EIS would be required. The USACE based its decision on the following factors:

- The impoundment of a large volume of water in the Red River Basin and its diversion to the Trinity River basin could result in significant adverse effects to aquatic ecology.
- The proposed project would result in the direct loss of bottomland hardwood wetlands and altered hydrology downstream of the proposed dam. Bottomland hardwood wetlands are a diminishing habitat in the region, identified by the EPA as an "aquatic resource of National importance".
- The proposed project may result in both adverse and beneficial effects to public lands within the Caddo National Grasslands, Bois d'Arc Unit, located downstream of the proposed dam.
- Two large reservoirs (Lower Bois d'Arc Creek and Lake Ralph Hall) in Fannin County have the potential for combined cumulative impacts on existing development patterns and significant alterations to the rural nature of Fannin County.
- Natural resource agencies such as USFWS, TCEQ, and TPWD, in addition to one environmental organization (Texas Conservation Alliance), are concerned about potential project impacts. The USFWS, EPA, and 45 other commenters requested that USACE prepare an EIS for this project.
- The proposed project would displace residents and result in the loss of livelihoods and substantial reduction to the functional size of adjacent landholdings.
- The need to assure adequate and impartial evaluation of the availability of less environmentally damaging practicable alternatives.
- The absence of a detailed mitigation plan which would offset the extensive impact to wetlands and aquatic resources in the proposed lake basin.
- The need to evaluate potential secondary, indirect, and cumulative impacts related to the construction of related pipeline and water treatment facilities.

In addition, USACE observed that the project appeared to be controversial in nature. In view of these findings, the Tulsa District determined that the LBCR project constitutes a major federal action with the potential to significantly affect the quality of the human environment. As such, in accordance with Regulatory Guidance Letter No. 05-08, "Environmental Impact Statements, Third Party Contracting," Headquarters guidance on EIS preparation, dated December 17, 1997, CEQ Regulations for Implementing the Procedural Provisions of NEPA (CFR 1500-1508), and the USACE Procedures for Implementing NEPA (33 CFR 320), the Tulsa District concluded that USACE is required to prepare an EIS on the proposed permit action through the use of a third party contractor paid by the applicant, but who is selected and supervised by the USACE (Manning, 2009).

1.6.2 Scoping Process for an EIS

NEPA requires lead agencies to invite public involvement prior to decision-making on proposed actions that may affect the environment. “Scoping” is the process of soliciting input (comments) from “stakeholders” – including Tribes, the public (both private citizens and non-governmental organizations or NGOs), and other agencies – at the outset of a NEPA (in this case, EIS) analysis. Not only may the information obtained from interested and knowledgeable parties be of value, but their perspectives and opinions as to which issues matter the most, and how or if the agency should proceed with a given proposed action are equally important. Input from scoping helps shape the development of alternatives to the proposed action and the direction that the NEPA analysis takes, helping analysts decide which issues merit consideration.

Public Scoping

Scoping for the EIS formally began on Friday, November 13, 2009 with the publication of an NOI in the *Federal Register* (Vol. 74, No. 218, pp. 58616-58617). With this public notification, USACE announced its intent to prepare an EIS on whether to issue a Section 404 permit under the CWA for the proposed construction and operation of LBCR in Fannin County, Texas. Comments for scoping were accepted until January 9, 2010.

On the afternoon and evening of December 8, 2009 the USACE conducted a public scoping meeting in the Fannin County Multi-Purpose Complex in Bonham, Texas. This meeting was advertised beforehand in the online and print editions of a local newspaper (*Bonham Journal*), local radio stations, and by means of a public notice issued by the USACE. The format of the meeting was that of an “open house.” At their leisure, attendees could pass through the facility looking at exhibits, maps, reports, and information arranged on tables. They could also speak informally and at length with representatives of USACE, TCEQ, NTMWD, and contractors/consultants working for the USACE and the NTMWD. In addition, they could submit written comments on a comment form as well as on a diagram depicting phases and elements of the proposed action. Approximately 100 people participated in this event (Figure 1.6-1).

During the scoping process, members of the public and public agencies broached a wide variety of issues and topics related to the Proposed Action reservoir construction and operation. These comments were furnished in several different modes: 1) on comment forms available at the public scoping meeting; these forms could be filled out and dropped into a box or mailed later; 2) in emails sent to the USACE; and 3) in hard copy letters mailed to the USACE.



Figure 1.6-1. Attendees at the EIS Scoping Open House in Bonham on December 8, 2009

The USACE received a total of 84 comment forms, emails, and letters submitted by more than 100 individual citizens and agencies. Several individuals sent more than one comment form, email or letter. Each form, email or letter contained multiple comments on different issues, sometimes many dozens of issues. Each of these was tallied as a separate “comment” on that given issue or topic. Approximately 630 comments were received in total.

Table 1.6-1 lists the most common issues or topics, as cited in written comments by the members of the public and governmental agencies during the scoping period. These are a gauge of the highest priority concerns that the public and agencies believe need to be addressed in the EIS.

Appendix D to this EIS is a scoping report that documents the public and agency scoping process. It includes the NOI, newspaper display ad, public notice, and a summary of all comments received.

Agency Scoping

On December 9, 2009, the day after the public scoping meeting in Bonham, the USACE held an inter-agency scoping meeting in Wylie, TX. Representatives of a number of federal and state agencies were in attendance. Appendix D to this EIS provides a summary of the agency scoping process.

Table 1.6-1. Top Issues Raised by the Public About the Proposed Lower Bois d'Arc Creek Reservoir

Place	Issue/Topic	Number of Commenters
1	Impacts on native wildlife species and habitats	33
2	Adverse impact to agricultural economy and livelihoods in county	29
3	Reduced tax revenues to county and heavier tax burden for remaining residents	23
3	Water is being wasted and needs to be conserved	23
5	Displacement of multi-generational residents, farmers and ranchers; loss of farming/ranching/rural heritage	20
6	Concerned that reservoir may cause flooding in Bonham, along tributaries, and upstream areas	19
7	Reputed recreational and related economic benefits are questionable because of fluctuating lake level and shoreline, mudflats, etc. – look at other reservoirs in area where claimed benefits have not been realized	17
7	Poor water quality in reservoir from upstream pollutants	17
9	Fluctuating lakeshore and resultant unattractive mudflats	12
10	Impacts to Indian artifacts or burial sites	11
10	Limited viable lifetime of reservoir (storage capacity loss over time from siltation)	11
12	Shallow and fluctuating lake will not be conducive to aquatic recreation opportunities	10
12	Upstream wastewater treatment plant discharges (treated and raw sewage)	10
14	Effects of chemical (arsenic) residues from cotton farming	9
14	Spread of invasive species, e.g. zebra mussel, hydrilla, feral hogs	9
14	Impacts to unmarked slave and pioneer cemeteries	9
14	Losing own home, land, and/or job	9
18	Endangered, threatened, rare species and habitats	8
18	Zoning effects on property rights and lakefront development	8
18	Lost food production and its economic value	8
18	Will benefit Lavon Lake (by maintaining water level) and its residents at expense of Fannin County residents	8
22	Impacts on trees and bottomland/riparian forests	7
22	Increase in disease vectors, e.g. mosquitoes	7
22	Damage to historic/cultural/archeological properties	7
22	Project will encourage beneficial local economic development	7
22	New reservoir will not be able to compete with established lakes that already offer high-quality recreational experience and real estate properties	7
22	Shallow depth of reservoir/reservoir only partially full much of year	7
22	Benefit of adding more water supply/additional water will be needed	7

1.6.3 Other Related Opportunities for Public Participation

Four meetings on the proposed LBCR took place several years ago and provided other opportunities for public comment and input. NTMWD voluntarily held an open meeting on January 30, 2007 in the City of Bonham to inform the public of the upcoming project. NTMWD and TCEQ jointly conducted three Inter-Basin Transfer (IBT) meetings: in Bonham on September 17, 2007; in Greenville on September 17, 2007; and in McKinney on September 18, 2007.

The January 30, 2007 public meeting was held at the Bonham Civic Center. Several hundred Fannin County residents attended this event to learn more about the LBCR project. Engineering experts, along with NTMWD representatives and Dr. Terry L. Clower, assistant professor with the Institute of Applied Economics at the University of North Texas, informed attendees how the reservoir would provide water supplies and recreational opportunities as well as spur economic growth for Fannin County. Six fact sheets were distributed and 90 comments were received at the meeting.

The IBT public meeting held on September 17, 2007 at the Fletcher Warren Civic Center in Greenville attracted about 18 attendees. The September 17, 2007 IBT public meeting in Bonham was at the Fannin County Multi-Purpose Complex. About 150 people were in attendance, not including TCEQ staff and the applicant. About 10 people attended the public IBT meeting the following day, September 18, 2007, at McKinney High School in McKinney.

All of these meetings gave local residents of Fannin County and neighboring areas the opportunity to provide comments and ask questions regarding a wide variety of issues and topics related to the Proposed Action – reservoir construction/operation, locations, acquiring mitigation lands, the impact to the county tax base, and others.

NTMWD has been working for years with local entities and interested parties to address their concerns on the LBCR project. NTMWD has a local office in Bonham that provides information to the public on the project. NTMWD also puts information about the proposed project on its website.

1.6.4 Draft Environmental Impact Statement

The original DEIS was released to the public in February 2015. The USACE and cooperating agencies conducted a public open house on the DEIS on March 24, 2015 at the Fannin County Multi-Purpose Complex (Figures 1.6-2 and 1.6-3). The comment period on the DEIS was from February 20 to April 21, 2015. A number of stakeholders (agencies and private citizens) commented on the DEIS and their comments, as well as the USACE's responses, are included in the Administrative Record for this NEPA process.



Figure 1.6-2. Fannin County Multi-Purpose Complex in Bonham



Figure 1.6-3. Attendees at the March 24, 2015 Public Open House on the DEIS at the Multi-Purpose Complex in Bonham

1.6.5 Forthcoming Opportunities for Public Participation under NEPA

Interested parties will be able to comment on the Revised DEIS for the proposed LBCR when it is released in early 2017. Concerned citizens will also be able to comment on the Final EIS later in 2017, although NEPA does not require the USACE to respond to these comments.

1.7 ISSUES DEVELOPMENT

The USACE considered all comments received from the public and agencies during the Section 404 public notification and during the scoping period for this EIS. Based on this review, and its own internal assessment of relevant topics, USACE developed a list of key issues raised by the proposed LBCR project.

1.7.1 Key Issues

Inter-Basin Water Transfer Issues

If approved, the Proposed Action would eventually result in the transfer of approximately 120,665 acre-feet of water annually from the Red River basin to the Trinity and Sulphur River basins. The appropriation request to TCEQ is for a maximum projected use of 175,000 AFY, but the firm yield would be approximately 120,665 AFY. Inter-basin water transfers may potentially affect both the “source” and

“receiving” water basins. Socioeconomic impacts to source basin communities, in-stream impacts to fish and wildlife, water and air quality degradation, and induced or indirect impacts from enabled population growth (e.g., from suburban sprawl that would not have occurred were water not made available) in the receiving water basin are all potential impacts of transfers (Baggett, 2009).

Wetlands and Other Waters of the U.S.

As noted earlier in Section 1.2.1, under Section 404 of the CWA, the USACE has the legal authority to regulate discharge of dredged and fill materials into waters of the United States, including wetlands. Under national policy, wetlands are recognized as a productive and valuable resource, and their destruction is discouraged as contrary to the public interest. In developing plans for any project that may affect wetlands, consideration must be given to alternatives that can avoid or minimize impacts to wetlands where practicable. The USACE is restricted from authorizing activities in wetlands where there is a practicable alternative with less adverse impact on the aquatic environment. Once the presumption of the availability of a less environmentally damaging practicable alternative has been refuted, those remaining wetland impacts which can neither be avoided nor minimized will require compensatory wetland mitigation. Such compensatory wetland mitigation may take the form of wetland restoration, enhancement, construction, or preservation (USACE, 2010a).

Impacts on wetlands and their values and functions were a concern expressed during scoping for this EIS. The proposed project would impact over 6,000 acres of wetlands and/or other waters of the U.S.

Alternatives to the Proposed Action

During the public participation process, many commenters argued that the proposed water supply dam and reservoir may not be necessary to meet the stated purpose and need (meeting NTMWD’s projected near term water needs by 2025 and a substantial portion of its long-term water needs through 2060), and that less environmentally damaging alternatives were available and needed to be thoroughly investigated. Among the many possible alternatives cited were water conservation and reuse, pipelines from existing water sources (mostly existing reservoirs), a desalination plant and pipeline to take advantage of virtually unlimited saltwater in the Gulf of Mexico, groundwater (the Carrizo-Wilcox formation), and various combinations of these actions. Chapter 2 of this EIS describes and analyzes the Proposed Action and alternatives to the Proposed Action.

Biological Resources

More commenters cited potential impacts of the proposed reservoir on native wildlife species and habitats as a concern than any other single issue in scoping (Table 1.6-1). The scale of the project – over 17,000 acres for the reservoir “footprint”, plus additional acreage impacted by the proposed pipeline(s), the WTP, and TSR – as well as the fact the proposed reservoir would impact wetlands and waters of the U.S., diminish bottomland hardwood forest in northern Texas, and convert the flowing waters of a stream into the slack waters of a lake, are the bases for these concerns.

The topic of biological resources is multi-faceted, and the EIS addresses a number of issues. A number of topics cited as concerns during scoping are covered in the EIS, including potential impacts to trees and bottomland/riparian forests, threatened and endangered species, Caddo Grasslands and its wildlife, timber rattlesnakes, bald eagles, cougars, wild turkeys, freshwater mussels, and migratory birds. Another concern expressed by agency staff was the potential for the spread of invasive plant and animal species.

Cultural Resources

Cultural resources broadly include archeological sites, artifacts, historic structures, as well as landscapes with cultural, spiritual, or historic properties. During scoping, concern was expressed about potential

impacts to American Indian artifacts or burial sites and unmarked slave and pioneer cemeteries. Other commenters mentioned Camp Benjamin for Confederate Soldiers near former Onstott Lake, the need for surveys given the cultural resource potential of the area, and the potential for historic structures within the reservoir site.

Geology and Soils

During scoping, several commenters expressed concern about the permanent loss of fertile, productive soils in the Lower Bois d'Arc Creek valley. Construction of the reservoir would permanently inundate thousands of acres of soils that are or could be used for sustainable agricultural production, including crop cultivation, hay production, and grazing. In addition, the geology of the reservoir site affects its suitability for dam construction and water impoundment behind the dam to form a reservoir.

Human Health and Safety

During scoping, commenters raised the prospect of a risk to human health and safety from an increase in disease vectors such as mosquitoes. Others commented on traffic, emergency access, health risks from chemicals used to control mosquitoes and aquatic weeds, and emotional stresses on the local population from the disruptions posed by the project.

Land Use

The public listed a number of concerns related to land use during scoping, among them zoning effects on property rights and lakefront development, the fate of the proposed mitigation land (Riverby Ranch), adverse impact to the Legacy Ridge golf course and Country Club, and loss of farmland and beef production acreage within the reservoir footprint.

Recreation

At present, Lower Bois d'Arc Creek, within the footprint of the proposed reservoir, supports a certain amount of outdoor recreation, primarily hunting and fishing. These activities would be permanently adversely affected by the Proposed Action. A substantial amount of recreation also occurs on Caddo National Grasslands that might be affected temporarily during reservoir construction and perhaps over the long term during operation. In contrast, the proposed reservoir could potentially provide lake-based recreation such as boating, fishing, and swimming, all of which are supported by other reservoirs in the region. During scoping, a number of commenters expressed concern that the lake would be shallow with a fluctuating lakeshore, which would not be conducive to aquatic recreation opportunities.

Socioeconomics

Socioeconomic issues are very important to the public as expressed during scoping for the EIS. A variety of interrelated concerns were raised. Many commenters feared adverse impacts to Fannin County's agricultural economy and livelihoods. A number worried that the Proposed Action would result in less tax revenue to the county government and a heavier tax burden on remaining residents. Others objected to the displacement of multi-generational residents, farmers and ranchers, and the loss of Fannin County's proud farming, ranching, and rural heritage. Various commenters called into question the reputed recreational and related economic benefits of the Proposed Action because of what they claimed would be a fluctuating lake level and shoreline and the presence of aesthetically displeasing mudflats. Still others pointed out that they and their families would be losing their homes and property because of the project. A number of other concerns were cited as well; they are listed in the Scoping Report (Appendix D).

A number of commenters noted the potential economic benefits of the Proposed Action to Fannin County, including the development of additional water supplies and generation of jobs.

Transportation and Utilities

The project has the potential for short-term and long-term adverse effects on existing roads and bridges, traffic, and infrastructure. The project also has the potential for long-term improvements to transportation infrastructure and utilities as a result of the need to rebuild, replace, or move affected infrastructure and facilities.

Air Quality

During construction, the Proposed Action could impact local air quality both from fugitive dust and from tailpipe emissions from workers' vehicles and heavy equipment. Long-term direct effects on surrounding air quality over the decades that the reservoir would be in operation would be relatively small, although a potential indirect, cumulative effect of the project would be degraded air quality within the NTMWD service area from a substantial increase in the number of residents and vehicles.

Climate Change

Impacts of the project on climate change from emissions of the greenhouse gases carbon dioxide (CO₂) and nitrous oxide (N₂O) during project construction would be negligible. However, there could be potential cumulative impacts from climate change on the yield of the proposed reservoir over the medium-term to long-term future, due to potential changes in regional precipitation patterns. Additionally, changes in air temperature can impact evaporation rates and water availability. Any such changes would also equally affect all existing and future water supply projects in the region.

Water Resources

The public provided many comments related to water during the scoping process for this EIS. A number of commenters believed that water is being wasted and needs to be conserved before considering the construction of a large, costly new reservoir that would permanently affect water resources. Many were concerned that the proposed reservoir may cause flooding in Bonham, along its tributaries, and in upstream areas. A fluctuating lakeshore and resultant unattractive mudflats and the proposed reservoir's limited viable lifetime (i.e., gradual storage capacity loss over time from siltation) were cited as other concerns with the Proposed Action.

Concerns about water quality were also cited by many during scoping. In particular, various commenters feared poor water quality in the reservoir from upstream pollutants, the ill effects from upstream wastewater treatment plant discharges of treated sewage, and the effects of chemical (arsenic) residues from cotton farming on drinking water derived from the reservoir.

Two commenters during scoping cited the possibility of reduced discharge from Bois d'Arc Creek, a tributary of the Red River, having a negative impact on the prospects for navigation in the Red River downstream of its confluence with Bois d'Arc Creek.

As mentioned earlier, several commenters also discussed the importance of developing Texas water resources to meet the growing demands of the greater North Texas area. Other issues related to water resources and water quality were mentioned during the scoping process, as listed in the Scoping Report (Appendix D).

Environmental Justice/Protection of Children

Two Executive Orders (12898 and 13045) require all federal agencies to examine possible disproportionate impacts of the Proposed Action on minority and low-income populations and on children.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, directs Federal agencies to identify and address any disproportionately high adverse human health or environmental effects of its projects on minority or low-income populations.

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, directs federal agencies to “identify and address environmental health risks and safety risks that may disproportionately affect children.”

In 2010, four parties – NTMWD, USACE Tulsa District, THC (i.e., the SHPO in Texas), and the Caddo Nation of Oklahoma – signed a PA regarding compliance with Section 106 of the NHPA of 1966 (as amended) concerning construction of the proposed LBCR dam and reservoir on lands that were traditionally inhabited by the Caddo people. This PA is still in effect and has governed all cultural resources investigations and analysis associated with this undertaking (i.e., the Proposed Action).

1.7.2 Issues Considered But Dismissed from Detailed Consideration

Incidental Wildlife Mortality in Mudflats

Concern was raised during scoping over the possibility of wildlife getting stuck and dying in mudflats around the perimeter of the prospective LBCR once water has been impounded. Throughout the state and the nation, millions of acres of mudflats occur at the margins of rivers, lakes, bays, estuaries, and saltwater marshes. The presence of these extensive areas of soft surfaces into which animals could hypothetically sink or become entrapped is not known to be a widespread or significant source of stress or mortality for any of the vertebrates (mammals, birds, reptiles, amphibians and fish).

Oil and Gas Resources Beneath the Reservoir

During scoping, several commenters remarked on the possibility of oil and gas resources occurring beneath the reservoir footprint being rendered inaccessible by the project. However, modern horizontal or directional drilling technology now used widely within the industry would hypothetically allow for exploration and production wells located at some distance from the edge of any future reservoir on the site. These wells would be able to drill into hydrocarbon-bearing formations located hundreds or thousands of feet below the bottom of the reservoir, and extract these liquid and gaseous fossil fuels without contaminating the overlying water. Therefore, the presence of a water reservoir alone would not preclude access to subsurface hydrocarbon reservoirs.

Increasing Humidity

Evaporation from the surfaces of inland bodies of water such as lakes and reservoirs is a source of moisture and moist static energy to the surrounding atmosphere, resulting in a general increase in water vapor loading over an area (Tomassetti et al., 2003). As such, large bodies of water can be expected to increase humidity and affect precipitation over surrounding areas. By increasing the surface area of water from which evaporation can occur, reservoirs are known to change local micro-climates by increasing relative humidity and reducing temperature extremes. These effects would be expected to occur as well from any future LBCR. However, while this effect of the lake on surrounding humidity levels can be predicted with confidence, the magnitude of this effect is not easy to determine (Nielsen-Gammon, 2011).

The phenomenon of increased humidity would likely occur to a greater extent in the summer months, when air and water temperatures are higher, and the potential for evaporation is greater. A small cumulative effect from the increasing area dedicated to water surfaces of reservoirs throughout north-central Texas may be observable; however, this has never been documented or quantified. The Texas State Climatologist has documented an increase of precipitation overall in the state over the past century,

and has suggested that the increased area of surface water, from reservoirs to stock tanks to irrigation, may have contributed to some extent (Nielsen-Gammon, 2011).

While there would be more evaporation and thus more humidity from the proposed reservoir in the summertime, conversely, any evaporation would remove energy away from heating the air, so summertime temperatures would be cooler. Furthermore, the increased humidity would increase precipitation. Therefore, two out of three of the potential effects would be considered beneficial (Nielsen-Gammon, 2011).

This much is known, and since it is not possible to amplify or modify these conclusions through further research and investigation for this EIS, this issue will not be considered further in the EIS.

1.8 MITIGATION SUMMARY

1.8.1 Project Footprint

The mitigation plan was developed to compensate for impacts to aquatic and terrestrial resources associated with the proposed LBCR project. This section provides a high-level summary of the mitigation plan; the reader is referred to the original plan for additional details (Appendix C). As proposed, the LBCR project encompasses approximately 20,732 acres of land (excluding proposed mitigation acres) of which 19,872 acres lie within the Bois d'Arc Creek watershed. For purposes of this mitigation plan, the scope of the LBCR project consists of:

- 19,768 acres, which includes 16,641 acres for the reservoir (conservation pool elevation 534 feet MSL), 2,700 acres of storage lands (between 534 and 541 feet MSL) and 427 acres for the dam and spillways;
- 860 acres associated with the proposed raw water pipeline, WTP, TSR, and rail spur; and
- 104 acres associated with the relocation of FM 1396 outside of the reservoir footprint

1.8.2 Impacts and Mitigation

The HEP methodology (see Appendix J) was used to evaluate emergent wetland, scrub shrub wetland, and terrestrial (upland) resources that could be impacted following construction of the proposed reservoir and its related components. Impacts for emergent and scrub shrub wetlands were measured using Habitat Units (HUs), a metric specific to the HEP methodology. Mitigation was developed using HUs to fully compensate for both cover types. In addition, NTMWD identified 98 acres of shrub wetlands at the Riverby Ranch mitigation site (Figure 1.8-1) that would be preserved as shrub wetlands, but a HEP evaluation of this area was not performed. Therefore, no HUs were calculated for the 98 acres of preserved shrub wetland area.

The Modified East Texas HGM Method was used to assess the functions of forested wetlands (see Appendix K). The proposed impacts and mitigation credits for forested wetlands are measured using Functional Capacity Units (FCUs). The RGA tool was used to assess stream quality (see Appendix L). Stream impacts and mitigation credits are measured using RGA Stream Quality Units (SQUs). A detailed summary of potential net impacts to resources and proposed compensatory mitigation to offset those impacts is shown in Tables 4.6-6, 4.6-7 and 4.6-8 and Appendix C.

1.8.3 Mitigation Objectives

Specific plan objectives are to mitigate for unavoidable adverse impacts to waters of the United States in the project area, which include forested wetlands, emergent wetlands, scrub shrub wetlands, open water, and streams, that would occur as a result of constructing the proposed LBCR. This mitigation would be achieved through wetland restoration and enhancement and stream restoration and enhancement at the nearby mitigation sites, Riverby Ranch and the Upper Bois d'Arc Creek (BDC) Mitigation Site. On the reservoir site, the creation of the lake would offset impacts to open waters and some of the stream impacts, and it would allow for creating emergent wetlands in shallow areas around the lake (littoral wetlands). The development of the reservoir also would enhance Bois d'Arc Creek downstream of the proposed reservoir site through reductions in the frequency of destructive high flow events and the passage of sustainable environmental flows to maintain and enhance existing downstream habitats.



Figure 1.8-1. Project Mitigation Site Riverby Ranch is a 15,000-acre Working Ranch in Fannin County

Specific plan objectives are to mitigate for impacts to:

- 4,035 FCUs of forested wetlands
- 514 HUs of emergent wetlands
- 23 HUs of scrub shrub wetlands
- 78 acres of open water
- 192,377 SQUs of streams

The impacts to 49 acres (23 HUs) of scrub shrub wetland at the reservoir site would be mitigated by restoring 150 acres (103.5 HUs) of scrub shrub wetlands habitat at the Riverby Ranch mitigation site, resulting in a mitigation surplus of 80.5 HU for this habitat type. In addition to restoring 150 acres of scrub shrub wetlands, NTMWD proposes to preserve 98 acres of existing scrub shrub wetlands at Riverby Ranch for a total scrub shrub mitigation area of 248 acres.

Mitigation would occur in three areas: 1) on-site mitigation at the proposed reservoir site; 2) near-site mitigation on the nearly 15,000-acre Riverby Ranch; and 3) near-site mitigation on the 1,900-acre Upper BDC Mitigation Site. Important points to note are:

- Mitigation provided for forested wetlands would be 4,675 FCUs, as well as 957 HUs for emergent wetlands, 103.5 HUs for scrub shrub, 16,036 acres for open water, and 181,153 linear feet for streams.
- Most of the proposed aquatic and terrestrial mitigation would occur on the Riverby Ranch, a contiguous, nearly 15,000-acre tract of land located downstream of the proposed reservoir site and partially within the Bois d'Arc Creek watershed (the remainder located directly within the Red River Basin).
- The remaining terrestrial mitigation area is located adjacent to the project site.
- These mitigation sites are proximal to each other and to lands enrolled in the Pintail Farms WRP area and the nearby Caddo Grasslands.

1.8.4 Site Protection, Management, and Financial Assurances

The compensatory mitigation resulting from construction of the LBCR would provide long-term protection through USACE- approved deed restrictions for the time NTMWD owns and controls the properties. Should the properties be transferred to a third-party land manager other than a governmental entity, a conservation easement or some other similar USACE-approved agreement shall be placed on the properties for perpetual protection.

All sites proposed as part of this mitigation plan would be managed long-term as compensatory mitigation areas associated with impacts to wetlands and waters of the United States. The long-term management of the mitigation site would be provided by the NTMWD until the USACE has determined that the mitigation project is meeting its performance standards or is on an acceptable trajectory to meeting those standards. An adaptive management approach would be used to assess mitigation conditions to facilitate project success with the final goal of native habitats that are stable and self-sustaining over time. If monitoring reports indicate that mitigation progress is falling short of success standards, consultation with the USACE and TCEQ would be initiated regarding the need for additional adaptive management measures to meet performance standards and overall mitigation goals and objectives. Once the USACE determines the mitigation project is fulfilling the compensatory mitigation requirements and the mitigation site is self-sustaining, NTMWD may seek to convey the mitigation site and long-term management to a public agency (i.e., state or federal resource agency).

NTMWD has made a commitment to mitigating for impacts to natural resources by already purchasing the approximately 15,000-acre Riverby Ranch Mitigation Site and portions of the 1,900-acre Upper BDC Mitigation Site that would be used for compensatory mitigation.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter of the Revised Draft Environmental Impact Statement (RDEIS) is divided into five main topics:

- Decision options available to the USACE
- Action alternatives
- No Action alternative
- Alternatives considered but dismissed from detailed consideration
- Summary comparison of impacts

Chapter 2 draws upon data, information, and analyses developed and compiled by water resources planners and civil engineers in Texas, including the Texas Water Development Board (TWDB), the Region C Water Planning Group, the North Texas Municipal Water District (NTMWD), and NTMWD's agent Freese and Nichols, Inc. Information sources are listed in Chapter 6.0, References Cited and include Freese and Nichols, 2003, 2006, 2008a, 2008b, 2009, 2010a, 2011c, 2013, 2015 a through i, 2016a and 2016b. These reports and data sources include information on reservoir design and operations, instream flow characteristics, geomorphic conditions, pipeline routing considerations, and jurisdictional wetlands. These data and analyses have been subjected to independent review and scrutiny by the Tulsa District of the U.S. Army Corps of Engineers (USACE), its third-party contractor (Solv), and Solv's subcontractors. These data and analyses were also used in subsequent chapters of this Revised DEIS.

The basic premise of Section 404 of the Clean Water Act (CWA) is that no discharge of dredged or fill material to waters of the U.S. should be permitted if there is a practicable alternative that would be less damaging, or if significant degradation would occur to the nation's waters. The USACE's permit review process is sequential regarding evaluation of impacts to waters of the U.S. It first requires demonstration of avoidance of impacts, followed by minimization of impacts and finally mitigation to compensate for unavoidable impacts to the aquatic environment (33 Code of Federal Regulations (CFR) 332.1c).

The alternative analysis presented in this document is intended to be thorough enough to be used in the USACE Tulsa District's public interest review and Section 404(b)(1) guidelines evaluation. The USACE Tulsa District intends to identify the Least Environmentally Damaging Practicable Alternative (LEDPA) in the Record of Decision (ROD) for this EIS.

2.1 DECISION OPTIONS AVAILABLE TO THE USACE

In evaluating the application for a Section 404 permit received from NTMWD, the USACE has three decision options: 1) to issue the Section 404 permit; 2) to issue the Section 404 permit with conditions; or 3) to deny the Section 404 permit. Each option is discussed further in the following subsections.

2.1.1 Issue the Section 404 Permit

One potential decision option available to the USACE is to issue the Section 404 permit for the project as described in the application submitted by NTMWD. In this option, the permit to allow for discharge of dredged or fill material into waters of the United States would be issued to NTMWD so that construction of the proposed project at the identified site on Bois d'Arc Creek could proceed.

2.1.2 Issue the Section 404 Permit With Conditions

Another potential decision option available to the USACE is to issue the Section 404 permit to NTMWD with conditions so that the water supply project at the identified site on Bois d'Arc Creek may be constructed. The permit conditions would be measurable and quantifiable performance standards relating to the required mitigation for unavoidable permanent impacts associated with waters of the U.S., cultural sites, and/or endangered species with which NTMWD would have to comply. Compliance with such conditions may avoid and/or reduce the project's adverse impacts on physical, chemical, biological, hydrological, and cultural resources, but would also potential benefit to these resources as they relate to the human environment.

2.1.3 Deny the Section 404 Permit

Another decision option available to the USACE is to exercise its prerogative to deny the Section 404 permit for construction of the Lower Bois d'Arc Creek Dam and Reservoir. Denial of the permit would mean NTMWD could not proceed with the proposed Lower Bois d'Arc Creek Reservoir (LBCR) project.

If the USACE were to deny the Section 404 permit, the denial could be based on its public interest review of NTMWD's current application or its evaluation of the Section 404(b)(1) guidelines. If the Section 404 permit was denied based on evaluation of the Section 404(b)(1) guidelines, it would be because the USACE determined that: 1) one or more practicable alternatives are available that would cause less damage to aquatic resources, or 2) significant degradation would occur to waters of the U.S. The alternative analysis presented in this document is intended to be thorough enough to be used in the public interest review and the Section 404(b)(1) guidelines evaluation.

2.2 ALTERNATIVE 1 – APPLICANT'S PROPOSED ACTION (APPLICANT'S PREFERRED ALTERNATIVE)

Under Alternative 1, the Proposed Action, a dam would be constructed on Bois d'Arc Creek to form the proposed LBCR. The proposed project site is in Fannin County, Texas, within the Red River Basin watershed, approximately 15 miles northeast of the City of Bonham. Lake Bonham is immediately to the west of the upstream edge of the proposed reservoir, while the small towns of Honey Grove, Windom, and Dodd City are located along Route 56 several miles to the south of the project site. Figures 2.2-1 and 2.2-2 are location and vicinity maps of the proposed reservoir. The proposed reservoir site is upstream of the Bois d'Arc Unit of the Caddo National Grasslands.

The drainage area of the proposed reservoir would be approximately 327 square miles, of which 29.6 square miles are upstream of Lake Bonham. At its full conservation elevation of 534 feet, the reservoir is expected to cover 16,641 acres, store 367,609 acre-feet of water and be approximately 70 feet deep at its deepest point. Figures 2.2-3 and 2.2-4 are photos taken within the proposed reservoir site.

2.2.1 Dam and Reservoir

Under Alternative 1, the LBCR dam would be constructed as a zoned earthen embankment. The dam would be approximately 10,400 feet long (approximately two miles long) and would have a maximum height of approximately 90 feet. The design top elevation of the embankment would be 553.5 feet above mean sea level (MSL). The embankment would be 19.5 feet higher than the conservation pool of the reservoir, which would be at elevation 534.0 feet MSL, and the embankment would provide approximately three feet of freeboard above the Probable Maximum Flood (PMF) elevation of 550.5 feet MSL. The upstream slope of the embankment would be three horizontal to one vertical (3:1), and the downstream side slightly less inclined at a slope of 3.5:1. All fill for the embankment is expected to come

from required excavations of the spillways and from the reservoir pool area. Soil cement would be placed on the upstream slope and a grass cover would be placed on the downstream slope. Preliminary drawings of the proposed dam and spillways are presented in Figures 2.2-5 and 2.2-6. The areas within the reservoir footprint that would be cleared of trees are illustrated in Figure 2.2-7.

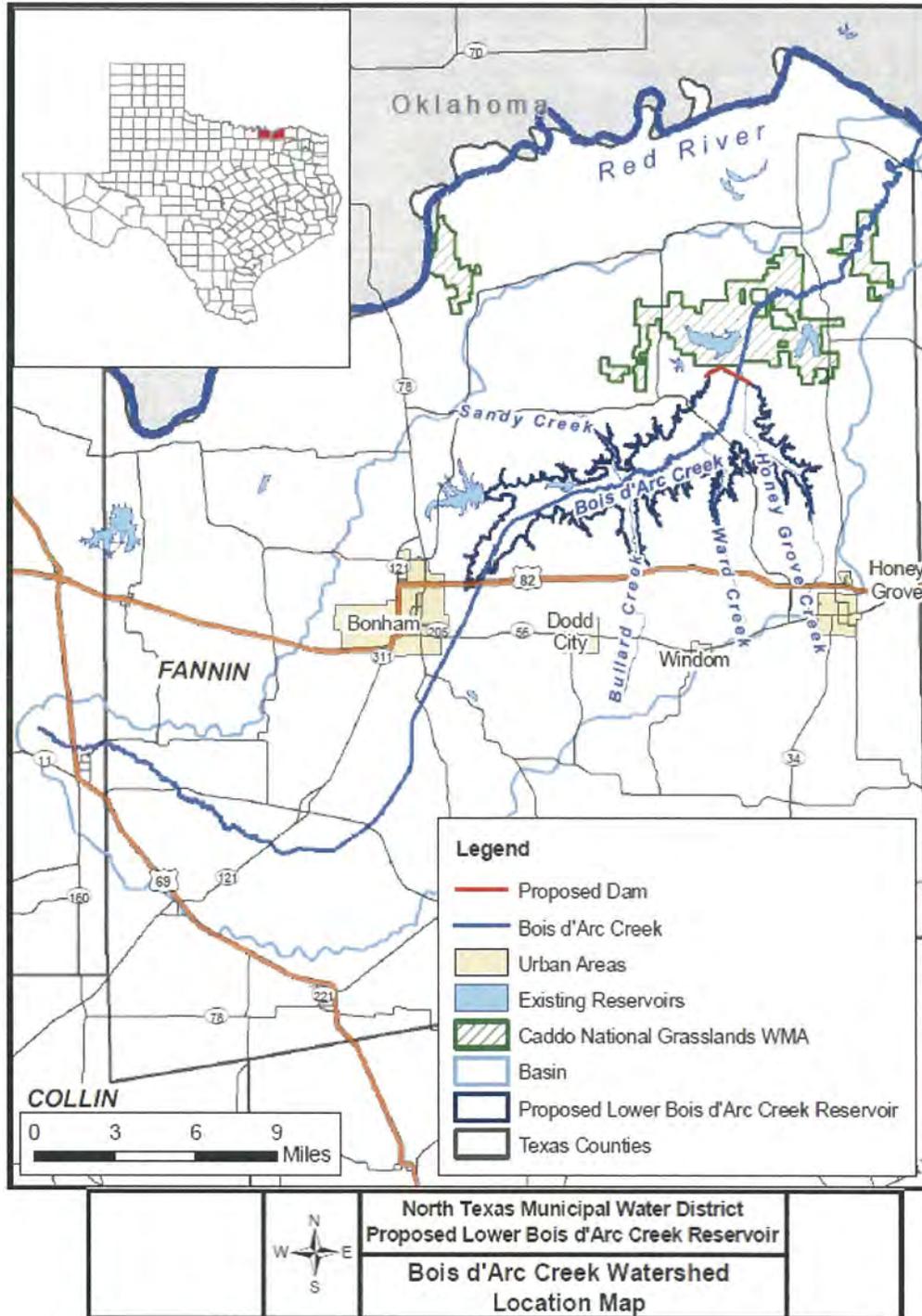


Figure 2.2-1. Lower Bois d'Arc Creek Reservoir Location Map

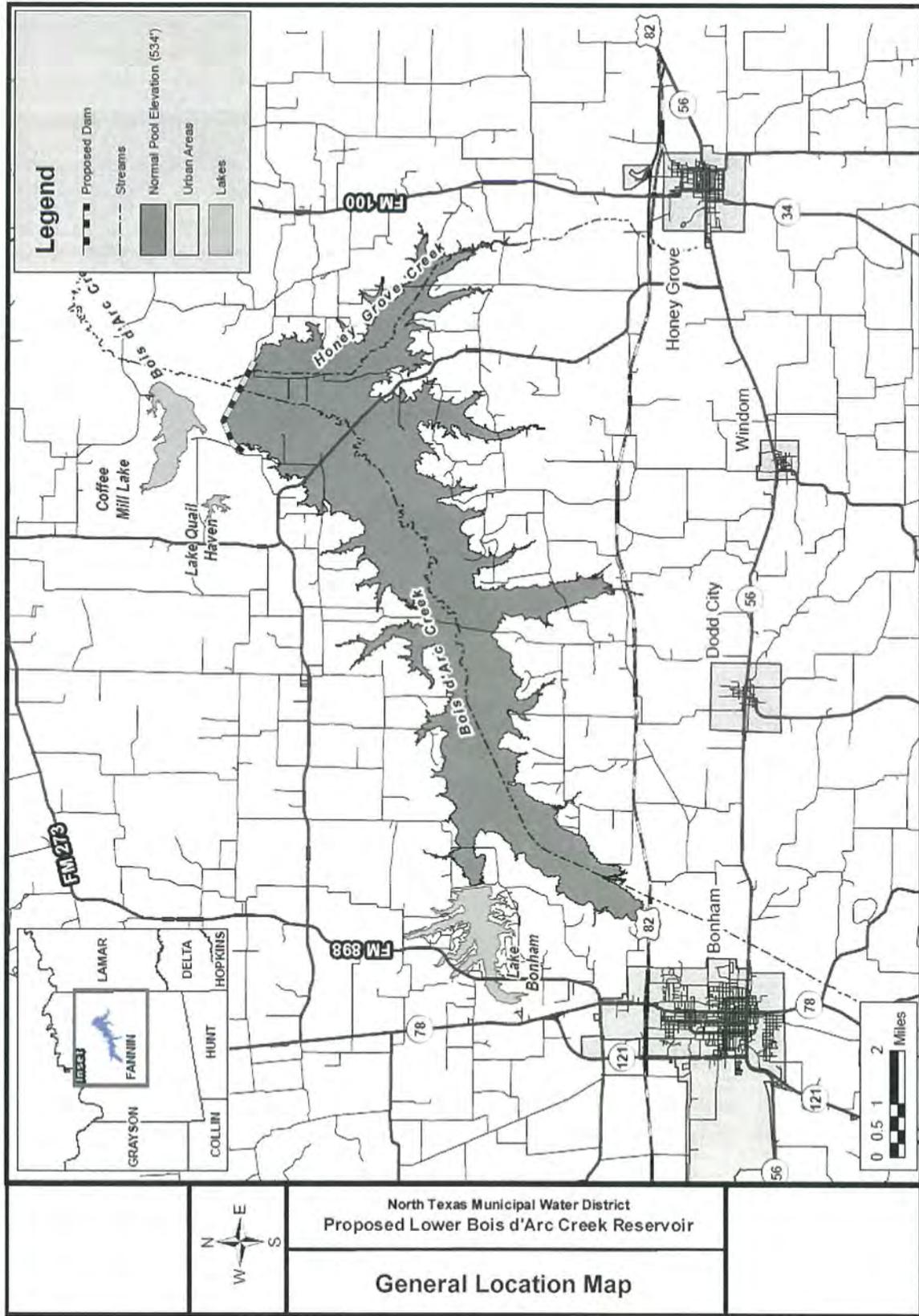


Figure 2.2-2. General Vicinity Map of the Lower Bois d'Arc Creek Reservoir



Figure 2.2-3. FM 1396 and Grazing Land Within the Proposed Reservoir Footprint



Figure 2.2-4. Bois d'Arc Creek and Riparian Corridor

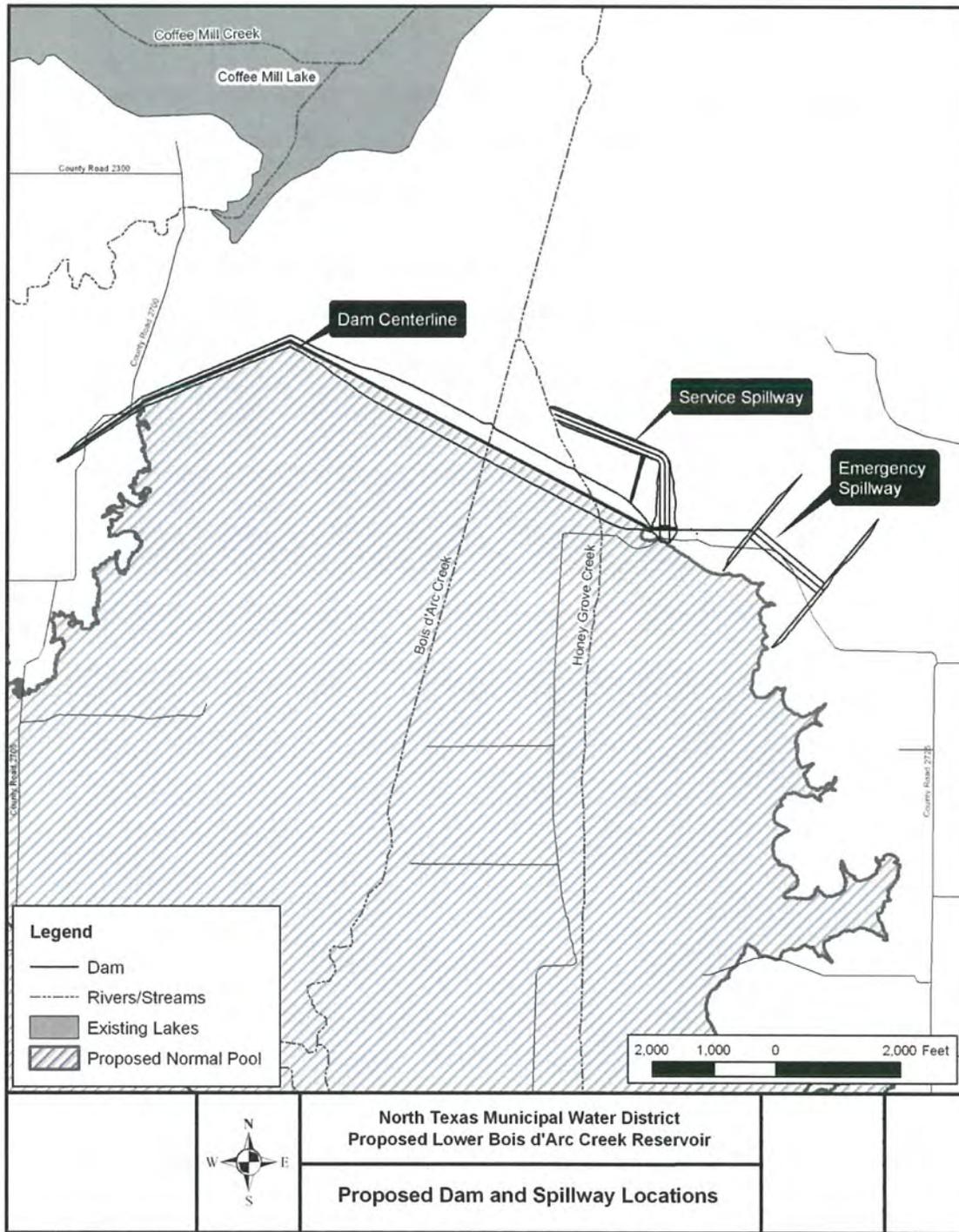


Figure 2.2-5. Proposed Lower Bois d'Arc Creek Reservoir – Dam and Spillway Locations

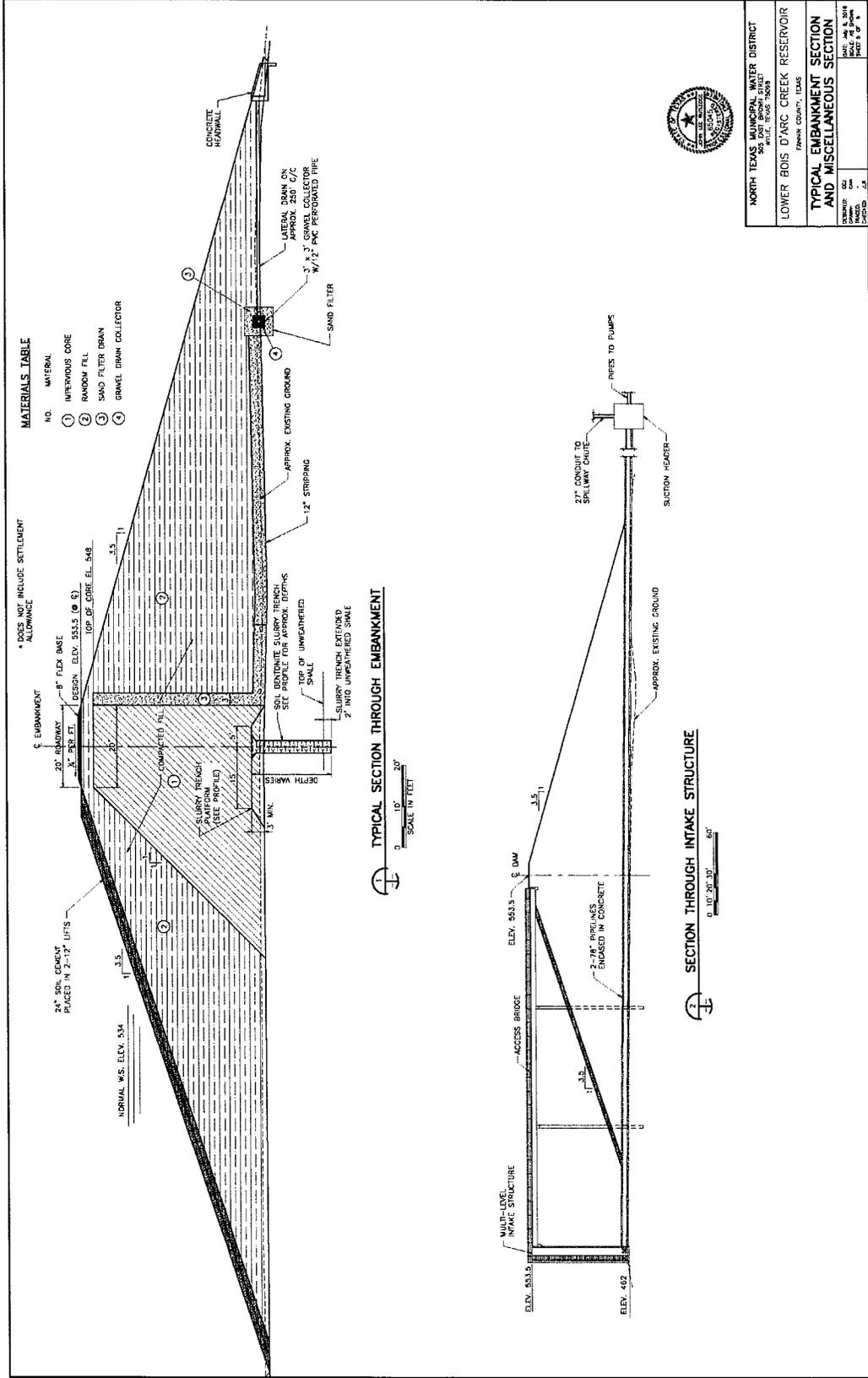


Figure 2.2-6. Preliminary Drawings of Lower Bois d'Arc Reservoir Dam Cross-section

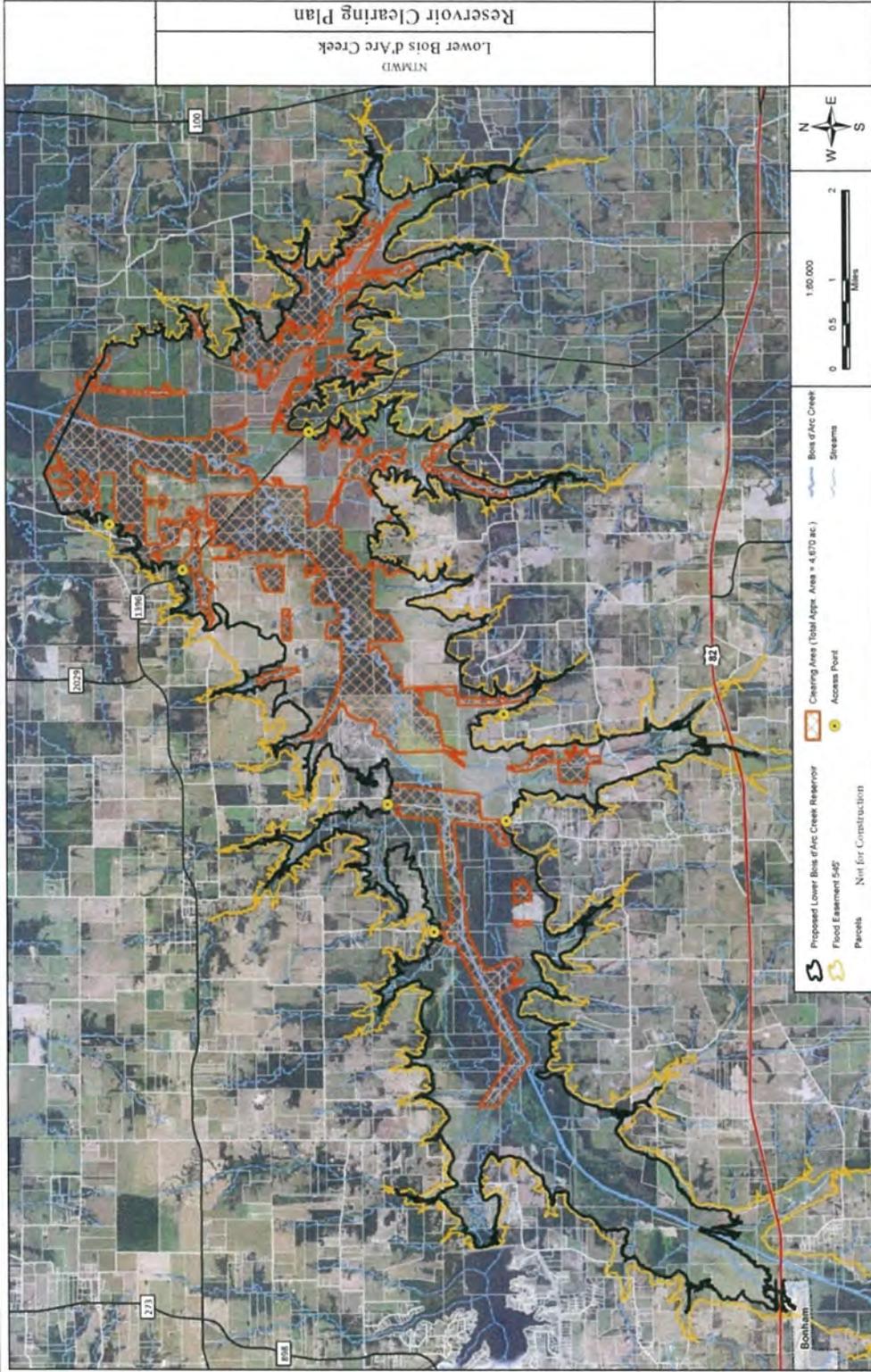


Figure 2.2-7. Conceptual Reservoir Clearing Plan

Source: NTMWD, 2015b

Table 2.2-1 summarizes the quantities and types of fill material to be deposited into Bois d'Arc Creek, Honey Grove Creek, and the wetlands abutting Bois d'Arc Creek.

Table 2.2-1. Types and Amounts of Fill Discharged into Bois d'Arc Creek and Tributaries for LBCR Dam Construction (Cubic Yards)

Location	Slurry Material ¹	Earthen Material ¹	Soil Cement ¹
Bois d'Arc Creek	67	2,230	27
Wetlands abutting Bois d'Arc Creek	11,494	130,503	1,891
Honey Grove Creek	61	411	5
Total	11,622	133,144	1,923

¹ Estimated amounts up to ordinary high water mark

2.2.2 Service Spillway and Outlet Works

Under Alternative 1, the service spillway would be located at the right abutment of the dam (Figure 2.2-5). The spillway would consist of an approach channel, a concrete weir, a chute, a hydraulic jump stilling basin and an outlet channel. The crest of the weir would control the conservation pool level at elevation 534.0 feet MSL, and the weir would have a discharge capacity of approximately 37,300 cubic feet per second (cfs) at the maximum design water surface, the PMF elevation of 550.5 feet MSL.

The spillway structure would extend 958 feet downstream from the dam centerline. A hydraulic jump stilling basin would be constructed with baffle blocks and an end sill. The stilling basin would be at elevation 456.0 feet MSL and it would be 128 feet long. Service spillway discharges would be conveyed to Honey Grove Creek by a discharge channel approximately 2,300 feet long and then flow approximately 1,500 feet in Honey Grove Creek to its confluence with Bois d'Arc Creek.

Water would be diverted by NTMWD through a multi-level intake tower located near the dam that would transport the water to a pumping station located immediately downstream of the dam. The intake structure would be a rectangular tower with two cells, each of which would have the capacity to withdraw water for the needed water supply demands as well as for the releases to meet Bois d'Arc Creek flow requirements. Under normal operating conditions, both cells would be used concurrently and would feed a pair of 78-inch concrete pipes that would carry water through the dam embankment to the pumping station. Diversions could occur through a single cell when the other is closed for maintenance, but this operation is not planned to occur during times of high demand. In the pumping station, the two 78-inch pipes would feed a 90-inch suction header line that would distribute the flow to the pumps being utilized.

Required low-flow releases would be conveyed from the reservoir through the multi-level intake tower and low-level outlet works (a closed conduit or tube through the dam with a slide gate to control the rate of flow) to be discharged to the service spillway chute. An approximately 27-inch pipeline would extend from this to the spillway channel and would be used to convey required low-flow releases. Higher velocity pulse flows would be released from the reservoir through multiple levels of sluice gates located in the service spillway.

An emergency spillway would also be located in the eastern abutment of the dam (Figure 2.2-5). The spillway would be a 1,400-foot wide uncontrolled broad crested weir structure with a crest elevation of 541 feet MSL. This elevation was selected to contain a 100-year storm such that no flow would pass through the emergency spillway.

During preliminary project design, NTMWD's engineers opted for a labyrinth spillway, shown in Figure 2.2-8, because of its ability to decrease the overall spillway width and footprint while still maintaining

adequate discharge over the weir during frequent flood events (Rutledge, 2016). A labyrinth spillway offers greater overflow weir length at lower water surface elevations (depths) than a traditional ogee spillway. Among other advantages, this spillway design permits storm events to pass through the reservoir faster when the lake is above the conservation pool (534 feet MSL). Furthermore, the labyrinth configuration allows large sluice gates to be incorporated into the spillway structure, which can be used for the higher environmental flow releases required by the Texas Commission on Environmental Quality (TCEQ) Water Use Permit, and reduces the size, cost, and complexity of the intake structure for the pumping station (Rutledge, 2016).



Figure 2.2-8. Rendering of Labyrinth Weir for LBCR Service Spillway, Viewed From Upstream

Source: Rutledge, 2016

The labyrinth configuration for the service spillway would be 60 feet wide with three weir cycles (“V” structure); each weir cycle would be 20 feet wide with a crest elevation of 534 feet MSL. The length of the weir parallel to water flow would be 46.55 feet, providing an effective weir length of 292 feet (the entire length along the rim of the three “V’s”), the same as the preliminary design which was part of the design storm determination reviewed and approved by the TCEQ (Rutledge, 2016).

2.2.3 Reservoir Clearing

Under Alternative 1, subject to the provisions of the Section 404 permit, Texas water right permit and Section 401 water quality certification, selected trees and shrubs would be cleared from the LBCR footprint prior to impoundment of water behind the dam. Standing woody material, including dead and living trees and shrubs five feet or more in height, as well as fallen trees five feet or more in length with a diameter of six inches or greater, would be cleared and removed in the areas shown on Figure 2.2-7.

NTMWD prepared first a preliminary Reservoir Clearing Plan and then a Conceptual Clearing Plan to guide the clearing process. The objectives of these plans are to enhance creation of fish habitat by

minimizing the clearing of standing trees and shrubs in selected areas within the reservoir; to improve human access to shore locations by creating shore access locations for boat ramps, bank fishing, etc. through selective clearing of trees and shrubs; to reduce hazards to boating safety and fishing resulting from large floating debris by minimizing the source of such debris; and to create aesthetic views of the reservoir along selected segments of the shoreline (NTMWD, no date-b; NTMWD, 2015b).

Both hand and machine clearing are proposed. The preferred method is mechanical clearing by shear-blading during the dry season. In this method, the cleared material would be deposited in windrows or piles and left to dry and eventually burned as fire danger conditions allow. Machine clearing has the advantage of shearing stumps off at ground level, along with all other vegetation. It also accumulates most of the loose and dead woody debris that is on the forest floor. Machine clearing would minimize the amount of woody and organic debris remaining on site and entering the water after reservoir impoundment.

The designated areas on Figure 2.2-7 would be cleared using mechanical methods, except for the following:

- Cultural sites, known or discovered to exist, within the areas identified for mechanical clearing would receive different treatment, as appropriate, determined on a case by case basis (see Cultural Resources, Section 3.14).
- Selected locations as may be designated by the NTMWD for tree salvage (for use as firewood, saw-logs, cabins, etc.), which would be hand cleared using chain saws or other appropriate timber harvesting machinery.

It may also be necessary to utilize hand clearing where it is not possible to operate mechanical clearing equipment due to site location or conditions.

Access and safe landing sites would be established along the reservoir shoreline to facilitate eventual lake-based recreational development. Consideration would be given to both wood salvage and environmentally sensitive areas that may require specific treatment during clearing operations. Flagging or marking of clearing boundaries and on-site supervision would be carried out for the successful implementation of all aspects of reservoir clearing.

After reservoir impoundment, large woody debris would continue to be removed as necessary for the safe operation of boats, boat ramps, swimming areas, water intake structures, and spillways (NTMWD, 2015b). NTMWD and Texas Parks and Wildlife Department (TPWD) are participating in ongoing discussions about the specific details of reservoir clearing that would best facilitate and enhance recreational fisheries at the proposed lake (McCarthy and Hein, 2016).

2.2.4 Road Realignment and Bridge Construction

Construction of the LBCR would inundate the existing paved rural road labeled Farm to Market (FM) 1396 and the existing bridge over which it crosses Bois d'Arc Creek (Figure 2.2-3). NTMWD would be responsible for replacing the road and bridge. The existing alignment of FM 1396 spans Bois d'Arc Creek at what would become one of the widest portions of the proposed reservoir (Figure 2.2-9). If the existing alignment was maintained and a new, longer bridge was constructed to span the reservoir at this location, it would likely interfere with possible recreational uses on the proposed reservoir. Thus, NTMWD investigated several options to relocate FM 1396 and build a new bridge crossing the proposed LBCR. NTMWD's preferred option would be to extend the existing rural road FM 897 two to three miles to the west of FM 1396 and build a new bridge over the reservoir along that alignment; the blue line in Figure 2.2-9 depicts the proposed alignment of the FM 897 extension.

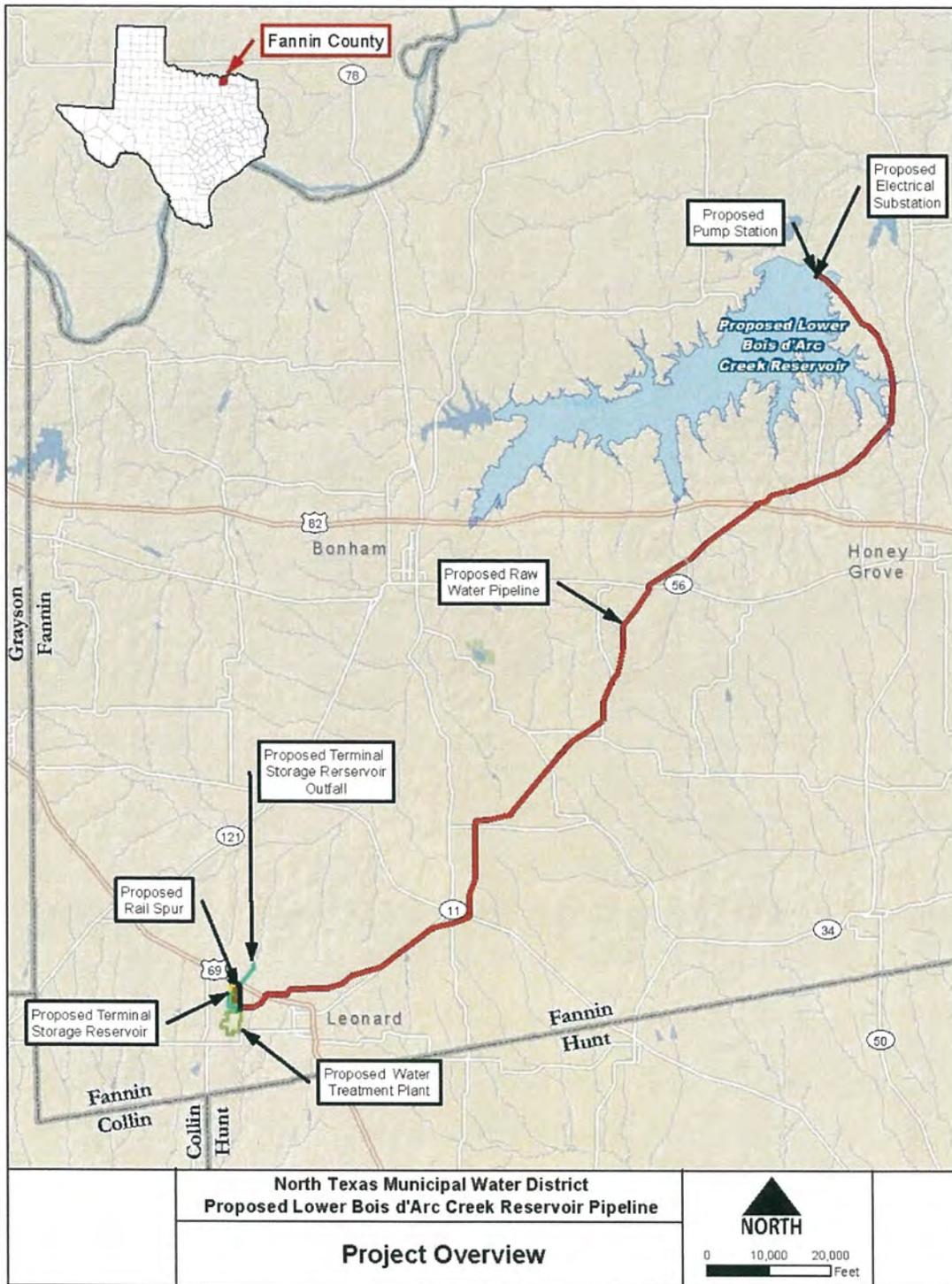


Figure 2.2-10. Proposed Alignment of Raw Water Pipeline and Location of Associated Facilities

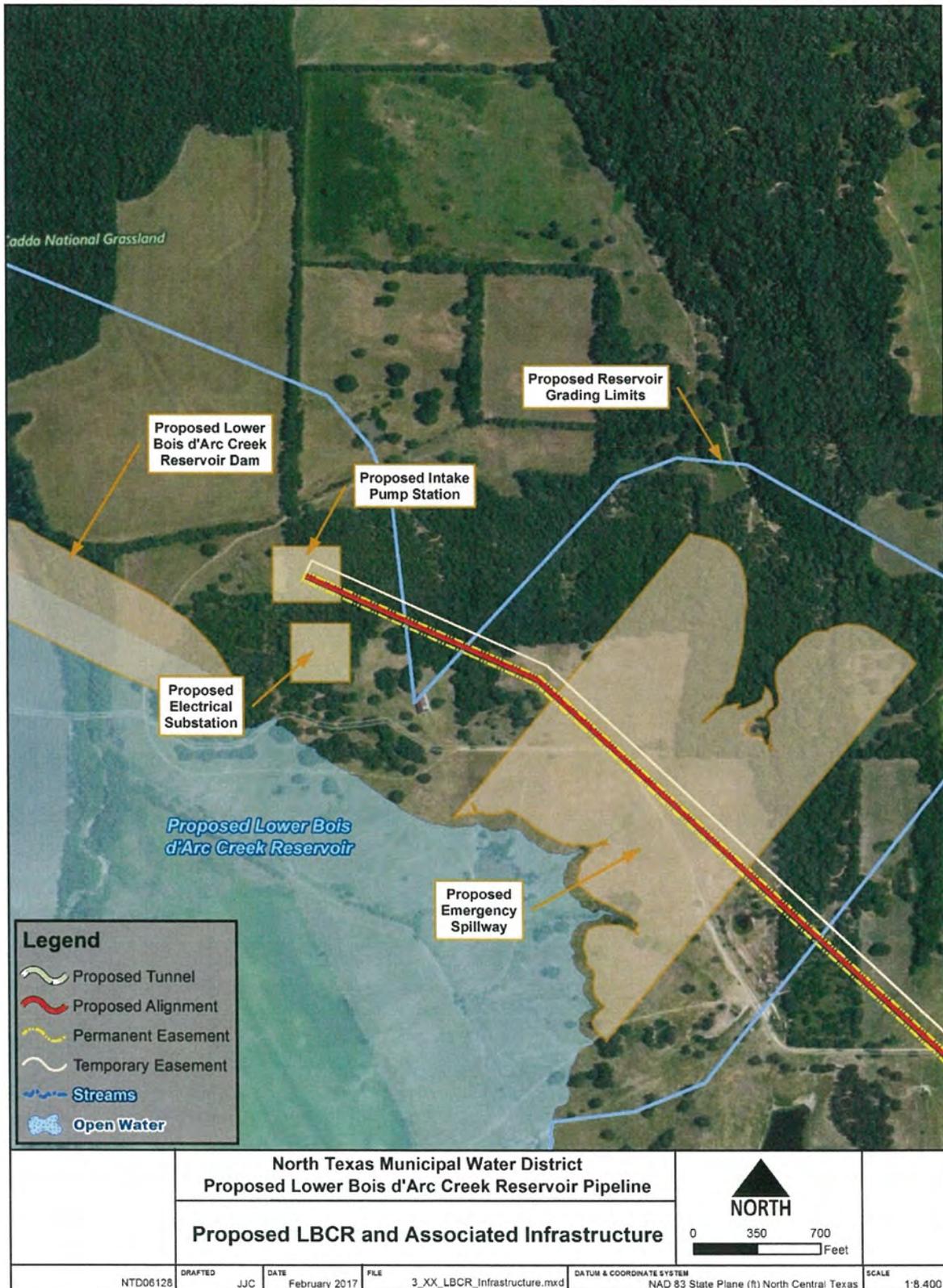


Figure 2.2-11. Location of Proposed Intake Pumping Station and Electrical Substation

The transmission facilities for the proposed LBCR would be constructed for an initial capacity of at least 170 million gallons per day (mgd), which represents a 1.5 peaking factor over the firm yield from the reservoir (120,665 acre-feet per year [AFY] or 108 mgd). However, the transmission system would be sized to allow for an ultimate peak flow capacity of at least 236 mgd, which is about 2.2 times the firm yield from the reservoir. The firm yield of a water supply reservoir is the maximum amount of water that can be diverted on an annual basis during a repeat of the historical drought of record without shortage, assuming that all of the water in the reservoir is available for use.

Intake Pumping Station

Because raw water flowing through the 35 miles of 90-96 inch diameter pipeline must move uphill for part of the distance, it will not flow on its own due to the force of gravity and must be pumped. Thus, a pumping station with several pumps would be built close to the southeastern end of the proposed dam site at the point of water withdrawal through the intake facilities (Figure 2.2-11). Each pump would require an approximately 6,000-horsepower (hp) motor.

The dimensions of the raw water intake pumping station site would be approximately 310 feet by 375 feet, or approximately 2.7 acres. This facility is proposed to be built at a different location than originally indicated in the Individual Section 404 Permit application submitted to the USACE Tulsa District in June 2008. However, it would still be within the original proposed footprint of the proposed dam and spillways associated with the reservoir and would not require additional acreage.

Electrical Substation

In order to provide power to the proposed intake pumping station, a new, dedicated, 138 kilovolt (kV) – 6.9 kV, low-resistance grounded substation housing two transformers would be built next to the proposed pumping station, near the southern end of the proposed LBCR dam site (Figure 2.2-11). The 138kV distribution line would potentially parallel the pipeline easement between the substation and the pumping station.

The electrical substation site would be approximately 325 feet by 325 feet, or approximately 2.4 acres. This facility would also be constructed within the footprint of the proposed dam and spillways associated with the reservoir. As with the intake pumping station, this site would be in a somewhat different location than in the Individual Section 404 Permit application submitted in June 2008. However, because it would still be within the grading limits initially proposed, it would not require additional acreage.

Raw Water Pipeline

NTMWD is proposing to build a pipeline that would convey raw water from the proposed reservoir site to the proposed WTP site near the City of Leonard in southwest Fannin County (Figure 2.2-10). The proposed 90 to 96-inch diameter pipeline would run from just downstream of the proposed LBCR dam site in a southwesterly direction for approximately 35 miles to just west of Leonard. The proposed pipeline would have a permanent easement width of 50 feet and a temporary construction easement width of 70 feet. Construction of the proposed pipeline would be achieved primarily with open-trench construction methods. However, three stream crossings – Ward, Honey Grove, and Bullard Creeks – would be tunneled. Once the pipeline is in place, all pre-construction contours would be restored, exposed slopes and stream banks would be stabilized, and disturbed areas would be revegetated. The total area of grading for pipeline construction would be approximately 512 acres.

The proposed pipeline route would cross several state, county, and minor roads as well as gas/petroleum pipelines, overhead power lines, train tracks, and minor utilities. It is anticipated that highway and railroad crossings would be designed as lined tunnel crossings across the entire Right-of-Way as per Texas Department of Transportation (TxDOT) specifications. County road, gas/petroleum pipeline,

overhead electric transmission line, train track, and minor utility crossings would be designed according to the requirements of each facility's owner and permitted as required by the relevant permitting authority.

The construction of the pipeline is proposed to be concurrent with the construction of the dam. The permanent easement would be cleared and seeded with native vegetation where possible. Most previous activities on the easement would be able to continue with the exceptions of the construction of structures and planting of trees.

This pipeline route was one of several pipeline routes examined and is being proposed because of its minimal impacts to waters of the U.S. (see Appendix I for Preliminary Jurisdictional Determination).

North Water Treatment Plant

Raw water transported from the proposed LBCR would be treated at a proposed WTP site (the "North WTP") that would be constructed just west of the town of Leonard, TX, (Figures 2.2-10, 2.2-12, 2.2-13, 2.2-16, 2.2-17). NTMWD currently owns an approximately 662-acre site that is located between State Highway 69 and FM 78 (Figures 2.2-12 and 2.2-13). The 662-acre site is bisected by County Road 4965, dividing the site into an eastern section (339 acres) and a western section (323 acres). The proposed WTP would be constructed within the western section and the grading limits would encompass approximately 186.2 acres.

The North WTP at Leonard is a facility that will be needed by NTMWD in the 2020 – 2021 timeframe, and it is being designed to treat water from several potential sources. NTMWD's intent is to treat LBCR water at the North WTP; should this reservoir project not proceed as planned, a WTP will still be constructed.

While the final treatment plant layout and processes would not be determined until the design phase of the LBCR project, because the raw water quality in Lower Bois d'Arc Creek is generally similar to that found at the District's Wylie and Bonham facilities and NTMWD's staff is accustomed to operating the treatment processes used at those facilities, the new North WTP would likely be a conventional, modular arrangement treatment facility, similar to the existing WTP IV in Wylie, but with the addition of ozonation equipment.¹

A TSR is proposed to be constructed west of the City of Leonard (Figures 2.2-10, 2.2-14, 2.2-15, and 2.2-16). The TSR site would consist of a north cell and a south cell, with grading limits of approximately 153.5 acres. Both cells would hold approximately 210 million gallons of water, thus providing a total of approximately two days of storage during peak water demand periods. The TSR site would be designed in such a way that it could be drained and the flow directed into the Red River Basin. This would be accomplished by building an overflow structure within the north cell which would lead to a proposed drainage pipeline. The drainage pipeline would only be used during overflow events and as needed for maintenance of the TSR. The grading limits for construction of the pipeline would be approximately 11.44 acres. It would have an outfall structure with a footprint of approximately 0.36 acres located slightly south of the headwaters of Valley Creek (Figure 2.2-15).

¹ Ozonation is the process of bubbling ozone gas through water during the water treatment process. The ozone reacts with metals present in the water to form insoluble metal oxides (solid particles) that can be filtered out.

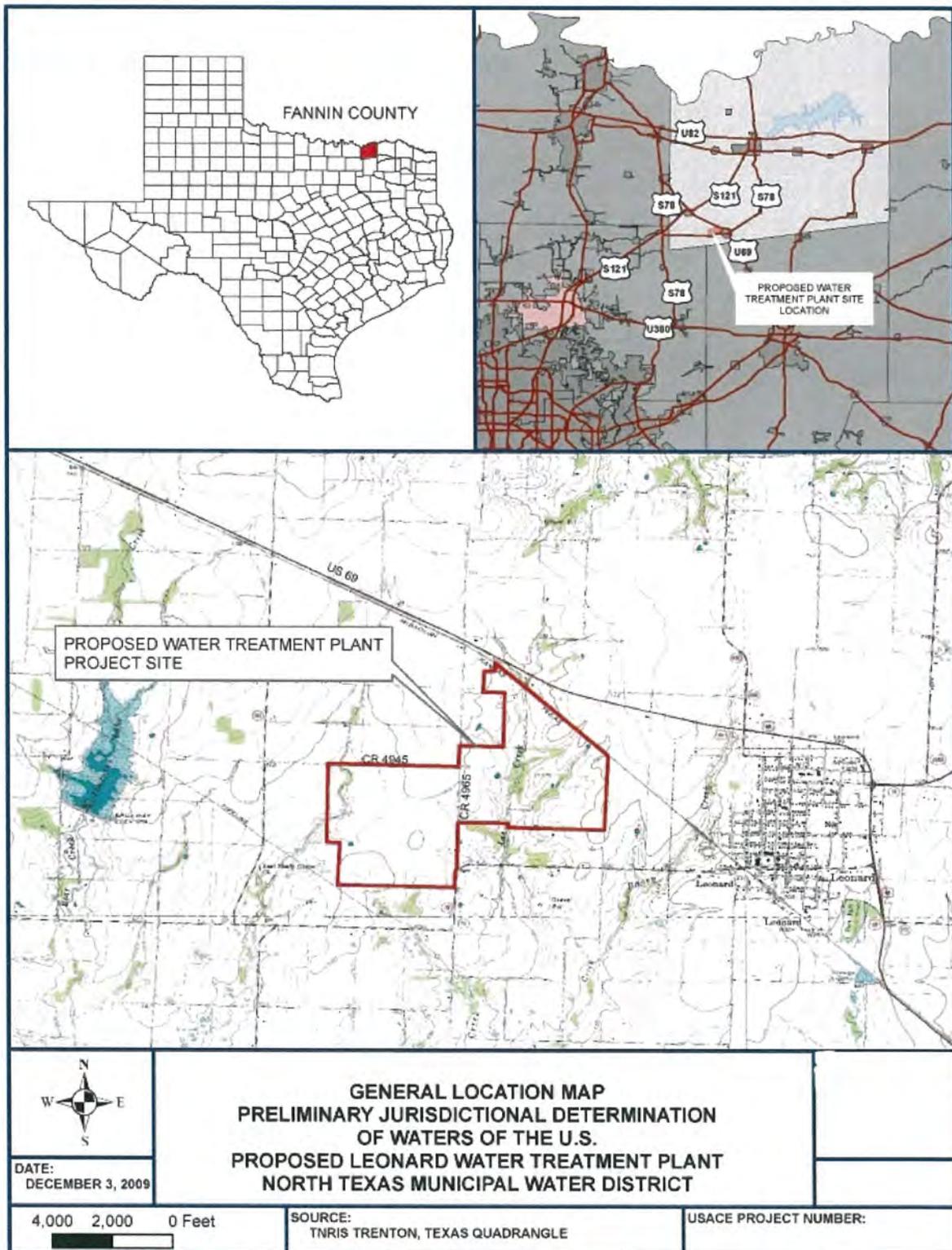


Figure 2.2-12. Location of NTMWD-Owned Property for Construction of North Water Treatment Plant

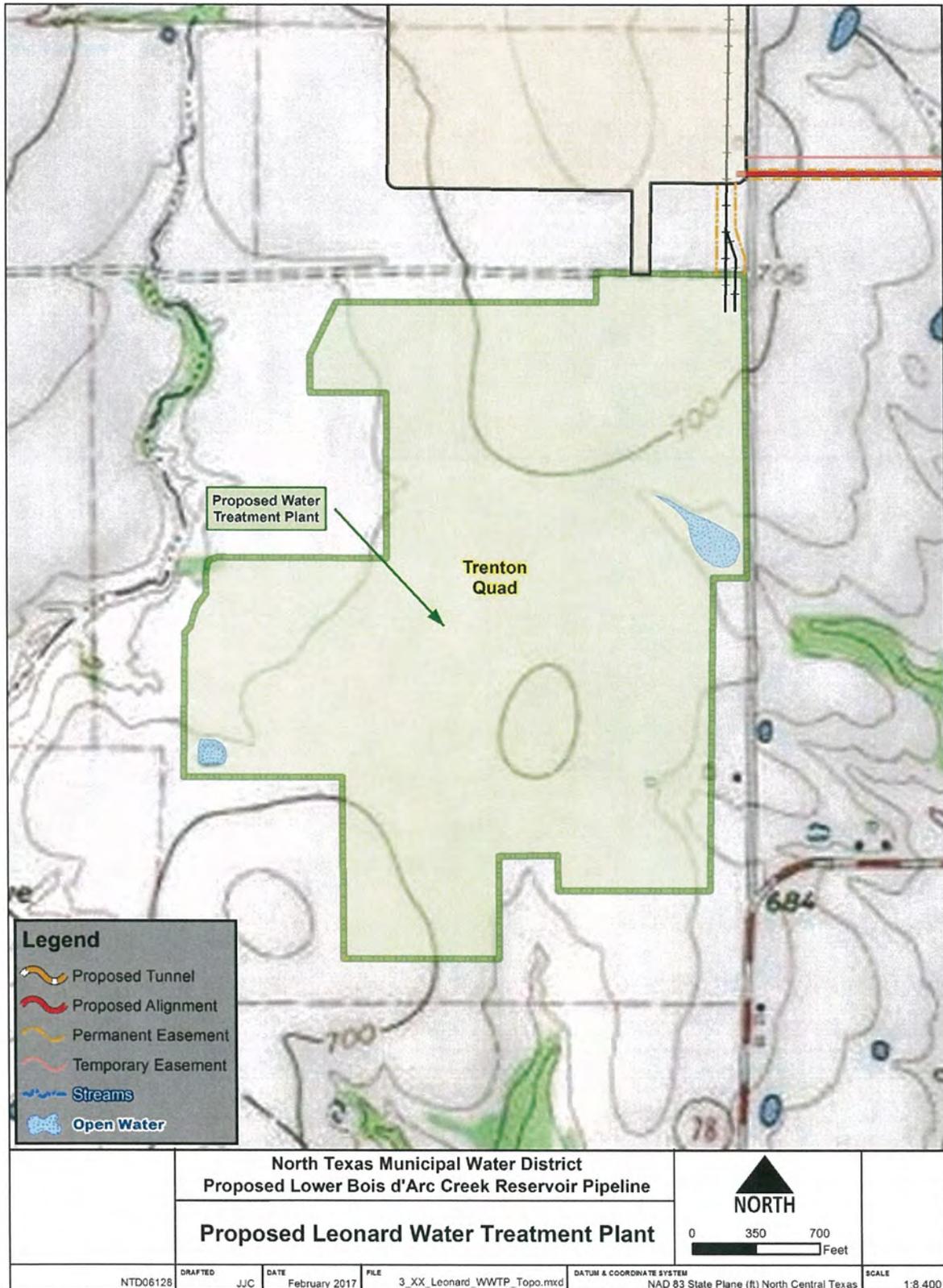


Figure 2.2-13. Location of Proposed North WTP

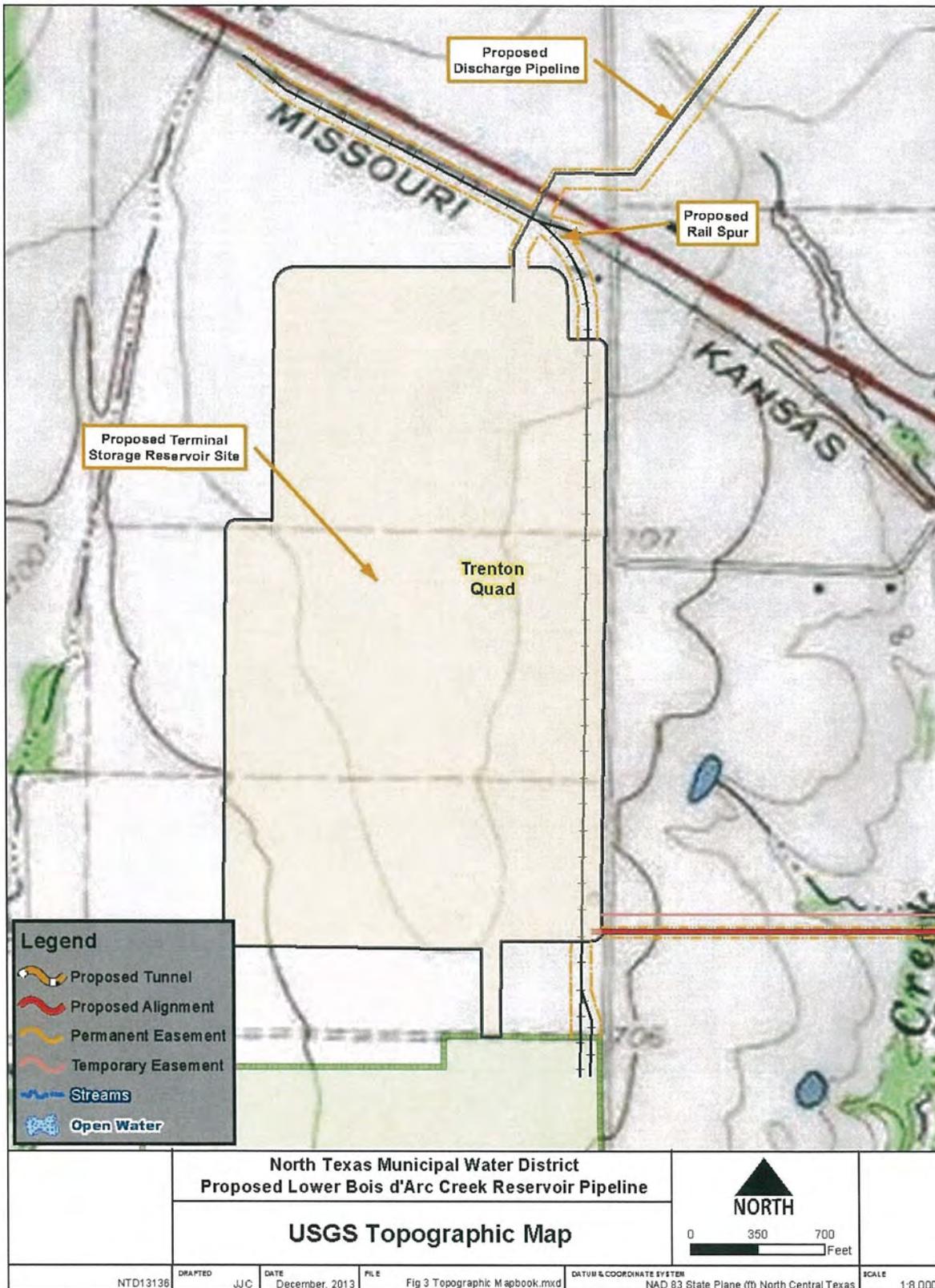


Figure 2.2-14. Location of Proposed Terminal Storage Reservoir

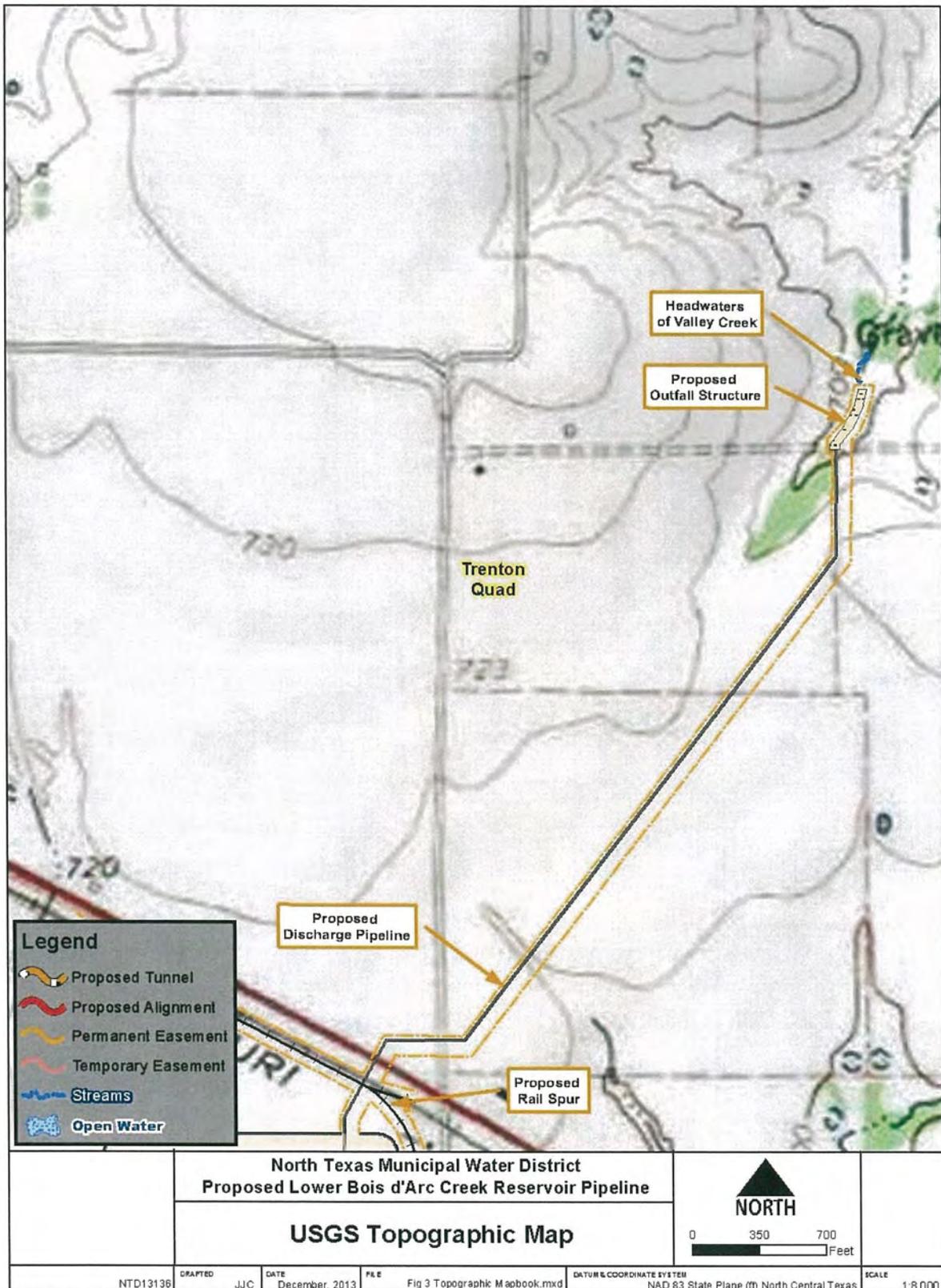


Figure 2.2-15. Location of Proposed TSR Discharge Pipeline and Outfall

The North WTP is anticipated to use conventional treatment with intermediate ozonation for primary disinfection and taste and odor (T & O) control. Major treatment processes would include flow metering and distribution, rapid mix chambers, flocculation basins, sedimentation basins, ozone contact basins, biologically-active filters, and a clearwell. Major treatment plant structures would include a control and chemical feed building, blower building, reclaimed water basin, sludge lagoons, and maintenance building. Liquid ammonium sulfate and sodium hypochlorite would likely be utilized for residual disinfection to avoid the risk management issues from gaseous chlorine and ammonia. The initial plant capacity is expected to be 70 mgd with future plant expansions as needed to meet growth in treated water system demands.

Rail Spur

A rail spur is proposed for construction off of the Missouri-Kansas-Texas Railroad located north of the TSR site; its terminus would be the proposed WTP site (Figures 2.2-10, 2.2-14, 2.2-15, 2.2-17). It would be routed through uplands along existing roads entirely on property already owned by NTMWD (Kiel, 2016a). The proposed rail spur would be used to transport materials and supplies to the WTP. The rail spur would be approximately 6,600 feet in length (1.25 miles) and the grading limits would be approximately 7.2 acres.

At a capacity of 70 mgd, it is estimated that the WTP would use slightly more than two tons of chlorine per day for the purpose of water disinfection. It is estimated that this would require a delivery of one train approximately every six weeks once the WTP is in operation; actual chlorine demand would be determined upon start-up testing. Chlorine is considered a hazardous material but the rail spur will be designed to comply with all safety requirements for transporting chlorine (Kiel, 2016a; Kiel, 2017).

Project Construction Schedule

The construction phase of Alternative 1 (including all components) would last approximately three to four years (Figure 2.2-18). Construction would begin first on the dam, mitigation, and FM 897 (replacement of the FM 1396 road and bridge). Construction of the pumping station, TSR, WTP, and raw water pipeline would start about a year later.

2.2.6 Reservoir Operation

It is important to note that the Section 404 permit, if issued by the USACE, does not address, authorize, or regulate reservoir operations once the reservoir is constructed. That is the purpose of TCEQ's Water Use Permit, issued on June 26, 2015. The Section 404 permit only addresses placement of dredge and fill material into waters of the U.S. to construct the LBCR dam. Under Alternative 1, year-to-year and seasonal operation of the reservoir would be governed by an Operation Plan (NTMWD, 2017). In general, the LBCR would impound up to 367,609 acre-feet of water and produce an estimated firm yield of 120,665 acre-feet of water per year (about 15,000 AFY more than the amount identified in the purpose and need identified in Chapter 1), an average of 108 mgd. The conservation pool, or normal water surface, of the reservoir would be maintained at an elevation of 534.0 feet MSL; however, the actual water surface and shoreline would fluctuate above and below this level.

In a typical year, the reservoir would be fullest in May and June. Reservoir elevations would typically drop during the drier months of late summer due to less precipitation and in-flow and more surface evaporation, with the lowest elevations typically occurring in September and October. However, water levels are related to extended periods of dry conditions versus wet conditions, as well as seasonal variations. Based on the historical hydrologic record, the water surface would exceed 534.0 feet MSL less than 10 percent of the 612-month (51-year) hydrologic period, and would drop below 516.4 feet MSL (40 percent full) approximately 10 percent of the time during this period (Figure 2.2-19). This means that

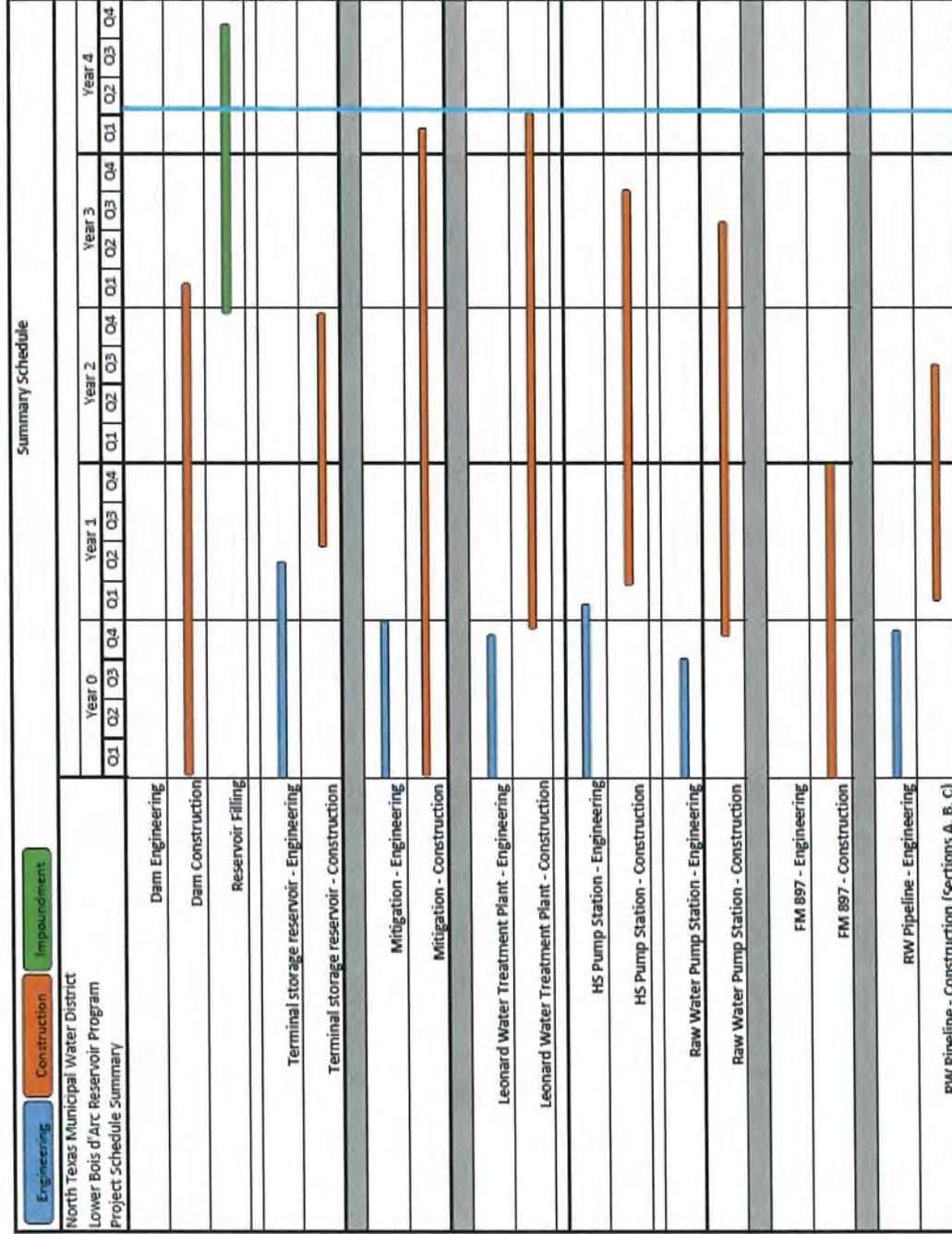


Figure 2.2-18. Alternative 1 Project Construction Schedule

Source: Kiel, 2016

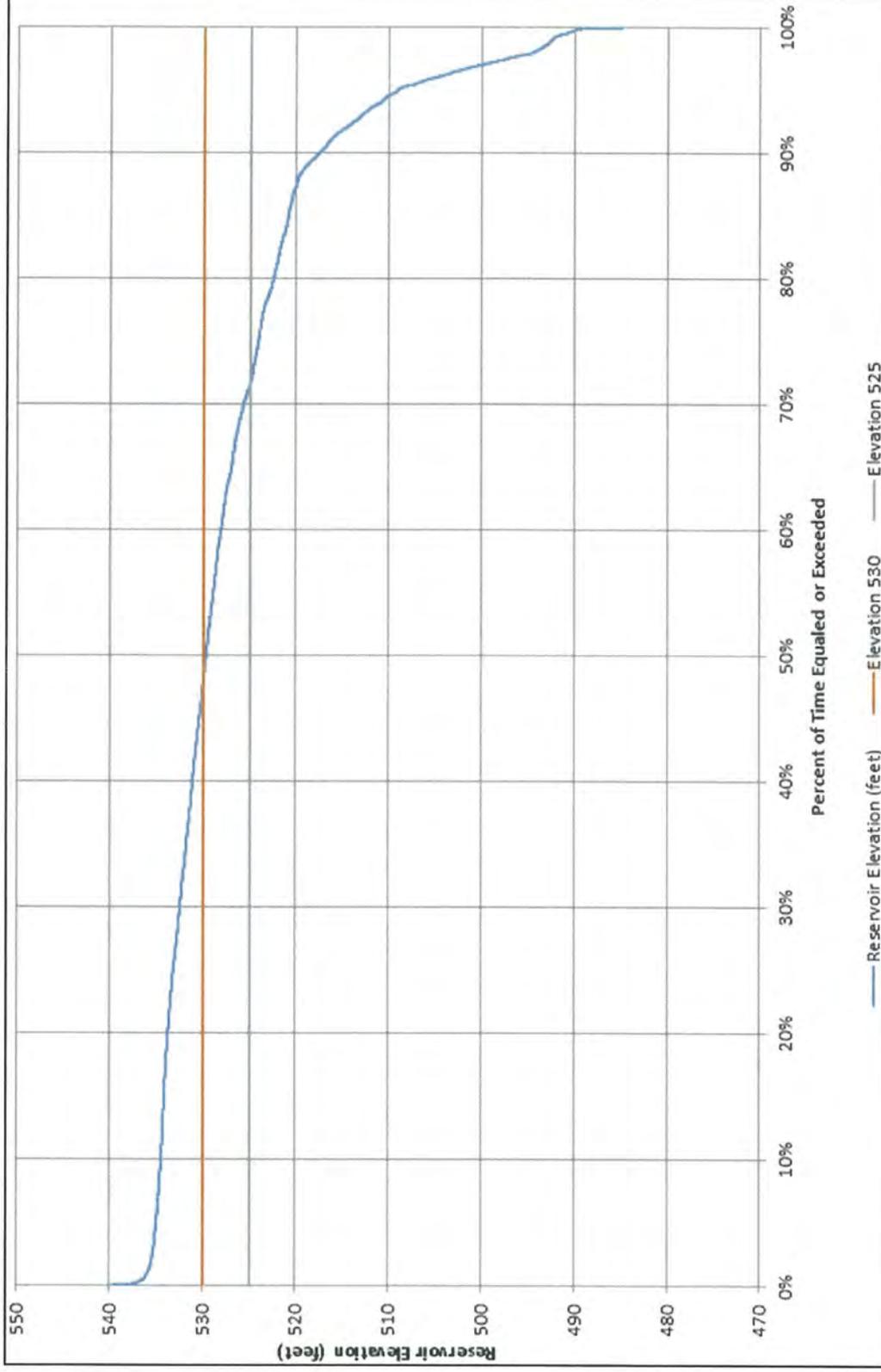


Figure 2.2-19. Alternative 1 Reservoir Elevation Frequencies, Including Permitted Environmental Flows and Bonham Wastewater Treatment Plant Discharges

the water level would be at 516.4 feet MSL or less for about 60 months of the 612-month hydrologic period. Low water levels could occur during several months of one year and not at all during most other years.

The reservoir would be operated in compliance with the state water right (i.e., the Water Use Permit issued by TCEQ in June 2015), and as part of the overall NTMWD water supply system. If conditions allow, and if the system need is there, NTMWD is authorized to divert water at a rate of 175,000 AFY, at a maximum diversion rate of 365.15 cfs from any point on the perimeter of the reservoir. As previously mentioned, a reservoir intake and pumping station is proposed to be built near the dam. In addition to diversions for water supply, inflows to the lake would be passed through the LBCR dam to Bois d'Arc Creek for downstream senior water rights and environmental flows (TCEQ, 2015).

The environmental flow releases incorporated into the Water Use Permit for the LBCR are based on the instream flow needs analysis and subsequent discussions with the TCEQ, and are summarized in Table 2.2-2. Under the Water Use Permit, the reservoir is considered to be in subsistence conditions when the lake storage reaches 40 percent capacity. According to the TCEQ technical memorandum accompanying the June 2015 Water Permit, subsistence flows are those that are “extremely low.” They should occur only during temporary or infrequent conditions, and they are intended to maintain survival of aquatic organisms. While they will not always provide suitable water quality, they will furnish limited instream habitat (TCEQ, 2013).

Table 2.2-2. Environmental Flow Criteria for Bypassing Inflows Through the Reservoir

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

AF = acre-feet; cfs = cubic feet per second

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

Source: NTMWD, 2017

Under normal operations, it is expected that the full yield of the reservoir would be 85 percent utilized within ten years of operation (i.e., by 2030). Figure 2.2-20 shows the projected annual diversions from LBCR based on current normal year projected demands. Under drought year conditions, demands on the reservoir would likely be higher. Depending upon the conditions of NTMWD’s other water sources, LBCR water levels, and locations of demands on NTMWD’s system, the diversions from LBCR could increase to the maximum allowable amount of 175,000 AFY.

Leading up to the current (February 2017) Draft Operation Plan for LBCR, potential reservoir operation was discussed in general terms in two memoranda written by FNI for NTMWD (Albright, 2014a; Albright and Gooch, 2008). The ability to maximize supply from LBCR is a key element in the operation

of NTMWD's water supply system, which utilizes multiple sources of water. Long-term utilization of water from LBCR would be influenced by demands in the system, local demands from Fannin County, and the possible development of other water sources for NTMWD. A 2008 FNI memorandum examined one potential operation scenario, considering the aim to maximize supply while balancing long-term needs. This memorandum is included with the Operation Plan in Appendix D.

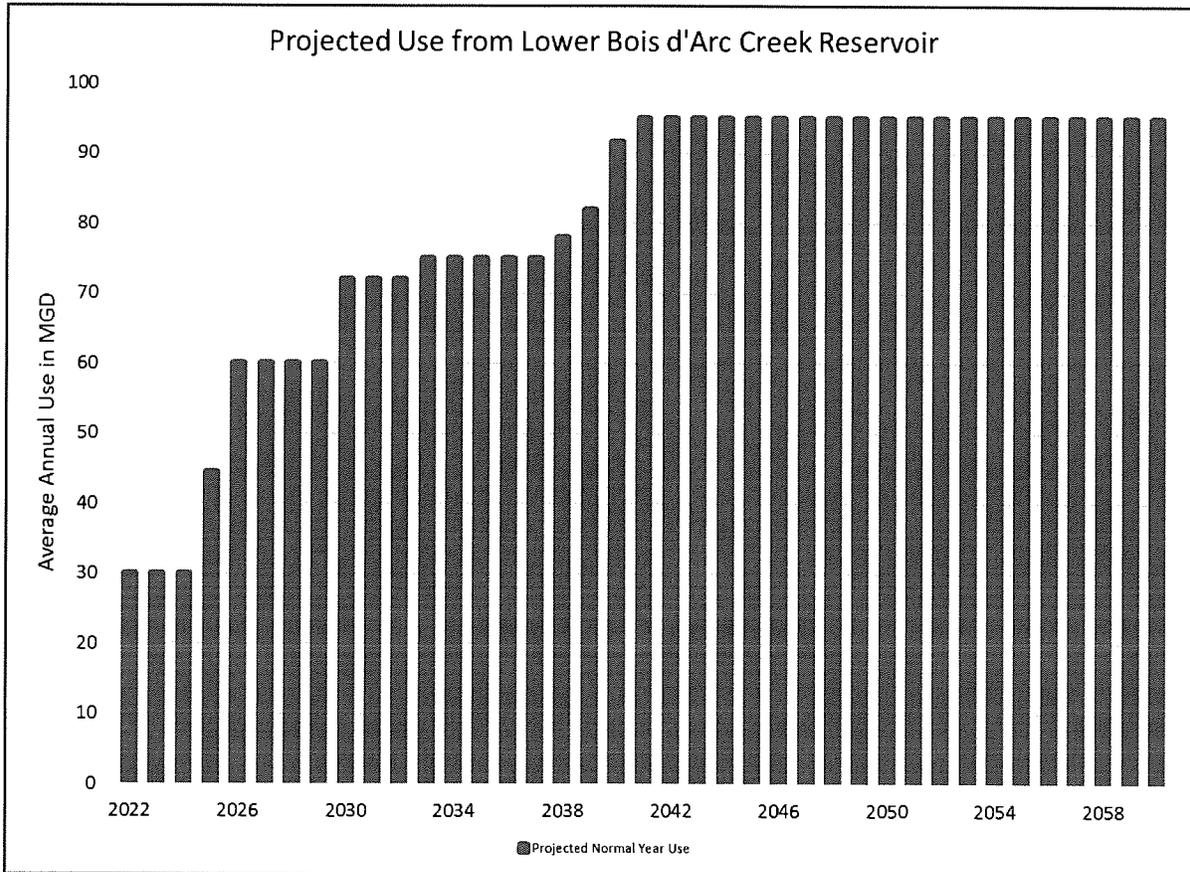


Figure 2.2-20. Projected Normal Year Diversions of Water from LBCR into NTMWD's System

Note: In 2028, water diversions from the LBCR would reach an average of 70 mgd or 78,400 AFY. If maintained for 365 days (1 year), an average of 1 mgd would equal 1,120 AFY, 10 mgd would equal 11,200 AFY, and 100 mgd would equal 112,000 AFY.

The potential operation scenario assumes that diversions would be made at the maximum diversion rate if the reservoir water level was above elevation 532 feet MSL (2 feet below the conservation pool elevation). When the water level was below 532 feet MSL, diversions would be reduced to less than the maximum diversion rate. Under this operation scenario, the maximum diversion of 175,000 AFY would be made in 14 years of the 51-year hydrologic period. About 50 percent of the time, the LBCR could support diversions above the firm yield, provided diversions were made at slightly less than the firm yield the other 50 percent of time.

Figure 2.2-21 compares the flow rate frequency at the FM 409 crossing stream gage with the LBCR operating at its firm yield and with the overdraft operation (a temporarily higher rate of water diversion or withdrawal than the firm yield) described in the potential operation scenario. The daily RiverWare model was developed to examine environmental flows for this project. Flows in Figure 2.2-21 are displayed on both a normal (top) and a log scale (bottom). The log scale graph accentuates the differences in flow between the two operations. The greatest difference is in the frequency of flows between 20 and 110 cfs. This difference occurs during periods when the LBCR dam would be spilling (releasing water) under firm yield operation. During overdraft operation, water releases are slightly smaller and may occur over a shorter duration because of the larger diversion during wet periods. During drier periods, when the reservoir content is lower, the flows are essentially the same. There is very little difference in flows less than 10 cfs. The critical period is during dry times when there are little to no differences in downstream flows with overdraft operation.

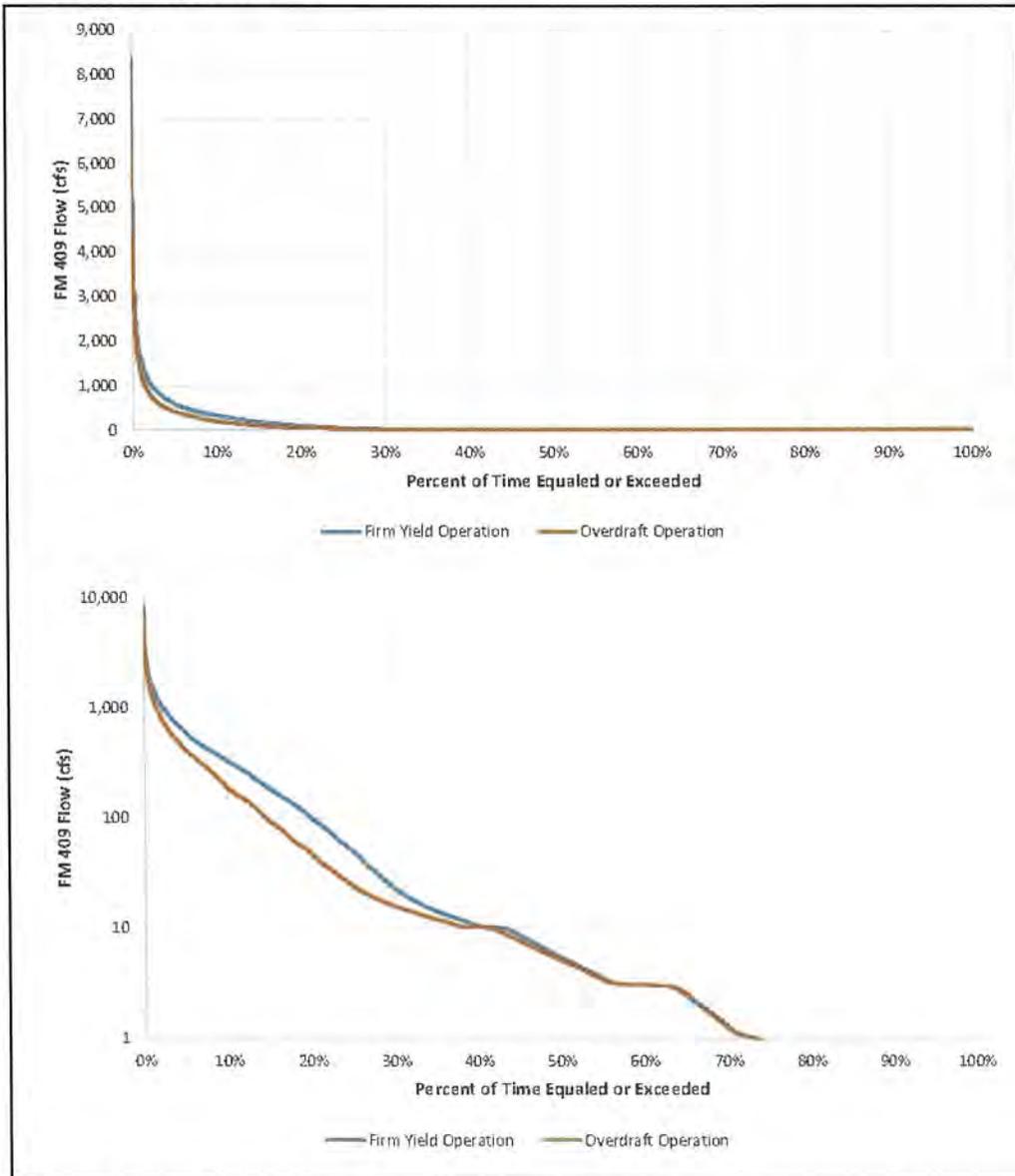


Figure 2.2-21. Comparison of Flows at FM 409, Firm Yield and Overdraft Operation, on Normal (Top) and Logarithmic Scales (Bottom)

As specified in the Draft Operation Plan (NTMWD, 2017), some of the factors that could affect the operation of the LBCR as part of NTMWD's water supply system would include:

- Climatic conditions. During relatively wet times, NTMWD could decide to use less imported water if Lake Lavon was full, to reduce its expenditures on electricity consumption.
- Available infrastructure. Initially, complete use of the LBCR could be limited by treatment and distribution capacity. At times, use of the LBCR could increase if another reservoir or other water transfer facilities were out of service which would limit the use from other supply sources.
- Other future water sources. As NTMWD adds more sources of supply to its system, the operation of the LBCR could change to accommodate the use of those other supplies, particularly if those sources are treated at the North WTP.

The operation policy outlined in the Draft Operation Plan is only one of many different potential operational options for the LBCR. Actual operation of the reservoir would depend on the extent of development of the NTMWD system, overall customer demands within the system, and local demands in Fannin County. As an example of other policies that might be used, the full permitted diversion from LBCR might be used even when the reservoir is drawn down two feet below the conservation pool level if NTMWD system demands are located close to available supplies and if new sources are being developed that would allow reduced diversions from LBCR in later years. NTMWD currently has six major sources of water (Lakes Lavon, Texoma, Chapman, and Tawakoni and reuse at Wilson Creek and the East Fork), and anticipates adding several more over the next few decades.

Some of these other potential new sources are quite far away from the NTMWD service area and it would be costly to pump their water to members and customers. Also, as described in Chapter 1, water from Lake Texoma has a relatively high salt content and must be blended with water from other sources to make it drinkable. LBCR would be relatively close to the NTMWD service area and the water is expected to be of high quality. The ability to use up to 175,000 AFY of water from the LBCR would give NTMWD flexibility, allowing it to make efficient use of LBCR during relatively wet times. During drier periods, other sources of water would be used to a greater extent. In all cases, NTMWD would need to balance the needs for reliable water supply, costs, water quality, water rights, and agreements when operating its system.

LBCR would provide lake-based recreational opportunities, such as boating, fishing, water-skiing, swimming, and other water sports. NTMWD would collaborate with county and state authorities to facilitate development of recreation infrastructure (e.g., docks, marinas, beaches, campgrounds, access roads, utilities) at the LBCR. At this stage, no specific facilities, activities, designs or locations have been chosen.

2.3 ALTERNATIVE 2 – DOWNSIZED LBCR WITH BLENDING

In response to comments, and in the interest of investigating alternatives that might result in reduced impacts to waters of the U.S. and to the environment in general, USACE analyzed the potential yield and impacts of a reduced size reservoir as a water supply supplemented with blended water from Lake Texoma. This alternative is referred to as Alternative 2 in this document. The dam would be located at the same site as Alternative 1, the proposed full-scale LBCR project (Kiel, 2015a; Kiel, 2016b).

The estimated 86,100-AFY firm yield from a downsized LBCR would provide insufficient water to meet the identified purpose and need of the Proposed Action (105,804 AFY by 2025). However, if water from this smaller version of LBCR were to be blended with water from Lake Texoma, the yield would be sufficient to meet the purpose and need. Water from the proposed LBCR is expected to have an acceptable Total Dissolved Solids (TDS) concentration. The firm yield of 86,100 AFY of water from the

smaller LBCR could be blended with 28,700 AFY of Lake Texoma water with elevated TDS concentrations at a ratio of three parts LBCR water to one part Lake Texoma water (3:1). This would result in a combined reliable supply of 114,800 AFY, greater than the 105,804 AFY need established in Chapter 1. Alternative 2 would therefore consist of three main elements: 1) a smaller dam and reservoir at the same LBCR site as Alternative 1, 2) a new raw water pipeline from LBCR to a new WTP at the same site as Alternative 1 (Figure 2.3-1), and 3) a new raw water pipeline from Lake Texoma to the new WTP.

NTMWD originally estimated that 2025 would be the earliest year that water could be available from a smaller LBCR. This time frame would allow for project design modifications; for amendments to the NTMWD water right application to TCEQ; for TCEQ's technical review of the smaller project; and for changes to the proposed project mitigation.

However, a more recent, more in-depth analysis suggests that December 2026 is a more realistic date for project completion than 2025 (Thornton and Rochelle, 2016). This is mostly due to the time required to amend the existing LBCR Water Right Permit No. 12151 with TCEQ to authorize the smaller footprint version of LBCR. Permit 12151 contains very specific conditions linked not only to the full-sized LBCR conservation storage level, 534 feet MSL, compared to 515 feet MSL for the smaller LBCR, but also to the quantity of diversions from LBCR, particularly when diversions reach 100,000 AFY. Permit 12151 Special Condition 6.O. provides that "[s]ubsistence flow requirements apply when storage is less than 40% of the authorized conservation storage." This condition was included based on the conservation storage level of 534 feet MSL. TCEQ would need to determine whether the percentage of authorized conservation storage needs to be adjusted for the environmental flow requirements based on the new conservation storage level of 515 feet MSL for the smaller LBCR, and may issue a permit amendment (Thornton and Rochelle, 2016).

Under another Special Condition (6.U.), NTMWD must conduct instream monitoring of Bois d'Arc Creek downstream at various intervals after reservoir impoundment. These monitoring requirement intervals continue until diversions reach 100,000 AFY. Reducing the size of the LBCR renders Special Condition 6.U. obsolete, because the firm yield would only be 86,100 AFY; thus, 6.U. would need to be modified and amended commensurate with the smaller reservoir size and diversions. Similarly, the mitigation requirements for LBCR in Permit 12151 are specific to the full-sized reservoir and would have to be revisited. Additional studies, surveys, and analyses would be needed to support the application for an amended permit, and the application may be protested by various stakeholders, a process which could considerably delay the issuance of the amended Water Use Permit.

A completion date of late 2026 is close enough to the 2025 criterion in the purpose and need statement that it is reasonable to consider this alternative more thoroughly in this EIS. However, in the subsequent Section 404 permit decision-making process, in determining the LEDPA in accordance with the 404(b)(1) Guidelines, the completion date is one of the factors that will be considered in determining the practicability of Alternative 2. See Figure 1.3-1 for a diagram of the factors taken into account in evaluating practicability during Section 404 permitting.

2.3.1 Dam and Reservoir

Alternative 2's smaller reservoir would have a conservation pool elevation at elevation 515 feet MSL, and would have a storage capacity of 135,200 AF and a surface area of approximately 8,600 acres, approximately half the acreage of Alternative 1. Figure 2.3-1 shows the configurations of the downsized and full-sized LBCR alternatives at their respective conservation pool elevations of 515 and 534 feet MSL.

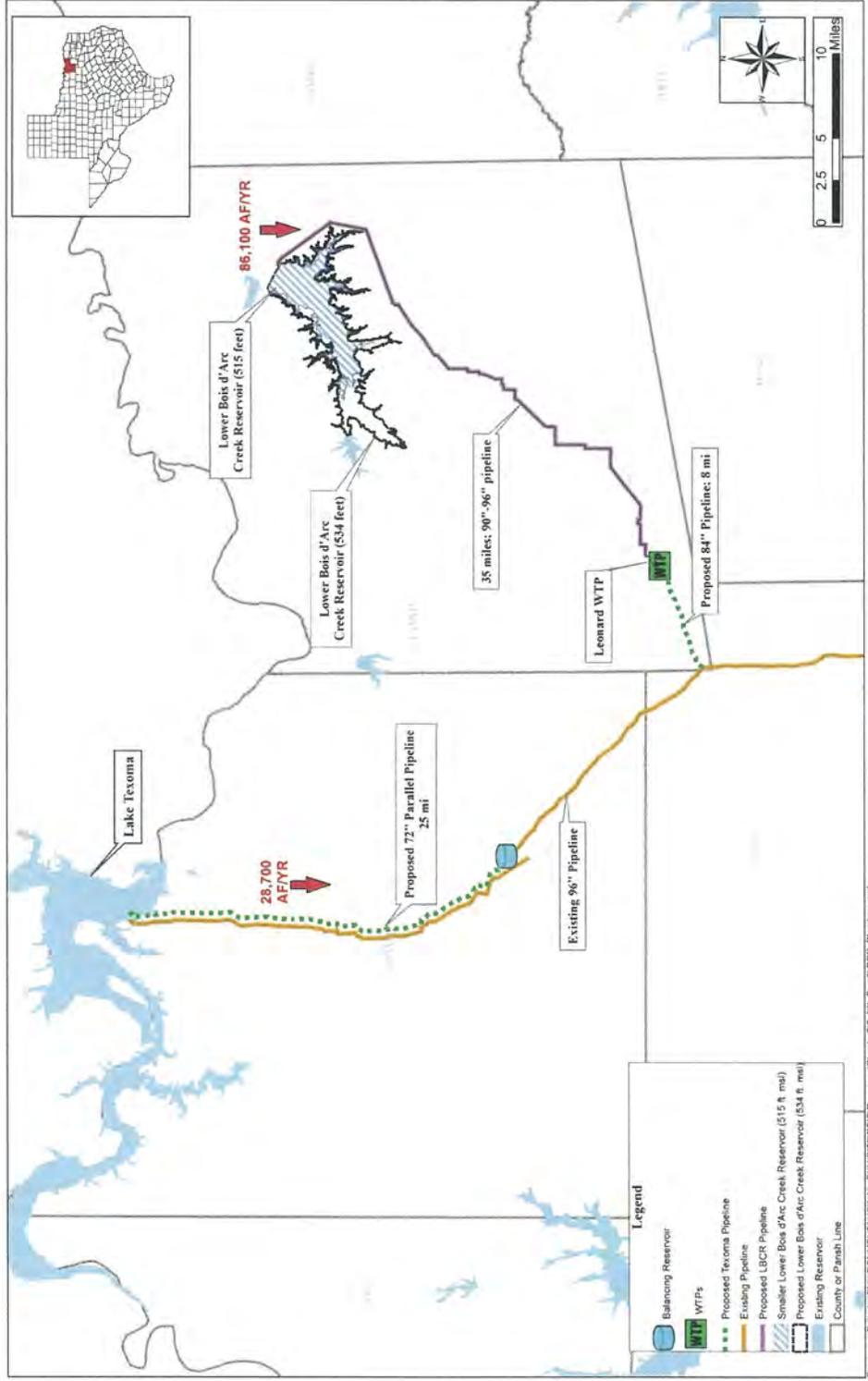


Figure 2.3-1. Alternative 2. Major Components of Downsized Lower Bois d'Arc Creek Reservoir with Lake Texoma Blending

Source: Kietl, 2016b

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The footprint of the dam is assumed to be similar in size and at the same location as Alternative 1. There would be a small reduction in dam height and corresponding footprint, but the dam would still need to be able to contain the PMF. Based on engineering judgment, it is estimated that the dam footprint would be about 90-100 percent of the size of the dam footprint for Alternative 1, although the reservoir footprint would be significantly smaller for Alternative 2 than for Alternative 1. The limit of construction for Alternative 2 is estimated at 9,390 acres (Kiel, 2016b), slightly more than half that of the full-sized LBCR (Alternative 1). Instream flow requirements for Bois d'Arc Creek downstream of the reservoir, specified in the Texas water right permit for the full-sized LBCR, would also apply to the smaller LBCR. The firm yield of this downsized version of the LBCR would be approximately 86,100 AFY of water, or approximately 68 percent of the 120,665 AFY yield of Alternative 1 (Kiel, 2015a).

2.3.2 Service Spillway and Outlet Works

The service spillway and outlet works for Alternative 2 would be slightly smaller versions of those proposed for Alternative 1. The service spillway for Alternative 2 would be located at the right abutment of the dam, as shown in Figure 2.2-5 for the full-sized dam. The spillway depicted in Figure 2.2-8 would include an approach channel, an uncontrolled concrete labyrinth weir, a chute, a hydraulic jump stilling basin and an outlet channel. Required low-flow releases would be made through a low-flow outlet. The weir would consist of a concrete gravity, labyrinth-type section. The crest of the weir would control the conservation pool level at elevation 515.0 feet MSL.

The spillway structure would extend downstream from the dam and discharge into Honey Grove Creek. A hydraulic jump stilling basin would be constructed with baffle blocks and an end sill. Service spillway discharges would be conveyed to Honey Grove Creek by a discharge channel and then flow approximately 1,500 feet in Honey Grove Creek to its confluence with Bois d'Arc Creek.

Water would be diverted by NTMWD through a multi-level intake tower located near the dam that would transport the water to a pumping station located immediately downstream of the dam. The intake structure would be a rectangular tower with two cells, each of which would have the capacity to withdraw water for the needed water supply demands as well as for the releases of water required for base and subsistence flows for Bois d'Arc Creek. Under normal operating conditions, both cells would be used concurrently and would feed a pair of concrete pipes that would carry water through the dam embankment to the pumping station. Diversions could occur through a single cell when the other is closed for maintenance, but this operation is not planned to occur during times of high demand.

Required low-flow releases would pass from the reservoir through the multi-level intake tower and low-level outlet works to be discharged to the service spillway chute. Higher velocity pulse flows would be released from the reservoir through multiple levels of sluice gates located in the service spillway.

An emergency spillway would also be located in the right abutment of the dam (see Figure 2.2-5). The service spillway would be sized to contain a 100-year storm such that no flow would pass through the emergency spillway.

2.3.3 Reservoir Clearing

Reservoir clearing for Alternative 2 would be similar to Alternative 1, though on a somewhat smaller scale due to the downsized dimensions of the reservoir footprint. Subject to the provisions of the Section 404 permit, revised Texas water right permit and Section 401 water quality certification, selected trees and shrubs would be cleared from the reservoir footprint prior to impoundment of water behind the dam. Standing woody material, including dead and living trees and shrubs five feet or more in height, as well as fallen trees five feet or more in length with a diameter of six inches or greater, would be cleared and

removed. Figure 2.3-2 shows vegetation cover types within the footprint of the Alternative 2 smaller reservoir.

NTMWD prepared first a preliminary Reservoir Clearing Plan and then a Conceptual Clearing Plan to guide the reservoir footprint clearing process. Under Alternative 2, both plans would be revised to account for the downsized reservoir footprint. The objectives of these plans would remain the same: to enhance creation of fish habitat by minimizing the clearing of standing trees and shrubs in selected areas within the reservoir; to improve human access to shore locations by creating shore access locations for boat ramps and bank fishing through selective clearing of trees and shrubs; to reduce hazards to boating safety and fishing resulting from large floating debris by minimizing the source of such debris; and to create aesthetic views of the reservoir along selected segments of the shoreline.

Both hand and machine clearing would be used under Alternative 2. The preferred method is mechanical clearing by shear-blading during the dry season. Under this method, the cleared material would be deposited in windrows or piles and left to dry and eventually burned as fire danger conditions allow. Machine clearing has the advantage of shearing stumps off at ground level, along with all other vegetation. It also accumulates most of the loose and dead woody debris that is on the forest floor. Machine clearing would minimize the amount of woody and organic debris remaining on site and entering the water after reservoir flooding.

Mechanical methods would be used in clearing except for the following sites:

- Cultural sites within the areas identified for mechanical clearing would receive different treatment, as appropriate, determined on a case by case basis (see Cultural Resources, Section 3.14).
- Selected locations that may be designated by the NTMWD for tree salvage (for use as firewood, saw-logs, cabins, etc.), would be hand cleared using chain saws or other appropriate timber harvesting machinery.

It may also be necessary to utilize hand clearing where it is not possible to operate mechanical clearing equipment due to site location or conditions.

Access and safe landing sites would be established along the reservoir shoreline to facilitate eventual lake-based recreational development. Consideration would be given to both wood salvage and environmentally sensitive areas that may require specific treatment during clearing operations. Flagging or marking of clearing boundaries and on-site supervision would be carried out for the successful implementation of all aspects of reservoir clearing.

After impoundment, large woody debris would continue to be removed as necessary for the safe operation of boats, boat ramps, swimming areas, water intake structures, and spillways (NTMWD, 2015b).

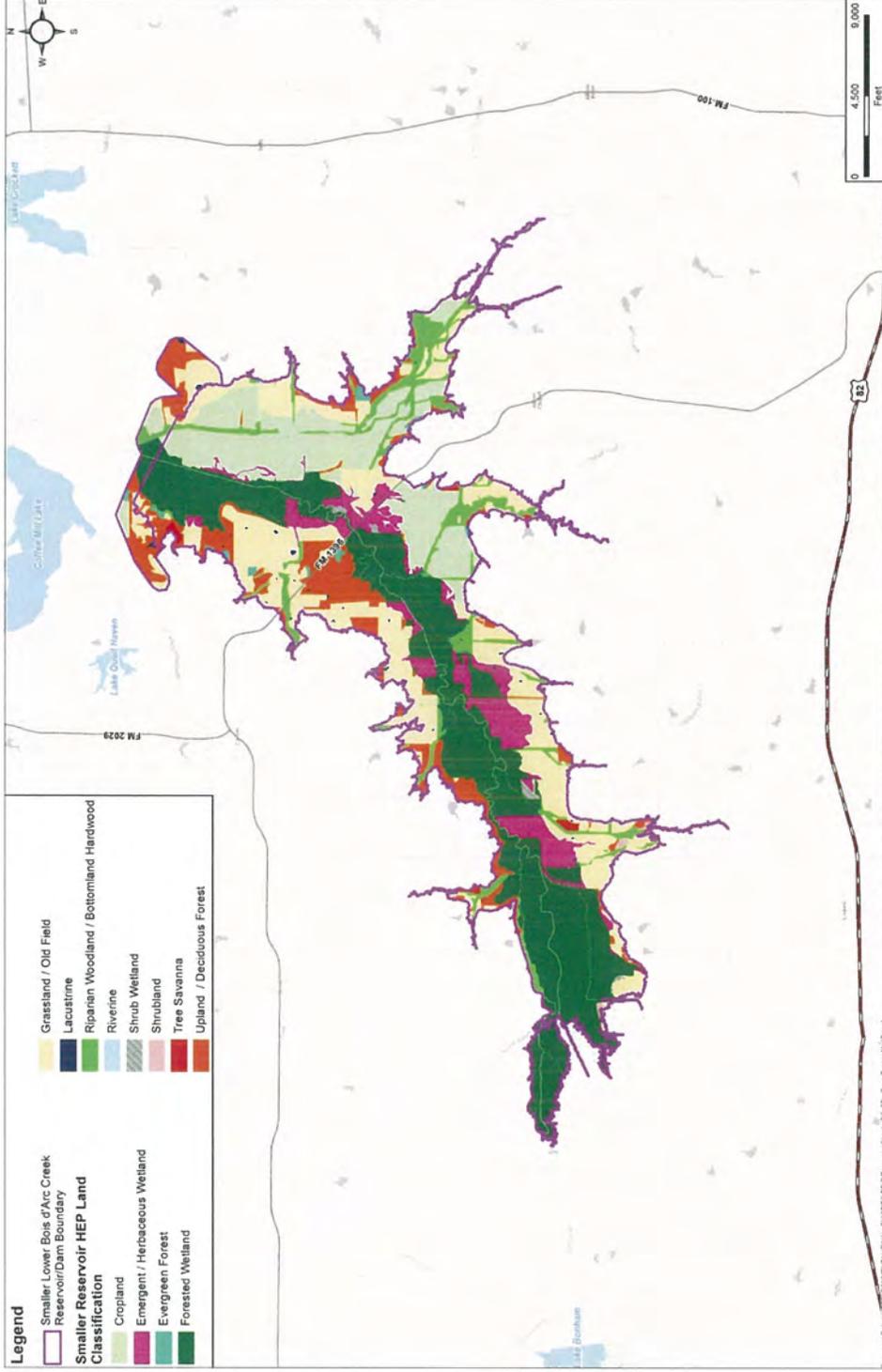


Figure 2.3-2. Existing Vegetation Cover Types within the Alternative 2 Reservoir Footprint

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2.3.4 Road Realignment and Bridge Construction

Construction of the downsized LBCR under Alternative 2 would also impact FM 1396 and the bridge over which it crosses Bois d'Arc Creek. NTMWD would be responsible for replacing the road and bridge. As noted for Alternative 1, the existing alignment of FM 1396 spans Bois d'Arc Creek at what would become one of the widest portions of the smaller reservoir. If the existing alignment was maintained and a new, longer bridge was constructed to span the reservoir at this location it would likely interfere with possible recreational uses on the proposed reservoir. As discussed in Section 2.3.4, NTMWD examined several options to relocate FM 1396 and build a new bridge crossing the proposed LBCR. NTMWD's preferred option would be to extend the existing rural road FM 897 two to three miles to the west of FM 1396 and build an entirely new bridge over the reservoir along that alignment. The existing FM 1396 and bridge crossing over Bois d'Arc Creek would be abandoned and inundated by LBCR.

The principal difference between Alternative 2 and Alternative 1 is that the new bridge on FM 897 spanning the reservoir would be slightly shorter (because the smaller reservoir would not be quite as wide) and the portion of the new paved road on FM 897 would be relatively longer. However, the total length of the FM 897 extension and new bridge as a replacement for FM 1396 and the existing bridge would be essentially the same under Alternatives 1 and 2.

2.3.5 Raw Water Transmission, Storage, and Treatment Facilities

Under Alternative 2, NTMWD would construct raw water transmission facilities that would be essentially the same as those for Alternative 1, though in some instances on a slightly smaller scale. The 35-mile long raw water transmission line, for example, would be a 90-inch diameter pipeline under Alternative 2 compared to a 90 to 96-inch diameter pipeline for Alternative 1. Locations and alignments would be virtually identical between the two alternatives.

As with Alternative 1, under Alternative 2 these facilities would be part of an overall system of raw water storage, transmission, treatment, and treated water transmission facilities that would ultimately provide water to the growing northern section of NTMWD's service area. These proposed facilities include a raw water intake pumping station and electrical substation at the reservoir site and approximately 35 miles of 90-inch diameter raw water pipeline. Figures 2.2-10 through 2.2-17 and 2.3-1 show the location of the proposed raw water transmission pipeline as well as ancillary and associated facilities, including the proposed pumping station, electrical substation, TSR, TSR outfall, WTP, and rail spur on the WTP site.

Intake Pumping Station

Since raw water flowing through the 35 miles of 90-inch diameter pipeline must move uphill for part of the distance, it will not flow on its own due to the force of gravity, and must be pumped. Thus, a pumping station with several pumps would be built close to the proposed dam site at the point of water withdrawal through the intake facilities (Figures 2.2-10 and 2.2-11). Each pump would require an approximately 6,000-hp motor. The dimensions of the raw water intake pumping station site would be up to 310 feet x 375 feet in size, or approximately 2.7 acres. The pumping station would be located within the original proposed footprint of the proposed dam and spillways associated with the reservoir.

Electrical Substation

In Alternative 2, as in Alternative 1, a new dedicated, 138kV – 6.9kV, low-resistance grounded substation housing two transformers would be required to power the 6,000-hp motors in the pumping station. The new electrical substation would be built near the southern end of the proposed LBCR dam site, next to the proposed pumping station (Figure 2.2-11). The 138kV distribution line would potentially parallel the

pipeline easement between the substation and the pumping station. The electrical substation site would be up to 325 feet x 325 feet, or approximately 2.4 acres. It would be constructed within the footprint of the proposed dam and spillways associated with the reservoir.

Raw Water Pipelines

Under Alternative 2, as in Alternative 1, NTMWD would build a pipeline to convey raw water from the proposed reservoir site to the proposed North WTP site west of Leonard (Figures 2.2-10 and 2.3-1). The proposed route and construction process under Alternative 2 would be identical to Alternative 1, but the pipeline would be slightly smaller in diameter (90 inches compared to 90 to 96 inches in diameter for Alternative 1). See Section 2.2.5.3 for a more detailed description of the construction process and procedures, including stream and road crossings. Pipeline construction would occur concurrently with dam construction.

Under Alternative 2, a second raw water pipeline would be constructed to carry water from Lake Texoma to blend with LBCR water at the North WTP (Figure 2.3-3). This alternative would entail constructing a new 72-inch, 25-mile pipeline carrying raw water from Lake Texoma to the Texoma Balancing Reservoir (uppermost green dots in Figure 2.3-3), parallel to the existing NTMWD Lake Texoma raw water pipeline. From there, raw Texoma water would utilize the existing 96-inch pipeline toward the proposed North WTP pipeline spur (yellow solid line). The proposed pipeline spur (green dots) connecting the existing Texoma to Wylie raw water pipeline with the proposed North WTP would be 84 inches in diameter and eight miles long, with a capacity of 70 mgd. These features are also shown in Figure 2.3-4.



Figure 2.3-3. Proposed Raw Water Pipelines Carrying Lake Texoma Water for Blending with Water from the Downsized LBCR (Alternative 2) at the North WTP

Note: Alternative 2 would entail constructing a new 72-inch, 25-mile pipeline carrying raw water from Lake Texoma to the Texoma Balancing Reservoir (upper segment with green dots). From there, raw Texoma water would utilize the existing 96-inch pipeline to the proposed North WTP pipeline spur (green dots). The proposed pipeline spur would be 84 inches in diameter and 8 miles long, with a capacity of 70 mgd.

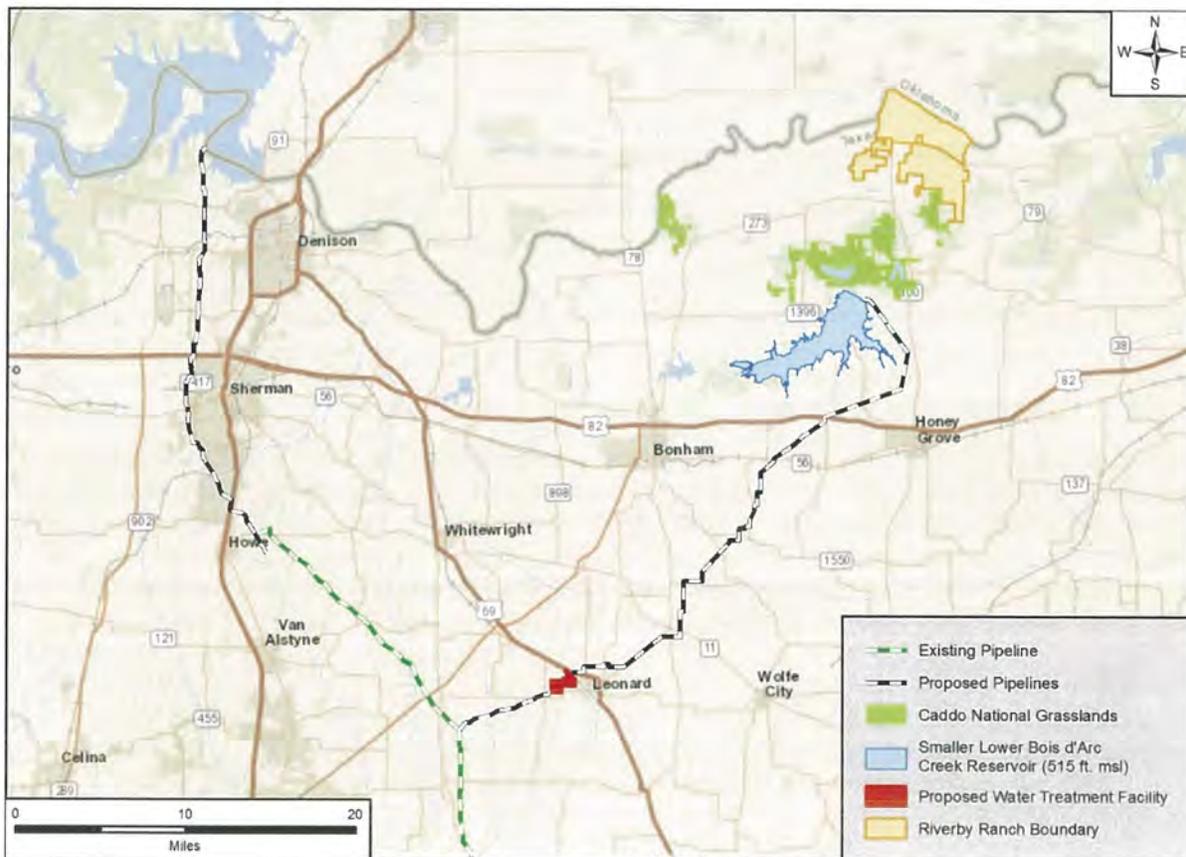


Figure 2.3-4. Proposed Pipelines for Alternative 2

Source: Kiel, 2016b

North Water Treatment Plant

Under Alternative 2, raw water from the downsized reservoir would be treated at the same proposed WTP site as in Alternative 1, which would be constructed just west of the town of Leonard, TX, (Figures 2.2-10, 2.2-12, and 2.3-3). See Section 2.2.5.4 for a more detailed description and diagrams of this site and its proposed facilities, the North WTP and accompanying TSR and overflow structure.

Rail Spur

In Alternative 2 as in Alternative 1, a rail spur would be constructed from the Missouri-Kansas-Texas Railroad located north of the TSR site; its terminus would be the proposed WTP site (Figures 2-16 and 2.2-17). The rail spur would be entirely located on property already owned by NTMWD. The proposed rail spur would be used to transport materials and supplies to the WTP. As in Alternative 1, under Alternative 2, the rail spur would be approximately 6,600 feet in length (1.25 miles) and the grading limits would be approximately 7.2 acres.

At a capacity of 70 mgd, it is estimated that the WTP would use slightly more than two tons of chlorine per day for the purpose of water disinfection. It is estimated that this would require a delivery of one train approximately every six weeks once the WTP is in operation; actual chlorine demand would be determined upon start-up testing. As noted above, chlorine is a hazardous material and but the rail spur

will be designed to comply with all safety requirements for transporting chlorine (Kiel, 2016a; Kiel, 2017).

Project Construction Schedule

The construction phase of Alternative 2 (including all components) would likely last almost as long as Alternative 1, which was estimated to last three to four years (Figure 2.2-18). Construction would begin first on the dam and FM 897 (replacement of the FM 1396 road and bridge). Construction of the pumping station, TSR, WTP, and raw water pipeline would start about one year later. With anticipated delays from having to modify specific conditions in the Water Use Permit with TCEQ, it is estimated that Alternative 2 could not provide water for NTMWD before 2026 (Kiel, 2016b; Thornton and Rochelle, 2016).

2.3.6 Reservoir Operation

Under Alternative 2, as in Alternative 1, year-to-year and seasonal operation of the reservoir would be governed by an operation plan. The Alternative 2 operation plan would be similar to that already drafted for the Proposed Action, Alternative 1 (NTMWD, 2017). In general, Alternative 2 would impound up to 135,200 AF of water and produce an estimated firm yield of 86,100 AFY, an average of 108 mgd. The conservation pool, or normal water surface, of the reservoir would be maintained at an elevation of 515.0 feet MSL, though actual water surface and shoreline would fluctuate above and below this level.

In a typical year, the reservoir would be fullest in May and June. Reservoir elevations would typically drop during the drier months of late summer due to less precipitation and in-flow and more surface evaporation, with the lowest elevations typically occurring in September and October. However, the water levels are also related to extended periods of dry conditions versus wet conditions, as well as seasonal variations.

Under Alternative 2, the reservoir would be operated in compliance with a state water right. As mentioned above, specific conditions in the Water Use Permit issued by TCEQ on June 26, 2015 would need to be revised to authorize operation of a downsized LBCR. In addition to diversions for water supply, a revised permit would require inflows to the reservoir to be passed through the LBCR Dam to Bois d'Arc Creek for downstream senior water rights and environmental flows, as in Alternative 1.

The environmental flow releases incorporated into the Water Use Permit already held by the NTMWD for Alternative 1 (the Applicant's Proposed Action) are based on the instream flow needs analysis and subsequent discussions with the TCEQ, and they are summarized in Table 2.2-2. These provisions would need to be revisited by TCEQ if Alternative 2 was selected for Section 404 permitting by the USACE; however, any modified provisions and conditions of a revised Water Use Permit would retain the mandate of providing for downstream water quality, quantity, and aquatic habitat. Under Alternative 2, approximately 34,500 AFY of additional water would flow downstream past the LBCR impoundment than in the case of Alternative 1. Much of this aggregate volume would be during high, ephemeral flows associated with storm events rather than during longer base flow periods. There would be ample opportunity to manage these flows for the benefit of instream conditions between the dam site and the confluence with the Red River, although not during periods of extremely low or environmental flows. At these times, as in the case of Alternative 1, environmental flows from the downsized reservoir would probably provide for limited instream habitat, but not for adequate water quality.

Under normal reservoir operations, it is anticipated that the full 86,100-AFY firm yield of the downsized LBCR would be 100 percent utilized within two to three years of its completion (i.e., by about 2028, see Figure 2.2-20), excluding the recommended reserve supply. If the recommended reserve supply is

included, NMTWD's water need would already exceed the downsized LBCR's firm yield even before the reservoir's completion.

However, Alternative 2 includes an additional 28,700 AFY of blended Lake Texoma water, for a combined reliable supply of 114,800 AFY. Thus, Alternative 2's water supply would be fully utilized by approximately 2031 if the recommended reserve supply is excluded, and by 2026 – the year construction on the project is expected to be completed – if the recommended reserve supply is included.

Under Alternative 2, as under Alternative 1, some of the factors that could affect the operation of the downsized reservoir as part of NTMWD's water supply system include:

- Climatic conditions. During relatively wet times, NTMWD may decide to use less imported water if Lake Lavon is full, reducing power consumption costs.
- Available infrastructure. Initially, complete use of the LBCR may be limited by treatment and distribution capacity. At times, use of the LBCR could increase if another reservoir or other water transfer facilities are out of service which would limit the use from other supply sources.
- Other future water sources. As NTMWD adds more sources of supply to its system, the operation of the downsized LBCR with Texoma blending may change to accommodate the use of those other supplies, particularly if those sources are treated at the North WTP.

Under drought year conditions, demands on the downsized reservoir would likely be higher. Depending upon the conditions of NTMWD's other water sources, LBCR water levels, and locations of demands on NTMWD's system, the diversions from LBCR could increase to the maximum amount allowed from the smaller reservoir.

As was noted for Alternative 1, there are various potential operational options for the downsized LBCR under Alternative 2. Actual operation of the reservoir would depend on the extent of development of the NTMWD system, overall customer demands within the system, and local demands in Fannin County. As an example of other policies that might be used, the full permitted diversion from LBCR might be used even when the reservoir is drawn down two feet below the conservation pool level if NTMWD system demands are located close to available supplies and if new sources are being developed that would allow reduced diversions from LBCR in later years. NTMWD currently has six major sources of water (Lakes Lavon, Texoma, Chapman and Tawakoni and reuse at Wilson Creek and the East Fork), and anticipates adding several more over the next few decades.

Under Alternative 2, the downsized LBCR would also provide lake-based recreational opportunities, including boating, fishing, water-skiing, swimming, and other water sports. NTMWD would cooperate with county and state authorities to facilitate development of recreation infrastructure (e.g., docks, marinas, beaches, campgrounds, access roads, utilities) at the downsized LBCR. At this time, there are no plans for specific facilities, activities, designs or locations.

2.4 NO FEDERAL ACTION ALTERNATIVE

The No Action Alternative is one which results in no construction requiring a Corps permit. It may be brought about by 1) the applicant electing to modify its proposal to eliminate work under the jurisdiction of the USACE permit, or 2) the denial of the permit (33 CFR 325, Appendix B, 9.b(5)(b)).

In terms of the applicant's proposed project, there is no way to modify the proposal to eliminate the need for Section 404 authorization. Consequently, the No Action Alternative analyzed stems from the possible denial of the permit application.

Section 1502.14(d) of the Council on Environmental Quality's (CEQ) Regulations for Implementing the National Environmental Policy Act (NEPA) requires the alternatives analysis in the EIS to "include the alternative of no action." While there is more than one interpretation of "no action," depending upon the nature of the proposal being evaluated, in the present instance of a federal decision on a proposal for a project – whether or not to issue a Section 404 permit for the LBCR – "no action" means that the proposed activity would not take place. Thus, the resulting environmental effects from taking no action would be compared with the effects of permitting the proposed activity or an alternative activity (CEQ, 1981).

In this EIS, the No Action Alternative consists of not building the proposed Lower Bois d'Arc Creek dam and reservoir. In the Environmental Consequences sections of Chapter 4, the results of the No Action Alternative will be compared to the results of proceeding with the Proposed Action. In some ways, describing the results of the No Action Alternative is the same as describing the affected environment, because there will be no change from existing conditions. In other ways, however, as a result of ongoing ecological, economic and social trends and processes, the environment can be expected to change even in the absence of the proposed dam and reservoir.

It is important to specify that "existing conditions" refer to those that existed either in 2008, when the application for the Section 404 permit was first submitted, or in 2016, when additional surveys were conducted using the Hydrogeomorphic (HGM) approach. Based on the USACE's ongoing experience with this project, land use practices and habitat conditions have remained relatively constant. Therefore, the reservoir habitat evaluation using HEP (the Habitat Evaluation Procedure mentioned in Chapter 1 and described in more detail in Chapter 3) and the jurisdictional determination studies conducted in 2007-2008 remain applicable. These studies, along with the HGM field surveys conducted in 2016 constitute the baseline for evaluation of the No Action Alternative.

Analysis of the No Action Alternative in this EIS does not include any speculative action that NTMWD might undertake if the Section 404 permit was denied. CEQ indicates that when a choice of "no action" by the decision-making agency would result in predictable actions by others, then this consequence of the "no action" alternative should be included in the analysis. CEQ further provides the example of denial of permission to build a railroad to a facility; if this denial would then lead to construction of a road instead, and thus, increased truck traffic, CEQ stipulates that the EIS should analyze this consequence of the "no action" alternative (CEQ, 1981). However, at the present time, NTMWD does not have a viable back-up option to the proposed reservoir.

The impacts of the No Action Alternative are assessed by resource in Chapter 4 of this EIS.

2.5 ALTERNATIVES DISMISSED FROM DETAILED CONSIDERATION

Other alternatives were evaluated but are not carried forward for detailed consideration in the EIS. These include alternatives that do not require a Section 404 permit, alternatives that are not available to the applicant, and other alternatives that are available to the applicant. Summaries of these are included below, and more detailed discussion and the reasons for not carrying them forward for assessment in the EIS are included in Appendix O, "Alternatives Dismissed from Detailed Consideration."

2.5.1 Alternatives that Do Not Require a Section 404 Permit

Three alternatives – new groundwater supplies, desalination, and water conservation – would not have required NTMWD to apply for a Section 404 permit because they do not entail placing fill into waters of the United States under USACE jurisdiction.

New Groundwater Supplies

Under Senate Bill 2, passed in 2001, Texas began a groundwater Joint Planning effort. Previous groundwater regulation was strictly limited to the jurisdiction of the individual Groundwater Conservation Districts (GCDs). TWDB's Joint Planning effort created 16 Groundwater Management Areas (GMAs) in Texas based on hydrogeologic and aquifer boundaries; GMAs are intended to provide management guidance over common aquifers. The GMAs are comprised of the GCDs that fall within the boundary of the GMA. GMA 8 covers all of Region C except for Jack County, Henderson County, and a small portion of Navarro County (Region C Water Planning Group, 2010).

The GMAs are responsible for developing Desired Future Conditions (DFCs) for aquifers within their respective areas. DFCs are defined in the Texas Administrative Code as the desired, quantified condition of groundwater resources (such as water levels, water quality, spring flows, or volumes) for a specified aquifer within a management area at a specified time or times in the future. TWDB then quantifies Managed Available Groundwater (MAG) based on the DFCs provided by the GMAs. The MAG is the amount of groundwater that models predict may be produced under a permit to meet the DFC established by the GMA for that particular aquifer.

In Texas water planning, groundwater use cannot exceed MAG values. The GMAs have adopted the MAG values and they are included in the 2016 regional water planning process. For the 2011 regional water plans, only a few GMAs had adopted MAG values prior to the development of the plans. Consequently, water that may have been shown as available in the 2011 regional water plans may not be available at present.

The *2011 Region C Water Plan* identified two potential groundwater sources for NTMWD: 1) Roberts County groundwater from the Ogallala Aquifer, and 2) Brazos County groundwater from the Carrizo-Wilcox Aquifer. At present, neither of these projects is viable. Neither is listed as a recommended or alternative strategy in the *2016 Region C Water Plan* (Region C Water Planning Group, 2015).

Roberts County Ogallala Aquifer Groundwater Alternative

Roberts County is located in the panhandle of Texas. Prior to 2011, Mesa Water, Inc. controlled rights to groundwater in Roberts County with options for additional supply and had permits from the local groundwater conservation district to export groundwater. Mesa Water had been interested in selling groundwater from the Ogallala Aquifer in Roberts County to water suppliers in North Texas. Mesa Water sold these rights to the Canadian River Municipal Water Authority on June 23, 2011. With the completion of this sale, this water supply alternative is no longer available to NTMWD.

Brazos County Carrizo-Wilcox Aquifer Groundwater Alternative

The Carrizo-Wilcox Aquifer covers a large area of east, central, and south Texas, including Brazos County. Brazos County is about 150 miles from the NTMWD service area. Because of this distance over which a pipeline would have to be built and operated, including pumping costs, this alternative is a relatively expensive source of supply for the NTMWD. Moreover, the Bureau of Economic Geology (BEG) has identified a potential conflict for the Carrizo-Wilcox Aquifer in Brazos County in 2020 because the sum of the county's currently available supplies and water management strategies exceeds the MAG in that year (BEG, 2011). MAG values are smaller than previous estimates of availability and the water supply potentially available for export from the Carrizo-Wilcox Aquifer in Brazos County is thus reduced.

Overall, due to high cost considerations, uncertain availability, and competition for this water source, the Carrizo-Wilcox groundwater alternative is not considered a viable alternative to the Proposed Action.

Freestone and Anderson Counties Carrizo-Wilcox Aquifer Groundwater (Region I)

The 2016 *Region C Water Plan* notes that development and export of water supplies from Freestone, Anderson, and surrounding counties has been under study, and that Dallas Metroplex wholesale water suppliers have been approached as possible customers (Region C Water Planning Group, 2015). The 2016 plan shows Carrizo-Wilcox groundwater from Freestone/Anderson counties as an alternative strategy for NTMWD. The quantity potentially available to NTMWD is listed as 42,000 AFY.

More recent analysis casts doubt on whether 42,000 AFY would be available from this alternative. The amount of water that could be permitted from both the Carrizo-Wilcox and Queen City aquifers under the current MAG value is about 21,000 AFY, only half of the proposed total quantity for this strategy. With the current MAG values, it is unclear whether this well field could be permitted without changes to the DFCs.

In conclusion, groundwater from Freestone and Anderson counties does not meet the quantity criterion of the purpose and need and may not meet the timeframe criterion either. Thus, this alternative is not considered a reasonable alternative.

Other Groundwater Supplies in Region C

Two major aquifers and four minor aquifers supply groundwater in Region C. The two major aquifers are the Trinity and the aforementioned Carrizo-Wilcox. The four minor aquifers are the Woodbine, Queen City, Nacatoch, and locally undifferentiated formations referred to collectively as the “other aquifer.” The Nacatoch and Queen City aquifers are known to have limited supplies and water quality issues, and therefore are not utilized extensively.

In all of Region C, an estimated 146,152 AFY of groundwater is hypothetically available in perpetuity, which is more than the estimated firm yield of 120,665 AFY for the proposed LBCR. However, many providers and users already compete for this water, and little additional water supply is actually available from Region C aquifers. In addition, the TCEQ has designated a ten-county area within Region C as a priority groundwater management area (PGMA) due to excessive declines in groundwater availability in the region. Overall, there is little groundwater available to NTMWD for future development in Region C and the surrounding region.

In conclusion, groundwater supplies in general, including aggregate supplies from a number of potential sources from major and minor aquifers over a widespread geographic area, do not represent a reasonable alternative for NTMWD. The quantities potentially available are insufficient to meet the purpose and need, these quantities may be subject to reduction to conform with MAG values, and there is growing competition among users for these constrained groundwater supplies.

Desalination

Desalination of Lake Texoma Water

As described in Chapter 1 of this EIS, Lake Texoma is a 2.5 million acre-feet reservoir which straddles the Texas –Oklahoma border on the Red River. This large lake was built and is owned and operated by the USACE. It serves four important functions: flood control, hydropower, water supply, and recreation. The water in Lake Texoma is shared by the states of Texas and Oklahoma (Water Data for Texas, 2016).

Water in the upper reaches of the Red River, as well as from Lake Texoma itself, has naturally-occurring high concentrations of dissolved salts. Thus, if this water is to be used for municipal and drinking water purposes, it requires either advanced treatment (desalination) or blending with freshwater sources.

Lake Texoma's brackish water would be desalinated using reverse osmosis water treatment or another similar treatment method. Reverse osmosis is an expensive and energy-intensive process. Desalination can result in losses of up to one-third of the raw supply to the treatment process and requires disposal of large quantities of highly saline water. Disposal options include deep injection wells, discharge to a stream or the ocean, or evaporation ponds. Each of these disposal options would require additional environmental studies of potential impacts.

Desalination is also a more expensive strategy than blending, and there are considerable uncertainties in the operation and long-term costs of a large-scale desalination facility. The estimated costs for desalination of water from Lake Texoma are based on current cost information for large desalination facilities. According to the *2016 Region C Water Plan*, the cost of desalination is more than four times the cost for water from LBCR: \$7.20 per thousand gallons for desalination versus \$1.55 per thousand gallons for LBCR. However, because the method, cost, and regulatory requirements of brine disposal for such a facility are uncertain these costs should be regarded as more uncertain than other cost estimates developed for the potential alternatives.

Due to this uncertainty, brine disposal has the potential to significantly increase both the estimated cost for desalination and the time required to bring it online. Deep well injection would probably require multiple sites to accommodate the quantity of discharge required, and large-volume discharges of brine to surface water would be difficult to permit. Building a pipeline for disposal in the ocean would be prohibitively expensive due to its length and would still require analysis of environmental impacts. Detailed studies to better quantify the cost estimates and feasibility would be required if a large-scale desalination strategy is pursued.

In conclusion, the Lake Texoma desalination alternative is not a reasonable alternative. It fails to meet both the time and quantity elements of the purpose and need (see Appendix O for more detailed discussion of these issues). While Lake Texoma is a reliable source of water for which NTMWD already has a substantial water right, and while environmental impacts at the site of withdrawal and along pipeline routes would be relatively small, the fact that this alternative could only deliver an estimated 97,000 AFY of water and not until at least 2030 disqualifies it from further consideration in this EIS.

Desalination of Gulf of Mexico Seawater

The State of Texas has sponsored initial studies of potential seawater desalination projects, which may be a future supply source for the state in general. However, as noted above, desalination continues to be both costly and energy-intensive. If fossil fuels such as coal or natural gas are used to generate the electricity to power the desalination process, this would: 1) contribute to the cumulative depletion of fossil fuels; 2) contribute to localized air pollution from criteria pollutants such as particulates, sulfur dioxide, nitrogen oxides, and volatile organic compounds, and possibly the toxic heavy metal mercury; and 3) emit carbon dioxide (CO₂), thereby contributing in a small but non-trivial way to the cumulative buildup of this greenhouse gas in the atmosphere.

Furthermore, because of the long distance from NTMWD's service area to the Gulf of Mexico (about 300 miles), and the subsequent cost of laying and operating a pipeline over this distance, seawater desalination is not a viable source of water supply for NTMWD. While the water supply from seawater desalination is essentially unlimited, this is a high energy use strategy and the unit cost is much higher than the cost of other water management strategies for NTMWD – \$8.46 per thousand gallons for treated water – more than five times as expensive as LBCR (Region C Water Planning Group, 2015). Thus, this is not a reasonable alternative to the Proposed Action.

Conservation

In the *2016 Region C Water Plan*, conservation is a recommended water management strategy for NTMWD. The *2016 Region C Water Plan* reaffirms the region's commitment to conservation and reuse. TWDB now mandates that each regional water planning group evaluate all water management strategies that it determines to be potentially feasible, including water conservation practices, reuse of treated wastewater effluent, and drought management measures. In response, the Region C Water Planning Group decided to incorporate water management strategies involving both water conservation and reuse of treated wastewater effluent as major components of the long-term water supply for Region C, to encourage planning and implementation of water conservation and reuse projects, and to monitor legislation and regulatory actions related to water conservation and reuse.

The USACE generally considers water conservation and reuse not as distinct, alternative methods or strategies of providing additional water, but rather as approaches and actions which make more efficient use of existing water supplies and thereby reduce per capita water consumption, partially offsetting the increasing municipal demand for water due to population growth. As such, in this EIS, water conservation and reuse are not considered alongside structural alternatives to the Proposed Action in Chapter 2 but are considered in the context of the purpose and need discussion in Chapter 1. NTMWD's conservation and reuse policies, programs, and projects will be implemented regardless of the USACE's permitting decision on the Proposed Action and alternatives.

2.5.2 Alternatives That Are Unavailable to the Applicant

Consistent with USACE Regulatory NEPA Regulations at 33 CFR 325 Appendix B, paragraph 9.b(5), alternatives that are unavailable to the applicant are to be included in the analysis of the No Federal Action alternative. The USACE considers the following two alternatives unavailable to NTMWD.

Importing Water from Oklahoma

Importing from Oklahoma is a possible alternative for NTMWD. The *2011 Region C Water Plan* estimated that it is comparable in cost with the proposed LBCR (Region C Water Planning Group, 2010) and the *2016 Region C Water Plan* states that "raw water from Oklahoma would be a relatively inexpensive supply and would have relatively low environmental impacts because of the use of existing sources" (Region C Water Planning Group, 2015).

However, in 2002, the Oklahoma Legislature placed a moratorium on out-of-state water sales. The moratorium was replaced in 2009 by a requirement that the Oklahoma Legislature approve any out-of-state water sales. The Tarrant Regional Water District (TRWD) subsequently filed a lawsuit in Federal Court against the Oklahoma's Legislature's moratorium, but the U.S. Supreme Court eventually ruled in favor of Oklahoma (Region C Water Planning Group, 2015). Thus, while Oklahoma is still a possible source of water supply for Region C, it is best regarded as a potential future source.

The *2016 Region C Water Plan* retains water from Oklahoma as a recommended strategy for NTMWD (Region C Water Planning Group, 2015). However, due to the lingering uncertainty regarding the Oklahoma moratorium on export of water to Texas, this strategy would likely not be able deliver water in a timely manner to meet the NTMWD's purpose and need (it is estimated to not be available before 2060). Therefore, this alternative is considered unavailable at present.

Lake O' the Pines

Lake O' the Pines is an existing USACE reservoir in the Cypress River Basin, about 81 miles upstream of its confluence with the Red River in Louisiana and 120 miles from the Dallas Metroplex. The *2016 Region C Water Plan* lists it as an alternative strategy for NTMWD at 87,900 AFY. However, because of

the distance, the limited supply it would provide, and uncertainty concerning the need to reach agreements with existing water rights holders, this supply is highly uncertain and in essence, unavailable at the present time. Also, this alternative is incapable of providing NTMWD's needed 105,804 AFY of additional water supply by 2025.

2.5.3 Other Alternatives Available to the Applicant

Other potential alternatives to the LBCR project can be divided into development of new reservoirs and transporting water from existing reservoirs. The alternatives summarized in the following subsections were identified through the Texas water planning process, previous studies, and as part of the development of this EIS. See Appendix O for more detailed information and analysis.

Water Supplied from New (Undeveloped) Reservoirs

All of the potential alternatives to the Proposed Action reviewed in this section would entail discharges of dredged or fill material into waters of the United States. Thus, to some extent, each would replicate impacts associated with the LBCR on waters of the U.S. including wetlands, other natural habitats such as bottomland hardwood forests, and hydrology. In addition, a new Texas state water right would need to be obtained for any new dam, reservoir, and water diversion. Under Texas state law, a right to surface water is granted under a priority system, "first in time, first in right."

Also known as "prior appropriation," "first in time, first in right" is the legal doctrine that the first individual or entity to take a given amount of water from a water source for a "beneficial use" such as agriculture, industry, or municipal, has the right to continue to use that amount of water for that purpose. All subsequent users can utilize the remaining water of a source for their own beneficial uses, but if and only if they do not impinge on the established rights of previous users. This priority system is a factor in determining the magnitude of prospective yields available from any given project. It is why the yields of projects can vary depending on when or the order in which they are permitted.

Downsized LBCR without Blending of Lake Texoma Water

This alternative refers to the smaller dam and reservoir project located at the same site on Bois d'Arc Creek as Alternative 2 described above, but without supplemental water transported from Lake Texoma for blending with the downsized LBCR water at the North WTP. See the description of Alternative 2 in Section 2.3 above for more detailed information about the dam and reservoir. The firm yield of this downsized version of the LBCR would be approximately 86,100 AFY, or about 68 percent of the 120,665 AFY firm yield of the full-sized LBCR and 81 percent of the stated purpose and need of 105,804 AFY. This alternative does not meet the stated purpose and need of the Proposed Action – supplying at least 105,804 AFY of water by 2025 – and therefore, has been dismissed from further consideration.

Upper Bois d'Arc Creek Reservoir

Other potential dam site locations on Bois d'Arc Creek have been considered in previous studies. Most of these sites were studied as potential flood control measures to reduce flooding along Bois d'Arc Creek and in the City of Bonham. An Upper Bois d'Arc Creek (BDC) reservoir site was studied by the USACE in 1968, and subsequently reviewed again by the USACE in 2000 (USACE, 1968; USACE, 2000). The proposed Upper BDC Reservoir would be located about 3.5 miles south of the City of Bonham. The Upper BDC Alternative would yield only about 26 percent of the stated purpose and need; thus, it is insufficient to meet NTMWD's needs. Due to the need for detailed engineering and environmental studies, it is unlikely this alternative could be developed earlier than 2035. This alternative does not meet the stated purpose and need of the Proposed Action – supplying at least 105,804 AFY of water by 2025 – and therefore, has been dismissed from further consideration.

Marvin Nichols Reservoir Alternative

Located in Region D on the Sulphur River in Red River and Titus counties, the undeveloped Marvin Nichols Reservoir site is an alternative strategy included in the *2016 Region C Water Plan* for the NTMWD, TRWD, Upper Trinity Regional Water District (UTRWD), and the City of Irving.

Development of the Marvin Nichols Reservoir water supply would be influenced by decisions made concerning management of the existing Wright Patman Lake, also located on the Sulphur River downstream of the Marvin Nichols Reservoir site. The *2016 Region C Water Plan* recommends a combined strategy of developing Marvin Nichols Reservoir with the reallocation of flood storage to conservation storage in Wright Patman Lake, a combination known as the Sulphur Basin Supplies strategy. This combination strategy could allow the Marvin Nichols Reservoir to be developed with a smaller footprint.

Reallocation of flood storage at Wright Patman at the scale envisioned for the Sulphur Basin Supplies strategy would require recommendation by the USACE and approval by the U.S. Congress. Prior to making any such recommendation, the USACE would have to conduct a detailed evaluation of impacts associated with raising the conservation pool elevation at Wright Patman. Potentially significant impacts from such an action could include inundation of natural resources within the flood pool, compromised flood protection downstream, increased impacts to cultural resources inside the reservoir perimeter, effects on the Congressionally-established White Oak Creek Mitigation Area in the upper reaches of the Wright Patman flood pool, and reduced flexibility for International Paper's downstream effluent management operations. Wright Patman reallocation could also be constrained by dam safety issues.

The Marvin Nichols Reservoir would provide substantial amounts of new water supply to the North Texas region at a relatively low cost. However, due to its size, the development of this reservoir would likely entail much larger environmental impacts than the proposed LBCR. The area that would be inundated by Marvin Nichols Reservoir is more than four times the inundation area of the LBCR, and the impacts on natural habitats could be comparably greater. Initial estimates of impacted wetlands and bottomland hardwoods acreage for this alternative are considerably greater than the acreage impacted by the Proposed Action (TWDB, 2008).

Development of the Marvin Nichols Reservoir would also require multiple participants to effectively achieve the cost benefits and full utilization of the available supply. Consequently, the timing for this strategy is dependent upon the needs of the other participants. Furthermore, due to the permitting requirements and current opposition to this project, this project could not be permitted and developed by 2025.

This alternative does not meet the stated purpose and need of the Proposed Action and therefore, has been dismissed from further consideration. While it supplies more than enough water (NTMWD's allotted share among the partners would be 160,300 AFY), it is not expected to be implemented before 2070, well beyond the needed 2025 time frame.

Marvin Nichols Reservoir (Site 1A)

Marvin Nichols Reservoir Site 1A is a potential reservoir site located on the Sulphur River in Titus and Red River counties, in the same location as the Marvin Nichols Reservoir described above. If constructed, the raw water pipeline from this reservoir would be at least 84 miles from NTMWD's proposed North WTP.

This alternative consists of a smaller reservoir footprint. At a proposed conservation elevation of 313.5 feet MSL, the reservoir would store 744,300 acre-feet of water and impact 41,722 acres, less than two-thirds as much as the full-scale Marvin Nichols Reservoir. This strategy, in combination with reallocation

of Wright Patman Lake, is a recommended strategy (labelled “Sulphur Basin Strategy” or “Sulphur Basin Supplies”) in the *2016 Region C Water Plan* for NTMWD, TRWD, and UTRWD.

The Lake Ralph Hall site is located upstream of the project. Lake Ralph Hall has already received a state water right from the TCEQ and would have senior priority over Marvin Nichols Reservoir Site 1A. Lake Ralph Hall was included in the hydrologic model used to develop the yield of this project. With this and other assumptions taken into account, the firm yield of Marvin Nichols Site 1-A is estimated at 299,500 AFY, of which 239,600 AFY would be available to NTMWD. This supply would be delivered to NTMWD in two phases: the first phase would transport half of the yield (i.e., 120,000 AFY), while the second phase would carry the second half by means of a parallel pipeline.

This alternative as described above would be just for NTMWD. However, at the present time, the Marvin Nichols project is being considered by the sponsors of the Sulphur Basin Study, including NTMWD, TRWD, Dallas, Irving, Sulphur River Basin Authority (SRBA), and Upper Trinity Regional WD. If NTMWD were to pursue this project on its own, the other parties would have to develop other sources of water supply.

Based on recent experience, it is likely to take about 20 years to obtain the necessary permits, two years to design the reservoir project and three years to construct the project. If NTMWD had started pursuing the Marvin Nichols Reservoir in 2015, the expected online date would be 2040. This alternative does not meet the stated purpose and need of the Proposed Action, and therefore, has been dismissed from further consideration. While it supplies more than enough water, it cannot be implemented before 2040, and therefore does not fit within the 2025 time frame.

George Parkhouse Lake South (Parkhouse I) Alternative

The George Parkhouse Lake South alternative, also known as Parkhouse I, is a potential reservoir that would be located in Region D on the South Sulphur River in Hopkins and Delta counties, approximately 18 miles northeast of the city of Sulphur Springs. If constructed, it would be immediately downstream from Jim Chapman Lake. It is listed as an alternative strategy for NTMWD in the *2016 Region C Water Plan*, providing 108,480 AFY of water at a unit cost of \$2.10 per thousand gallons (Region C Water Planning Group, 2015). With a conservation pool elevation of 401 feet MSL, Parkhouse I would inundate approximately 29,000 acres and store 652,000 acre-feet. The reservoir would have a total drainage area of 654 square miles (TWDB, 2008). It is estimated that it could not be built before 2035.

The yield of Parkhouse I would be reduced substantially by the development of Marvin Nichols Reservoir (Region C Water Planning Group, 2015). Yield studies conducted for TWDB as part of the Reservoir Site Protection Study indicate the yield of this lake would be reduced by 60 percent, to 48,400 AFY, if constructed after Marvin Nichols (TWDB, 2008).

This alternative does not meet the stated purpose and need of the Applicant's Proposed Action, and therefore, has been dismissed from further consideration. While it does supply the needed amount of water (an estimated 108,480 AFY, compared to the specified 105,804 AFY), it cannot be implemented before 2035, and therefore does not fit within the 2025 time frame.

George Parkhouse Lake North (Parkhouse II) Alternative

The George Parkhouse Lake North alternative, also known as Parkhouse II, is a potential reservoir that would be located in Region D on the North Sulphur River in Lamar and Delta counties, about 15 miles south of Paris, TX. If constructed, it would provide 148,700 AFY of water with 118,960 AFY available for Region C, but its yield would be reduced substantially by development of Lake Ralph Hall or Marvin Nichols Reservoir. Its development would require both a water right permit and an interbasin transfer permit. Parkhouse II is not a recommended water management strategy for any Region C wholesale

water provider; however, like Parkhouse I, it is an alternative strategy for NTMWD and UTRWD (Region C Water Planning Group, 2015).

If constructed, Parkhouse II would be located approximately 50 miles from the proposed NTMWD North WTP. At a proposed conservation elevation of 410.0 feet MSL, the reservoir would store 330,871 acre-feet of water and inundate 14,387 acres. The firm yield of Parkhouse II (taking into account instream flow releases of 10 percent) is estimated at 111,780 AFY. Of this quantity, 89,400 AFY would be available to NTMWD. The remaining 20 percent of the yield would remain in the Sulphur Basin for local use.

This project, if built, would affect the yields of other projects being considered for development in the Sulphur Basin, including construction of the proposed Marvin Nichols Reservoir and the Wright Patman Lake reallocation. A sensitivity study of the reservoir yield found that the yield of Parkhouse II could range from 32,100 AFY (assuming both Lake Ralph Hall and Marvin Nichols Reservoir are constructed prior to Parkhouse II) to 117,400 AFY assuming only Lake Ralph Hall is constructed prior to Parkhouse II (TWDB, 2008). The reliability of this water supply source would be moderately high, but a drought worse than the drought of record could impact the reservoir yield.

This alternative does not meet the stated purpose and need of the Proposed Action, and therefore, has been dismissed from further consideration. It would not supply enough water to NTMWD, it cannot be implemented any sooner than 2035, and it therefore does not fit within the 2025 time frame.

Other New Reservoirs

Several other proposed reservoirs in the region were recommended or considered in the 2016 Region C Water Plan and 2017 Texas State Water Plan, but are not considered feasible for NTMWD because the water supply has already been committed to other users. These other proposed reservoirs included Lake Fastrill, Lake Columbia, Lake Tehuacana, and Lake Ralph Hall. Water from proposed Lake Fastrill was already committed to Dallas, but now it is no longer a viable option because in 2006 the Neches River National Wildlife Refuge was established at the proposed reservoir site, a decision upheld in federal court in 2010. Most of the water from proposed Lake Columbia is already committed to users in the Neches River Basin, and the remainder is insufficient for NTMWD's purpose and need. Proposed Lake Tehuacana is located adjacent to Richland- Chambers Reservoir, and would be used and operated by the TRWD. Lake Ralph Hall (for which a separate EIS is now under preparation by the Fort Worth District of the USACE) would be developed and used by the UTRWD (Region C Water Planning Group, 2015).

Transporting Water From Existing Reservoirs

This section examines the potential for augmenting NTMWD's water supplies by using or modifying existing impoundments rather than constructing entirely new impoundments. This may be accomplished in several ways: 1) building new pipelines or enlarging existing ones; 2) increasing the height of dams and thus the size, storage capacity, and firm yield of the reservoirs behind them; or 3) reallocating a portion of a reservoir's flood storage to water supply storage, which in effect, increases its capacity to store water for use in municipal or other purposes (e.g., irrigation, industry). However, this would decrease the flood control capacity of the reservoir.

Lake Lavon Alternative

Lake Lavon, owned and operated by the USACE, is located in the Trinity River Basin near the town of Wylie and near the headquarters and main WTP of the NTMWD. At present, Lake Lavon is permitted for 443,800 AF of storage for water supply and 118,680 AFY of diversions. At the current conservation pool elevation (492 feet MSL), there is approximately 275,600 AF of flood storage. If the water conservation pool elevation were to be raised by five feet to elevation 497 feet MSL, there would be an estimated 115,649 AF of additional storage available for water supply (Kiel, 2014).

To use this additional water, NTMWD would need to obtain a Texas water right. Using the Trinity River WAM, the additional amount of water that could be permitted for diversion from Lake Lavon with the increase conservation pool elevation of 492 feet MSL is estimated at 7,200 AFY, which does not represent a significant increase in water supply for NTMWD. Furthermore, under the Texas system of prior appropriation for surface water rights, nearly all of the water in the Trinity River Basin is: a) appropriated to existing water rights holders, or b) committed to environmental flows. A new water right accorded to NTMWD to divert additional water from Lake Lavon would be the most junior in priority. Thus, if a drought worse than the drought of record were to occur, this water right would be affected prior to more senior water rights.

Adding to the complexity of this alternative, because it is a USACE project, an Act of the U.S. Congress would be required to reallocate flood storage that exceeds 50,000 AF. Reallocating 115,649 AF of flood storage would necessitate such an action, and its approval is doubtful because Lake Lavon is located in a developed area next to Wylie. Conversion of some of the reservoir's flood storage to water supply would reduce the flood protection that Lake Lavon now provides for local residents, businesses, and facilities. Such a loss would need to be mitigated before an approval could be issued. Thus, it is doubtful that this project could be online in time to meet the 2025 deadline established in the purpose and need for the Proposed Action. The earliest year it might be available is 2030.

Reallocating flood storage to water supply in Lake Lavon is not a viable alternative to the Proposed Action. It would only provide about seven percent of the water needed and it cannot be implemented by 2025.

Lake Jim Chapman Alternative

Lake Jim Chapman (also known as Cooper Lake), owned and operated by the USACE for both water supply and flood control, is situated in the Sulphur River Basin in Hopkins County. It is a current water source for NTMWD, the City of Irving, UTRWD, and the Sulphur River Municipal Water District. At the present time, the reservoir is permitted for 273,000 AFY of water supply. At its current conservation storage, the permitted total diversion from Lake Jim Chapman is 146,520 AFY. Of this amount, NTMWD's water right is 54,000 AFY (Kiel, 2014).

The flood pool of Lake Jim Chapman is between elevations 440 and 446.2 feet elevation. This storage has a volume of 130,000 AF and a footprint of 4,905 acres. If the entire volume of the flood storage pool were reallocated to conservation storage (water supply), the additional amount of water that could be diverted from Lake Jim Chapman would be almost 25,000 AFY (24,950 AFY to be exact), about one-sixth the amount that can be withdrawn under existing Texas water rights, and about one-fifth of the expected average annual diversions from the proposed LBCR.

These yields do not account for environmental flows in the Sulphur River Basin, which have not yet been developed by the State of Texas. With environmental flows applied, the additional yield would be less. To tap into this potential water supply, NTMWD would need to apply for a Texas water right both for the additional storage and the additional diversion. As in the case of Lake Lavon above, this water right would be the most junior in priority, so that if a drought worse than the drought of record were to occur, this water right would be affected prior to senior water rights.

This alternative would provide less than 20 percent of the yield of the proposed LBCR and it cannot be implemented within the timeframe needed for the water. To receive Congressional approval, conduct the necessary studies, and obtain a Texas water right could take 10 to 15 years, or by about 2030, assuming Congressional approval is granted.

Reallocating flood storage to water supply in Lake Jim Chapman is not a viable alternative to the Proposed Action. It would supply less than one-quarter of the water needed and it cannot be implemented within the 2025 timeframe.

Reallocation of Storage at Other Reservoirs in the Region

Other reservoirs in the general vicinity of the NTMWD service area include Lakes Ray Hubbard, Ray Roberts, Lewisville, Tawakoni, and Fork. The City of Dallas owns and operates Lake Ray Hubbard, Lakes Ray Roberts and Lewisville are owned and operated by the USACE, and the Sabine River Authority (SRA) owns and operates Lakes Tawakoni and Fork. All five lakes are used by the City of Dallas for water supply (Kiel, 2014).

Three of these lakes – Hubbard, Tawakoni and Fork – are used exclusively for water supply and do not have dedicated flood storage. These lakes are surrounded by developed land. The homes and businesses surrounding these lakes would be inundated if the water conservation pool were to be raised. This would almost certainly generate intense public opposition to raising the conservation pool water level to increase water supply storage. The two lakes owned and operated by the USACE, Lakes Ray Roberts and Lewisville, have dedicated flood storage; however, both are located in urban environments where flood protection is an important consideration. Conversion of flood storage to water supply would reduce the flood protection that these lakes currently provide.

Based on the analyses for Lakes Lavon and Jim Chapman, the anticipated increase in yield associated with increased storage for water supply at these existing lakes in the region would be relatively small compared to NTMWD's needs. This is because, as a rule, existing reservoirs are for the most part optimally sized and fully permitted. Reallocation of these reservoirs individually or as a group does not constitute a viable alternative to the Proposed Action because they can neither provide the amount of water supply needed, nor within the time period required. Also, there would probably be strong opposition both at the local level and in Congress and there would likely be an unacceptable increase in the flood hazard from any reallocation of storage capacity at these lakes.

Lake Texoma Alternatives

As described in Chapter 1 of this EIS, Lake Texoma is a large USACE reservoir on the Red River bordering Texas and Oklahoma. NTMWD has a 1986 water right to divert 84,000 AFY of water from Lake Texoma, and to use 77,300 of this amount through the bed and banks of Lake Lavon (after an allowance of 6,700 AFY in channel losses moving the water from Lake Texoma to Lake Lavon, a distance of approximately 54 miles. Water from Lake Texoma is relatively high in naturally-occurring dissolved salts, (i.e. it is brackish). This means it must be either blended with a freshwater source or desalinated before it can be used for drinking water. Currently, the NTMWD blends Lake Texoma water with its other sources to make it suitable for municipal use.

As explained in Chapter 1, because zebra mussels are now present in Lake Texoma, NTMWD is no longer blending Texoma water in Lake Lavon as it used to. Instead, Texoma water is now piped directly to the NTMWD Wylie WTP, where it is blended at a ratio of 4:1 (fresh: brackish) with water from other sources. This ratio is based on the current water quality of NTMWD's existing fresh water sources, which include Lakes Lavon and Chapman and a considerable amount of reuse supplies. NTMWD is able to utilize approximately 77,000 AFY of Lake Texoma water for blending with its current existing freshwater sources. Any additional use of Lake Texoma water with blending would require the development of a new freshwater source.

Blending Lake Texoma Water with New Fresh Water Supplies

The elevated dissolved salts in Lake Texoma would have certain environmental impacts whether the water is used by blending or by desalination. The NTMWD's preferred use of this water source is to blend the Texoma water with a new fresh water supply because of the environmental concerns and costs

associated with large desalination projects. NTMWD anticipates blending Texoma water in a constructed balancing reservoir near a treatment facility and not in an existing lake or stream. This would reduce the potential impacts of adding high concentrations of dissolved solids to existing lakes or streams. It is assumed that NTMWD would use one part of Lake Texoma supply for every 1.7 to 3 parts of other fresh water, depending on the water quality of the source. NTMWD would deliver the water directly from Lake Texoma and/or from the Red River downstream of the lake. Downstream diversions offer the advantage of reduced levels of dissolved solids (Region C Water Planning Group, 2010).

Five potential alternative new sources of fresh water could be blended with Texoma water. These include the proposed LBCR (the Proposed Action), a smaller LBCR (Alternative 2 in this EIS, described in Section 2.3), George Parkhouse Lake North, Wright Patman, and Toledo Bend. Blending Lake Texoma water with water from Marvin Nichols Reservoir would be similar to Parkhouse North. The amount of water that can be blended is a function both of the water quality and available quantity of the fresh water source.

Table 2.5-1 lists the new freshwater sources, the blend ratios, and blended quantities of water that would be made available by each source. For this analysis, the TDS concentration for Texoma water is assumed to be 1,100 milligrams per liter (mg/L). This concentration is consistent with documented values of Lake Texoma water samples over the past eight years, as well as with previous reports. The blend ratios for each source were designed to achieve a maximum TDS level of 500 mg/L of the blended water (well within drinking water standards for public water supplies).

Table 2.5-1. Quantities of Water Supplied by Blending Lake Texoma Water with Selected New Freshwater Sources

Water Quality	New Freshwater Source				
	Full-sized LBCR	Downsized LBCR	George Parkhouse North	Wright Patman	Toledo Bend
TDS (mg/L)	300	300	300	150	200
Texoma TDS (mg/L)	1,100	1,100	1,100	1,100	1,100
Blend ratio	3	3	3	1.7	2
Supply (AFY)					
Freshwater source	120,000	86,100	89,400	105,360	130,000
Texoma	40,000	28,700	29,800	61,460	65,000
Total new supply	160,000	114,800	119,200	166,820	195,000

AFY = acre-feet per year; mg/L = milligrams per liter; TDS = total dissolved solids.

As shown in Table 2.5-1, blending new freshwater sources with existing Texoma supplies to which NTMWD already has a water right would increase the amount of water made available to NTMWD. The quantities range from 114,800 AFY for the smaller proposed LBCR up to 195,000 AFY for Toledo Bend. The smaller LBCR and George Parkhouse Lake North, both described above in this section, would provide less water to NTMWD even augmented by blending with Texoma water than the proposed full-sized LBCR would without any blending. Blending of Texoma water would be reliable because the NTMWD holds the water right to this source and Lake Texoma is large enough to be capable of supplying water reliably even during a severe drought.

The time to implement each blending alternative depends upon the availability of the freshwater supply (Table 2.5-2). The actual time to design and construct the blending infrastructure (pipeline(s) and balancing reservoir) would be under three years. The blending project would probably be initiated when

additional supplies are needed above the amount provided by the freshwater source alone. In each of these alternatives, the year of implementation is influenced primarily by the estimated time it would take to conduct the requisite studies and acquire the needed permits and authorizations.

Table 2.5-2. Supply Size and Year of Availability of Selected Lake Texoma Blending Alternatives

	New Freshwater Source				
	Full-sized LBCR	Downsized LBCR	George Parkhouse North	Wright Patman	Toledo Bend
Total supply with blending (AFY)	160,000	114,800	119,200	166,820	195,000
Year of implementation	2020	2025-26	2035	2040	2030

AFY = acre-feet per year; LBCR = Lower Bois d'Arc Creek Reservoir.

In summary, the feasibility of the Lake Texoma blending alternative is contingent upon the ability to obtain fresh water from a new source. For those alternatives that cannot be implemented in time to meet NTMWD's near and mid-term term needs, blending Texoma water does not meet the purpose and need of the Proposed Action. As seen in Table 2.5-3, only the proposed (full-sized) LBCR and the smaller proposed (downsized) LBCR analyzed in this Revised DEIS could be developed and implemented in time, because each of the other alternatives would need considerably more time for studies, permitting, and authorization.

Toledo Bend Reservoir Alternative

Toledo Bend Reservoir is a large artificial lake located on the Texas state border with Louisiana, approximately 200 miles from NTMWD's service area. The Toledo Bend Project was originally conceived, licensed (in 1963), and developed primarily as a water supply reservoir, with hydroelectricity and recreation as secondary purposes. By surface area, Toledo Bend Reservoir is the largest man-made water body in Texas and the South, as well as the fifth-largest in the entire U.S., with water normally covering 185,000 acres; the reservoir has a controlled storage capacity of 4,477,000 AF (SRA, no date-b).

The reservoir is owned and operated by the SRA of Texas and the SRA of Louisiana for water supply and hydropower generation. According to the Texas State Water Plan, this lake has available water. Use of this water by NTMWD would require a contract with the SRA and an interbasin water right transfer to move the water from the Sabine River Basin to the Trinity River Basin. Due to the scale of the Toledo Bend pipeline alternative and its current conceptual status, planning, development, and implementation of this alternative would take an estimated 15 to 20 years. Thus, the earliest water from Toledo Bend could be made available is after 2030.

The Toledo Bend project would result in lower impacts than the proposed LBCR on both terrestrial and aquatic habitats, including waters of the U.S. However, it would have significantly higher capital costs, entail greater long-term energy usage and associated CO₂ (greenhouse gas) emissions, and incur higher long-term operating costs. In any case, it is not a viable alternative to the Proposed Action, because although it would provide about the same amount of water, it cannot supply this water in time to meet the purpose and need, that is, by 2025.

Wright Patman Lake Alternatives

Wright Patman Lake is an existing reservoir in the Sulphur River Basin approximately 150 miles from the NTMWD, owned and operated by the USACE. As discussed above under the Marvin Nichols' alternatives, in the 2016 Region C Water Plan, Wright Patman Lake is considered under the heading of Sulphur Basin Supplies (Section 5B.3). Region C wholesale water providers interested in pursuing the development of these supplies include NTMWD, TRWD, City of Dallas, UTRWD, and City of Irving.

Along with the SRBA, these entities have created a Joint Committee on Program Development. Continuing Sulphur Basin feasibility studies are underway by the USACE, SRBA and the Joint Committee. These studies seek to address Region D concerns with respect to natural resources protection, environmental impacts, and the socioeconomic effects of water supply development within Region D and the Sulphur Basin. At present, Sulphur Basin Supplies are a recommended water management strategy for NTMWD, UTRWD, and TRWD (Region C Water Planning Group, 2015).

There are several different strategies by which water could be made available to NTMWD from Wright Patman Lake:

- Flood storage in Wright Patman Lake could be converted to conservation storage (raising the flood pool), and the NTMWD could use the increased yield.
- Water could be purchased from the City of Texarkana under its existing water right.
- Wright Patman Lake could be operated as a system with Jim Chapman Lake (aka Cooper Lake) upstream to further increase yield.

These strategies are summarized below.

Raise Flood Pool of Wright Patman Lake

Increasing the conservation storage in Wright Patman Lake to an elevation of 228.6 feet MSL and allowing for diversions to as low as an elevation of 215.3 feet MSL would increase the yield of the project to about 364,000 AFY; Region C Water Planning Group, 2015). In this analysis, it was assumed that 180,000 AFY of the additional supply developed could be made available to water suppliers in North Texas while the remainder of the supply would be reserved for local use. The studies found that increasing the elevation above 228.6 feet MSL would inundate portions of the White Oak Creek Mitigation Area, located upstream from Wright Patman Lake. Approximately 500 acres of the mitigation area are below an elevation of 230 feet MSL, and about 3,800 acres are below an elevation of 240 feet MSL. This strategy would require changes to the USACE operation of Wright Patman. Also, this strategy is recommended for the City of Dallas in the City's long-range water supply plan, the 2007 and 2012 Texas State Water Plans, and the *2011 Region C Water Plan*. Due to the available quantity of water from this source, it is unlikely that both NTMWD and Dallas would pursue this strategy.

The proposed Lake Ralph Hall would be located upstream of the Wright Patman Lake. Lake Ralph Hall has already received a state water right from the TCEQ and therefore, it would have senior priority over the reallocation of Wright Patman Lake. Wright Patman Lake water releases affect the operations of an International Paper (IP) paper mill at Queen City, TX, a large downstream user of water and a large employer in the area. The effect of reallocation of Wright Patman on IP operations is uncertain but is currently being investigated as part of the Sulphur Basin Feasibility Study. Greater releases from the reservoir may need to occur to mitigate the impact on IP, which could reduce the yield of this option. Twenty percent of the yield of the project was also assumed to be reserved for local use in the Sulphur Basin, an assumption based on an inter-local agreement. Reallocation of flood storage at Wright Patman to water supply would require congressional authorization.

Given the above assumptions, the firm yield of Wright Patman reallocation (taking into account instream flow releases) was estimated in 2015 at 131,700 AFY. Of this amount, 80 percent or 105,360 AFY would be available to NTMWD, with the remaining 20 percent of the yield staying in the Sulphur Basin for local use.

Feasibility studies have been conducted for the Wright Patman reallocation, but no detailed field studies; no permit applications have been submitted. Congressional authorization would be required to reallocate the flood storage at Wright Patman to water supply. The reallocation process requires substantial study

and coordination with the USACE. After this authorization is obtained, a state water right permit, a USACE Section 404 permit, and the appropriate NEPA assessment would all be needed prior to construction. The state and federal permitting process could take 10 to 15 years, depending upon the data developed during the reallocation authorization, permit applications, complexity of the project, and potential opposition to the project. It is expected to take 20 to 25 years to obtain the necessary authorizations and permits, two years to design the project and three years to construct it. If NTMWD were to pursue the Wright Patman reallocation starting in 2015, the expected online date would be in the 2040 to 2045 timeframe.

In conclusion, there is a good deal of uncertainty of reaching contractual agreements with existing water rights holders and there are potential conflicts with other regional wholesale water suppliers. The reallocation alternative would entail potentially substantial environmental impacts to the White Oak Mitigation Area and other forested wetlands from raising the flood pool. It would also involve higher operational costs than the Proposed Action. However, the principal reason that water supply from Wright Patman Lake is not considered a viable alternative to the Proposed Action is that it would not be able to provide the needed amount of 105,802 AFY of water by 2025.

Purchase Water from City of Texarkana

This alternative pertains to the potential availability of water for NTMWD from Wright Patman Lake under existing contracts and authorizations that define two operating policies for water supply from the reservoir. The City of Texarkana obtains most of its water from Wright Patman Lake, which serves both flood control and water supply functions. This reservoir can provide a very large amount of water; however, the amount available depends greatly on how the reservoir is operated. An interim federal contract with the City of Texarkana governs current water supply operation of the reservoir. Proposed operation of the reservoir is defined by a different contract which has never been implemented. Under the current operation regime – the Interim Curve – and assuming, 1) storage between 220 feet MSL and the Interim Curve and, 2) a constant 10 cfs release, the current firm yield of Wright Patman Lake is 40,263 AFY. If the 96 cfs release from May through October is used instead, the yield would be reduced by about 30,000 AFY, resulting in a firm yield of just 10,000 AFY. This yield would be insufficient to sustain even current use from the reservoir, much less meet current obligations for water supply from the City of Texarkana. Therefore, there is no water available for other interested parties from the City of Texarkana under current operations.

Under the proposed operation regime – the Ultimate Curve – a constant 10 cfs release from Wright Patman Lake would result in a firm yield of about 145,000 AFY. According to the *2015 Region D Plan*, 136,000 AFY of this water is reserved for the City of Texarkana or contracted to its customers, leaving only about 9,000 AFY uncommitted. This quantity is below 10 percent of the yield of the proposed LBCR and does not come close to meeting the need of the Proposed Action.

Thus, purchasing Wright Patman water from Texarkana is not a viable alternative to the Proposed Action. It would supply only about eight percent of the quantity stated in the purpose and need.

Operate Wright Patman Lake and Jim Chapman Lake as a System to Increase Combined Yield

System operation of Wright Patman Lake and Jim Chapman Lake could increase the joint yield from the two projects by about 108,000 AFY. The combination of purchasing water from Texarkana, converting flood storage to conservation storage, and system operation with Jim Chapman Lake could potentially make 390,000 AFY available from Wright Patman Lake. The *2012 State Water Plan* and the *2011 Region C Water Plan* and *2016 Region C Water Plan* assume that this strategy would be developed jointly with multiple water providers in North Texas. The amount of supply for the NTMWD would be 130,000 AFY. Other suppliers have not committed to participating with this strategy.

In addition to the inherent uncertainty associated with a multiplicity of possible participants, this option would have the same implementation and environmental concerns noted for the other Wright Patman alternatives – contractual changes between the USACE and Texarkana, willing sellers, impacts to the White Oak Mitigation Area, changes to USACE operations of the lake, and conflicts with other potential users.

Lake Livingston Alternative

Lake Livingston is an existing reservoir on the Trinity River in Region H. Most of the lake is located in Polk and San Jacinto Counties. The Trinity River Authority (TRA) and the City of Houston hold the water rights for this reservoir. The TRA has indicated that as much as 200,000 AFY of water from Lake Livingston might be available to water suppliers in Region C (Region C Water Planning Group, 2010). However, according to the 2007 and 2012 State Water Plans, much of this available supply is expected to be used to meet projected needs in the greater Houston area and would not be available for NTMWD. Furthermore, the *2011 Region C Water Plan* indicates that water from Lake Livingston is not a recommended strategy for any Region C supplier. The *2016 Region C Plan* does not list it as either a recommended or alternative strategy for NTMWD (Region C Water Planning Group, 2015).

Lake Livingston is located about 180 miles from the North Texas service area. Because it is an existing supply from an existing reservoir, the on-site environmental impacts of utilizing this water management strategy would be non-existent to low (Region C Water Planning Group, 2010). However, due to the distance to NTMWD, and the need to build and operate a lengthy raw water pipeline, this alternative would cost more than twice as much as the proposed LBCR (Region C Water Planning Group, 2010). It would also entail greater energy use (for pumping) and greenhouse gas emissions.

Overall, this alternative is not viable because of the much greater distance, unit cost, greenhouse gas emissions, and uncertain future availability. Therefore, it cannot meet the purpose and need of the Proposed Action.

Sam Rayburn Reservoir/Lake B.A. Steinhagen Alternative

Sam Rayburn Reservoir is an existing USACE reservoir on the Angelina River in the Neches River Basin. Lake B.A. Steinhagen is located on the Neches River downstream from Sam Rayburn Reservoir. During the development of the *2007 Texas State Water Plan*, the Lower Neches Valley Authority, which holds Texas water rights in both reservoirs, indicated that as much as 200,000 AFY from these reservoirs might be available to water suppliers in North Texas. The Lower Neches Valley Authority wants the water to be diverted from Lake B.A. Steinhagen, which is about 200 miles from the North Texas region, in order to preserve hydropower generation from Sam Rayburn Reservoir. These reservoirs are more than 150 miles from the NTMWD service area. Because of the long distance, they would be relatively expensive sources of water supply for NTMWD. There also has been recent interest in supplies from Sam Rayburn Reservoir/Lake B.A. Steinhagen from other users.

This strategy was considered in the *2007 Texas State Water Plan* but was not listed in the *2011 Region C Water Plan* or the *2016 Region C Water Plan* due to excessive cost and unavailability for water suppliers in Region C. As with the other alternatives involving the need to construct and operate long water pipelines with attendant pumping stations, this strategy would entail greater greenhouse gas emissions than the Proposed Action.

Other Existing Lakes

Other existing lakes in the vicinity of NTMWD service area include Lake Grapevine, Cedar Creek Reservoir, Richland-Chambers Reservoir and Lake Palestine. However, each of these sources is fully committed to its existing customers. Lake Grapevine and Lake Palestine are water supply sources for the City of Dallas, and these sources are needed to meet the demands of Dallas, its customers, and other holders of water rights in the lakes. Cedar Creek and Richland-Chambers reservoirs are owned and

operated by the TRWD. These water sources are fully committed to meeting the water demands of the TRWD. Therefore, none of these existing lakes is able to meet the purpose and need of the Proposed Action.

2.5.4 Comparison of Alternatives

Figures 2.5-1 and 2.5-2 compare the main alternatives discussed above with Alternatives 1 and 2 according to quantity of water provided and cost.

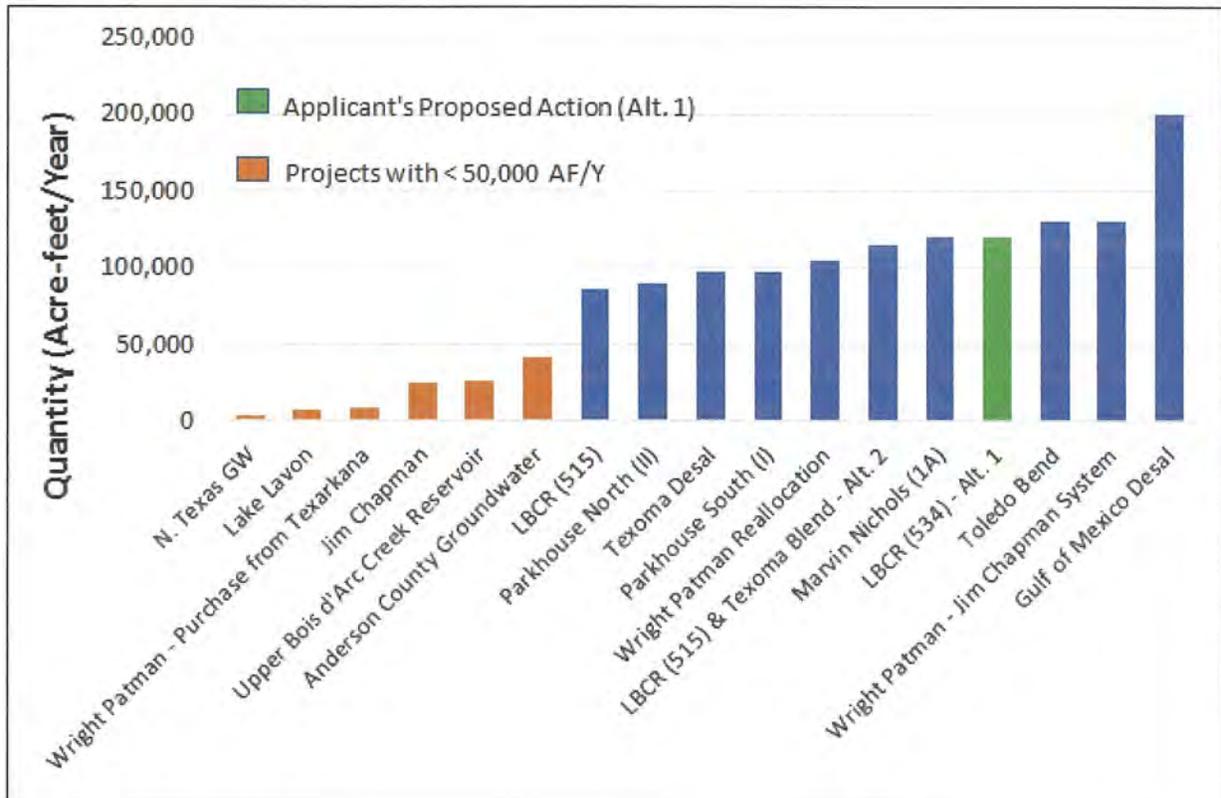


Figure 2.5-1. Quantity of Water Supplied by Selected Alternatives Considered in Chapter 2

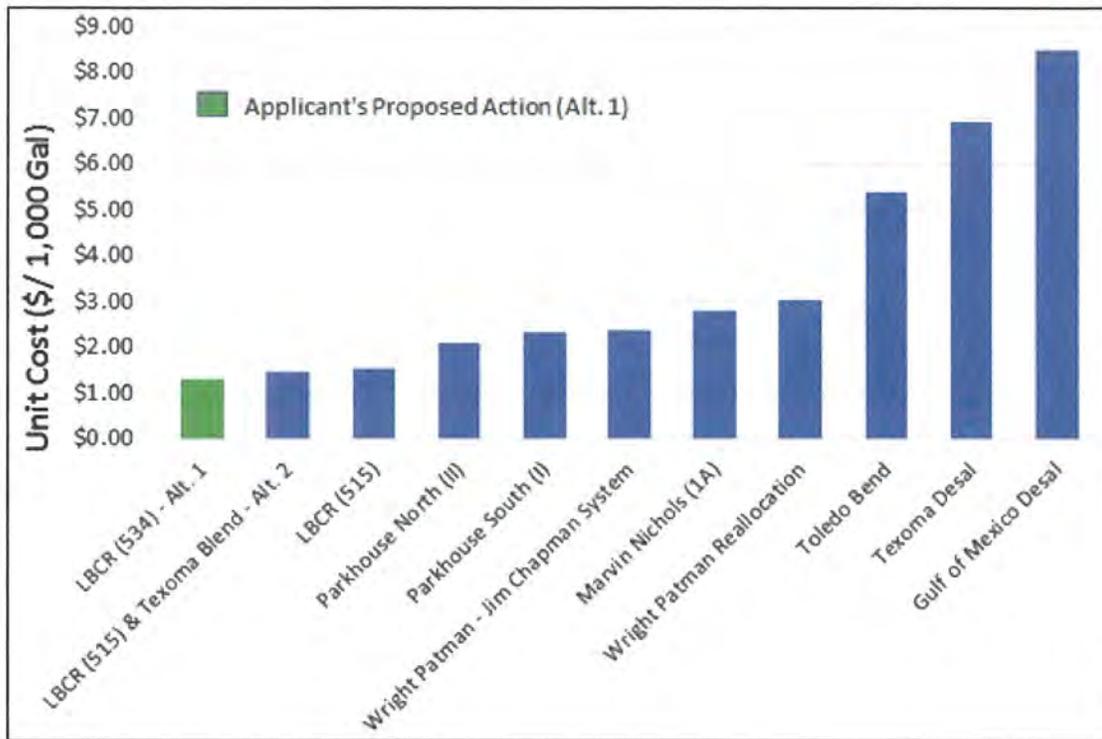


Figure 2.5-2. Unit Cost Comparison of Selected Alternatives Considered in Chapter 2

2.5.5 Meeting the Purpose and Need

Table 2.5-3 evaluates each alternative discussed above on the basis of whether it is capable of meeting the fundamental purpose and need of the Proposed Action: supplying at least 105,804 AFY of water to NTMWD by 2025. Those alternatives that meet both the quantity and timing criteria of the purpose and need are assessed in more detail in Chapter 3 (Affected Environment) and Chapter 4 (Environmental Consequences) of this Revised DEIS. Those alternatives that do not meet both the quantity and timing of the purpose and need are not considered reasonable or viable at this time and are thus dismissed from more detailed consideration in this Revised DEIS. Appendix O contains more detailed information from which this table was derived.

Table 2.5-3. Ability of Alternatives Considered to Meet the Purpose and Need

Alternative	Purpose and Need				Assess in More Detail or Dismiss from Detailed Consideration
	Quantity of Water Available (AFY)	At Least 105,804 AFY?	Year Available	Available by at Least 2025?	
Alternative 1 – Applicant’s Proposed Action (Applicant’s Preferred Alternative)					
Full-scale LBCR	120,665	Yes	2020	Yes	Assess in more detail
Alternative 2 – Downsized LBCR with Lake Texoma Blending					
Downsized LBCR with Lake Texoma Blending	114,800	Yes	2026	No ^a	Assess in more detail ^a



Alternative	Purpose and Need				Assess in More Detail or Dismiss from Detailed Consideration
	Quantity of Water Available (AFY)	At Least 105,804 AFY?	Year Available	Available by at Least 2025?	
Alternatives that Do Not Require a Section 404 Permit					
<i>New Groundwater Supplies</i>					
Ogallala Aquifer groundwater in Roberts County	0	N/A	N/A	No	Dismiss
Carrizo-Wilcox Aquifer Groundwater in Brazos County	uncertain	No	unknown	No	Dismiss
Carrizo-Wilcox Aquifer in Freestone and Anderson Counties	Up to 42,000	No	N/A	N/A	Dismiss
Other Groundwater Supplies in Region C and Nearby Counties	uncertain	No	N/A	N/A	Dismiss
Desalination					
Desalinate Lake Texoma Brackish Water	97,000	No	2030	No	Dismiss
Desalinate Gulf of Mexico Seawater	Unlimited	Yes	N/A	No	Dismiss
Alternatives Unavailable to the Applicant					
Importing Water from Oklahoma	50,000	No	2060?	No	Dismiss
Lake O' the Pines	87,900	No	unknown	No	Dismiss
Other Alternatives Available to the Applicant					
<i>Water Supplied from New (Undeveloped) Reservoirs</i>					
Downsized LBCR without Blending of Lake Texoma Water	86,100	No	2025	Yes	Dismiss
Upper Bois d'Arc Creek Reservoir	26,900	No	2035	No	Dismiss
Marvin Nichols Reservoir	160,300	Yes	2070	No	Dismiss
Marvin Nichols Reservoir (Site 1A)	239,600	Yes	2040	No	Dismiss
George Parkhouse Lake South (Parkhouse I)	108,480	Yes	2035	No	Dismiss
George Parkhouse Lake North (Parkhouse II)	89,400	No	2035	No	Dismiss
George Parkhouse North Lake with Lake Texoma Blending	119,200	Yes	2035	No	Dismiss
Lake Frastrill	0	No	N/A	No	Dismiss

Alternative	Purpose and Need				Assess in More Detail or Dismiss from Detailed Consideration
	Quantity of Water Available (AFY)	At Least 105,804 AFY?	Year Available	Available by at Least 2025?	
Lake Columbia	unknown	No	unknown	No	Dismiss
Lake Ralph Hall	0	No	N/A	No	Dismiss
Lake Tehuacana	0	No	N/A	No	Dismiss
Transporting Water from Existing Reservoirs					
Lake Lavon Reallocation	7,200	No	2030	No	Dismiss
Lake Jim Chapman Reallocation	24,950	No	2030	No	Dismiss
Lake Ray Hubbard Reallocation	N/A	No	N/A	No	Dismiss
Lake Ray Roberts Reallocation	N/A	No	N/A	No	Dismiss
Lake Lewisville Reallocation	N/A	No	N/A	No	Dismiss
Lake Tawakoni Reallocation	N/A	No	N/A	No	Dismiss
Lake Fork Reallocation	N/A	No	N/A	No	Dismiss
Lake Texoma Without Blending	0	No	N/A	No	Dismiss
Toledo Bend Reservoir	130,000	Yes	2030	No	Dismiss
Toledo Bend Reservoir with Lake Texoma Blending	195,000	Yes	2030	No	Dismiss
Wright Patman Lake: Raise Flood Pool	105,360	No	2040	No	Dismiss
Wright Patman Lake: Raise Flood Pool with Lake Texoma Blending	166,820	Yes	2040	No	Dismiss
Wright Patman Lake - System Operation with Lake Jim Chapman	130,000	Yes	2040	No	Dismiss
Purchase Water from Texarkana	9,000	No	unknown	No	Dismiss
Lake Livingston	Up to 200,000	Yes	unknown	No	Dismiss
Sam Rayburn Reservoir/ Lake B.A. Steinhagen	200,000?	Yes	unknown	No	Dismiss
Lake Grapevine	0	No	N/A	No	Dismiss
Cedar Creek Reservoir	0	No	N/A	No	Dismiss
Richland-Chambers Reservoir	0	No	N/A	No	Dismiss
Lake Palestine	0	No	N/A	No	Dismiss

AFY = acre-feet per year; LBCR = Lower Bois d'Arc Creek Reservoir; N/A = not available.

^a Although Alternative 2 (downsized LBCR with Lake Texoma blending) may miss the 2025 purpose and need criterion by one year, this is close enough that it will be considered in more detail in this EIS.

2.5.6 Alternatives to be Considered in More Detail in this EIS

In Table 2.5-3, only two of the alternatives listed meet the purpose and need stated in Chapter 1: supplying a minimum of 105,804 AFY of water to NTMWD by the year 2025. These are the Proposed Action (the LBCR project) and a downsized version of the LBCR in combination with blended water from Lake Texoma. In the USACE's judgment, none of the other alternatives is reasonable or viable at this juncture.

Three alternatives will therefore be examined in more detail in the following chapters: the No Action Alternative, Alternative 1 – the Applicant's Proposed Action (LBCR), and Alternative 2 – a downsized version of the LBCR in combination with Lake Texoma blending.

Chapter 3 of this Environmental Impact Statement addresses the affected environment of the Proposed Action (Alternative 1), Alternative 2, and the No Action Alternative. Chapter 4 of this EIS covers the potential environmental consequences of these three alternatives. Chapter 5 reviews cumulative impacts, those which could occur due to the incremental impact of the action alternatives in combination with other past, present, and reasonably foreseeable future actions and trends.

3.0 AFFECTED ENVIRONMENT

This chapter of the Revised DEIS describes the environment that would be affected by Alternatives 1 and 2. Resources that may be affected by the alternatives include land use; topography, geology, and soils; water resources; biological resources (including wetlands, aquatic biota, wildlife, and habitats); air quality; the acoustic environment; recreation; visual resources; utilities; transportation; socioeconomics; environmental justice; and cultural resources. The affected environment is described by resource below.

The geographic area of the affected environment for this analysis extends from the reservoir site to encompass Fannin County and the surrounding five counties (see Figure 3-1). However, most of the resources potentially affected by Alternatives 1 and 2 are located within the boundaries of Fannin County because most of the project components for Alternatives 1 and 2 will be located in Fannin County; the dam and reservoir; the raw water pipeline and road rights-of-way; and the footprint of the water treatment plant (WTP). This analysis assumes that there are no major differences between the affected environments for Alternatives 1 and 2, because they include the same major components: dam, reservoir, road and bridge replacement, raw water pipeline(s), and water treatment plant (WTP).

The information provided in this chapter includes summary descriptions of studies that were conducted to describe the affected environment. These studies were carried out as part of the USACE permit application process. They include:

- Habitat Evaluation Procedure (HEP) – HEP was developed by the USFWS in 1974 to provide a habitat-based evaluation methodology for use as an analytical tool in impact assessments and project planning (USGS, 2010). It is a species-habitat analysis of the ecological value of a study area. For the proposed LBCR project, HEP was conducted at the proposed reservoir site footprint to measure the magnitude of impacts and at the proposed Riverby Ranch mitigation site to characterize its existing conditions and evaluate the potential for habitat creation, restoration, and overall “ecological uplift.” The HEP report for the proposed LBCR site (Freese and Nichols, 2008e) is included as Appendix J to this Revised DEIS.
- Hydrogeomorphic Approach (HGM) – Developed as a tool to be used with the Section 404 Regulatory Program (Williams et al., 2010), the HGM approach is applied to wetland sites to derive functional indices as well as the protocols to apply these indices to the assessment of wetland functions. HGM can be applied to analyze project alternatives, minimize impacts, assess unavoidable impacts, determine mitigation requirements, and monitor the success of compensatory mitigation. The HGM process and report for this Revised DEIS were developed in direct response to comments from EPA on the 2015 DEIS. The HGM report (Camp et al., 2016) is included in this Revised DEIS as Appendix K.
- Rapid Geomorphic Assessment (RGA) – RGA is a tool for making preliminary evaluations of channel stability and sensitivity to an alteration in the sediment-flow regime. RGA was used to quantitatively characterize the existing conditions in Bois d’Arc Creek and its tributaries within the proposed reservoir footprint. The initial RGA report was revalidated and expanded as a result of comments on the 2015 DEIS and recommendations of cooperating agencies. These two RGAs (Freese and Nichols, 2008d; Coffman and Cardenas, 2016) conducted at the proposed reservoir site are included in this Revised DEIS as Appendix L.

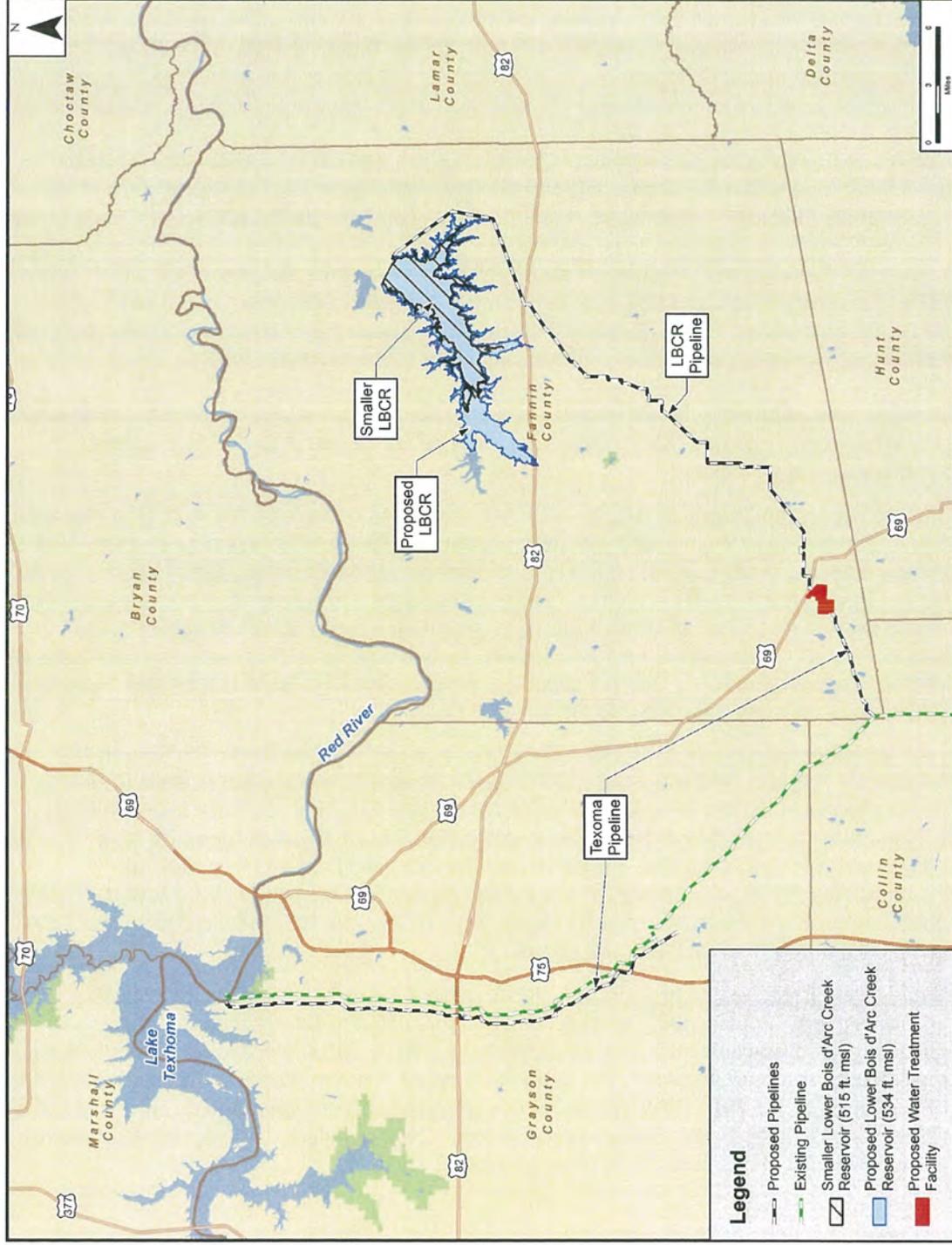


Figure 3-1. Geographic Area of the Affected Environment for Alternatives 1 and 2

- **Instream Flow Study** – An Instream Flow Study was conducted on Bois d'Arc Creek for this project. The primary purpose of the Instream Flow Study was to characterize baseline stream conditions within the footprint of the proposed reservoir site and downstream of the proposed reservoir. The Instream Flow study also predicted conditions in the reservoir pool and developed a proposed instream flow regime to safeguard a sound ecological environment downstream of the dam. The instream flow regime considers the four technical components described in the TWDB's *Texas Instream Flow Studies: Technical Overview*: fluvial geomorphology, hydrology and hydraulics, water quality and biology. The Instream Flow Study (Freese and Nichols, 2010a) is attached to this Revised DEIS as Appendix M.
- **Economic Studies** – Dr. Terry Clower, director of the Center for Economic Development and Research at the University of North Texas, conducted a study and two updates on the economic, fiscal, and development effects of the Proposed Action (Clower and Weinstein, 2004; Clower and Weinstein, 2007; Clower, 2012). These are included in this Revised DEIS in Appendix G.
- **Cultural Resources Studies** – An ongoing series of archeological and cultural resources surveys and studies have been conducted by AR Consultants, Inc. (e.g., see references AR Consultants, 2013; AR Consultants, 2014) under the direction of the four parties to the LBCR Programmatic Agreement: NTMWD, USACE, THC (the SHPO in Texas), and the Caddo Nation of Oklahoma. Surveys have been carried out at the proposed reservoir site, primary mitigation site (Riverby Ranch), FM 1396 relocation alignment, and raw water pipeline route. These studies and surveys are not included as appendices to this Revised DEIS because of the sensitivity of the information and data they contain.

3.1 LAND USE

The proposed reservoir of Alternatives 1 and 2 would be built in Fannin County, Texas. Fannin County is a rural county in north Texas near the Texas-Oklahoma border. The total land area of Fannin County is approximately 570,597 acres (892 square miles). Fannin County is sparsely populated with most residents spread out among the various agricultural lands that surround the City of Bonham, which is the county seat. The county's land use is predominantly hay and pasture land. Row crops are found more in the eastern half of the county. Other land uses include forest land, residential, light industrial and commercial (TCOG, no date).

3.1.1 Historical Land Use

According to the 1946 Soil Survey of Fannin County, historical land uses have been primarily cropland and pastureland. In 1939, harvested cropland represented almost half of the area of the county; cotton and corn were two of the dominant crops. Most of the remaining land within the county was used for pasture. During this time, practically all of the highly productive land was cultivated, except for the lower floodplain of Bois d'Arc Creek. Although these areas could not be cultivated, a considerable amount of rough lumber was cut, especially bois d'arc wood (Osage orange) (NRCS, 2001).

3.1.2 Current Land Use

Based on the 2001 National Land Cover Dataset, there are 570,597 acres of land in Fannin County. Seventy-one percent of the land is agricultural, making this the predominant land use in the county at present. Forest cover accounts for 21 percent of the land in the county. Other types of land use in the county are developed land (6 percent), open water (1.27 percent), wetlands (0.42 percent), barren land (0.15 percent), and shrub/scrub (0.06 percent). Figure 3.1-1 shows land use and land cover in Fannin County.

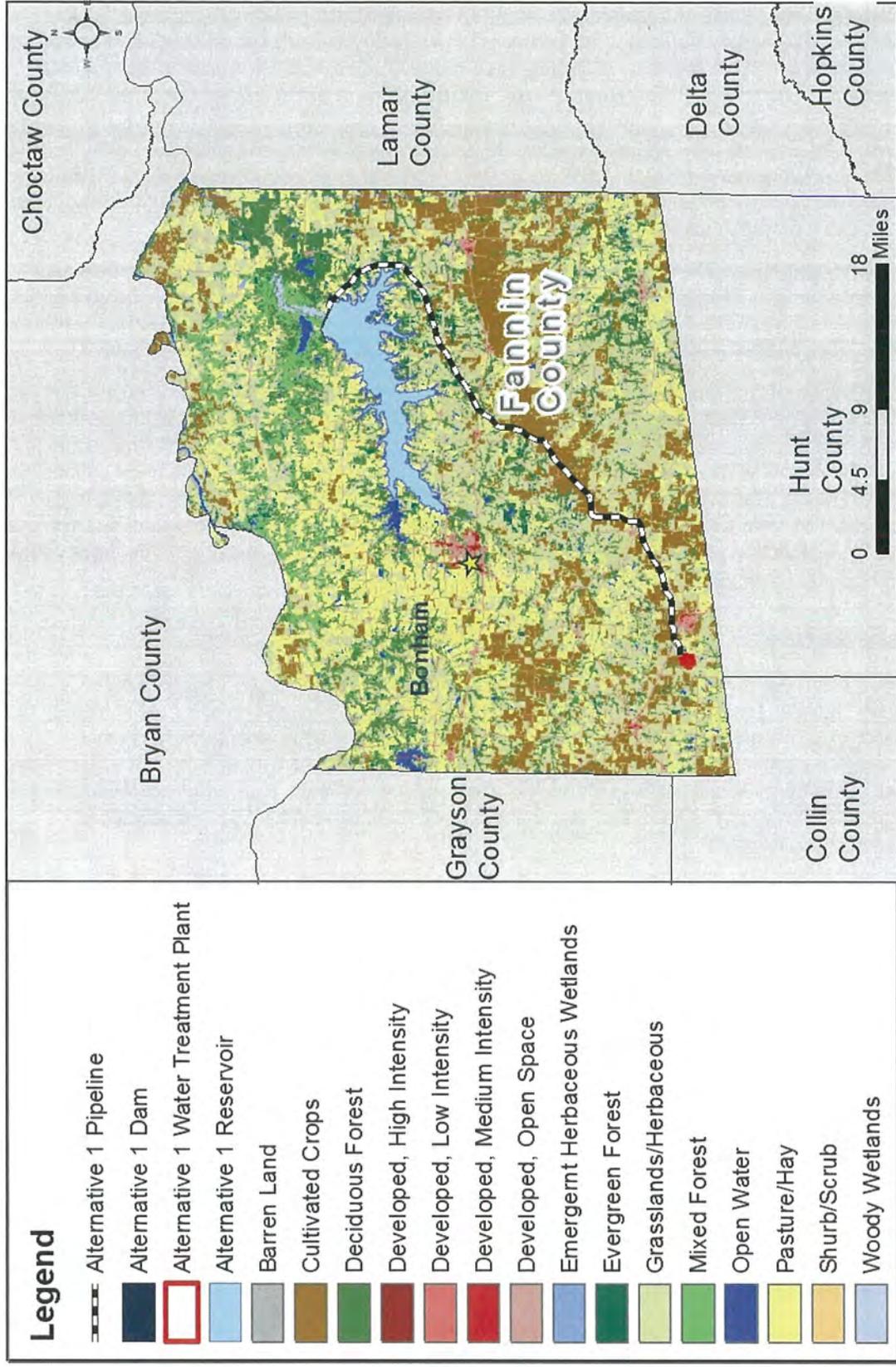


Figure 3.1-1. Land Use and Land Cover Map of Fannin County

The reservoir, dam, and spillway described in Alternatives 1 and 2 would be located on bottomland and adjacent upland habitat along Bois d'Arc Creek and on upland areas within Fannin County. The land affected by the proposed alternatives is predominantly undeveloped and includes agricultural land with grassland or old field succession. Most of the remaining land is undeveloped, consisting of natural or previously disturbed vegetative cover types. A very small portion of the affected land is in transportation, utility corridor, and scattered single family residential use. Land use of the adjoining properties does not differ substantially from that found within the boundaries of the proposed alternatives, with most of the area being agricultural or undeveloped land. Since the adjoining areas are not within the floodplains of Bois d'Arc Creek and contain a smaller component of wetlands, a higher portion of the adjoining area is in agricultural land use instead of undeveloped land and a greater proportion of the undeveloped lands have been cleared.

The Caddo National Grasslands is a federally-designated Wildlife Management Area (WMA) within Fannin County. The jurisdictional boundaries of the Grasslands cover 17,785 acres and contain three lakes. The Caddo National Grassland is comprised of two units, the Bois d'Arc Unit and the Ladonia Unit. The Bois d'Arc Unit is located just north of the proposed reservoir site and the Ladonia Unit is located Northeast of the site. Public recreational facilities are not present within the proposed LBCR area (USFS, 2008).

3.1.3 Agricultural Land

Agricultural land is land that is suitable for agricultural production, both crops and livestock. Agricultural land can be divided into the following components, all of which can be found in Fannin County:

- Arable land – land under annual crops, such as corn, cotton, and technical crops, potatoes, vegetables, and melons. It also includes land left temporarily fallow.
- Orchards and vineyards - land under permanent crops.
- Meadows and pastures – areas for natural grasses and grazing of livestock.

The first two components, arable land and orchards and vineyards, are cultivable lands. The croplands in the project area are primarily planted with oats (*Avena sativa*), soybeans, and hay crops, which are often alternated with winter wheat (*Triticum aestivum*) cover. Trees and shrubs are excluded from these areas, but are often present in adjacent fencerows. The agricultural land cover type makes up about 1,757 acres of the larger reservoir site.

In the 2000s, the area in and surrounding the identified alternatives has lost agricultural land to industrial and urban uses. From 1997 to 2012, Texas had a net conversion of 1.1 million acres of working lands to non-agricultural uses, which is correlated with population growth (Texas Land Trends, 2014). Working lands including privately owned farms, ranches, and forests that produce food and fiber, support rural economies, and provide environmental and recreational benefits (Texas Land Trends, 2014). Texas is currently leading the nation in the loss of total acres of working lands (Texas Land Trends, 2014).

3.1.4 Rural Residential

Most housing in Fannin County consists of single family residences. Scattered single family residential land use occurs within the affected areas for Alternatives 1 and 2. Approximately 20 single family homes fall within the footprint of Alternatives 1 and 2.

3.2 TOPOGRAPHY, GEOLOGY, AND SOILS

This section describes the topography, geology, and soils of the affected environment for Alternatives 1 and 2. These resources are discussed in relation to construction of the proposed dam and reservoir.

3.2.1 Topography and Geology

Most of the project components of Alternatives 1 and 2 as well as their connected actions will be in Fannin and Grayson County, Texas. These counties are considered part of the Gulf Coastal Plain physiographic province (USGS, 2003). This region is characterized by elevation levels varying from 478 feet MSL near the confluence of Bois d'Arc Creek and the Red River to 767 feet MSL in southwestern Fannin County (NRCS, 2001). A further subdivision of the Gulf Coastal Plain places the site of the proposed alternatives in the Blackland Prairies subprovince. Specifically, the Blackland Prairies have a maximum elevation of 1000 feet and a minimum elevation of 450 feet MSL. Most of the terrain features low, gently rolling hills growing progressively flatter moving from west to east. Figure 3.2-1 shows a physiographic map of Texas with the location of the proposed alternatives added.

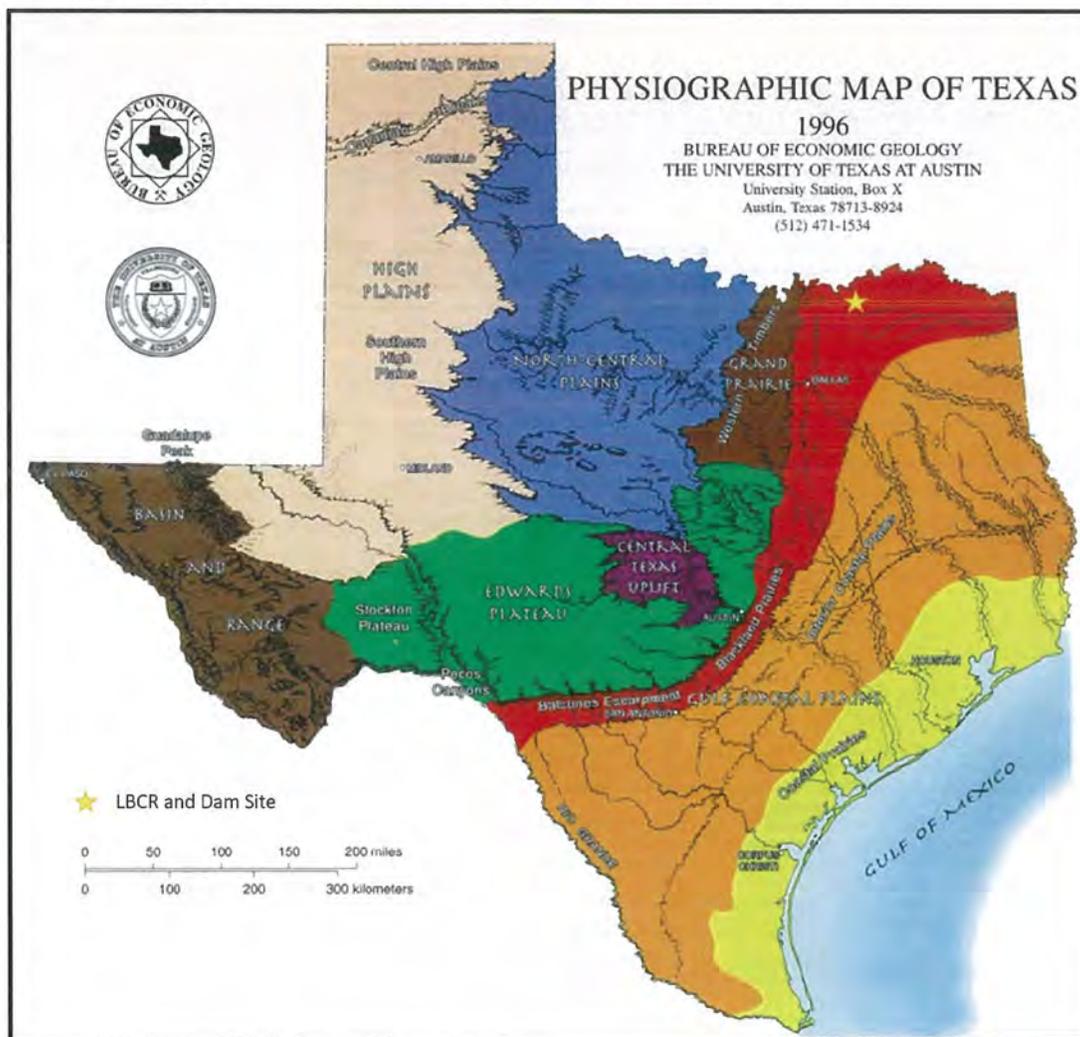


Figure 3.2-1. Physiographic Map of Texas

Note: The proposed LBCR and dam site was added on to the original map.

Over geologic time, and like other streams in the region, Bois d'Arc Creek and its tributaries have created a broad, gently-sloping valley rimmed by low hills. Maximum relief across the proposed dam site is approximately 86 feet and the elevation of the valley floor at the proposed dam site is approximately 476 feet MSL. The confluence of tributary Honey Grove Creek, entering from the southeast, with Bois d'Arc Creek is approximately 1,800 feet downstream from the proposed centerline of the dam. A broad, nearly flat floodplain separates the two creeks near the proposed dam's centerline. The proposed project area is in the Red River Basin.

Table 3.2-1 lists the geologic units at the proposed reservoir site. Cretaceous outcroppings are evident throughout Fannin County and dip south and southeast (Henderson et. al, 1973). Much of the subsurface geology is made up of fluvial, or river-sourced, deposits from both present and past streams. The first three feet of subsurface geology are deposits from floodplains and streams from relatively recent geologic history. Following the most recent deposits are much older deposits of the same nature, also floodplain and stream in origin. These can extend to a depth of 30 feet before reaching the Ozan or Bonham formation, which is Upper Cretaceous in age. This formation continues to a depth of about 425 feet and is comprised mainly of muds and clays that are alternately bedded (USGS, 2011d). Excavation for the proposed dam and reservoir would not exceed the depth of the Ozan formation listed on Table 3-2.

Table 3.2-1. Geologic Units at the Proposed Lower Bois d'Arc Creek Reservoir Site

Age	Unit	Thickness (feet)	Description
Recent	Alluvium	3+/-	Floodplain and stream deposits
Pleistocene	Fluviatile terrace deposits	30	Terrace deposits generally sands and gravel
Upper Cretaceous	Ozan Formation	425+/-	Poorly bedded calcareous clay, weathers light brownish gray
	Austin Group, Roxton Limestone	10	Sandy, red limestone
	Austin Group, Gober Chalk	400+/-	Argillaceous Chalk weathers white
	Austin Group, Brownstone Marl	30	Massive calcareous clay, weathers light gray to yellowish gray
	Austin Group, Blossom Sand	20	Quartz sand, weathers brown and red
	Austin Group, Bonham Marl	400+/-	Marl and Clay, weathers light gray to yellowish gray
	Austin Group, Ector Chalk	35	Chalk, weathers white
	Eagle Ford Formation	300-400	Medium to dark gray shale
	Woodbine Formation, Templeton Member	70-80	Gray shale
	Woodbine Formation, Lewisville Member	75-95	Glauconitic sandstone, gray to brown, and yellowish brown
Woodbine Formation, Red Branch Member	25-80	Sandstone, shale, and lignite, gray, brown, yellowish brown and grayish black	

Source: adapted from Henderson, et al., 1973

In support of their application to the TCEQ for a Texas Water Right, NTMWD conducted preliminary subsurface investigations in 2006 and 2008 at the proposed Lower Bois d'Arc Creek reservoir site. The subsurface investigations consisted of six borings to depths of approximately 50 to 70 feet along the proposed dam alignment as shown in Figure 3.2-2. Samples of rock and soils obtained in the field investigations were subjected to laboratory tests to classify the materials and evaluate pertinent engineering properties. Classification and index property tests included water content, dry unit weight, sieve tests, and liquid and plastic limits. In addition, unconfined compression tests were conducted to evaluate the strength of the bedrock.

Figure 3.2-3 presents a map showing the surficial geology of the proposed dam site (UTX, 1996). According to the Texarkana Sheet of the *Geological Atlas of Texas*, the right abutment of the proposed dam is underlain by Pleistocene-age Qt (Quaternary) 1 and Qt 4 Fluvial terrace deposits. Qt1 deposits are mostly sand and silt, with some clay. They are moderately well bedded, and mostly red to tan in color. The Qt1 deposits are surface scoured with a maximum thickness of 30 feet, and a top surface of about 17 feet above the floodplain. Qt 4 Fluvial terrace deposits consist of gravel, sand, and silt. They are characterized by basal gravel grades upward to sand and silt, and are tan and gray in color. They are surface smooth on large outcrops, generally dissected with exposed bedrock at the edges, and locally sheet-washed at the head of gullies. The maximum thickness of the Qt4 deposits is 30 feet, with the top surface about 11 feet above the floodplain.

The Fluvial terrace deposits at the proposed dam and reservoir site are underlain by the Bonham Formation (listed as the Ozan Formation in Table 3.2-2) of Upper Cretaceous Age. The Bonham Formation is composed of marl and clay, and grows progressively sandier towards the east. Glauconite (a green, iron potassium silicate) is abundant locally. The Bonham Formation is waxy, greenish gray and weathers yellowish gray and has a clay bed near the middle, is calcareous, and abundantly glauconitic. Marine megafossils (large fossils) are common in the Bonham Formation, which has a thickness that ranges from 375 to 530 feet.

Borings associated with the preliminary subsurface investigations indicated that the proposed left abutment of the dam consists of 50 to 60 feet of very stiff to hard plastic clays underlain by about 10 feet of sand and clayey sands. Beneath the sands lies unweathered shale of low permeability. The lower slope of the left abutment has about 15 feet of lean sandy clay underlain by about 10 feet of clayey or silty sands. Shale is found beneath these sands, with a thin weathered zone, approximately one foot thick, atop the shale.

Based on the preliminary 2006 geotechnical survey at the site, it appeared that medium plastic clays to highly plastic clays for the dam core might be available in sufficient quantities from the proposed reservoir areas within the floodplain and at the left abutment. An additional 2008 boring in the floodplain (Boring D-5 on Figure 3.2-2) confirmed the presence of approximately 24 feet of medium to highly plastic clays. Based on this and two other borings in each abutment, it appears there are sufficient quantities of clay for the proposed dam core and outer zones of the dam from the proposed reservoir areas within the floodplain and the proposed abutments. Silty sand may be available in the lower slope of the proposed left abutment for soil cement to protect the upstream slope of the dam.



Figure 3.2-2. Location of Geotechnical Borings at Proposed LBCR Dam Site

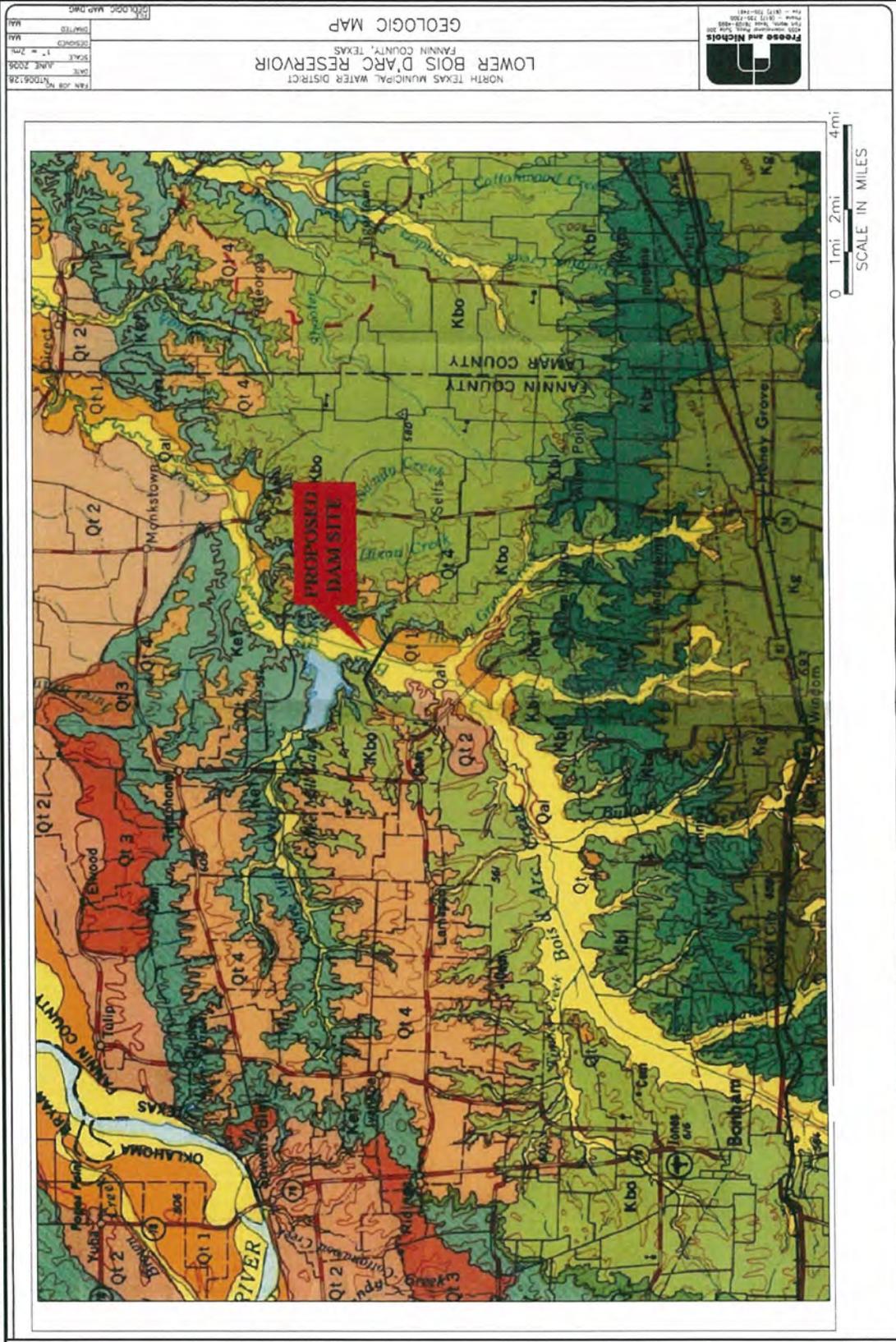


Figure 3.2-3. Geologic Map Depicting Surficial Geology of the Proposed LBCR site

Source: Geotechnical Investigation, Appendix C, Texas Water Rights Application

Overall, the preliminary geotechnical investigations concluded that long-term seepage loss of water from the reservoir is expected to be small. Excavations to construct the spillway would encounter unweathered shale with reasonable load-bearing pressures at depths of about 50 feet, reducing the scale of excavation and the quantity of roller-compacted concrete needed.

In 2014, an additional geotechnical study was conducted in support of the proposed dam design process. This study consisted of a total of 152 borings, including 73 embankment borings, 21 borrow borings, 18 service spillway chute borings, 28 emergency spillway borings, and 12 service spillway borings. Thirteen (13) standpipe piezometers were installed at selected boring locations to study groundwater conditions within the embankment foundation. A geophysical survey was also carried out on the right abutment to supplement the borings and map the extents of sandy terrace deposits.

The 2014 geotechnical study confirmed that the proposed dam site is covered with alluvial/fluvial terrace deposits that overlie bedrock of the Ector Chalk and Bonham Clay formations (both are of the Austin Group). The alluvial/fluvial deposits are primarily fat clays, with some lean clays and clayey sands, which are suitable for use in the proposed dam's core. These studies also concluded that there is sufficient clay in the proposed borrow areas within the reservoir footprint for use in construction of the dam. The rocks that are present are primarily chalky limestone with some clayey zones and shale layers. These kinds of soil and rock deposits are typical for this physiographic region, and these findings are generally consistent with the findings and recommendations of the 2006 preliminary study. The 2014 study did not identify any geotechnical issues that would impede development of the proposed alternatives.

3.2.2 Soils

This section characterizes the soils found in the areas of the proposed reservoir and dam, the proposed pipelines, water treatment plant, and terminal storage reservoir. Table 3.2-2 provides definitions for important soil science terms that are key factors in determining the appropriate location and building materials for reservoirs and dams.

Table 3.2-2 Important Soil Science Terms and Definitions

Term	Definition
Permeability	The ability of a substance to allow another substance to pass through it, especially the ability of a porous rock, sediment, or soil to transmit fluid through pores and cracks. Geologic permeability is usually measured in millidarcies.
Shrink-swell potential	The relative change in the volume of a soil to be expected with changes in moisture content, that is, the extent to which the soil shrinks as it dries out or swells when it gets wet. The extent of shrinking and swelling is influenced by the amount and kind of clay in the soil. Building foundations, roads, and other infrastructure may be harmed by shrinking and swelling soils.

Term	Definition
Soil Plasticity	The capability of soils to retain volume while changing shape due to constant pressure. After the pressure is removed, said shape is retained.

Source: Dictionary.com, 2002

Proposed Lower Bois d'Arc Creek Reservoir Site

Soil texture is determined by the proportions of different-sized particles – sand, silt, and clay – found in a particular soil sample. Figure 3.2-4 shows a diagram of soil textural classes depicted by the percentage of clay, silt, and sand in the soil. The soils in the proposed project area include many clays and loam combinations. Figure 3.2-5 shows the soil types within the footprint of both proposed reservoirs. Bois d'Arc Creek and the footprint of the proposed reservoir traverse the Tinn Soil Series. This series is moderately well drained, has very slow permeability, and features clay soils. Development of this type of soil occurs on floodplains and the soils are frequently to occasionally flooded. Since clay is the largest component of this series, there is very high shrink-swell potential. Typically, clay soils have very low erosion potential (Alan Plummer Associates, 2008).

Following the flow direction of the Bois d'Arc Creek on the south side of the proposed reservoir is a long strip of Frioton silty clay loam. This strip, which also developed on a floodplain, is occasionally flooded. The shrink-swell potential is high and the erosion potential is low. It is moderately well drained with low permeability (NRCS, 2001).

The north side of the proposed reservoir contains large areas of Dela loam, Porum loam, Derly silt loam, and the Derly-Raino complex. These complexes are all moderately well drained with moderate to slow permeability. The Dela and Porum series are subject to flooding. The Derly series is commonly subject to ponding (formation of shallow, temporary ponds) during rainy periods due to its location in depressions, slow permeability, and negligible runoff. The Derly Raino complex has the same characteristics of the other classes found at the site with low permeability and low runoff (NRCS, 2001).

In the preliminary geotechnical investigation, Borings D-5, D-6, and D-7 (shown in Figure 3.2-2) encountered Tinn Clay, Ellis Clay and Porum Loam, respectively. The Tinn Series is described as “very deep, moderately well drained, very slowly permeable, clayey soils on flood plains along streams. These soils formed in clayey alluvium.” The Ellis Series soils are, “very deep, well drained, very slow permeable, clayey soils on uplands. These soils formed in clay and shale.” The Porum Series soils include: “very deep moderately well drained, slowly permeable, loamy soils on terraces along the Red River. These soils formed in loamy sediments” (NRCS, 2001).

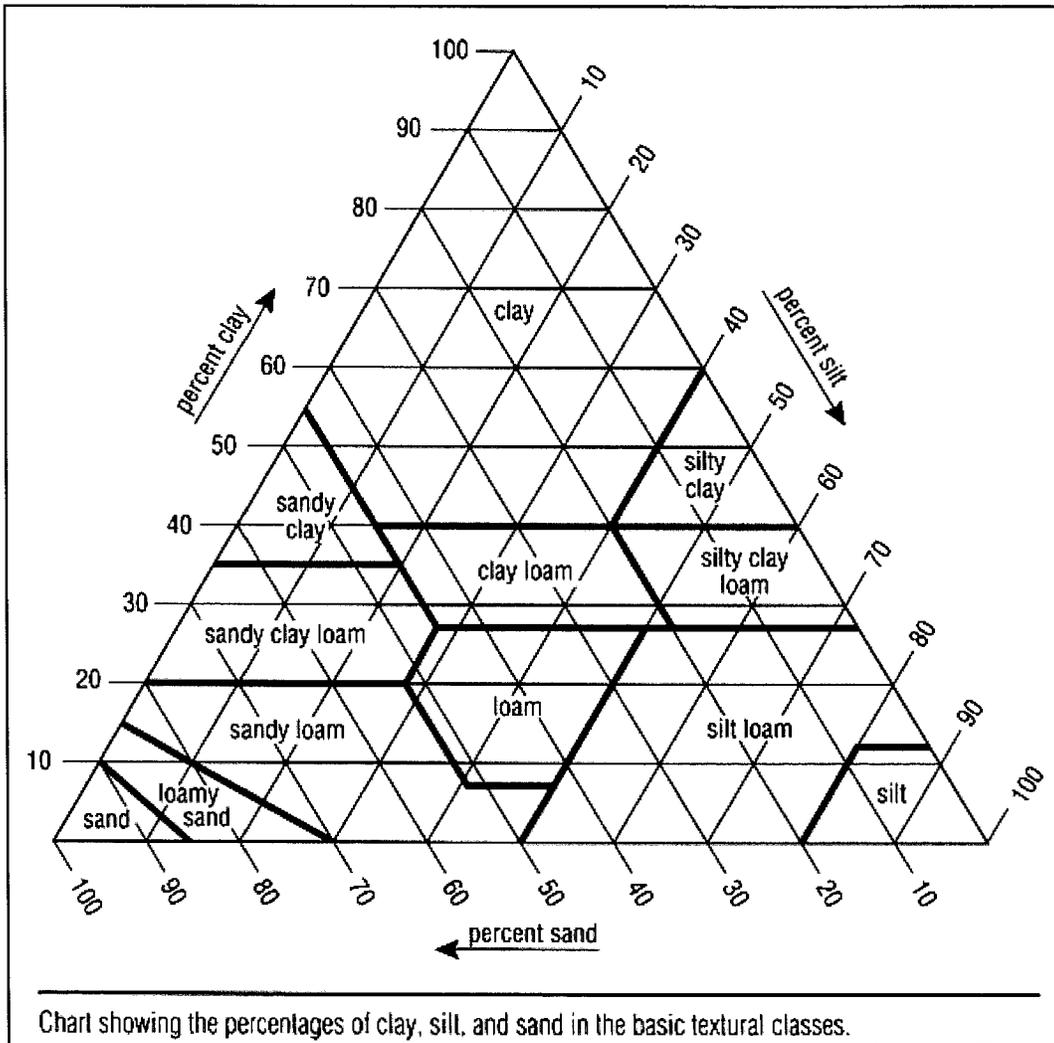


Figure 3.2-4. Diagram Depicting Soil Textural Classes

Source: NRCS, no date

Borings D-5 and D-6 (shown in Figure 3.2-2) in the preliminary geotechnical investigation encountered clay soils at the ground surface. These contained varying amounts of silt with traces of sand and gravel and ranged from low to high plasticity. They extended to depths of about 10 to 24.2 feet below ground surface (bgs), and were underlain by weathered shale. Boring D-7 (see Figure 3.2-2) encountered sandy soils at the ground surface which extended to a depth of about 3 feet bgs and were underlain by clayey and sandy soils. The sandy soils were fine to medium grained, and the clayey soils ranged from low to high plasticity. The sandy and clayey soils extended to a depth of about 42.5 feet bgs and were underlain by weathered shale. Moisture content for the sandy soils ranged from 3 to 19 percent with the lower moisture contents encountered near the ground surface. Moisture content for the clayey soils ranged from 12 to 37 percent with the lower moisture contents obtained in the sandy clays and the higher moisture contents obtained in the high plastic clays. Liquid limits for the clayey materials ranged from 36 to 85 and plasticity indices in the clayey materials ranged from 22 to 59. Based on the Fannin County Soil Survey, it appears that sandy soils and lean clays are present along the west valley slope and on top of the

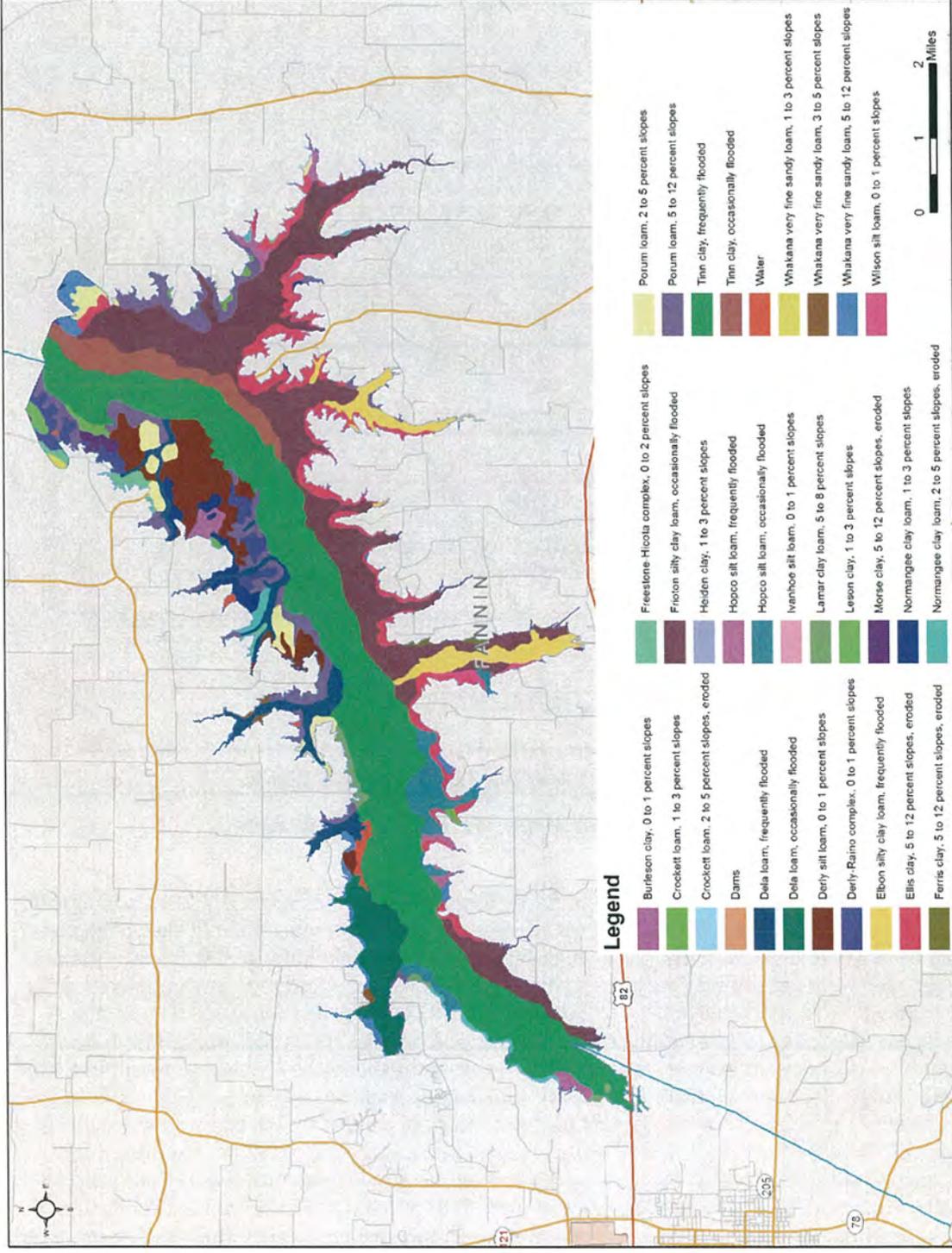


Figure 3.2-5. Soil Types Within Larger Reservoir Footprint

right abutment area of the proposed dam. These soils could be used in the outer zones of the dam, but additional borings would be required to determine the type and quantity of soils in the embankment available for use.

Proposed Raw Water Pipeline Routes, WTP, and TSR

The soils found along the proposed raw water pipeline routes, as well as the soils found at the site of the proposed WTP and the adjacent TSR fall mainly under the classification of “clayey and loamy slightly acid to moderately alkaline soils on uplands” (NRCS, 2001). Nearly 30 distinct soil units occur, including the following:

- Austin silty clay loam, 1 to 3 percent slopes
- Crockett loam, 1 to 3 percent slopes
- Crockett loam, 2 to 5 percent slopes, eroded
- Dela loam, frequently flooded
- Derly-Raino complex, 0 to 1 percent slopes
- Ellis clay, 5 to 12 percent slopes, eroded
- Fairlie clay, 0 to 1 percent slopes
- Fairlie-Dalco complex, 1 to 3 percent slopes
- Ferris clay, 5 to 12 percent slopes, eroded
- Freestone-Hicota complex, 0 to 2 percent slopes
- Frioton silty clay loam, occasionally flooded
- Heiden clay, 1 to 3 percent slopes
- Heiden-Ferris complex, 2 to 6 percent slopes, eroded
- Hopco silt loam, frequently flooded
- Houston Black clay, 1 to 3 percent slopes
- Howe-Whitewright complex, 3 to 5 percent slopes
- Leson clay, 1 to 3 percent slopes
- Normangee clay loam, 1 to 3 percent slopes
- Normangee clay loam, 2 to 5 percent slopes, eroded
- Porum loam, 2 to 5 percent slopes
- Porum loam, 5 to 12 percent slopes
- Stephen silty clay, 1 to 3 percent slopes
- Tinn clay, occasionally flooded
- Tinn clay, frequently flooded
- Whakana very fine sandy loam, 5 to 12 percent slopes
- Whitewright-Howe complex, 5 to 12 percent slopes, eroded
- Wilson silt loam, 0 to 1 percent slopes

The percent slope refers to the unit of measurement for the slope gradient ranging from Nearly Level (0-2) to Very Steep (>35) (Purdue Extension, no date). The term eroded indicates the removal of soil by water, wind, or both. These units are shown in 35 detailed maps included in a supplemental report titled *Supporting an Application for a 404 Permit for Lower Bois d'Arc Creek Reservoir (SWT-0-14659)*, (Freese and Nichols, 2013b).

The major soil groups along the pipeline routes and at the site of the WTP and TSR include the Fairlie-Delco complex, Houston Black clay, Howe-Whitewright complex. The Fairlie-Delco complex consists of deep soils with surface and subsoil layers reaching about 54 inches in depth. These are moderately alkaline soils that are also clayey and are used as cropland. They tend to have high shrink-swell potential, which decreases their potential for urban and industrial uses. Slopes are low, averaging 0 to 3 percent (NRCS, 2001). The Houston Black clays are very deep and can have a total depth of up to 80 inches. As

with the Fairlie-Delco complex, these soils are well suited for use as cropland. The shrink-swell potential is high due to the high concentration of clay in the complex. Slopes are low, with ranges from 1 to 3 percent (NRCS, 2001). The Howe-Whitewright complex soils are shallower than the previous two soil types discussed. These soils usually reach a depth of 20 inches, and are followed by grey chalk parent materials. These soils can be found on slopes of 3 to 12 percent. This complex is useful as rangeland and sometimes improved pasture. There is a high concentration of lime, which can have a negative effect on certain crops. There is a high shrink-swell potential, which limits options for soil use (NRCS, 2001).

The soils in the footprint of the site of the proposed WTP and TSR are similar to those found along the pipeline route. Figures 3.2-6, 3.2-7, and 3.2-8 illustrate the variety of soils found at this location.

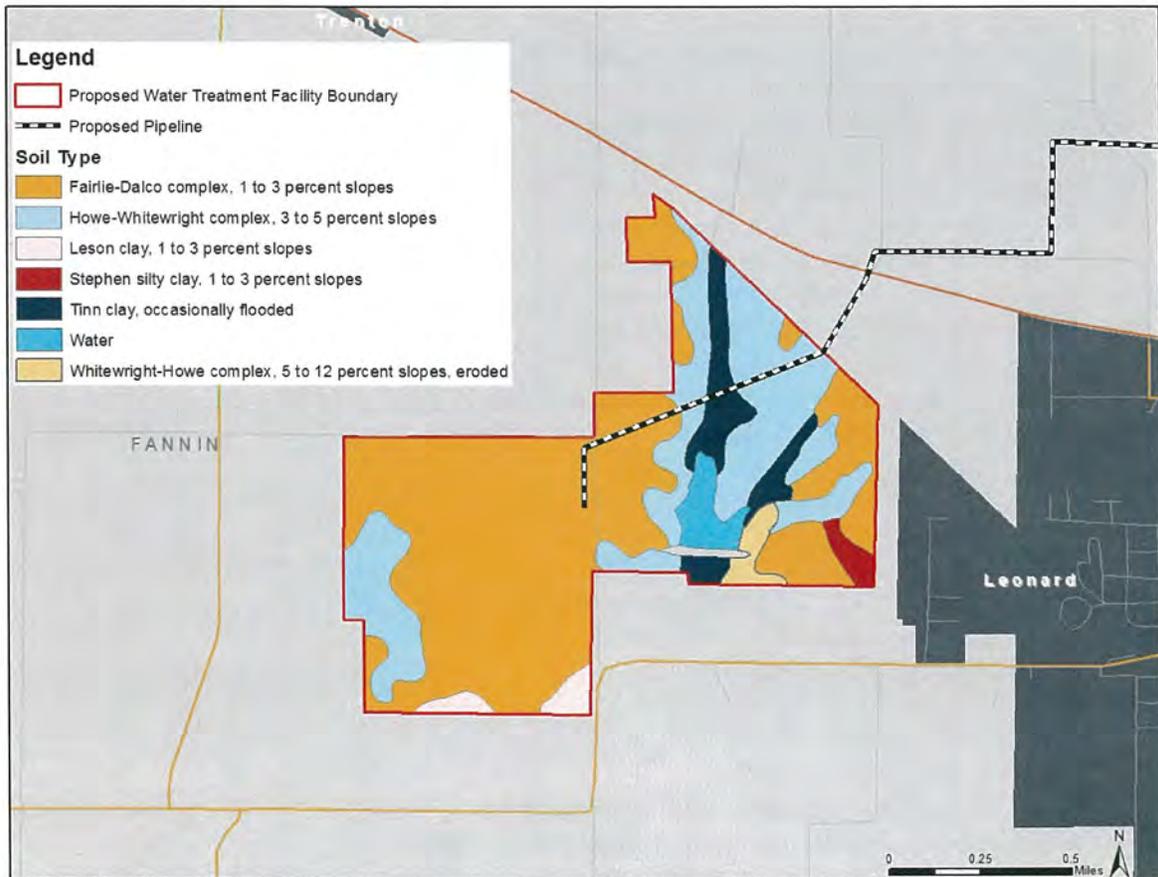


Figure 3.2-6. Location Map of Soils Found at the Site of the Proposed WTP and TSR

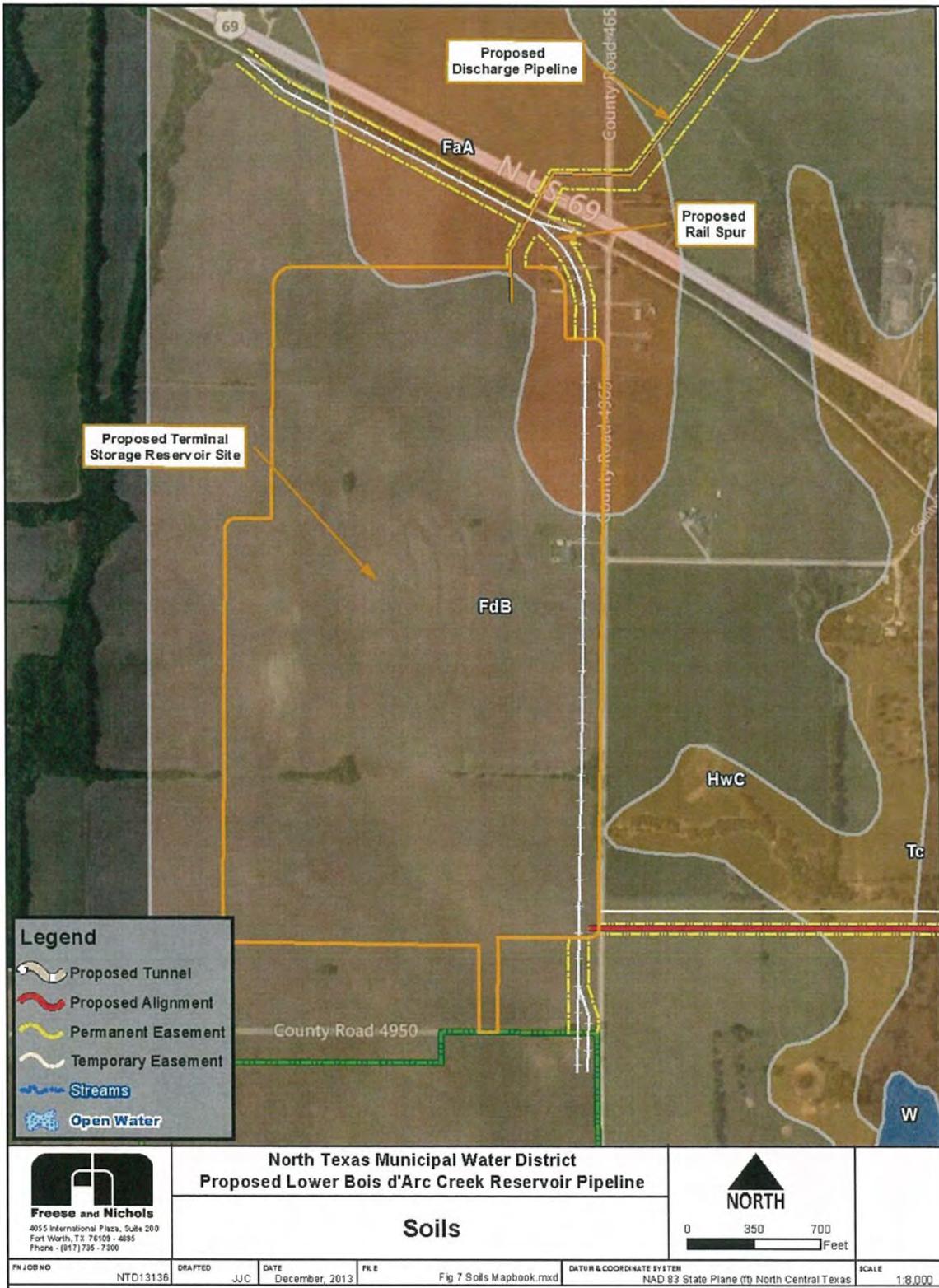


Figure 3.2-7. Vicinity Map of Soils Found at the Site of the Proposed TSR

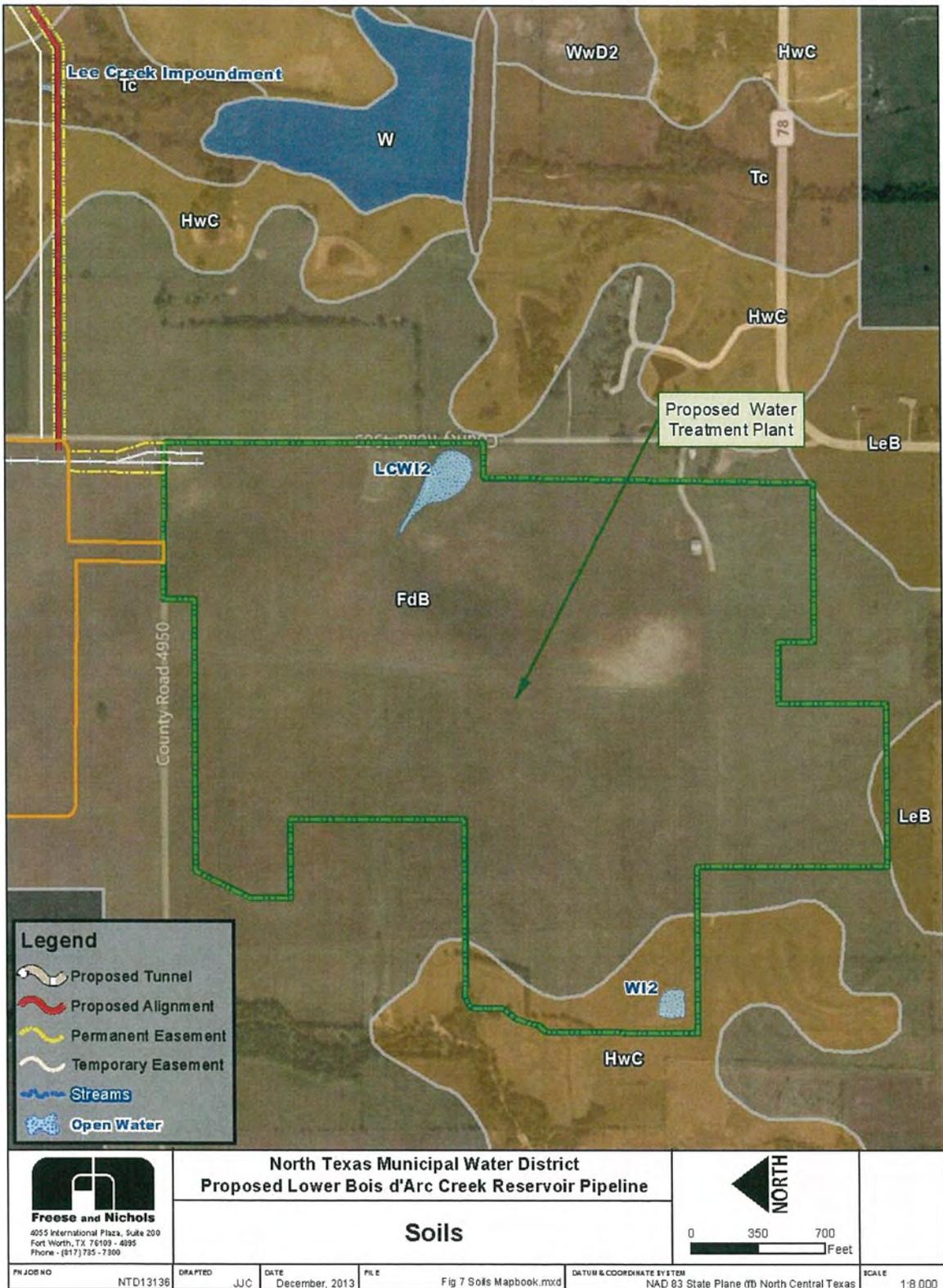


Figure 3.2-8. Vicinity Map of Soils Found at the Site of the Proposed WTP

3.2.3 Prime Farmland

Within the proposed reservoir site, there are 13 soils considered Prime Farmland. Prime Farmland soils are defined by the United States Department of Agriculture (USDA) in section 622.04 of the National Cooperative Soil Survey (NCSS) Standards as soils containing the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops.

The 13 soils at the site of the proposed reservoir that are designated as Prime Farmland by the USDA include (NRCS, 2001).

- Austin silty clay loam, 1 to 3 percent slopes
- Burleson clay, 0 to 1 percent slopes
- Dela loam, occasionally flooded
- Fairlie clay, 0 to 1 percent
- Fairlie-Delco complex, 1 to 3 percent slopes
- Freestone-Hicota complex, 0 to 2 percent slopes
- Frioton silty clay loam, occasionally flooded
- Heiden clay, 1 to 3 percent slopes
- Houston black clay, 1 to 3 percent slopes
- Leson clay, 1 to 3 percent
- Tinn clay, occasionally flooded
- Whakana very fine sandy loam, 1 to 3 percent slopes
- Whakana very fine sandy loam, 5 to 12 percent slopes.

3.3 WATER RESOURCES

This section discusses the existing conditions for water resources that would be affected by Alternatives 1 and 2. A brief description of the methodology used to characterize the affected environment is provided. The affected area for water resources is generally the Bois d'Arc Creek watershed.

3.3.1 Methods

Water resources are described and quantified in this chapter based on information obtained from several different methods, including field sampling, water and sediment transport models, and database searches.

Surface Waters

Bois d'Arc Creek Watershed

The United States Army Corps of Engineers (USACE) river channel floodwave routing model, HEC-RAS, and site-specific data were used to estimate the water surface along Bois d'Arc Creek under different rainfall conditions. Elevation contour data from aerial photography and LiDAR mapping were used to develop more than 100 cross-sections along 22 miles of Bois d'Arc Creek for the HEC-RAS model. The 2-year and 100-year floodplains were mapped. A detailed description of the HEC-RAS modeling is presented in Appendix Q.

Bois d'Arc Creek and Red River Surface Flow

Surface flows were obtained from United States Geological Survey (USGS) gaging stations on Bois d'Arc Creek and the Red River (USGS, 2017). An Instream Flow Study for Bois d'Arc Creek was also conducted where some additional baseline flow conditions within the study area were characterized. The complete Instream Flow Study is presented in Appendix M. Downstream baseline conditions were characterized using USGS stream gage data supplemented with recently collected data. As part of the study, a RiverWare model was assembled to simulate the response of the watershed to changing stream

conditions over time. RiverWare is a hydrologic model that simulates management of reservoir and stream segments. It was originally developed by the Center for Advanced Decision Support for Water and Environmental Systems, a division of the University of Colorado at Boulder. The Bois d'Arc Creek RiverWare model was used to characterize the existing baseline conditions of the watershed as well as to assess future conditions with a dam and reservoir in place. Flows for the RiverWare model are based on data from the nearby North Sulphur River near Cooper gage (USGS 07343000) and the Texas Council on Environmental Quality (TCEQ) Red River Basin Water Availability Model. The Bois d'Arc Creek RiverWare model uses a daily time step, and it covers the half-century period from 1948 to 1998.

During the Instream Flow Study, Freese and Nichols personnel and cooperating agency participants from USACE, Texas Commission on Environmental Quality (TCEQ), and the Texas Parks and Wildlife Department (TPWD) collected data from May through July 2009 at locations along the mainstem of the Bois d'Arc Creek. Data were collected at locations above and below the proposed reservoir site at Highway 82, at County Road (CR) 2645, at Farm-to-Market (FM) 1396, at FM 409, and on United States Forest Service (USFS) property located downstream of FM 100. Flow measurements and field activities were not random but rather targeted for specific flow events. The hydrology/hydraulics field methods included measuring discharge, velocity, and depth at low flow at the FM 1396 and FM 409 sites. Information available from TCEQ that classifies stream channels as intermittent and /or ephemeral was also incorporated as appropriate (TCEQ, 2016a).

Stream Channel Characterization (Fluvial Geomorphology)

In 2008, a Rapid Geomorphic Assessment (RGA) was conducted on Bois d'Arc Creek and four major tributaries (Honey Grove Creek, Sandy Creek, Ward Creek, and Bullard Creek) within the inundation pool of the proposed reservoir (detail of the RGA are available in Appendix Q). An RGA is similar to Step 1 of a Texas Instream Flow Study. The RGA methodology integrates field data and desktop sources to quantify the features that affect stream stability and aquatic habitat potential. The RGA classified each stream segment as "good," "fair," or "poor" rating the segment's state of equilibrium and stream stability. A "good" rating indicates a relatively stable channel in which sediment transport capacity is balanced with sediment supply, while a "poor" rating implies disequilibrium with unstable, eroding channel sections and degraded instream habitats. A "fair" rating indicates a moderately stable channel reach, in which the sediment transport capacity is not in balance with the sediment supply.

Additional RGA surveys and data collection were carried out at the proposed reservoir site in 2016. Figure 3.3-1 shows the locations identified for RGA data collection in 2007 and 2015 that were subsequently sampled in 2008 and 2016. For the 2016 RGA survey, the USACE and cooperating agencies identified 10 additional smaller tributaries within the footprint of the proposed reservoir for additional data collection. These tributaries included Allen's Creek, Burns Branch, Fox Creek, Onstott Creek, Pettigrew Branch, Sandy Branch, Stillhouse Branch, Timber Creek, Thomas Branch, and Yoakum Creek. The 2016 RGA also included additional sampling points on Honey Grove Creek, Sandy Creek, and Ward Creek. Fieldwork to gather the supplemental RGA data occurred in January 2016. Cooperating agency members were invited to participate in the field data collection effort. The supplemental RGA data were collected using the same RGA methodology as the previous investigations at the proposed reservoir footprint in 2008.

Bois d'Arc Creek Water Quality

Water quality sampling was used to assess Bois d'Arc Creek. Water quality samples were collected at seven sites on Bois d'Arc Creek, including sites located upstream of the proposed reservoir site (at FM 78 and U.S. 82), within the proposed reservoir site (at CR 2645 and FM 1396), and downstream of the proposed reservoir site (at FM 409, FM 100, and USFS). These water quality sampling sites are shown on Figure 3.3-2.

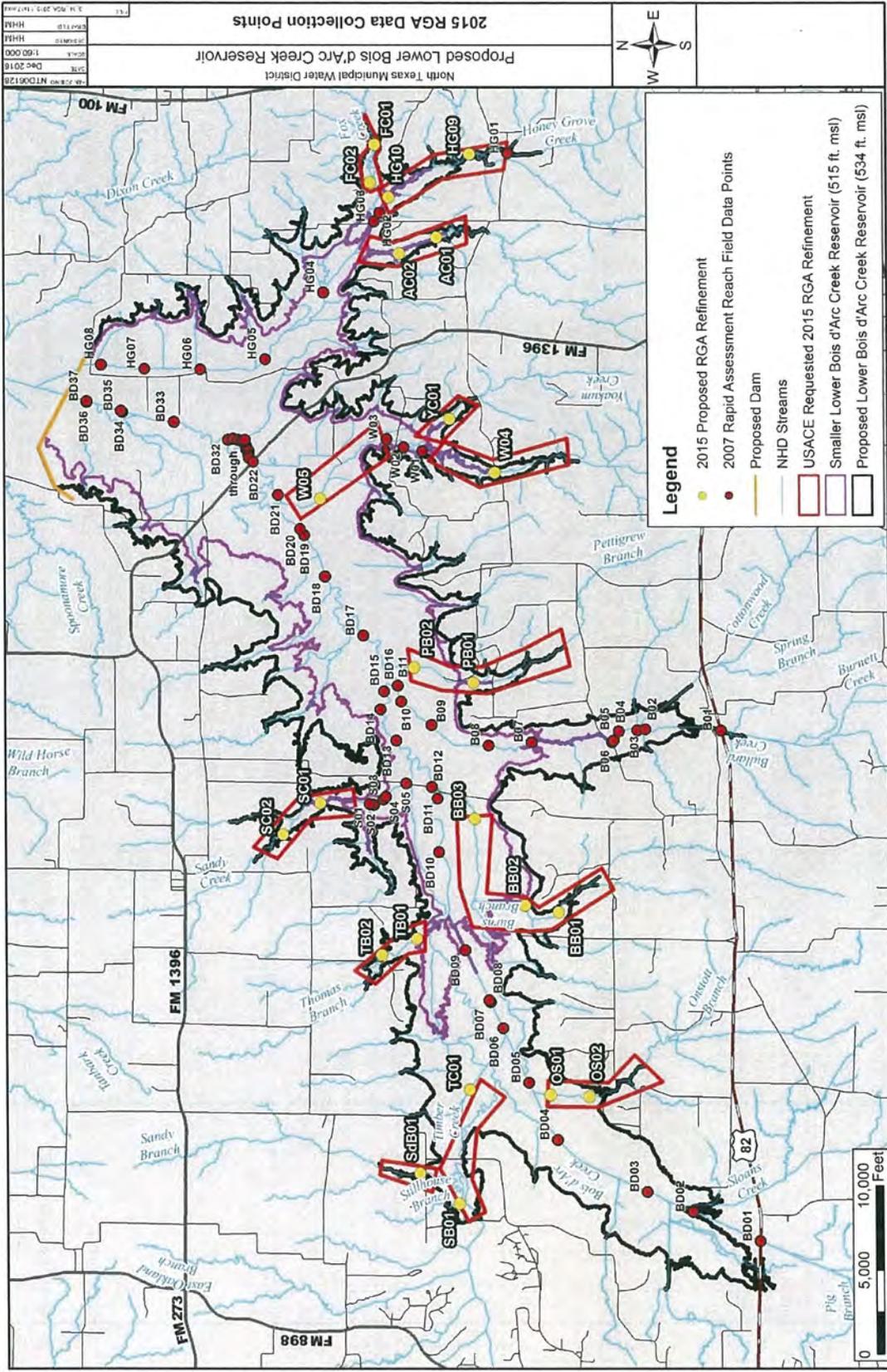


Figure 3.3-1. Rapid Geomorphic Assessment Data Collection Sites

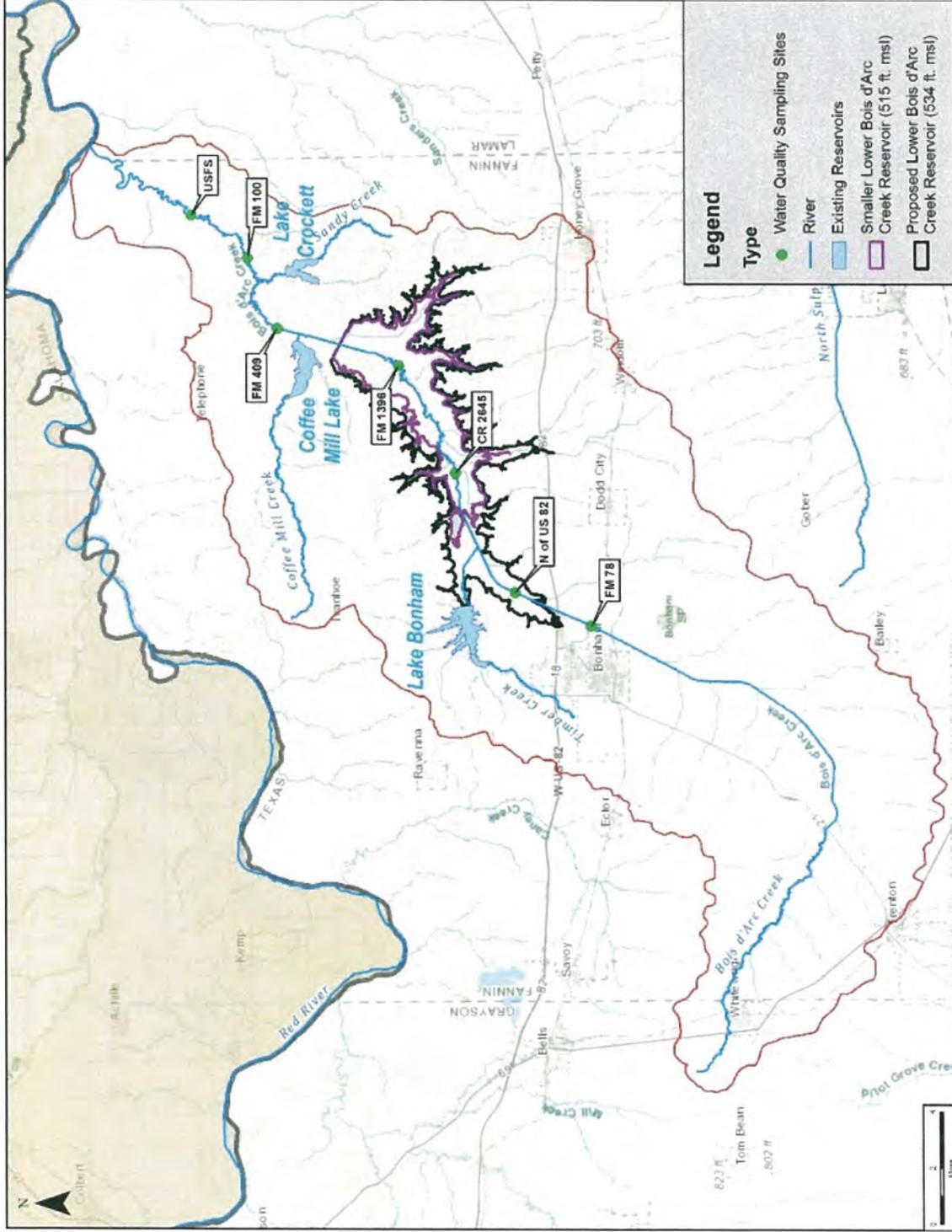


Figure 3.3-2. Water Quality Sampling Sites Along Bois d'Arc Creek

Bois d'Arc Creek water quality sampling included:

- FM 100 site by the Red River Authority between 1997 and 2006
- FM 78 site by the Red River Authority in 2004 and 2005
- FM 1396 and FM 409 site by the USGS between 2006 to present
- U.S. 82, FM 1396, and FM 409 sites by the NTMWD between June 2007 and December 2008
- U.S. 82, CR 2645, FM 1396, FM 409, and USFS sites in June and July 2009

Also, for historical reference, water quality results from 1996 to 2006 were summarized for 13 water quality sampling stations within the Red River Basin as a part of the North Texas Municipal Water District's (NTMWD) report supporting an application for a Texas water right for the Lower Bois d'Arc Creek Reservoir. The Instream Flow Study also collected water quality data from other sources (USGS, TCEQ, and Red River Authority (RRA)).

Groundwater

The analysis of groundwater conditions in the study area are based on records obtained from the Texas Water Development Board (TWDB) groundwater database (TWDB, 2017). Although this database includes only a small percentage of wells in the state, it is the most comprehensive source of data on groundwater wells in the state and is reliable for the purposes of this analysis because the data are representative of groundwater conditions. Thus, while the use of this database will provide valuable information upon which to base aquifer descriptions, it does not include all of the wells that have actually been drilled or are currently present in the affected area.

3.3.2 Surface Waters

Surface waters located in the affected environment for Alternatives 1 and 2 fall within three river basins: Red River, Sulphur and Trinity. Surface waters in the Red River Basin are associated with the reservoir and pipeline footprints in Fannin County while surface waters in the Sulphur and Trinity Basins are associated solely with the pipelines' footprints. Surface waters within the project footprint in the three basins for Alternative 1 include approximately 120 acres (286,139 linear feet) of existing intermittent streams, 99 acres (365,002 linear feet) of intermittent/ephemeral streams, and 78 acres of open water, 1.91 acres of upland, off-channel open waters (ponds, stock tanks, etc.), and 0.10 acre of on-channel open waters. Alternative 2 includes these waters plus Lake Texoma, which has a surface area of 86,910 acres.

River Basins

Texas river basins are illustrated in Figure 3.3-3. The affected environment for Alternatives 1 and 2 covers three drainage basins. The Red River Basin is the fourth largest river basin in Texas, with a drainage area of 24,297 square miles in Texas. Additionally, the Red River is the second longest river associated with Texas, with 695 miles of the river located in Texas. From its headwaters in eastern New Mexico, the Red River flows across Texas, along the Texas–Oklahoma border, and into Arkansas before reaching its confluence with the Mississippi River in Louisiana. The Red River Basin is area number 2 in Figure 3.3-3. The Sulphur River basin (area number 3 in Figure 3.3-3) has the largest average watershed yield of any river basin in Texas with 3,558 square miles in Texas. From the eastern state line of Texas, the Sulphur River flows into Arkansas and joins with the Red River. The Trinity River basin (area number 8 in Figure 3.3-3) is the largest river basin whose watershed is entirely within the State of Texas and the third largest river in Texas by average flow volume (TWDB, 2017). The Trinity River is formed in the northern part of the state and flows southeasterly into the Trinity Bay and into the Gulf of Mexico (TWC, 1963). The drainage area is 17,969 square miles at the mouth (USGS, 1963).

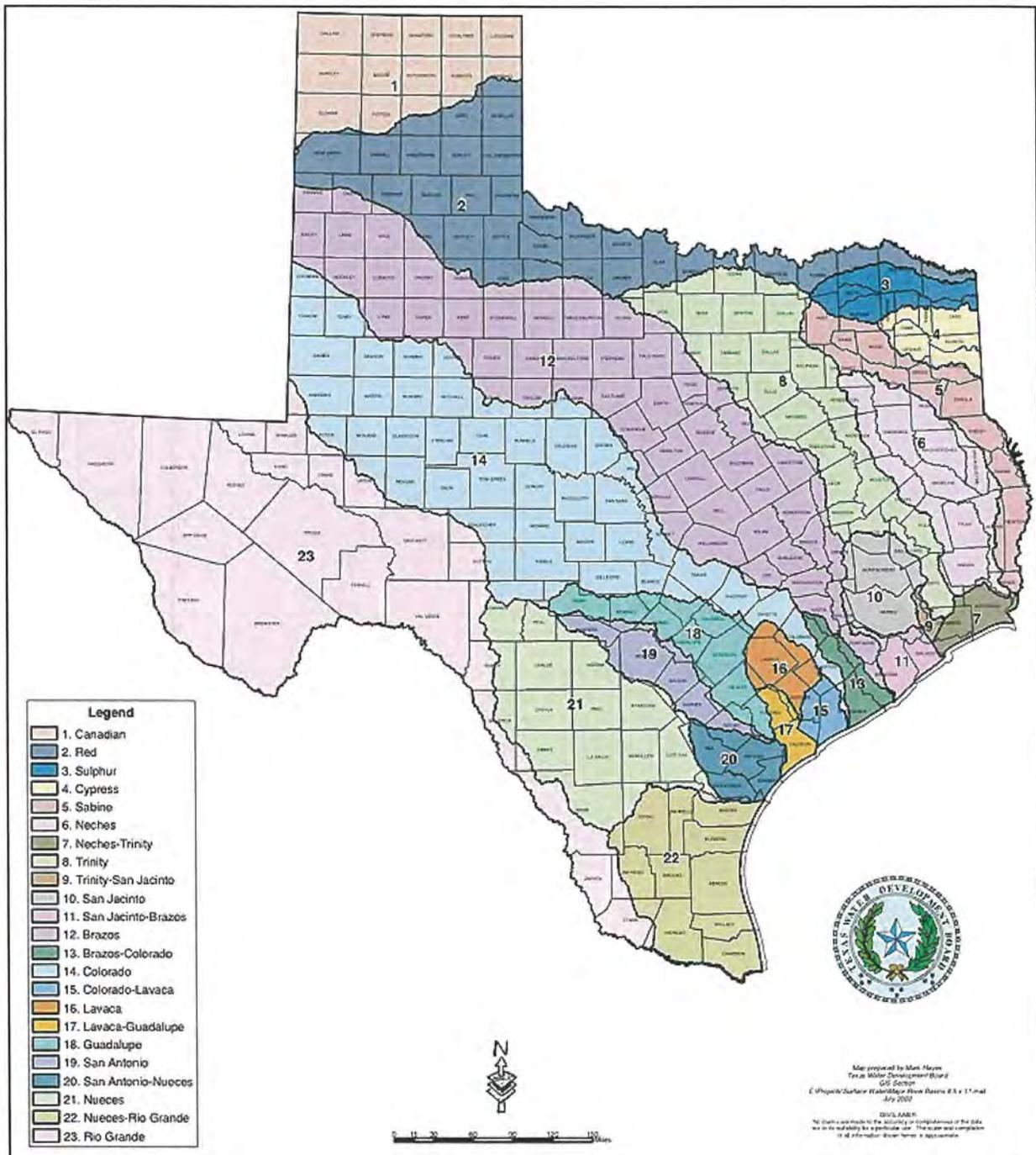


Figure 3.3-3. Texas River Basins

Precipitation and Evaporation

Hydrological variability over time in a catchment basin or watershed is influenced by variations in precipitation over daily, seasonal, annual, and decadal time scales. The frequency of low flows within a river basin is primarily affected by changes in the seasonal distribution and year-to-year variability of

precipitation and the occurrence of prolonged droughts. Evaporation from the land surface includes evaporation from open water, soil, shallow groundwater, and water stored on vegetation, along with transpiration through plants. The rate of evaporation from the land surface is driven by meteorological controls, mediated by the characteristics of vegetation and soils, and constrained by the amount of water available. Climate change has the potential to affect all of these factors in a combined way that affects each evaporation component differently but is not yet clearly understood (IPCC, 2013).

Average annual precipitation in the region of the proposed project is 45 inches per year as shown in Figure 3.3-4. Most of the rain falls in May (an average of 5.55 inches), June (an average of 5.31 inches), and October (an average of 5.08 inches) (U.S. Climate Data, 2017). In the extremely wet year of 2015, the area received over 76 inches of rain. During the growing season, the median rainfall is 1.63 inches per two-week period. Weather records from nearby Bonham, Texas indicate the four highest consecutive rainfall periods are from the end of April through mid-June, with median rainfall levels ranging from 2.69 to 2.25 inches over 14 days. The total median rainfall over this 8-week period is nearly 10 inches (Watters and Kiel, 2016).

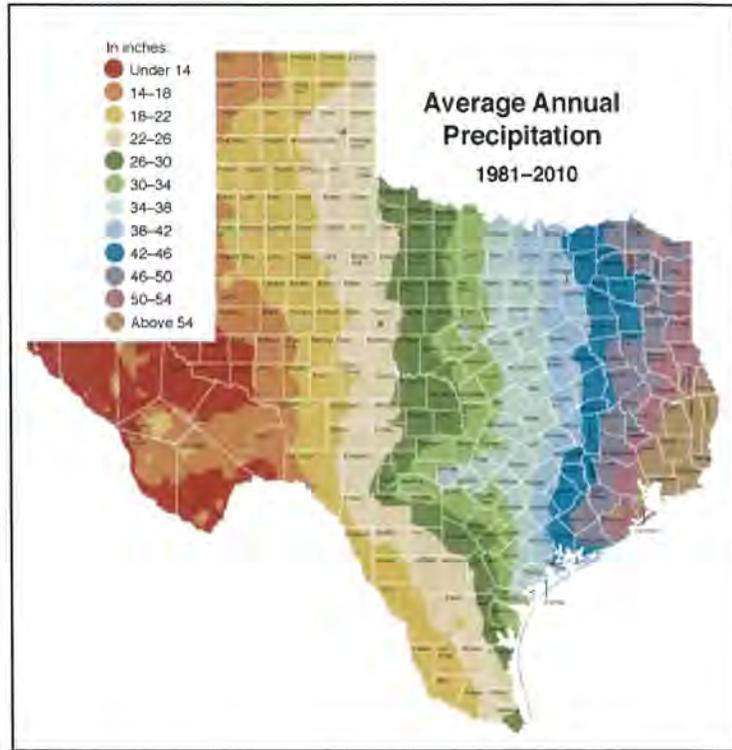


Figure 3.3-4. Average Annual Precipitation in Texas

Texas has experienced several droughts in modern history. A record drought occurred in the State from 1950–1957. This seven-year drought was a turning point in Texas history that led to the formation of the TWDB (TWDB, 2017). Since then, Texas has faced several droughts, including the most recent and most severe drought from 2010 to 2011. In north-central Texas, precipitation during a 12-month period (September 2010 to August 2011) was only 64 percent of normal, the driest September–August period since 1956.

The State experienced a short and rainy respite in the winter and spring of 2012, but by the fall of 2012, dry conditions had returned to much of the State. Dry conditions persisted until late in the summer of 2013, when a sustained rainy period lowered the percentage of the State experiencing drought (NPR, 2017). However, dry conditions have remained in the study area. The U.S. Drought Monitor currently shows north-central Texas to be in a “severe drought” (National Drought Mitigation Center, 2017).

Rivers and Streams

Red River

The Red River’s name comes from its color, which in turn comes from the fact the river carries large quantities of red soil during floods. The drainage area of the Red River in Texas is 30,700 square miles. In 1944, Denison Dam was completed on the Red River to form Lake Texoma. Principal tributaries of

the Red River, exclusive of its various forks, include the Pease and Wichita Rivers in north central Texas, and the Sulphur River in northeast Texas.

There are no USGS gages on the Red River in Fannin County. The closest USGS gage on the Red River downstream of its confluence with Bois d’Arc Creek is located at Arthur City (USGS 07335500). Approximately half the flow at this gage originates as releases from Lake Texoma, which are mostly related to operation of a hydropower electric generating plant and can vary substantially on any given day. In recent years, on average, approximately 3 to 4 percent of the total flow at the Arthur City gage originated from the Bois d’Arc Creek watershed above the proposed dam site.

Table 3.3-1 shows daily average flow rates of the Red River at Arthur, Texas and near De Kalb, Texas during the eight years between July 2006 and June 2014, a recent period for which data are available at this site. Minimum daily average flows for the selected gages range from approximately 177 cfs to 351 cfs, and maximum daily average flows ranged from approximately 80,800 cfs to 97,800 cfs. The median flow of 2,150 cfs at Arthur City is that which is exceeded half of the time; by the time the Red River reaches De Kalb, the median flow has grown to 3,510 cfs, as a result of inflows from tributaries.

Table 3.3-1. Daily Average Flow Rates of the Red River at Arthur Texas and Near De Kalb, Texas, July 2006 to June 2014

Relative Total Water Flow	Red River Flow at Arthur City, TX (cfs)	Red River Flow near De Kalb, TX (cfs)
Maximum	80,800	97,800
90%	17,590	28,490
75%	5,288	9,265
Median	2,150	3,510
25%	873	1,623
10%	456	850
Minimum	177	351

Source: Albright, 2014b.

The “Red River near De Kalb, Texas” (USGS 073368270) gage is located 112 river miles downstream of the Bois d’Arc Creek–Red River confluence in Bowie County near the state line. Daily mean discharge values were compiled for this gage for its period of record (1969 to 2010), yielding an average annual discharge at this point on the Red River of 10.3 million acre-feet (USGS, 2011b). That is, on average, 10.3 million AF of water flow past this point every year.

Bois d’Arc Creek

Bois d’Arc Creek is a tributary of the Red River and has a drainage area of 425 square miles. The Bois d’Arc Creek watershed has three existing reservoirs: Lake Bonham, Coffee Mill Lake, and Lake Crockett. Surface flows in the watershed are characterized by three USGS stream gages: 1) station number 07332600, Bois d’Arc Creek near Randolph, Texas, which operated between December 1962 and September 1985; 2) station number 07332620, Bois d’Arc Creek at FM 1396 near Honey Grove, Texas, which began collecting data in June 2006; and 3) station number 07332622, Bois d’Arc Creek at FM 409 near Honey Grove, Texas, which began collecting data in June 2009. The existing reservoirs and the locations of the two currently existing stream gages are shown in Figure 3.3-5.

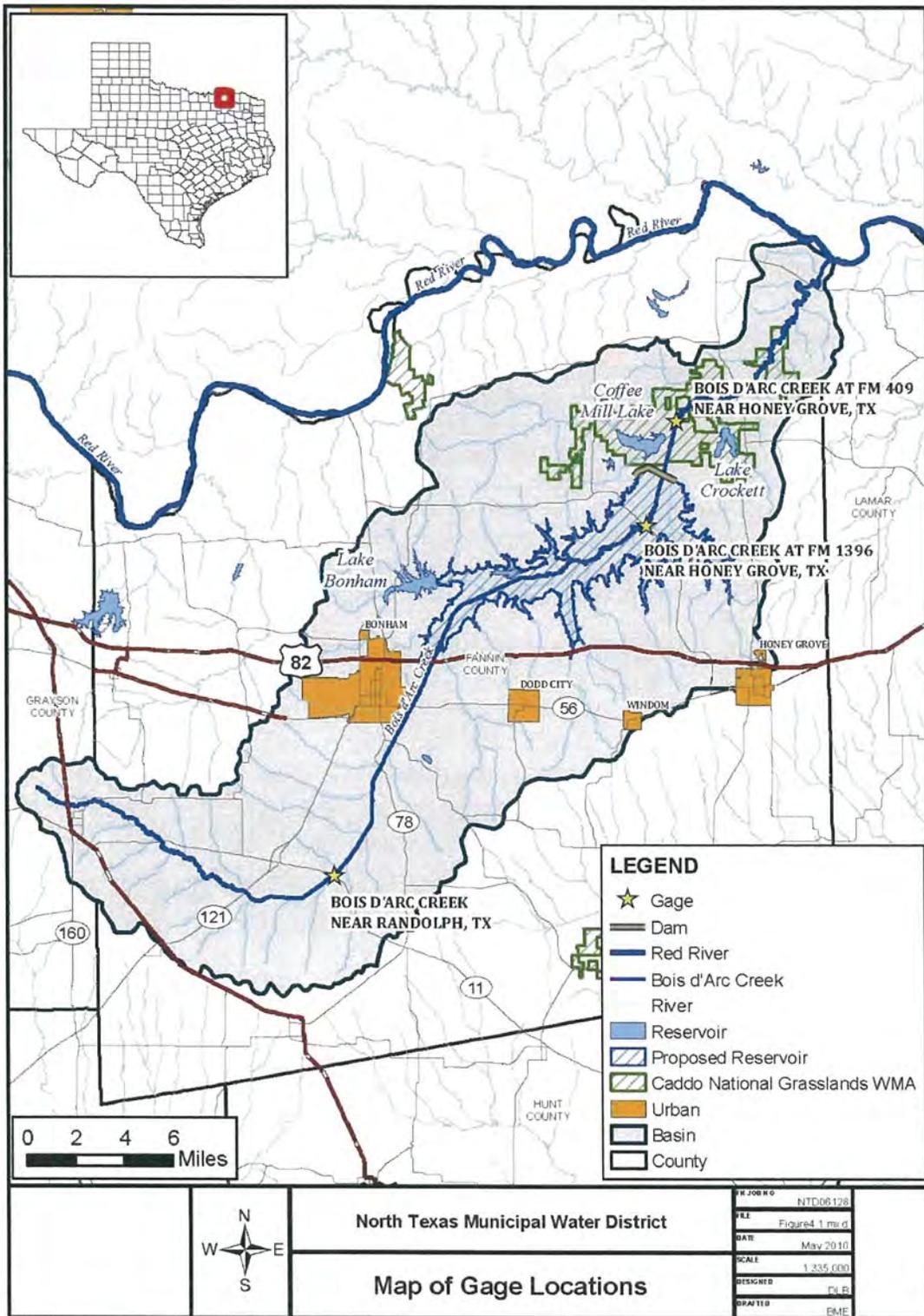


Figure 3.3-5. Stream Gages within the Bois d'Arc Creek Watershed

Bois d’Arc Creek is categorized as an intermittent stream with perennial pools. The creek has historically experienced periodic flooding, especially adjacent to the Highway 56 bridge located 19 miles upstream of the proposed dam site, as well as along the creek banks and in the City of Bonham (Appendix Q). The creek is channelized within approximately two-thirds of the project area and has been characterized as flashy, showing rapid response to rainfall events with extended periods of little or no flow, as shown by the Instream Flow Study (Appendix M). This “flashiness” is evident in the historical flow data for Bois d’Arc Creek. The highly channelized and straightened nature of Bois d’Arc Creek has resulted in considerable erosion of its bed and banks, limited habitat and biotic diversity in channelized sections, and minimal lateral migration. The channelized condition is also responsible for the current hydrological behavior and geomorphological processes (mechanisms of erosion and deposition) that are prevalent in this stream.

Bois d’Arc Creek near Randolph, Texas (USGS 07332600)

Three stream flow gages have been placed on Bois d’Arc Creek; these form the basis of our understanding of the creek’s seasonal flow patterns and its year to year variations. Historical surface water flow data for the Bois d’Arc Creek watershed are available from the USGS Bois d’Arc Creek near Randolph, Texas gage (station number 07332600) for December 1962 to September 1985, which recorded flows for a drainage area of 72 square miles (Appendix Q). Although the Randolph gage only measures flow for 22 percent of the proposed reservoir’s drainage area, historical flows at the Randolph gage are considered equivalent to naturalized conditions for the watershed, because there are no water rights or significant return flows upstream from this gage. Naturalized datasets are derived by backing out any human impacts to a watershed, such as surface water diversions and return flows.

Daily mean discharge statistics for the period of record (December 1962 to September 1985) for the Bois d’Arc Creek near Randolph, Texas gage are shown in Table 3.3-2. Annual flows were below 0.12 cubic feet per second (cfs) at the Randolph gage 25 percent of the time (Q₂₅) during the period of record. Based on these figures, the average annual discharge was 39,845 acre-feet per year.

Table 3.3-2. Bois d’Arc Creek near Randolph, Texas Gage (USGS 07332600)

Daily Mean Discharge Statistics December 1, 1962 to September 30, 1985										
Month	Daily Mean Discharge (cfs)					Percentile Flows (cfs)				
	Minimum	Median	Average	Maximum	Standard Deviation	10th	25 th	50 th	75 th	90 th
January	0	8.5	30	2,230	127	0.09	1.5	8.5	24	46
February	0	16	73	4,520	304	0.71	5.1	16	37	84
March	0	17	74	6,000	325	1.7	7.2	17	45	96
April	0.10	12	82	6,940	375	2.0	5.0	12	29	81
May	0.03	12	105	10,600	580	2.3	5.3	12	38	141
June	0	4.7	51	3,190	250	0.06	1.1	4.7	15	54
July	0	0.39	13	3,750	150	0	0	0.39	2.5	8.4
August	0	0	5.1	2,640	99	0	0	0	0.36	2.1
September	0	0	54	5,410	364	0	0	0	1.9	21
October	0	0.27	68	6,360	418	0	0	0.27	9.2	41
November	0	5.0	46	3,170	236	0	0.06	5.0	17	52
December	0	7.9	59	7,510	342	0.02	0.53	7.9	30	60
Annual	0	4.6	55	10,600	328	0	0.12	4.6	19	55

Note: “Percentile Flow” indicates the percentage of time Bois d’Arc Creek flows were at or below the indicated values shown in cubic feet per second (cfs).

Source: USGS, 2012.

Bois d'Arc Creek at FM 1396 (USGS 0733260)

The Bois d'Arc Creek at FM 1396 gage is located just upstream of the proposed dam site as shown in Figure 3.3-5 and measures flow for a drainage area of 270 square miles, or approximately 83 percent of the proposed reservoir's drainage area (Appendix Q). The USGS has adjusted the rating curve for this gage several times due to horizontal and vertical changes in the channel bed since its installation, which is an indication of the dynamic, eroding nature of this stream channel.

Daily mean discharge statistics for July 1, 2006 to June 30, 2016 for the Bois d'Arc Creek at FM 1396 gage are shown in Figure 3.3-6 and Table 3.3-3. Annual flows were below 0.02 cfs at the FM 1396 gage 25 percent of the time during the period of record. Based on these figures, the average annual discharge at this location is approximately 170,970 AFY.

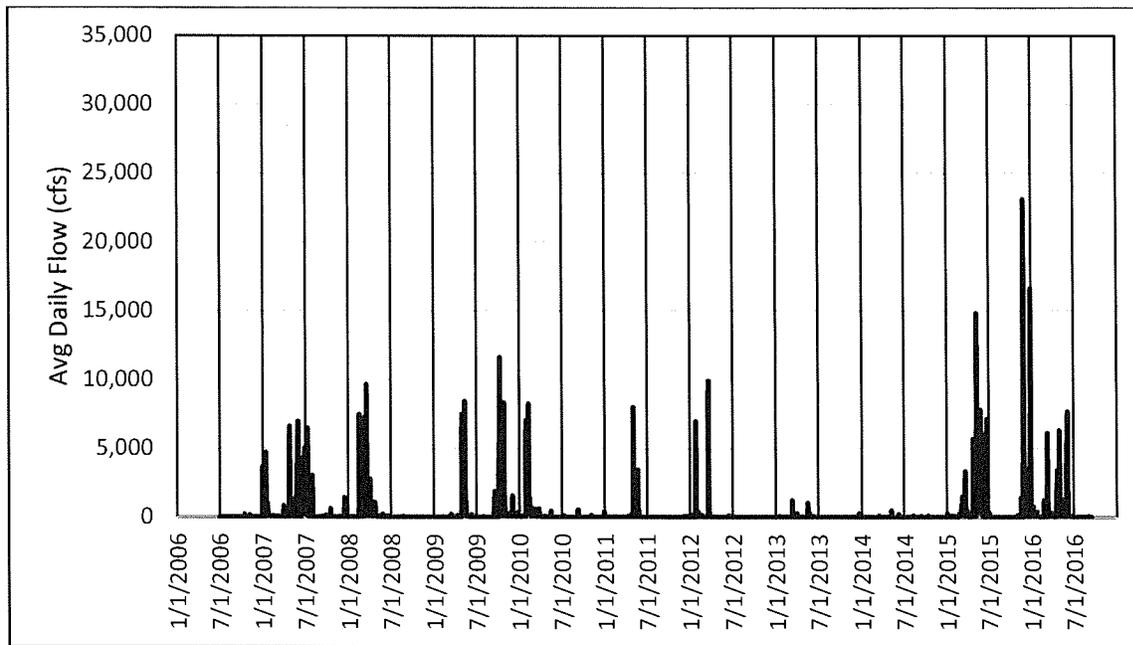


Figure 3.3-6. Historical flow data for Bois d'Arc Creek at FM 1396 (USGS 07332620) (Appendix M)

Table 3.3-3. Bois d'Arc Creek at FM 1396 Gage (USGS 07332620)

Daily Mean Discharge Statistics July 1, 2006 to June 30, 2016										
Month	Daily Mean Discharge (cfs)					Percentile Flows (cfs)				
	Minimum	Median	Average	Maximum	Standard Deviation	10th	25 th	50 th	75th	90th
January	0.04	21.5	195	7,030	791	0.2	4.6	21.5	86.75	205
February	0.01	31	191	8,240	796	1.5	6.85	31	67	263
March	0	47	395	9,900	1,270	1.1	9.28	47	189	632
April	0.10	38	267	6,600	881	4.0	14	38	97	345
May	0	60	668	14,800	1,696	0.7	10.25	60	287	2,363
June	0	12.5	302	7,670	1,027	0.1	0.91	12.5	62	374
July	0	0.06	107	6,480	614	0	0	0.06	6.0	53

Daily Mean Discharge Statistics July 1, 2006 to June 30, 2016										
Month	Daily Mean Discharge (cfs)					Percentile Flows (cfs)				
	Minimum	Median	Average	Maximum	Standard Deviation	10th	25 th	50 th	75th	90th
August	0	0	18	3,030	181	0	0	0	0.35	10
September	0	0	29	1,880	155	0	0	0	1.1	26
October	0	0	267	11,600	1,200	0	0	0	2.6	130
November	0	0.50	214	23,100	1,756	0	0	0.5	11	93
December	0	6.65	209	16,600	1,163	0	0.4	6.65	69.75	207
Annual	0	6	236	23,100	1,108	0	0.02	6.0	52	232

Note: "Percentile Flow" indicates the percentage of time Bois d' Arc Creek flows were at or below the indicated values shown in cubic feet per second (cfs).

Source: USGS, 2012.

Long-Term Hydrologic Modeling using RiverWare at FM 1396 (USGS 07332620)

The available USGS gage data at the reservoir site show flow conditions in Bois d'Arc Creek for only a short period of time. As described in the methods section above, a RiverWare model was developed to estimate the response of the watershed to changing stream conditions over a longer period of time. The model was used to estimate the reservoir yield associated with Alternatives 1 and 2 as well as the total annual discharge from the Bois d'Arc Creek drainage. Figure 3.3-7 shows the layout of the RiverWare model.

Table 3.3-4 summarizes the modeled flows at FM 1396. For this analysis, there are three seasons per year based on the flow characteristics of the watershed. April, May, and June are typically high flow months associated with spring rains. July and August are typically low-flow months associated with high summer temperatures and lower rainfall, and these low flows tend to persist through September and October, which also tend to be relatively dry. From November through March the creek has variable flows, but the flows are typically higher than in the summer season. The median flow for an entire year is about 9 cfs. Note that the July- October flows are significantly less than the other two seasons, with flows less than 1 cfs about 60 percent of the time and less than 10 cfs about 80 percent of the time. Outside of the July- October season, flows are less than 1 cfs from 12 to 15 percent of the time and less than 10 cfs about 36 percent of the time. Based on RiverWare, the total discharge at FM 1396 is approximately 167,347 acre-feet per year.

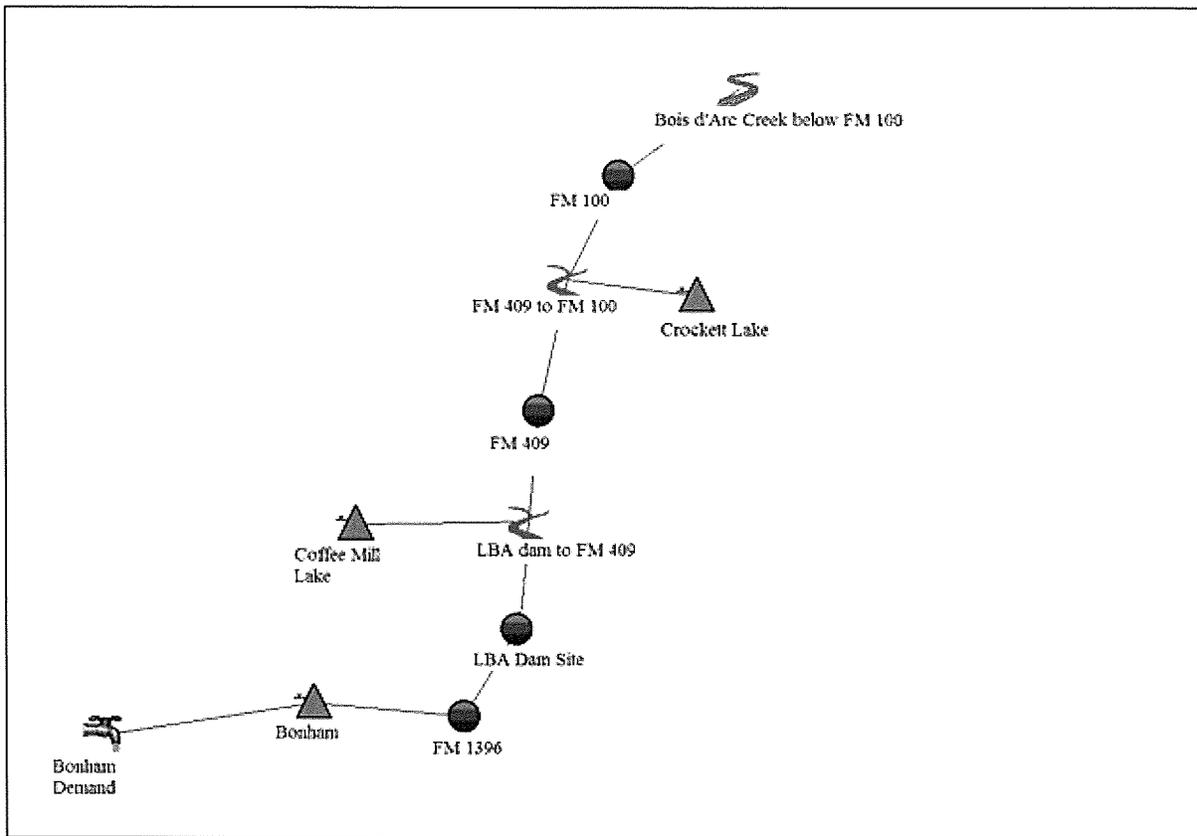


Figure 3.3-7. RiverWare Model Layout

Table 3.3-4. Modeled Flow Statistics for Bois d'Arc Creek at FM 1396 (USGS 07332620)

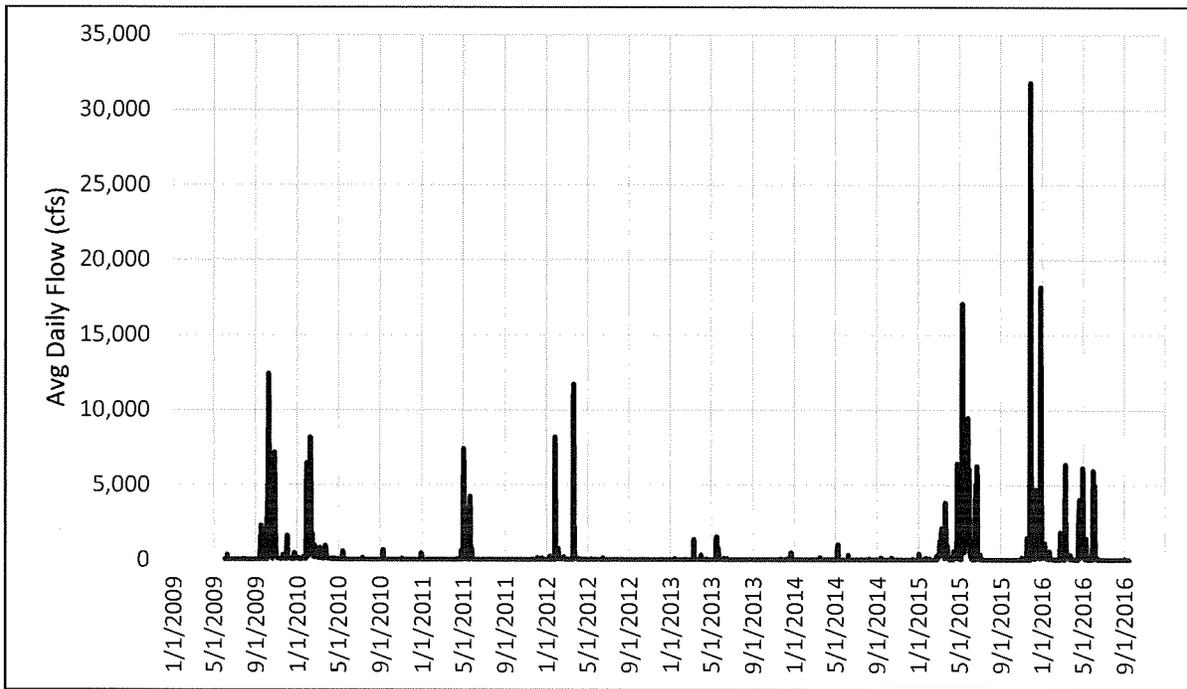
Statistic	Modeled Flows, 1948-1998, in cfs			
	Full Period	April-June	July-October	November-March
Average	231	341	104	268
Minimum	0.0	0.0	0.0	0.0
15%	0.0	2.0	0.0	1.1
30%	1.2	7.2	0.0	6.2
Median	9.2	19.3	0.3	22.1
70%	38.1	63.5	3.2	67.7
85%	145	246	20	234
Maximum	39,914	34,914	30,163	28,091

Bois d'Arc Creek at FM 409 (USGS 07332622)

The Bois d'Arc Creek at FM 409 gage is located just downstream of the proposed dam site as shown in Figure 3.3-5 and measures a drainage area of 370 square miles (Appendix M). Like FM 1396, the USGS has adjusted the rating curve for this gage several times due to horizontal and vertical changes in the

channel bed since its installation, which is an indicator of the dynamic nature of the stream channel at this site; specifically, it indicates that the stream is undergoing rapid erosion and deposition.

Daily mean discharge statistics for June 4, 2009 to June 30, 2016 for the Bois d'Arc Creek at FM 409 gage are shown in Figure 3.3-8 and Table 3.3-5. Annual flows were below 0.19 cfs at the FM 409 gage 25 percent of the time during the period of record. Based on these figures, the average annual discharge at this location is 168,796 AFY.



**Table 3.3-8. Historical flow data for USGS Gage 07332622
Bois d'Arc Creek at FM 409 (Appendix M)**

Table 3.3-5. Bois d'Arc Creek at FM 409 near Honey Grove, Texas Gage (USGS 07332622)

Daily Mean Discharge Statistics June 4, 2009 to June 30, 2016										
Month	Daily Mean Discharge (cfs)					Percentile Flows (cfs)				
	Minimum	Median	Average	Maximum	Standard Deviation	10th	25 th	50 th	75 th	90 th
January	0.7	21	226	8,190	909	2.6	8.4	21	110	254
February	1.5	36	230	8,170	783	4.2	8.95	36	117	450
March	0.9	74	408	11,700	1,271	2.6	8.1	74	290	821
April	2.2	47	262	6,430	860	7.2	18	47	91	416
May	0.4	47	811	17,100	2,147	3.2	9	47	356	2,786
June	0	10	245	6,260	948	0.6	1.9	10	44	175
July	0	0.5	11	390	38	0	0.04	0.5	4	22
August	0	0	2	96	9	0	0	0	0.47	3
September	0	0	50	2,270	240	0	0	0	0.9	33



Daily Mean Discharge Statistics June 4, 2009 to June 30, 2016										
Month	Daily Mean Discharge (cfs)					Percentile Flows (cfs)				
	Minimum	Median	Average	Maximum	Standard Deviation	10th	25 th	50 th	75th	90th
October	0	0.01	372	12,400	1,398	0	0	0.01	3.1	403
November	0	2.3	370	31,800	2,666	0	0.11	2.3	33	119
December	0.04	20	320	18,200	1,555	0.46	1.9	20	123	377
Annual	0	5.1	233	31,800	1,327	0	0.19	5.1	42	209

Note: "Percentile Flow" indicates the percentage of time Bois d' Arc Creek flows were at or below the indicated values shown in cubic feet per second (cfs).

Source: USGS, 2012.

Tributaries to Bois d'Arc Creek

Over 16 main tributaries contribute flows to Bois d' Arc Creek. These tributaries are characterized in Table 3.3-6 and are classified as intermittent/ephemeral or intermittent. While no specific flow measurements were made on tributaries, the contributions of tributaries between USGS gage 07332600 near Randolph, TX, located upstream of the proposed reservoir site, and the FM 1396 gage (USGS 07332620), located just upstream of the dam site and within the proposed reservoir footprint for both alternatives, could amount to as much as 131,000 acre-feet per year. While no empirical information was collected, these contributions likely follow similar flow patterns as those recorded for Bois d' Arc Creek.

Table 3.3-6. Intermittent/Ephemeral Stream Channels in the Bois d'Arc Creek Watershed

Stream Name	Length (feet)	Stream Type
Allens Creek	11,781	Intermittent
Allens Creek Unnamed Tributary	1,843	Intermittent/Ephemeral
Bois d'Arc Creek	80,690	Intermittent
Bois d'Arc Creek Unnamed Tributary	172,907	Intermittent/Ephemeral
Bullard Creek	25,221	Intermittent
Bullard Creek Unnamed Tributary	6,621	Intermittent/Ephemeral
Burns Branch	18,589	Intermittent
Burns Branch Unnamed Tributary	24,126	Intermittent/Ephemeral
Cottonwood Creek	4,079	Intermittent
Fox Creek	7,593	Intermittent
Fox Creek Unnamed Tributary	6,124	Intermittent/Ephemeral
Honey Grove Creek	37,432	Intermittent
Honey Grove Creek Unnamed Tributary	61,967	Intermittent/Ephemeral
Onstott Branch	7,807	Intermittent
Onstott Branch Unnamed Tributary	351	Intermittent/Ephemeral
Pettigrew Branch	12,227	Intermittent
Pettigrew Branch Unnamed Tributary	4,040	Intermittent/Ephemeral
Sandy Branch	4,982	Intermittent
Sandy Branch Unnamed Tributary	3,578	Intermittent/Ephemeral
Sandy Creek	15,416	Intermittent
Sandy Creek Unnamed Tributary	15,264	Intermittent/Ephemeral
Sloans Creek	1,698	Intermittent

Stream Name	Length (feet)	Stream Type
Sloans Creek Unnamed Tributary	655	Intermittent/Ephemeral
Stillhouse Branch	3,445	Intermittent
Stillhouse Branch Unnamed Tributary	1,163	Intermittent/Ephemeral
Thomas Branch	9,567	Intermittent
Thomas Branch Unnamed Tributary	31,837	Intermittent/Ephemeral
Timber Creek	13,311	Intermittent
Timber Creek Unnamed Tributary	19,449	Intermittent/Ephemeral
Ward Creek	26,602	Intermittent
Ward Creek Unnamed Tributary	14,927	Intermittent/Ephemeral
Yoakum Creek	5,851	Intermittent

Source: Coffman, 2016

It is also important to note that tributaries below the proposed dam site will continue to contribute flows to Bois d'Arc Creek. The entire Bois d'Arc Creek drainage area is 425 square miles. The drainage area below the dam is 98.2 square miles, which represents approximately 23 percent of the watershed. As such, the total discharge from the Bois d'Arc Creek watershed at its confluence with the Red River could be as much as 232, 876 AFY, which includes the approximately 170,000 AFY at the point of the dam plus 52,876 acre-feet per year from the tributaries below the proposed dam site.

Streams in the Sulphur River and Trinity Basins

From the confluence of the North and South Sulphur rivers in East Texas, the Sulphur River flows to its confluence with the Red River in Arkansas. Smaller streams in the Sulphur River basin include the North, Middle, and South Sulphur rivers, and White Oak Creek. From the confluence of its Elm and West Forks near Dallas, the Trinity River flows to Trinity Bay, which drains to the Gulf of Mexico. Smaller streams within the Trinity River basin include the Clear, East, Elm, and West forks of the Trinity River and Cedar, Chambers, and Richland creeks.

Reservoirs

Lake Bonham

Lake Bonham is located three miles northeast of Bonham in Fannin County. Developed by the City of Bonham, it was impounded in 1969 and has a surface area of 1,020 acres. The Lake Bonham water right transferred to NTMWD in November 2010, and the lake is now utilized for water supply by NTMWD. This lake furnishes the raw water for NTMWD's supply of potable water to the City of Bonham, which used approximately 1,760 AFY in 2011, more than half the firm yield. However, this source is not connected to NTMWD's primary water supply system and can only be used to meet the City of Bonham's water demands and potential new local demands in Fannin County. Considering this constraint, the available supply from Lake Bonham is limited by the projected demand on this source. In 2020, Lake Bonham is expected to supply 2,511 AFY, increasing to 3,195 AFY by 2030. These supply estimates differ from those in the *2011 Region C Water Plan*, which show the full 3,195 AFY yield of Lake Bonham as available to meet NTMWD's water demands (Kiel and Gooch, 2015).

Coffee Mill Lake

Coffee Mill Lake is a reservoir located approximately 15 miles northeast of Bonham, in the Caddo National Grasslands, under the authority of and managed by the USFS. It was impounded in 1939, has a surface area of 630 acres at its conservation pool elevation of 496 feet MSL, and a maximum depth of 30 feet. The water surface level fluctuates very little even though outflow from the lake is uncontrolled.

Discharge from Coffee Mill Lake flows into Bois d'Arc Creek about two miles downstream of the dam site of the proposed LBCR. There are no stream gage data on its discharge.

Lake Crockett

Lake Davy Crockett is a reservoir located approximately 20 miles east-northeast of Bonham, in the Caddo National Grasslands, under the authority of and managed by the USFS. It was impounded in 1938, has a surface area of 355 acres at its conservation pool elevation of 487 feet MSL, and a maximum depth of 20 feet. The water surface level fluctuates moderately with the seasons and rain events. As with Coffee Mill Lake, outflow from the Lake Crockett is uncontrolled. It flows into Bois d'Arc Creek about four miles downstream of the dam site of the proposed LBCR. There are no stream gage measurements on its daily, seasonal, or annual discharges.

Lake Texoma

Denison Dam and Lake Texoma were authorized for construction by Congress in 1938 for flood control and hydroelectric power generation. The dam, spillway, and outlet works were begun in 1939 and completed in 1944. Lake Texoma is the largest USACE reservoir in the Tulsa District and 12th-largest USACE reservoir in the country. Impounded by the Denison Dam on the Red River in Bryan County, Oklahoma and Grayson County, Texas, Lake Texoma has a normal surface area of 86,910 acres (136 sq. miles), a volume of 2,516,232 acre feet, and 580 miles of shoreline. The dam is 726 miles upstream from where the Red River discharges into the Atchafalaya and Mississippi Rivers, and the drainage area above the dam is 39,719 square miles. The reservoir is located at the confluence of the Red River and Washita River. The dam site is approximately five miles northwest of Denison, Texas, and 15 miles southwest of Durant, Oklahoma (USACE, no date-b).

NTMWD's water right in Lake Texoma is 197,000 AFY, but actual use has never approached this quantity due to several constraints. Beginning in 1990, NTMWD began importing water from Lake Texoma to Lavon Lake because Lake Texoma water is naturally high in total dissolved solids (TDS) and is therefore not usable as potable water on its own. The water is discharged into a tributary of Lavon Lake (Sister Grove Creek) and blended in Lavon Lake to reduce salinity. The water from Lavon Lake is subsequently diverted for treatment at NTMWD's Wylie water treatment plant (WTP). According to the Region C Water Planning Group, the water supply available to NTMWD from Lake Texoma in 2020 will be 70,623 AFY and the same amount will still be available in 2060 (Region C Water Planning Group, 2015).

3.3.3 Bois d'Arc Creek Channel Form

Bois d'Arc Creek is a threshold bedrock channel that has been incised into weathered clays, marls, and shales with limited sources of coarser sediments (Appendix M). The 2-year and 100-year floodplains along Bois d'Arc Creek within the proposed reservoir footprints are depicted in Figure 3.3-9. For Alternative 1, the 2-year floodplain covers approximately 43 percent of the proposed reservoir footprint, and the 100-year flood plain extends over 55 percent of the proposed reservoir footprint (Appendix Q). Because the reservoir for Alternative 2 is smaller, these estimates would be higher.

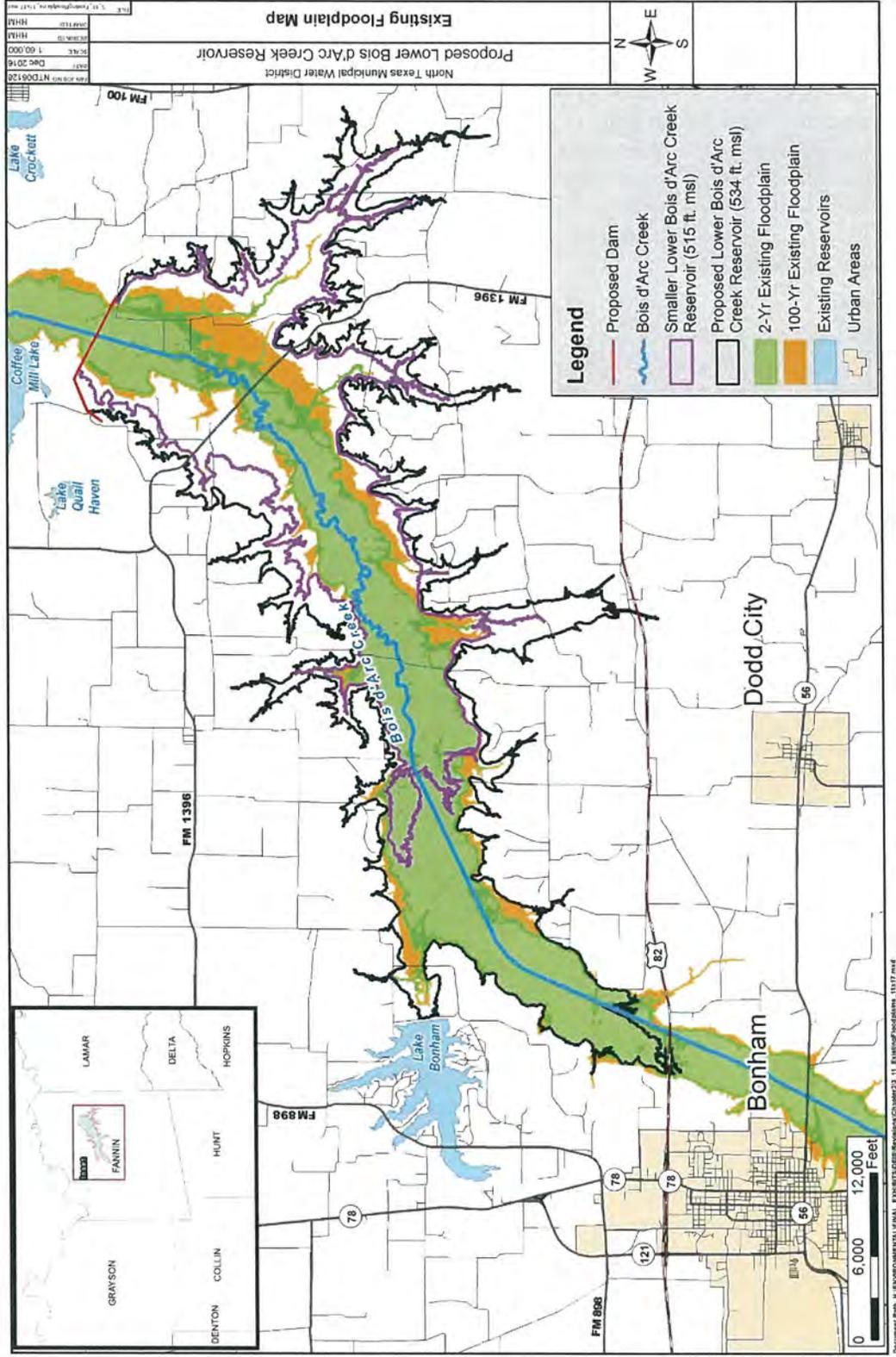


Figure 3.3-9. Floodplains Along Bois d'Arc Creek

Bar deposits of sand and gravel can be found dispersed along the creek. The Instream Flow Study compared a 1915 watershed map to the current system and found that Bois d'Arc Creek has lost over 20 stream miles from channelization. The channelization has resulted in more rapid transport of stream flow and bed materials that has compromised the stream ecology (Appendix M).

The Bois d'Arc Creek has been identified as a highly-channelized stream system (approximately 62 percent of the length of Bois d'Arc Creek within the proposed reservoir site has been channelized), which has contributed to sudden high-flow events and reductions in base flows, erosion of the stream bed and bank areas, and a deficiency in habitat diversity. The Instream Flow Study found flows of less than 1 cfs could transport fine sediments, and gravel would be transported at flows of 25 cfs or more. The hydrologic and geomorphic analyses conducted in the Instream Flow Study also demonstrated Bois d'Arc Creek was in disequilibrium with increased downcutting and erosion and decreased lateral migration or meandering, and stream conditions were generally considered poor (Appendix M).

Alterations of the natural stream channel in Bois d'Arc Creek began prior to 1915, and substantial portions of the stream have been channelized over the past century. Archival aerial photographs show that channelization within the Bois d'Arc Creek system continued all the way into the 1970s. An important question is whether the system has re-established equilibrium since the time it was channelized and the riparian vegetation buffer changed. Determining the state of the channel is accomplished by determining if the channel is in dynamic equilibrium or if the sediment supply and stream power are out of balance. Over the years, many studies of incised channels within alluvial materials have shown that, following channelization, the altered channel geometry evolves through a predictable sequence of channel stages (Appendix Q). These channel evolution sequences/models offer a method for interpreting the current stage of the channel morphology by evaluating the existing channel form and geomorphic processes. The evolution model also provides a means for predicting future channel evolution/channel processes.

Figure 3.3-10 depicts the sequential stages of channel form, starting with the channelized reach, which disrupts the dynamic equilibrium, through major stages of disequilibrium and channel evolution back to a state of dynamic equilibrium. As shown in the diagrams, the channel incises (i.e., cuts down through alluvium or sediments), and then widens as a result of bank failure and mass wasting. As the channel becomes over-widened, it will begin to aggrade (i.e., accumulate sediments on its bed, raising the elevation of the bed once more), because the stream power is insufficient to carry the existing sediment load. Eventually a new channel will form within the over-widened section with sufficient stream power to carry the total sediment supply, and a new dynamic equilibrium will be reached (Appendix L). The entire process can take many decades.

The 2008 RGA documented that all of the surveyed reaches of Bois d'Arc Creek and its tributaries have been affected by human activities; none of them has yet reached a new state of dynamic equilibrium. The 2008 RGA classified 54 percent of Bois d'Arc Creek within the inundation pool of the proposed reservoir as "poor" with the remaining 46 percent being classified as "fair." Eighty-six percent of Honey Grove Creek within the inundation pool was classified as "fair" with the remainder classified as "good" (8%) or "poor" (6%). Ward Creek was classified mostly as "fair" (84%) with the remaining 16 percent classified as "poor." Majorities of Bullard Creek (82%) and Sandy Creek (83%) were classified as "poor" with the remainder of both streams classified as "fair".

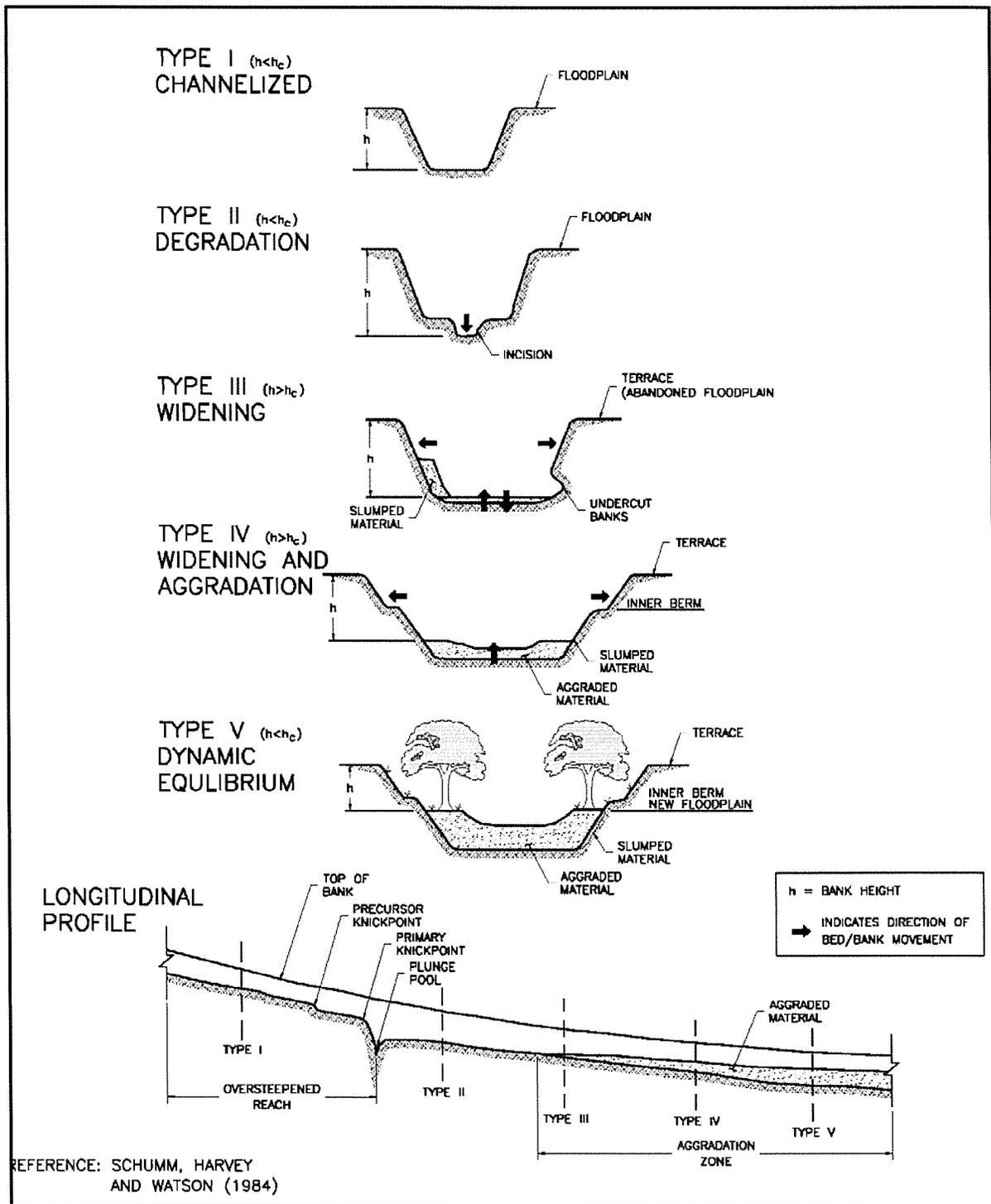


Figure 3.3-10. Incised Channel Evolution Process

Source: Figure 3-1 in Appendix L

The Instream Flow Study looked at planform stability (planform is the contour of a shape viewed from above) and inferred lateral migration rates by analyzing historical photographs of Bois d'Arc Creek. The study found that the banks of Bois d'Arc Creek were actively eroding and channel widening was occurring as a result, with limited meander development within the incised straightened channel. The studied reaches in Bois d'Arc Creek were found to be increasing in cross-sectional area due to mass failure of bank material that was induced by scouring and removal of lower bank material leading to oversteepening of banks and subsequent bank collapse. Higher amounts of fluvial erosion occurred on the sparsely vegetated, exposed banks at the FM 1396 site than the FM 409 site (Appendix M). Abandoned channels or artificial oxbows have been created from the channel straightening, and bank loss was estimated at 0.5 foot per year. Reduced habitat has resulted from channelization and bank instability as peak flows scour away gravel bars and low flows reduce the connectivity along the stream with little to no flow during dry times (Appendix M).

3.3.4 Bois d'Arc Creek Water Quality

TCEQ has adopted Texas Surface Water Quality Standards in order to protect the quality of the state's water, and these standards include both general and site-specific criteria (TCEQ, 2010c). According to TCEQ, Bois d'Arc Creek is not a classified stream segment as defined in Appendix A of their standards, although Appendix D does list a site-specific standard for dissolved oxygen for the reach that runs from the confluence with Sandy Creek upstream to the confluence of Pace Creek; this reach is upstream of the proposed reservoir site (TCEQ, 2010c). In the absence of site-specific standards, water quality standards apply from the segment downstream from where the stream is located; the site-specific criteria outlined in Appendix A for the Red River below Lake Texoma segment apply to Bois d'Arc Creek (TCEQ, 2010c). The water uses associated with the site-specific criteria for the Red River below Lake Texoma segment include primary contact recreation, high aquatic life, and public water supply (TCEQ, 2010c).

Some of the TCEQ surface water quality standards that are applicable to Bois d'Arc Creek are summarized in Table 3.3-7. The criteria listed for chloride, sulfate, and total dissolved solids are maximum annual averages, and the dissolved oxygen criterion is a minimum 24-hour mean (TCEQ, 2010c). Criteria for specific toxic materials for the protection of aquatic life and human health have not been included in this table but are listed in Tables 1 and 2 of the full water quality standards (TCEQ, 2010c).

Table 3.3-7. Applicable Water Quality Standards for Bois d'Arc Creek

Site-specific Uses and Criteria for Classified Segments ^a	
Chloride, maximum annual average (mg/L)	375
Sulfate, maximum annual average (mg/L)	250
Total dissolved solids, maximum annual average (mg/L)	1,100
Dissolved oxygen, minimum 24-hour mean (mg/L)	5.0
pH (standard units)	6.5-9.0
<i>E. coli</i> (colony forming units per 100 mL)	126
Temperature (°F)	93
Site-specific Criteria for Unclassified Water Bodies ^c	
Dissolved oxygen (mg/L)	4.0

^a = Applicable site-specific criteria are for the Red River below Lake Texoma segment.

^c = Applicable unclassified water body standard is for Bois d'Arc Creek between the Sandy Creek and Pace Creek confluences (located upstream of the proposed reservoir).

Source: TCEQ, 2010c

Water quality results from 1996 to 2006 were summarized for 13 water quality sampling stations within the Red River Basin as part of the NTMWD's report supporting an application for a Texas water right for the proposed reservoir (Appendix R). A summary of these data are provided in Table 3.3-8. Samples from these sampling stations had average concentrations between 6 and 302 mg/L for chloride, 14 and 286 mg/L for sulfate, and 101 and 930 mg/L for total dissolved solids (Appendix R). One sampling station (Red River below Denison Dam) had an average sulfate concentration of 286 mg/L and exceeded the water quality criterion for sulfate. No other sampling stations exceeded these water quality criteria.

Table 3.3-8. Red River Basin Water Quality Data, 1996-2006

Sampling Location	Average concentration		
	Chloride (mg/L)	Sulfate (mg/L)	Total dissolved solids (mg/L)
Lake Texoma near Dam	297	237	930
Red River below Denison Dam	302	286	NA
Red River at SH 78 (Bonham)	301	222	927
Red River at U.S. 271 (Arthur City)	211	194	817
Red River at SH 37 (Clarksville)	178	167	684
Post Oak Creek (2 sites)	57	130	447
Choctaw Creek (2 sites)	179	206	808
Bois d'Arc Creek at FM 100	31	61	343
Pine Creek (2 sites)	86	114	336
Pat Mayse Lake	6	14	101

Notes:

NA = no data available.

Source: Appendix R

Table 3.3-9 provides a summary of Bois d'Arc Creek water quality data collected for the proposed reservoir project and the applicable water quality criteria. Water quality data collected during the Instream Flow Study and from other sources (i.e., USGS, TCEQ, RRA) indicate Bois d'Arc Creek meets its High Aquatic Use classification, meaning that water quality is high enough to protect aquatic life (Appendix M).

Table 3.3-9. Summary of Bois d'Arc Creek Water Quality Data

Water Quality Parameter	Applicable Criteria	Sampling Site						
		FM 78	U.S. 82	CR 2645	FM 1396	FM 409	FM100	USFS
Sampling date or range	NC	3/2004 to 7/2005	6/2007 to 7/2009	6/2009 to 7/2009	6/2009 to 7/2009	6/2009 to 7/2009	10/1997 to 1/2006	7/9/2009
Number of samples	NC	10	24	7	34	32	10	4
Mean (or range in) flow (cfs)	NC	0.0375 to 52	0 to 0.4 ^a	0.6 to 1.6	0.1 to 3.1 ^a	0.1 to 2.5 ^a	---	0 to 0.3
Mean (or range in) temperature (°C)	33.9	19.2	4.30 to 30.0	28.6 to 30.9	3.72 to 33.1	3.55 to 31.2	---	26.5 to 25.8

Water Quality Parameter	Applicable Criteria	Sampling Site						
		FM 78	U.S. 82	CR 2645	FM 1396	FM 409	FM100	USFS
Mean (or range in) specific conductance (µS/cm)	NC	542	123 to 665	502 to 511	255 to 567	278 to 872	---	650 to 654
Mean (or range in) pH (standard units)	6.5 to 9.0	8.1	6.32 to 9.04	7.5 to 7.8	6.3 to 8.31	7.71 to 8.26	---	7.3 to 7.4
Mean (or range in) dissolved oxygen (mg/L)	5	8.1	2.48 to 11.5	5.2 to 6.2	3.4 to 13.0	3.53 to 11.5	---	6.3 to 6.8
Mean (or range in) turbidity (NTU)	NC	9.4	3.15 to 1,950	---	3.66 to 1,290	5.02 to 822	---	---
Mean (or range in) chloride (mg/L)	375	---	5.77 to 75.1	---	9.45 to 37.0	10.6 to 82.8	31	---
Mean (or range in) sulfate (mg/L)	250	---	8.45 to 67.3	---	20.6 to 54.1	19.5 to 131	60	---
Mean (or range in) total dissolved solids (mg/L)	1,100	---	142 to 390	---	150 to 346	158 to 526	343	---

Notes:

NC = No criterion.

--- = no data.

^a Flow for 7/2009 water quality data only.

Sources: Appendix R and M; TCEQ, 2010c.

3.3.5 Groundwater

The site of the proposed reservoir is underlain by several aquifers. An aquifer is an underground layer of saturated, permeable (capable of being penetrated by liquids or gases), porous rock or unconsolidated materials (gravel, sand, or silt) that can contain or transmit water. Groundwater may be extracted from aquifers and put to beneficial use by means of water wells drilled from the ground surface down into the aquifer. Aquifers may occur at widely varying depths beneath the ground surface. Those closer to the surface are not only more likely to be used for water supply and irrigation, but are also more likely to be responsive to local rainfall patterns, rising during periods of high rainfall and falling during droughts. The upper boundary of unconfined aquifers is the water table, the upper surface level of the zone of saturation, above which lie unsaturated rock and/or soil. Water in confined aquifers is blocked from upward movement by a layer of low hydraulic-conductivity (or relatively impermeable) rock above the aquifer.

Some of the aquifers in the proposed project area, such as the Northern Trinity Aquifer and Woodbine Aquifer, are significant regional aquifers and recognized by the State of Texas as major or minor aquifers. Other aquifers in the area are less important regionally, although groundwater may be produced from local sources to meet a variety of needs. In addition to the Northern Trinity and Woodbine aquifers, groundwater in Fannin County is also produced from the Austin Chalk formation, the Blossom Aquifer, and the Red River alluvial aquifer, as well as an unnamed, shallow aquifer present beneath the proposed reservoir site. A generalized stratigraphic section (showing underlying rock strata or layers) of all the

major geologic formations that are present underneath Fannin County is shown in Table 3.3-10, and a generalized cross-section showing geologic formations through the region is shown in Figure 3.3-13.

Woodbine Aquifer

The Woodbine Aquifer is a Cretaceous age sandstone aquifer that crops out or reaches the ground surface in northern Fannin County along the Red River. The Woodbine Aquifer is a significant source of groundwater supply in Fannin County and accounts for a majority of the wells in the county and nearly 50 percent of total groundwater pumping in the county. The Woodbine Aquifer is primarily used for municipal purposes and accounts for the majority of municipal groundwater use in Fannin County. Lesser amounts of groundwater from the Woodbine Aquifer are also used for livestock and steam-electric purposes. The locations and depths of wells producing from the Woodbine Aquifer in Fannin County from the TWDB database are shown in Figure 3.3-12.

The Woodbine Aquifer is composed of water-bearing sandstone beds interbedded with shales and clay. The aquifer outcrops, or reaches the ground surface, along the Red River and dips south and eastward to depths of over 2,500 feet below land surface with a thickness of about 700 feet (LBG-Guyton, 2003). Wells in or near the outcrop area are less than 500 feet deep, with depths rapidly increasing to a maximum of over 2,500 feet. Most wells are less than 1,800 feet deep in the Woodbine Formation.

Wells completed into this aquifer can yield moderate to large quantities of water. However, water levels in some areas are declining, with some wells showing significant water level declines over time, with some cases of declines of hundreds of feet. The wells with more stable water levels tend to be located in the northern part of Fannin County where the tilted Woodbine Aquifer outcrops, that is, it reaches the ground surface. The Woodbine Aquifer contains mostly fresh water (less than 1,000 mg/L total dissolved solids) within Fannin County, although some areas in and near the outcrop of the Woodbine Aquifer contain groundwater of poorer quality. However, these areas are sporadic and may be associated with areas of the Woodbine Aquifer that are in hydraulic connection with Red River alluvium.

Table 3.3-10. Stratigraphic Units (Rock Layers or Formations) and Their Water-Bearing Characteristics in Fannin County

Era	System	Series	Group	Stratigraphic Unit/Formation	Estimated Maximum Thickness	Strata Description	Water-Bearing Characteristics ^a	
Cenozoic	Quaternary	Recent		Alluvium	100	Sand, silt, clay, and gravel	Yields small to large quantities of water to wells	
		Pleistocene		Fluviatile terrace deposits				
	Tertiary			Undifferentiated				
			Navarro	Kemp Clay/Corsicana Marl	800	Fossiliferous clay and hard limy marl	Not known to yield water to wells.	
			Taylor	Nacatoch Sand		Fine sand and marl, fossiliferous	Yields small quantities of water near the outcrop.	
			Austin	Marlbrook Marl/Pecan Gap Chalk/Wolf City/Ozan	1,500	Clay, marl, mudstone and chalk	Yields small quantities of water to shallow wells.	
		Gulf		Gober Chalk/Brownstone Marl/Blossom Sand/Bonham Formation	700	Chalk, limestone and marl, fine to medium sand, fossiliferous	Yields small to moderate quantities of water to wells; very limited as an aquifer.	
			Eagle Ford	Undifferentiated	650	Shale with thin beds of sandstone and limestone	Yields small quantities of water to shallow wells.	
			Woodbine	Undifferentiated	700	Medium to coarse iron sand, sandstone, clay and some lignite	Yields moderate to large quantities of water to municipal, industrial and irrigation wells.	
Mesozoic	Cretaceous		Washita	Grayson Marl		Fossiliferous limestone, marl and clay; some sand near top	Yields small quantities of water to shallow wells.	
		Mainstreet/Pawpaw/Weno/Denton						
		Fort Worth/Duck Creek						
					Kiamichi			
				Comanche	Fredericksburg	Goodland	250	Cherty limestone, marly limestone
			Trinity	Walnut Clay		Clay, marl, shale and shell agglomerates	Not known to yield water to wells.	
				Paluxy	400	Fine sand, sandy shale and shale	Yields small to moderate quantities of water to wells.	
				Antlers	1,500	Limestone, marl, shale and anhydrite	Yields small quantities of water in localized areas.	
				Twin Mountains	1,000	Fine to coarse sand, shale and clay; basal gravel and conglomerate	Yields moderate to large quantities of water to wells.	
Paleozoic				Paleozoic Rocks Undifferentiated				

^a Yield, in gallons per minute (gpm): small, less than 100 gpm; moderate, 100-1,000 gpm; large, more than 1,000 gpm

Sources: Bené et al., 2004; Nordstrom, 1982

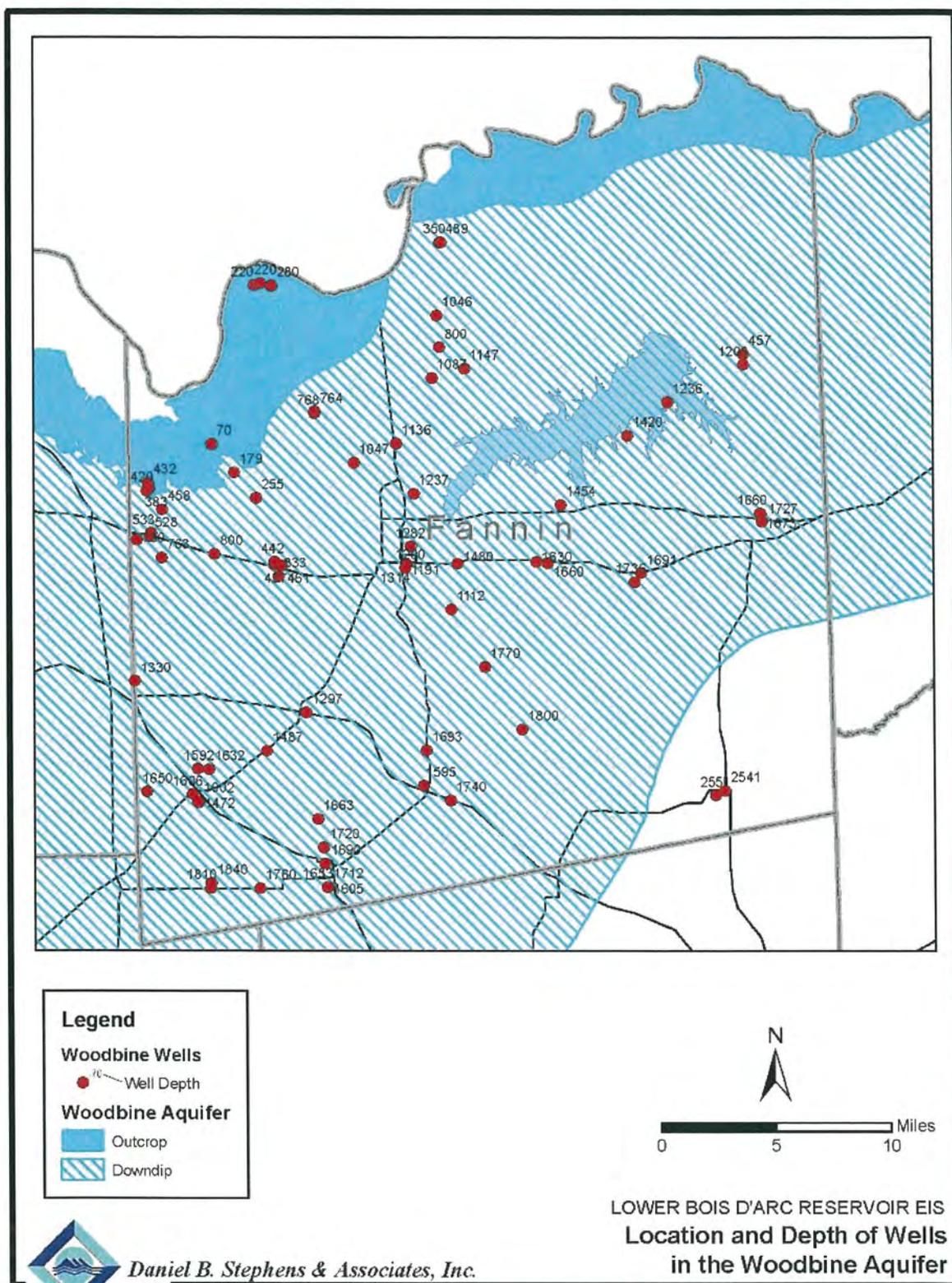


Figure 3.3-12. Location and Depths of Wells in the Woodbine Aquifer in Fannin County, Texas

Trinity Aquifer

The Trinity Aquifer is an aquifer system composed of several individual aquifers within the Cretaceous-age Trinity Group. The Trinity Aquifer is found throughout Fannin County and is located stratigraphically several layers beneath the Woodbine Aquifer (shown in Table 3.3-10). Very little groundwater is produced from the Trinity Aquifer in Fannin County, with only a few wells present in the southeastern corner of the county. These wells are extremely deep (greater than 3,000 feet), can produce several hundred gallons per minute, and are generally used for municipal water supply purposes.

Trinity Group deposits in Fannin County generally include sands, limestones, shales, and clays of the Paluxy Formation. Groundwater flow in the Trinity Aquifer is generally from the outcrop areas in a downdip direction. Because the Trinity Aquifer does not outcrop within Fannin County, all groundwater in the Trinity Aquifer within the county is found under artesian conditions, that is, under pressure which pushes the water upward. Due to the limited number of wells in the Trinity Aquifer in Fannin County, it is not possible to delineate groundwater flow directions. In general, the flow will be in a downdip direction, toward the east-southeast. Water level measurements providing data on the Trinity Aquifer are also scarce, although hydrographs of Trinity Aquifer wells within Fannin County indicate that water levels in the Paluxy Formation of the Trinity Aquifer are declining by 3 to 4 feet per year.

Because of the limited number of wells producing from the Trinity Aquifer in Fannin County, it is difficult to fully define the water quality within this aquifer. The available data indicate the Trinity Aquifer has very consistent water quality results, with total dissolved solids ranging between 850 and 900 mg/L. However, based on water quality analyses from adjacent counties (LBG-Guyton, 2003), there is likely to be some slightly saline water present in the Trinity Aquifer in Fannin County.

3.4 BIOLOGICAL RESOURCES

This section provides a discussion of the existing conditions of the biological resources for Alternatives 1 and 2. The biological resources that have been identified that may be affected by Alternatives 1 and 2 include waters of the United States, including wetlands; upland habitat; aquatic biota; wildlife; threatened and endangered species; and invasive wildlife and plant species.

The project components of Alternative 1 and 2 are defined at the beginning of Chapter 3. The evaluation of the biological resources has been conducted with the understanding that the reservoir footprint of Alternative 2 is fully situated inside the reservoir footprint of Alternative 1. The footprint for the associated project components including the dam, raw water pipeline, WTP, and TSR is the same for both Alternatives 1 and 2. A broad description of the existing conditions is provided in some instances for the Bois d'Arc Creek watershed for resources such as tree cover or streams.

The assessment of the affected environment is based on information reported in the Preliminary and Approved Jurisdictional Determinations (Appendices H and I), Habitat Evaluation Procedure (HEP) Report for the Proposed Lower Bois d'Arc Creek Reservoir Site (Appendix J), Application of the East Texas Hydrogeomorphic Approach (HGM) to the LBCR Project (Appendix K), Rapid Geomorphic Assessments (RGAs) of Bois d'Arc Creek (Appendix L), Instream Flow Study (Appendix M), Environmental Report Supporting an Application for a 404 Permit for Lower Bois d'Arc Creek Reservoir (Appendix Q), and supporting publications and documents cited in Chapter 6, References Cited, of this Revised DEIS.

3.4.1 Methods

It should be noted that data collection related to biological resources was inhibited to an extent by land access issues, that is, lack of permission for access to all private properties, especially within the reservoir footprint. This necessitated extrapolation of findings from sites to which access was gained and data obtained to other sites which were not actually visited or observed by biologists.

Wetland Delineation

Wetlands and surface waters in the proposed LBCR reservoir site for Alternatives 1 and 2 (i.e., the area in which existing or baseline habitats would be altered by construction activities, reservoir clearing, and impoundment of water) were identified through a field delineation using the *1987 Corps of Engineers Wetland Delineation Manual*. Section 404 of the Clean Water Act (CWA) authorizes the USACE to review and issue regulatory permits for activities that may discharge dredged or fill material into waters of the United States, which includes wetlands. The *1987 Corps of Engineers Wetland Delineation Manual* was written to provide technical guidance on how to determine wetlands and waters of the United States that are under USACE jurisdiction pursuant to Section 404 of the CWA. Objectives of the manual are to provide technical guidelines and methods for implementing the guidelines. These technical guidelines for wetlands do not constitute a classification system, but provide a basis for determining whether a given area is a wetland under Section 404 (USACE, 1987).

Habitat Evaluation Procedure

The Habitat Evaluation Procedure (HEP) was conducted to quantify habitat value of the proposed LBCR reservoir site for Alternatives 1 and 2 (i.e., the area in which existing or baseline habitats would be altered by construction activities, reservoir clearing, and impoundment of water). The HEP analysis was conducted by multiple interagency teams that included personnel from USFWS, USACE, EPA, USFS, TPWD, TWDB, TCEQ, NTMWD, and Freese and Nichols, Inc. This evaluation was made to determine baseline conditions of the nine habitat types identified. HEP was also performed on the proposed Riverby Ranch mitigation site to quantify existing habitat values on that site. In this Revised DEIS, HEP was used to determine compensatory mitigation requirements for emergent and shrub wetlands. A detailed description of the HEP analysis is provided in Appendix J.

HEP was developed by the USFWS in 1974 to provide a habitat-based evaluation methodology for use as an analytical tool in impact assessments and project planning. HEP is a species-habitat analysis of the ecological value of a study area. Its approach is to quantify the value of habitat available in a geographic area to a selected set of wildlife species (evaluation species). The HEP analysis describes wildlife habitat values at baseline and future conditions to allow for comparison of different areas. Providing quantitative values for comparisons means this analytical approach may be used in planning applications such as the assessment of current and future wildlife habitat, trade-off analyses or compensation analyses. Two general types of wildlife habitat comparison can be made using HEP:

1. The relative value of wildlife habitats at different locations at the same point in time; and
2. The relative quality of wildlife habitats at the same locations at future points in time.

To quantify habitat quality, sixteen evaluation species (American kestrel, barred owl, brown thrasher, Carolina chickadee, downy woodpecker, eastern cottontail, eastern meadowlark, eastern turkey, field sparrow, fox squirrel, green heron, raccoon, racer, scissor tailed flycatcher, swamp rabbit, and the wood duck), were selected by the HEP team based on their ecological significance and the availability of applicable Habitat Suitability Index (HSI) models. The HSI scale ranges from 0.0 to 1.0, with 0.0 being unsuitable habitat and 1.0 being optimal habitat for an evaluation species. The HSI value obtained from this comparison becomes an index of carrying capacity (the population size or density a habitat of a given quality can support) for selected evaluation species.

Hydrogeomorphic Approach (HGM)

Developed to be used with the Clean Water Act Section 404 Regulatory Program, the HGM approach derives functional indices as well as the protocols to apply these indices to the assessment of wetland functions at specific sites. The HGM tool can be applied to analyze project alternatives, minimize impacts, assess unavoidable impacts, determine mitigation requirements, and monitor the success of compensatory mitigation (Camp et al., 2016).

The HGM approach includes four parts: (a) the HGM classification, (b) reference wetlands, (c) assessment variables and assessment models from which functional indices are derived, and (d) assessment protocols. HGM is conducted in two phases (Williams *et al.*, 2010). In the first, an interdisciplinary assessment team of experts carries out the development phase of the HGM approach. In the second phase, the assessment variables, models, and protocols are applied to assess wetland functions at the site(s) of interest.

In 2011, the Office of Wetlands, Oceans, and Watersheds at EPA in Dallas contracted with the Waters of East Texas Center, Stephen F. Austin State University, Arthur Temple College of Forestry and Agriculture (SFASU) to conduct field testing in Fannin County of the methods outlined in the *Regional Guidebook for Applying the Hydrogeomorphic Approach to the Functional Assessment of Forested Wetlands in Alluvial Valleys of East Texas* (Williams et al., 2010), referred to as the East Texas Guidebook. The East Texas Guidebook was originally prepared to support forested wetland functional assessment in the modern floodplains of riverine systems in the East Texas Pineywoods ecoregion. The objective of the 2011 study request by EPA was to evaluate the methods and models in the guidebook for use in assessing forested wetland functions for the proposed LBCR of Alternatives 1 and 2.

The 2011 assessment team sampled forested wetlands associated with riverine geomorphic sites in Fannin County that were believed to approach the highest functional condition to measure the wetland variables identified in the East Texas Guidebook. Property access limited specific sample locations. The variables were used in models to calculate functional capacity indices (FCI). The USACE Tulsa District Regulatory Office contacted SFASU during the summer of 2015 to discuss the additional work that would be necessary to modify variable metrics and models in the East Texas HGM FCI spreadsheet calculator for use in the evaluation of the proposed LBCR site for Alternatives 1 and 2. In 2016, an interagency team conducted HGM at both the proposed reservoir site and the proposed Riverby Ranch mitigation site.

In this Revised DEIS, HGM was used to determine compensatory mitigation requirements for forested wetlands. A detailed description of the HGM analysis is provided in Appendix K.

3.4.2 Habitat

Wetlands

Wetlands are habitats that represent a transition zone between dry upland and wet areas. The USACE defines wetlands as areas that are inundated or saturated by surface or groundwater at a frequency and duration that will support vegetation and soil characteristics that will thrive in saturated conditions (USACE, 1987). Wetlands are identified and delineated using the methodologies and procedures identified in the 1987 Corps of Engineers *Wetlands Delineation Manual* (USACE, 1987). The manual uses three factors, vegetation, hydric soil, and hydrology, to determine if an area is a wetland. Hydrology largely determines how soils develop and the plant and animal communities that live in and on a given soil type. Soils exposed to prolonged saturation or inundation develop particular physical and chemical properties and become hydric or wetland soils.

Wetlands may support both terrestrial and aquatic species. They also support hydrophytes, specialized plants that have adapted to thrive under the prolonged presence of water. Wetlands include habitats such as, but not limited to, marshes (emergent wetlands), swamps (forested wetlands), bogs, muskegs, vernal pools and other habitat types. "Jurisdictional wetlands" are those wetlands that are considered waters of the United States, as defined in 33 CFR 328.3, and therefore are regulated by the USACE under Clean Water Act Section 404. Determining if an area is a wetland and determining if that wetland is also jurisdictional are two separate steps. The first task is to determine if an area is a wetland. After determining whether an area is a wetland, a jurisdictional determination is made.

The vegetation communities and plant species in eastern Texas are highly diverse; the bottomland communities and their associated wetlands are among the most biologically productive and diverse ecosystems in North America (USFWS, 1984). A desktop analysis was conducted to identify land cover types that occur within the footprint of the proposed reservoir under Alternative 1, as shown in Figure 3.4-1. Upland land cover types are discussed in Section 3.4.2.3.

A map identifying the boundaries of jurisdictional wetlands and water bodies within the project area is presented in Figure 3.4-2. A formal wetland delineation for the entire reservoir project area was not conducted, although some data collection occurred during field efforts associated with the instream flow study and field applications of functional assessment tools. Wetland land cover types in the proposed reservoir footprint were estimated to include 4,602 acres of forested wetlands, 1,223 acres of emergent wetlands, and 49 acres of scrub shrub wetlands. Water bodies or waters of the United States were initially identified and delineated in 2007 by a Preliminary Jurisdictional Determination (PJD) and then verified in 2015 when an Approved JD (AJD) was conducted by the USACE. Water bodies present within the project area consist of 78 acres of open water and approximately 651,140 linear feet (219 acres) of streams later classified as 286,139 linear feet (120 acres) of existing intermittent streams and 365,002 linear feet (99 acres) of intermittent/ephemeral streams.

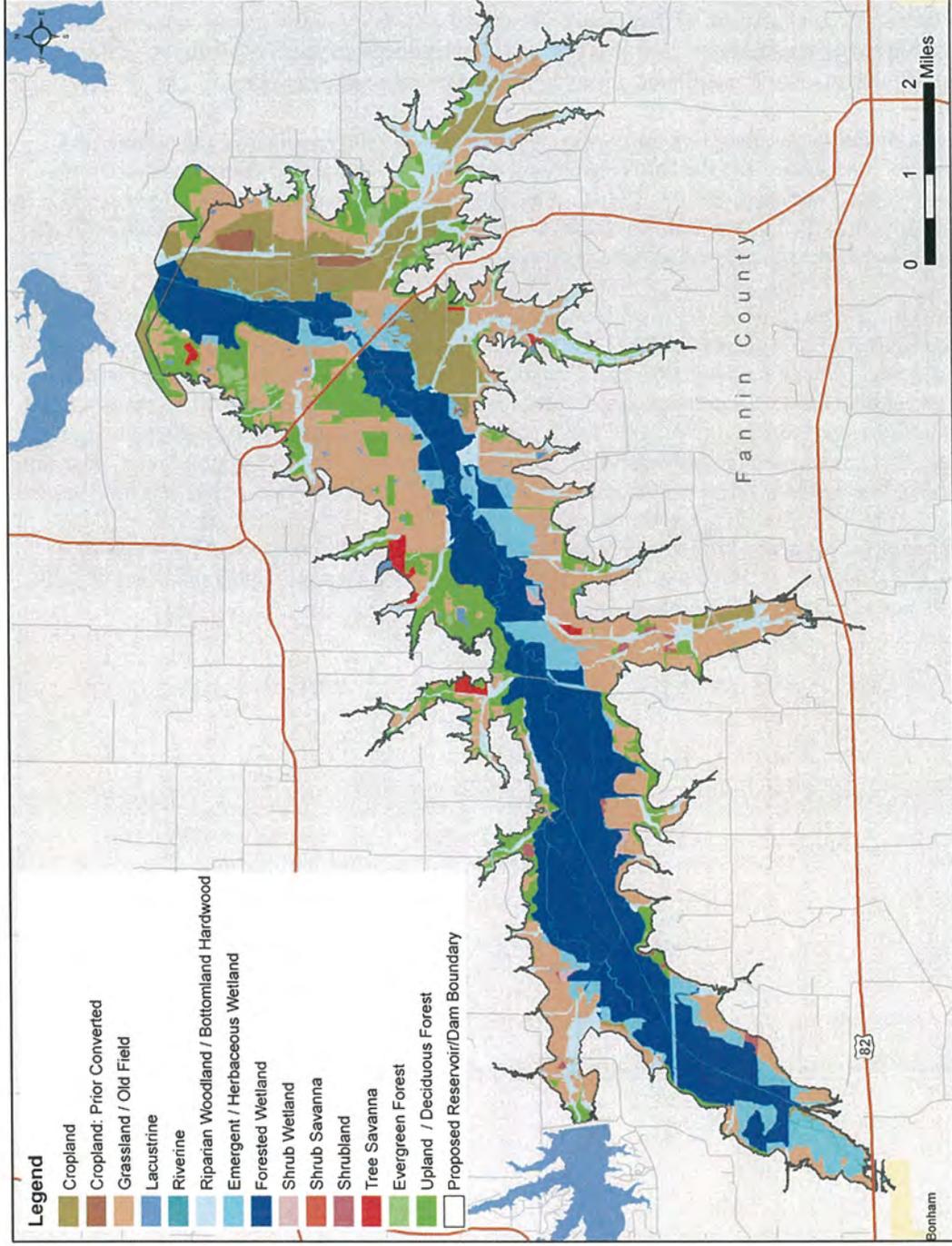


Figure 3.4-1. Existing Land Cover Types within the Reservoir Footprint for Alternative 1

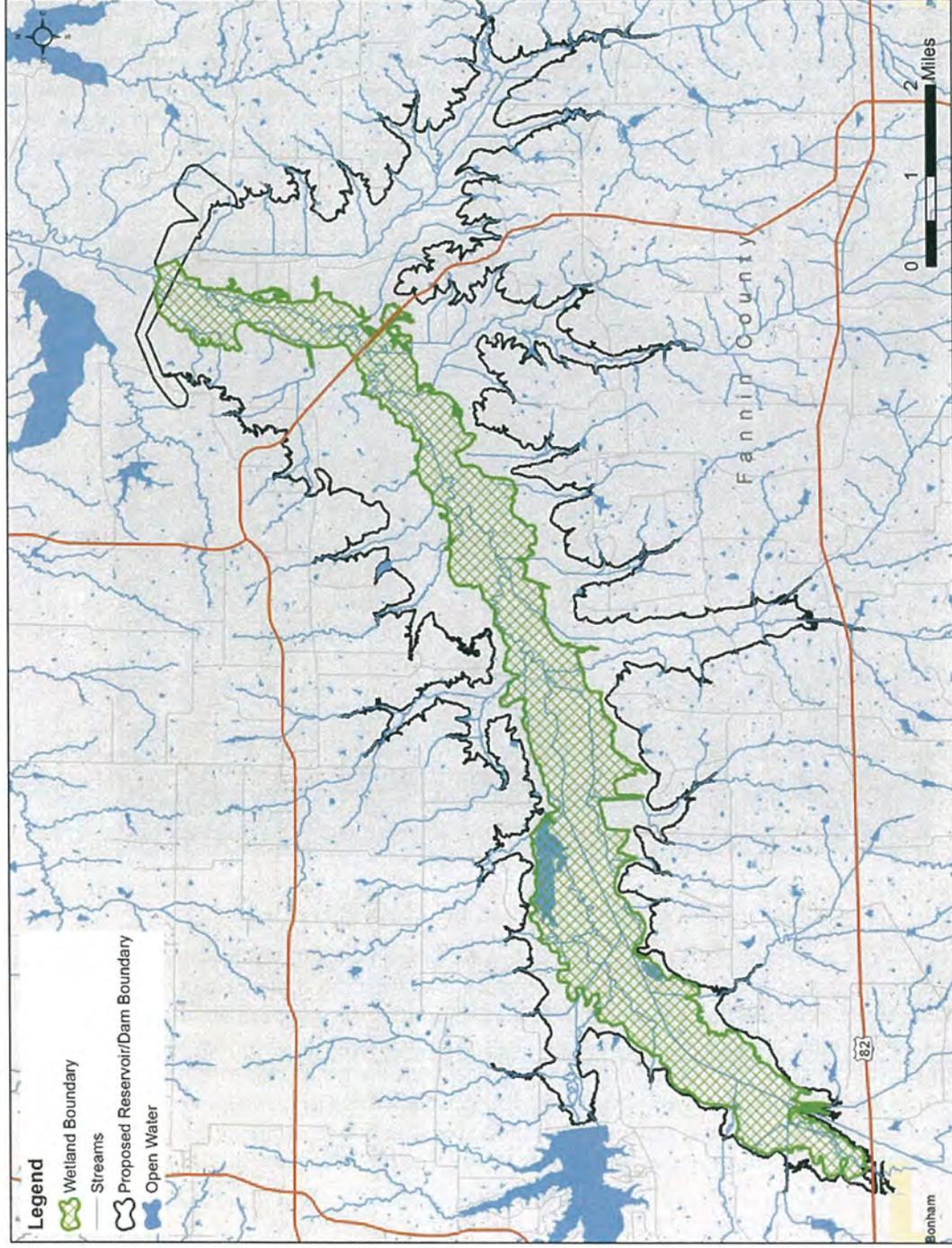


Figure 3.4-2. Existing Jurisdictional Wetlands and Waters within the Reservoir Footprint for Alternative 1

The primary stream within the project area is Bois d'Arc Creek; all other streams on the site are either direct tributaries of Bois d'Arc Creek or tributaries of tributaries to Bois d'Arc Creek. Bois d'Arc Creek flows in a generally southwest to northeast direction to its confluence with the Red River at the northern boundary of Fannin County which is also the northern state boundary. Approximately 62 percent of the main stem of Bois d'Arc Creek within the LBCR footprint has been channelized (Kiel, 2016a). The creek has been characterized as flashy, showing rapid response to rainfall events with extended periods of little or no flow. It experiences periodic flooding. Bar deposits of sand and gravel can be found dispersed along the creek. The highly channelized and straightened nature of Bois d'Arc Creek (Figure 3.4-3) plays an important role in determining the current behavior and geomorphological processes that prevail in the stream, and also contributes to considerable erosion of its bed and banks, limited habitat and biotic diversity in channelized sections, and minimal lateral migration. Detailed information regarding hydrology is discussed in Section 3.3.



Figure 3.4-3 Channelized Portion of Bois d'Arc Creek

In the Revised DEIS, a desktop assessment of the affected environment for wetlands and waters was also conducted for the proposed smaller LBCR (Alternative 2). The footprint of the proposed reservoir project area for Alternative 2 in certain areas is the same as the footprint of the proposed project area of Alternative 1, and in other areas is smaller and situated within the footprint of the larger proposed project area of Alternative 1. Therefore, the assessment and descriptions for wetlands and waters of Alternative 1 encompass the footprint of the reservoir project area for the smaller LBCR. A map, also generated by a desktop exercise, of the vegetation cover types for Alternative 2 is shown in Figure 3.4-4. Jurisdictional wetlands and waters identified under this assessment for Alternative 2 are displayed in Figure 3.4-5.

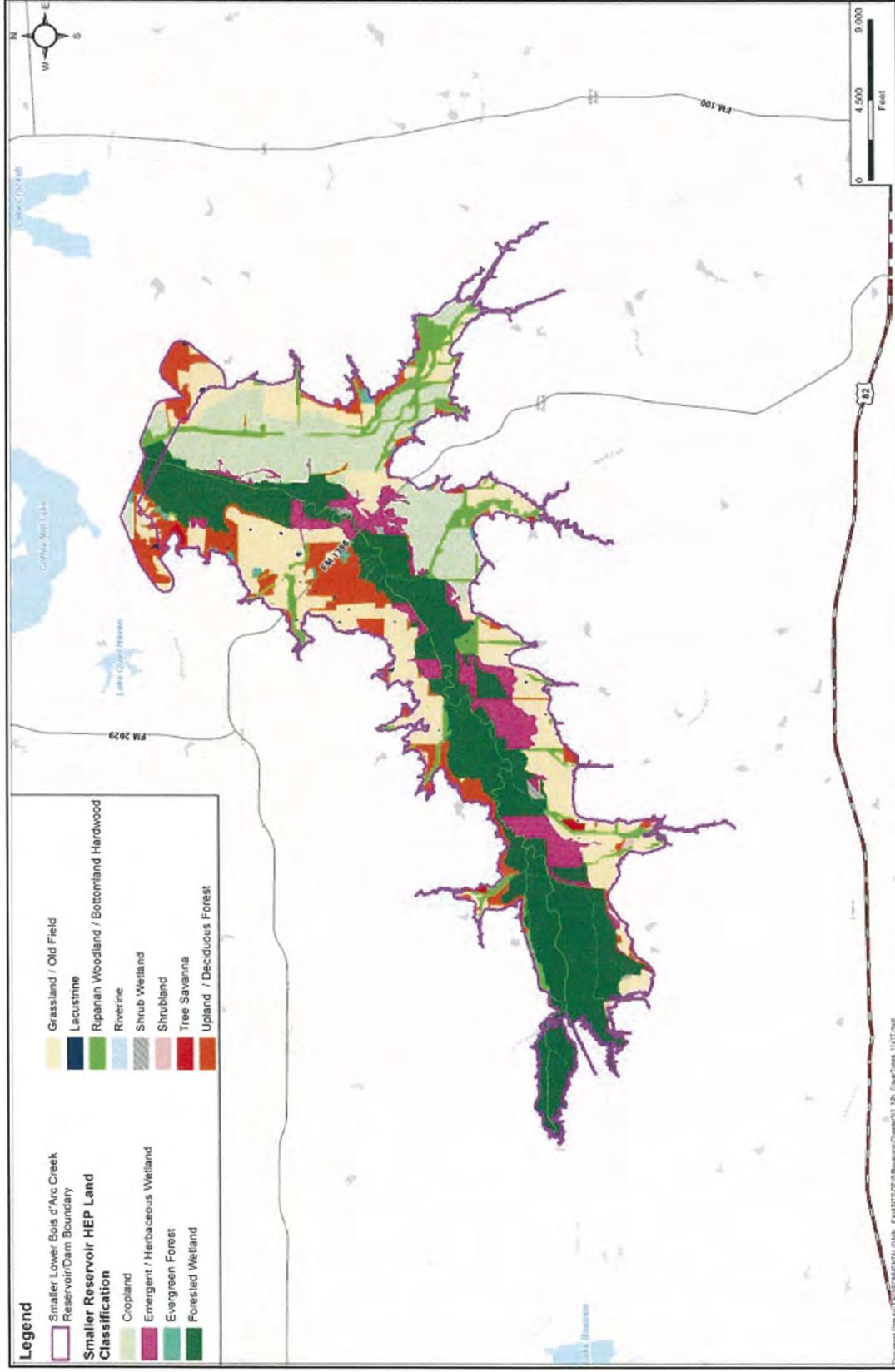


Figure 3.4-4. Existing Land Cover Types within the Footprint of the Smaller Lower Bois d'Arc Creek Reservoir (Alternative 2)

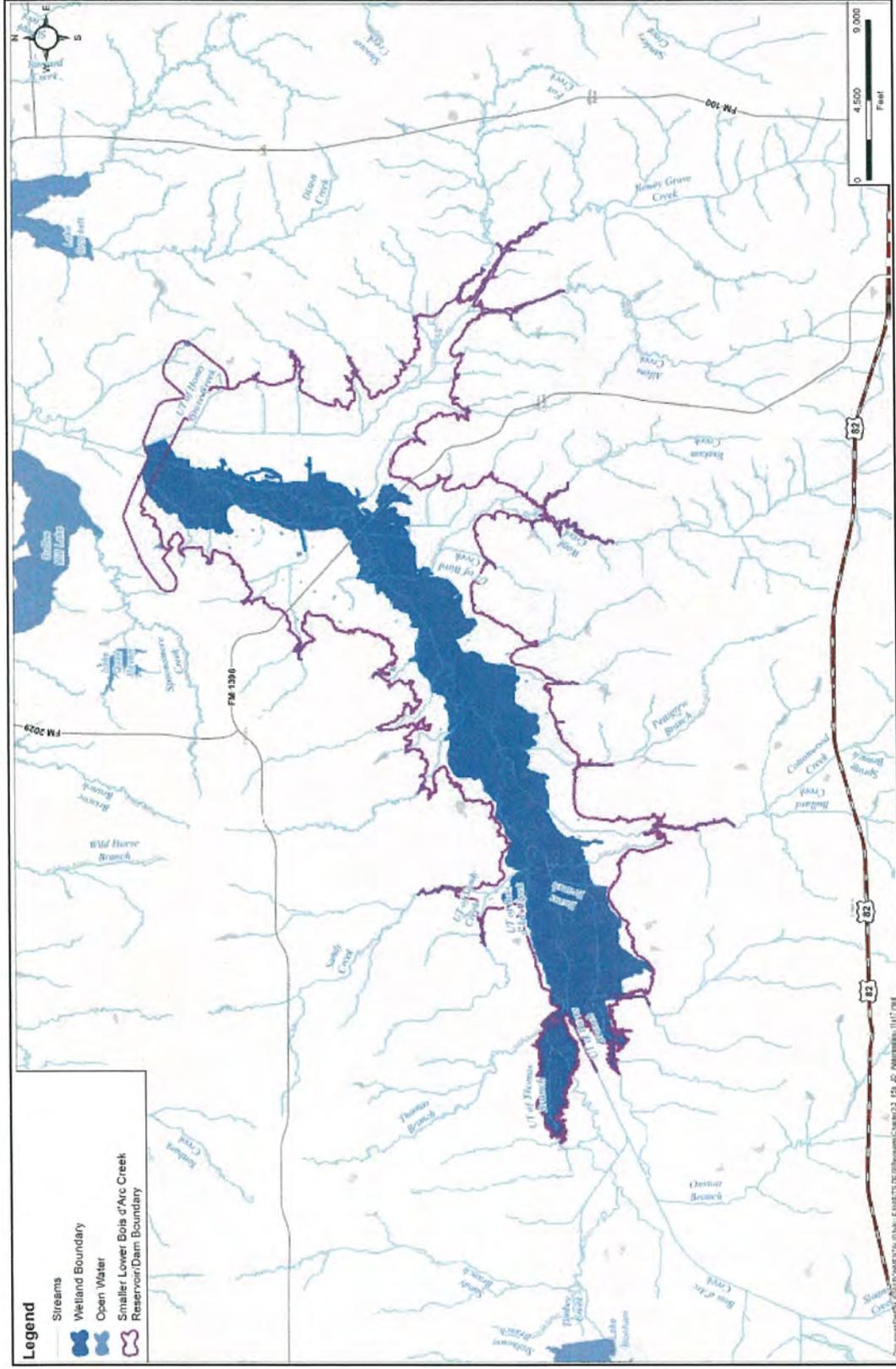


Figure 3.4-5. Existing Jurisdictional Wetlands and Waters within the Footprint of the Smaller Lower Bois d'Arc Creek Reservoir (Alternative 2)

For both Alternatives 1 and 2, the areas in which the proposed raw water pipeline, WTP, and TSR would be constructed have no wetlands present, and all of these components have been sited in uplands or existing right-of-way (ROW). Vegetative cover was not assessed for the pipeline to be constructed from Lake Texoma to the balancing reservoir (for Alternative 2 only) since it is being placed within an existing ROW. Waters (in the form of streams) that occur within the overall proposed project area are discussed in Section 3.3.

Forested Wetlands

The forested wetlands cover type includes wetland areas dominated by woody vegetation at least six meters tall, with a total vegetation cover of more than 30 percent; this designation is synonymous with the riparian woodland / bottomland hardwood cover type. The forested wetlands in the proposed reservoir footprint are predominantly deciduous forests and are associated with the floodplains of Bois d'Arc Creek and Honey Grove Creek. The condition of the forest floor in these areas varies from standing water to dry, cracking mud. Average tree canopy cover equals approximately 68 percent, while the shrub cover equals approximately 19 percent. There are approximately 4,602 acres of forested wetlands in the proposed footprint of Alternative 1.

The forested wetlands, also known as bottomlands, of the southeastern United States, including Texas, are increasingly subjected to various development pressures which have resulted in high rates of conversion of stream bottom habitats. As a result, in 1984 the USFWS published the Texas Bottomland Hardwood Preservation Program Category 3 (U.S. Fish and Wildlife Service, 1985) which identified 62 forested bottomland areas proposed for conservation consideration, and further placed the sites into six priority categories. Bois d' Arc Creek is categorized as Priority 4, which is defined as moderate quality bottomlands with minor waterfowl benefits. The USFWS Preservation Program recognizes the forested region of eastern Texas as having value for wintering mallards, wintering and breeding wood ducks and other species; it also recognizes that the area has played a key role in sustaining continental waterfowl populations (USFWS, 1984).

Dominant trees include black willow (*Salix nigra*), boxelder (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), sugarberry (*Celtis laevigata*), and cedar elm (*Ulmus crassifolia*). Average diameter at breast height (dbh) of overstory trees is approximately nine inches and basal area in the forest averages 97 square feet per acre. Dominant shrubs are often small trees of the species listed above, as well as honey locust (*Gleditsia triacanthos*), poison ivy (*Toxicodendron radicans*), coralberry (*Symphoricarpos orbiculatus*), buttonbush (*Cephalanthus occidentalis*), and Virginia creeper (*Parthenocissus quinquefolia*). Common herbaceous plants in the bottomland hardwood forest include baccharis (*Baccharis* spp.), Cherokee sedge (*Carex cherokeensis*), ragweed (*Ambrosia* spp.), and Virginia wildrye (*Elymus virginicus*).

The tree cover observed both in the LBCR footprint as well as in the Bois d'Arc Creek watershed is commonly limited to one to three dominant tree species including green ash, sugarberry, and cedar elm. Green ash, which is a pioneer species that readily invades cutover sites in the project area, is the most prevalent. This is indicative that the wetland forest is immature within areas that have experienced logging activities that have been ongoing for decades.

All of the forested wetlands within the footprint of the proposed reservoir are designated under HGM as sub-class low-gradient riverine. Riverine wetlands occur within the 5-year floodplain and the riparian corridor associated with stream channels. Their primary water source is from overbank or backwater flow from the channel. Other water sources for riverine wetlands include interflow, overland flow from adjacent uplands, tributary inflow, and direct precipitation. Low-gradient riverine wetlands are found within the floodplains of rivers. These floodplains can be wide even along relatively narrow channels, a feature that is common in modern coastal plain river systems. Typically, such systems have large,

distinctive geomorphic features and are often subjected to both overbank and backwater flooding. Their typical hydrogeomorphic setting includes point bars, backswamps, and natural levee deposits associated with meandering streams within the 5-year floodplain (Williams et al., 2010). All of the forested wetlands are contiguous and are located within the 5-year floodplain of Bois d'Arc Creek, as shown in Figure 3.4-6 (Votaw, 2016). The forested wetlands are strongly associated with the Tinn Clay, 0-1 percent slopes, frequently flooded and Tinn Clay, 0-1 percent slopes, occasionally flooded soil map units.

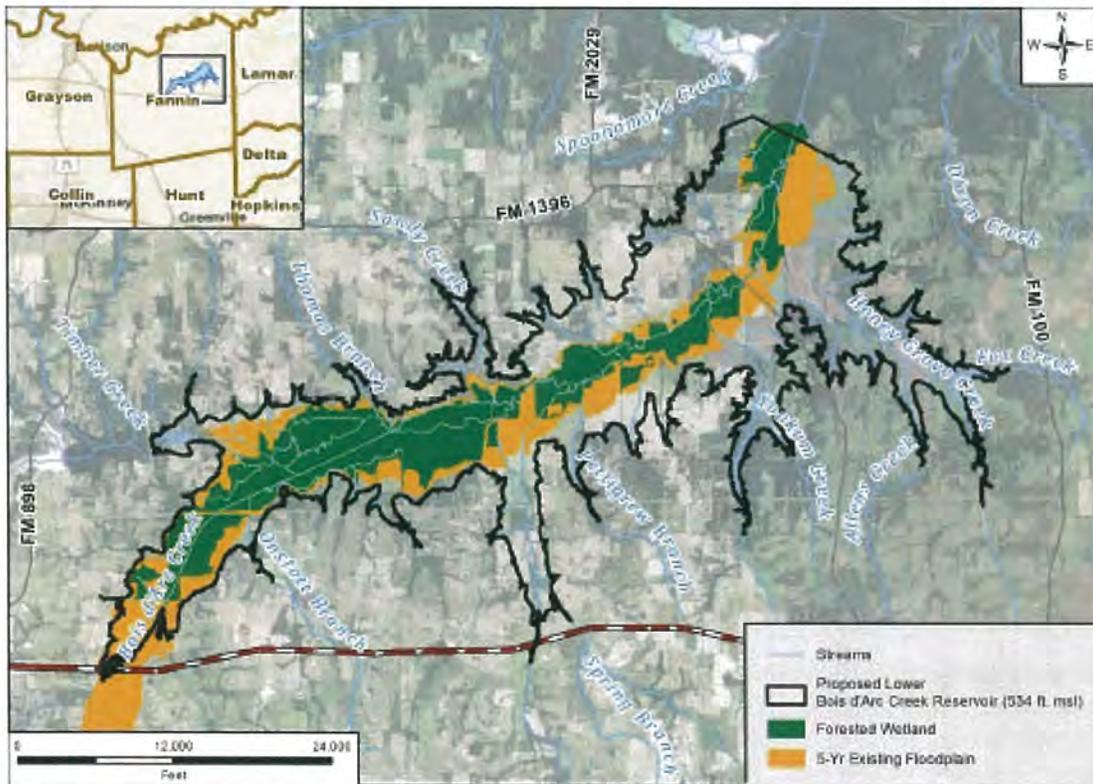


Figure 3.4-6. Forested Wetlands Located Within the 5-year Floodplain of the Project Area

Initially, the United States Fish and Wildlife Service (USFWS) HEP was used as an assessment tool for forested wetlands. The HEP is a species-specific analysis of the ecological value of an area that evaluates the relative quality and value of wildlife habitat. A detailed description of the HEP analysis is presented in section 3.4.1.2 and Appendix J. The HEP determined the forested wetlands in the project area to be low quality (Figure 3.4-7), with a habitat suitability index of 0.25 (on a scale of 0 to 1).



Figure 3.4-7. View Looking Upstream (towards Southeast) of Bullard Creek, an Example of a Sub-class Low Gradient Riverine Forested Wetland

In response to comments on the 2015 DEIS, changes to the forested wetlands assessment methodology were made. In collaboration with the cooperating agencies EPA, USFWS, and TPWD, the HEP assessment tool for forested wetlands was changed to the hydrogeomorphic (HGM) approach. HGM is a model specifically designed to measure the functions of Forested Wetlands. It cannot be used to assess emergent or scrub shrub wetland functions. At the time the LBCR Section 404 permit application was submitted in 2008, there was no vetted HGM model available in the Tulsa District to measure such functions; therefore HEP was originally used to assess Forested Wetlands. In 2016, HGM was introduced and USACE and the cooperating agencies participated in a collaborative reassessment of the forested wetlands using the Modified East Texas HGM. HEP reports quality units as habitat units (HUs) while the HGM reports functional capacity units (FCUs).

FCUs are derived by multiplying the area of forested wetlands by the functional capacity index (FCI) value. The FCI value is an indication of the ability of a given wetland to perform a specific function relative to the ability of reference standard wetlands to perform the same function. FCI values range from 0.0 to 1.0; wetlands with an FCI of 1.0 perform the assessed function at a level comparable to reference standard wetlands. A lower FCI indicates that the wetland is performing a function at a level below reference standard wetlands. The FCI value for each function was multiplied by the acreage of forested wetlands in the proposed reservoir area, 4,602 acres, to determine the functional capacity units (FCUs) for the function. The six wetland functions evaluated, their FCI value as determined by the HGM approach, and the resulting functional capacity units for each function are summarized in Table 3.4-1. A detailed description of the HGM analysis is presented in section 3.4.1.3 and Appendix K.

Table 3.4-1 shows relatively high FCI values for the six wetland functions, indicating that the forested wetlands within the project area are functioning close to the reference standard community. "Reference standard wetlands" are high-quality wetlands and are given an FCI of 1.0, the highest score possible; reference wetlands perform functions at a level characteristic of the least altered wetland sites in the least modified landscapes (Williams et al., 2010). The functional capacities of the downstream wetlands are similar to the functional capacities within the proposed reservoir footprint.

Table 3.4-1. Forested Wetlands Functional Capacity Index Values and Functional Capacity Units

Wetland Function	FCI	Functional Capacity Units in Acres (hectares)
Detain Floodwater	0.92	4,233.84 (1,713.04)
Detain Precipitation	0.78	3,589.56 (1,452.36)
Cycle Nutrients	0.85	3,911.70 (1,582.70)
Export Organic Carbon	0.87	4,003.74 (1,619.94)
Maintain Plant Communities	0.90	4,141.80 (1,675.80)
Provide Habitat for Fish and Wildlife	0.86	3,957.72 (1,601.32)

Emergent Wetlands

Emergent wetlands are defined as areas with a total vegetation cover of greater than 30 percent that are dominated by hydrophytic plants growing on or below the water surface (USFWS, 1980c; Cowardin et al., 1979). An example of an emergent wetland is pictured in Figure 3.4-8. Emergent wetlands in the project area are dominated by an herbaceous layer made up of wetland obligates (species that are found only in wetlands) such as rushes (*Juncaceae* spp.), sedges (*Cyperaceae* spp.), smartweed (*Polygonum* spp.), and redstem (*Ammannia* spp.). The shrub layer is primarily made up of black willow, green ash, baccharis, swampprivet (*Forestiera* spp.), buttonbush (*Cephalanthus occidentalis*), honey locust, cocklebur (*Xanthium strumarium*), and desert false indigo (*Amorpha fruticosa*). The herbaceous canopy includes numerous grass species, such as barnyard grass (*Echinochloa crus-galli*), crowngrass (*Paspalum* spp.), and eastern gammagrass (*Tripsacum dactyloides*). Other plants found in the herbaceous wetlands include rushes, blue sedge (*Carex glaucoidea*), spikerush (*Eleocharis* spp.), flatsedge (*Cyperus* spp.), smartweed, sumpweed (*Iva annua*), frog fruit (*Phylla* spp.), water primrose (*Ludwigia* spp.), balloon vine (*Cardiospermum halicacabum*), dock (*Rumex* spp.), and buttercup (*Ranunculus* spp.).



Figure 3.4-8. Example of an Emergent Wetland

A HEP analysis was conducted in 2007 for the proposed reservoir site and in 2013 for other project component areas including the raw water pipeline, WTP and TSR sites. A brief description of the HEP analysis is provided in Section 3.4.1.2 and a more detailed description is provided in Appendix J. Approximately 1,223 acres of emergent wetlands were identified within the Alternative 1 (full-sized) reservoir footprint in 2007. During the HEP field data collection, 11 emergent wetland habitat variables were assessed at six random sites within these 1,223 acres of emergent wetlands. The total acreage of existing emergent wetlands (1,223 acres) was multiplied by the average habitat quality, called the Habitat Suitability Index (HSI), which had a value of 0.42 to obtain a Baseline Habitat Unit (HU). The HEP determined an HU of 514 for emergent wetlands within the Alternative 1 reservoir footprint. This value is an estimate of the aggregate value of emergent wetlands present on site. This is the value that serves as the basis for determining the amount of compensatory mitigation.

Scrub Shrub Wetlands

Scrub shrub wetlands are areas dominated by woody vegetation that is less than five meters tall, with greater than 30 percent total vegetation cover. Shrub-dominated riparian zones are included in this cover type (USFWS, 1980c). Scrub shrub wetlands in the project area (Figure 3.4-9) can be considered wetlands in successional transition between herbaceous wetlands and bottomland hardwood forests. The scrub shrub layer is dominated by small trees such as green ash, sugarberry, and cedar elm, as well as shrub species such as honey locust and baccharis. Scrub shrub canopy cover in the project area averages approximately 48 percent. Dominant herbaceous plants include sedge, ragweed, ironweed (*Vernonia* spp.), goldenrod (*Solidago* spp.), evening primrose (*Oenothera speciosa*), round-leaf groundsel (*Packera obouta*), trumpet vine (*Campsis radicans*), and wild pea (*Lathyrus* spp.). Herbaceous canopy cover averages approximately 66 percent.

Approximately 49 acres of scrub shrub wetlands were identified within the Alternative 1 reservoir footprint. Applying HEP in the same way as described above for emergent wetlands, an average HSI value of 0.46 was obtained for these scrub shrub wetlands and thus it was determined that 23 HUs exist within this community. This value is an estimate of the aggregate value of scrub shrub wetlands present on site and serves as the basis for determining the amount of compensatory mitigation that would be required.



Figure 3.4-9. Scrub Shrub Habitat within the Reservoir Project Area

Streams

Bois d' Arc Creek is a warm water precipitation dependent stream characterized by a high degree of artificial channelization. Channelized stream reaches were identified through an assessment using a comparison of a 1915 topographic map to contemporary aerial photography. The effects of artificial channelization are exacerbated by local geology, which is characterized by cohesive highly erodible soils. Increased overland sheet flow (associated with watershed agricultural land use) and large flood pulse occurrences caused from rainfall events have downcut stream banks approximately 20 to 30 feet throughout the majority of the mainstem channel. These changes to channel morphology have reduced channel bed and bank topography, thus leading to an altered aquatic system with reduced instream habitat variability.

The Instream Flow Study included in Appendix M is a compilation of multiple studies that includes hydrology, geomorphology, biology, and water quality. The biological component of the instream flow study reflects the integration of the hydrology, hydraulics, geomorphology and water quality aspects of the stream (Bovee et al., 1998; Annear et al., 2002; TWDB, 2008). These components directly impact aquatic habitats, biological migration, reproduction, and aquatic life viability. Understanding these relationships provides a mechanism to create and maintain a stable ecological environment.

To characterize the baseline conditions of a stream, the biological component of an instream flow study includes determining relationships among aquatic communities, life histories, and habitats (TIFP, 2008). Flow regimes affect the quality and quantity of available habitat (Bunn and Arthington, 2002). Flow regimes also manipulate the geomorphic structure of a channel and affect water quality conditions in streams, in turn influencing the biological processes. Habitat conditions are generally characterized in terms of water velocity, depth, substrate composition, and instream cover. The aquatic habitats in Bois d' Arc Creek are subject to displacement during high flow events. During periods with low flows, the habitats are generally limited to perennial pools, which limits both run and riffle habitats. The aquatic life must be adaptable to changes in flow, which can limit biotic diversity.

A stream order designation is a measure of the relative size of streams. The smallest tributaries are designated as first-order streams, while the largest river in the world, the Amazon, is designated as a twelfth-order waterway. The order of a stream can be used to understand the sediment potential in a stream segment and to determine what types of aquatic life might be present in the waterway. Bois d' Arc Creek is classified as a 3rd to 4th order stream for the sampling reaches of the instream flow study.

Existing Stream Classification

Seventeen named streams/creeks and 15 associated tributaries that support aquatic biota exist within the project area. All of the streams/creeks are intermittent or intermittent/ephemeral. Figure 3.4-10 shows an example of an intermittent/ephemeral stream. A detailed discussion of these streams may be found in Section 3.3.

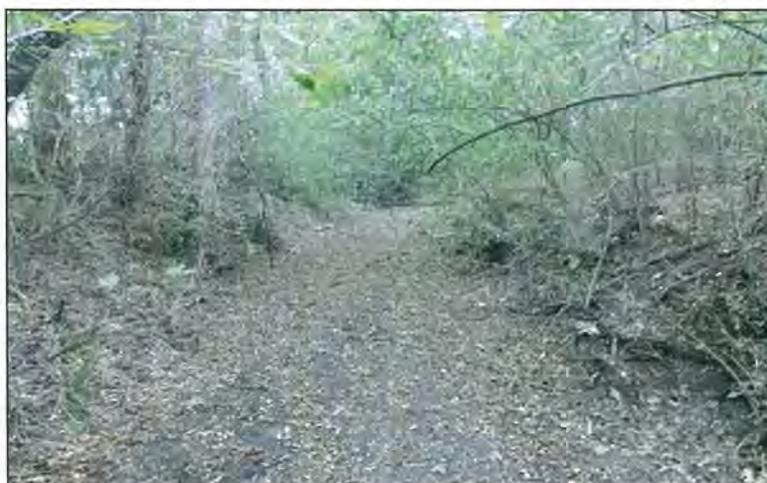


Figure 3.4-10. Downstream View (East) of an Unnamed Ephemeral Tributary of Loring Creek, an Example of an Intermittent/Ephemeral Creek

Upland Habitats

Upland habitat occurs in areas of land lying above the level where water flows or where flooding occurs, at a higher elevation than the alluvial plain or stream terrace. This section discusses regional upland habitat, as well as the various upland community types that occur in the project area.

Regional Vegetation

The proposed project area is located in the Blackland Prairie and the Northern Post Oak Savannah Level IV Ecological regions (see Figure 3.4-11) (Griffith et al., 2004). These regions extend from approximately the Red River of Oklahoma south to San Antonio, Texas, east to the East Texas Pineywoods and west to the Eastern Cross Timbers.

The Backland Prairie represents the southernmost extension of the North American tallgrass prairies and is dominated by a diverse assortment of perennial and annual grasses and forbs. Historically, vegetation in the northern portion of this ecoregion consisted of little bluestem (*Schizachyrium scoparium*), yellow Indiangrass (*Sorghastrum nutans*), and tall dropseed (*Sporobolus asper* var. *asper*). Dominant grasses included eastern gamagrass (*Tripsacum didactylus*), switchgrass (*Panicum virgatum*), Silveanus dropseed (*S. silveanus*), Mead's sedge (*Carex meadii*), and long-spike tridens (*Tridens strictus*). Common forbs included asters (*Aster* spp.), prairie bluet (*Hedyotis nigricans*), prairie clovers (*Dalea* spp.), and black-eyed susan (*Rudbeckia hirta*) (Griffith et al., 2004). While prairie grasslands were the dominant vegetation cover in this ecoregion, forests were located primarily along stream courses and some upland areas (USGS, 2011e). Bur oak (*Quercus macrocarpa*), Shumard oak (*Q. shumardii*), sugar hackberry (*Celtis laevigata*), elm (*Ulmus* spp.), ash (*Fraxinus* spp.), eastern cottowood (*Populus deltoides*), and pecan (*Carya illinoensis*) once dominated these forests (Griffith et al., 2004).

By the 1800s most of this area was converted to farmland, which remains the dominant land cover today. Forests, grassland/shrubland, and developing land are also leading land covers found in this ecoregion. Minor land covers include wetlands, water, and mining. Forests within the region are primarily located in stream drainages or in areas where mesquite and juniper shrubland was allowed to grow into tree height woodlands. Grassland/shrublands can be found in 1) areas where less intense grazing occurs, 2) land where wood vegetation was allowed to grow on pasture land, and 3) on idle Conservation Reserve Program (CRP) farmland.

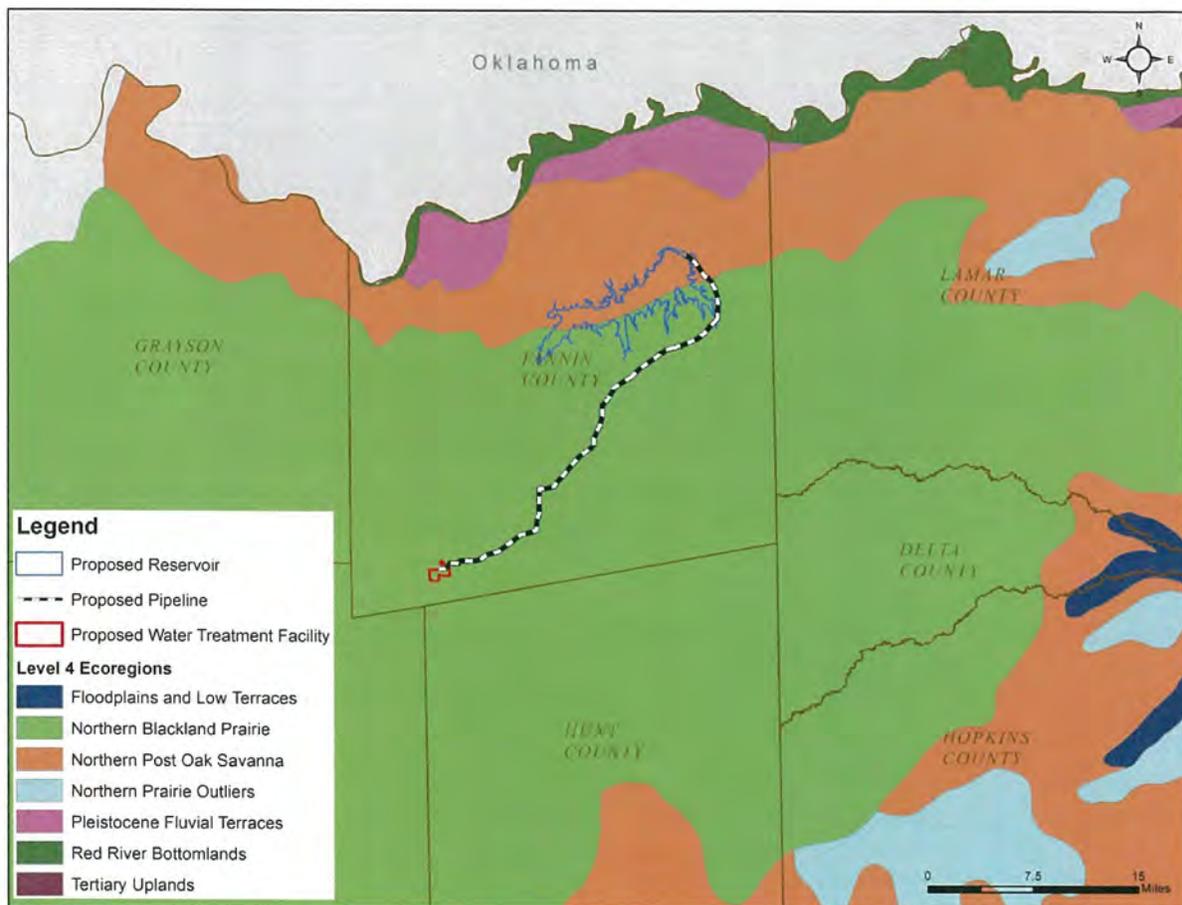


Figure 3.4-11. Ecoregion Types of Fannin and Surrounding Counties, Texas

The Northern Post Oak Savannah Ecoregion is found within the East Central Texas Plains and is characterized by native bunch grasses and forbs with scattered clumps of trees, primarily post oak (Griffith et al., 2004). Today improved pastures, rangelands, and croplands make up the majority of this Ecoregion. Historically, fires and burns in the northern part of the East Central Texas Plains maintained grassy openings, but with the absence of fires, woody plants have taken over many of these grassy openings. Mixed native and introduced grasses and forbs on grassland sites or mixed herbaceous communities have resulted from the recent clearing of woody vegetation.

Forested areas in this ecoregion are limited to hardwood bottomlands along major rivers and creeks, or in areas protected from fire (Freese and Nichols, 2008a). These forests are dominated by post oak (*Q. stellata*), blackjack oak (*Q. marilandica*), eastern red cedar (*Juniperus virginiana*), and black hickory (*Carya texana*). Unlike the Northern Blackland Prairies, prairies found in this ecoregion contain little bluestem and other grasses and forbs (Griffith et al., 2004).

Federally protected land near the proposed project site of Alternatives 1 and 2 includes the Caddo National Grasslands. The proclamation boundaries of the Grasslands cover 17,785 acres and contain three lakes. The Caddo National Grasslands is comprised of two units, the Bois d'Arc Unit and the Ladonia Unit (Freese and Nichols, 2008a). The Bois d'Arc Unit is located adjacent to the north end of the proposed LBCR.

The types and quantities of habitat within the proposed reservoir site of Alternatives 1 and 2 were identified during the summer of 2007. Table 3.4-2 provides a breakdown of vegetation cover types within the reservoir site. The distribution and location of each vegetation cover type are shown in Figures 3.4-1 and 3.4-4.

Table 3.4-2. Upland Habitat Types within Proposed LBCR Site of Alternatives 1 and 2

Habitat Type	Acreage	Percent ^a
Evergreen Forest	228	1
Upland/Deciduous Forest	2,216	13
Riparian Woodland/ Bottomland Hardwood	1,728	10
Shrubland	63	0
Grassland/ Old Field	4,761	28
Cropland	1,757	10
Tree Savanna	132	1
Shrub Savanna	4	0
<i>All wetland and aquatic habitats</i>	6,179	37
Grand Total	17,068	100

^a Percentage of entire reservoir footprint of Alternative 1, including dam.

Upland Deciduous Forest

On average, upland deciduous forests in the project area are composed of 90 percent deciduous trees, with overstory trees having an average height of 43 feet. The upland forest cover type makes up approximately 2,216 acres of the proposed Lower Bois d'Arc Creek Reservoir site (both alternatives) (Figure 3.4-12).



Figure 3.4-12. Upland Deciduous Forest at the LBCR Site

Dominant tree species include post oak, water oak (*Q. nigra*), southern red oak (*Q. falcata*), Shumard's oak (*Q. shumardii*), cedar elm (*Ulmus crassifolia*), sugarberry, bois d'Arc (*Maclura pomifera*), green ash (*Fraxinus pennsylvanica*), and eastern red cedar. Tree canopy closure averages approximately 68 percent.

Common shrub and vine species include coralberry (*Symphoricarpos orbiculatus*), greenbrier (*Smilax* spp.), honey locust, poison ivy, Virginia creeper (*Parthenocissus quinquefolia*), and dogwood (*Cornus drummondii*). Shrub canopy closure in the typical upland forest averages about 33 percent. Dominant herbs include sedges, flatsedge (*Cyperus* spp.), panicgrass (*Dichanthelium* spp.), corn salad (*Valerianella* sp.), Virginia wildrye (*Elymus virginicus*), ironweed (*Vernonia* spp.) (Figure 3.4-13), Venus' looking-glass (*Triodanis* sp.), and wild onion (*Allium ascalonicum*). Average herbaceous canopy cover equals approximately 38 percent of the proposed LBCR site (both alternatives).



Figure 3.4-13. Ironweed

Evergreen Forest

Evergreen forests in the project area have a tree canopy with very few deciduous trees and with little understory. The evergreen forest cover type makes up approximately 228 acres of the proposed Lower Bois d'Arc Creek Reservoir site (both alternatives) (Figure 3.4-14).



Figure 3.4-14. Upland Juniper Woods at LBCR Site, an example of Evergreen Forest

These forests are dominated by the evergreen eastern red cedar mixed with deciduous tree species including southern red oak, post oak, and blackjack oak. Average tree canopy closure equals approximately 70 percent, with evergreens comprising 98 percent of the tree canopy on average. Shrub and herbaceous cover is sparse in these areas, averaging about 5 and 8 percent, respectively. Shrub and vine species occurring in these forests include coralberry, greenbrier, gum bumelia (*Sideroxylon* (syn. *Bumelia*) *lanuginosum*), and possumhaw holly (*Ilex decidua*). Herbaceous species include Cherokee sedge (*Carex cherokeensis*), panicgrass, Johnsongrass (*Sorghum halepense*), and king ranch bluestem (*Bothriochloa schaeumum* var. *songarcia*).

Shrubland

Shrublands occupy 63 acres in the project area and represent a midpoint in the successional transition from upland old fields to forests, with a shrub layer dominated by tree species such as green ash, bois d'Arc, and eastern red cedar. Shrub canopy cover averages approximately 44 percent, while tree canopy cover averages approximately three percent. The diverse herbaceous layer is dominated by Cherokee sedge, goldenrods (*Solidago* spp.), Johnsongrass, silver bluestem (*Bothriochloa laguroides*), wild pea (*Lathyrus* spp.), and snow-on-the-prairie (*Euphorbia bicolor*). The herbaceous cover is high, averaging approximately 89 percent.

Grassland/Old Field

The grassland/old fields (Figure 3.4-15) in the project area are generally upland improved pastures, typically the result of forest clearing. These areas may be currently or recently grazed or thickly grown over by grasses and forbs. There are 4,761 acres of grassland/oldfield within the reservoir footprint.

Dominant grass species include tall fescue (*Lolium arundinaceum*), perennial rye (*L. perenne*), bahiagrass (*Paspalum notatum*), Bermudagrass (*Cynodon dactylon*), Texas wintergrass (*Nassella leucotricha*), and dallisgrass (*Paspalum dilatatum*). Common forbs include western ragweed (*Ambrosia psilostachya*), ironweed, dock (*Rumex* spp.), vetch (*Vicia* spp.), and wild pea. Herbaceous canopy cover averages approximately 87 percent, while the herbaceous canopy height in spring averages about 13 inches.



Figure 3.4-15. Grassland/Old Field Within the Proposed Reservoir Footprint

Cropland

The croplands in the project area, 1,757 acres, are primarily planted with oats (*Avena sativa*), soybeans (*Glycine max*), and hay crops, often alternated with winter wheat (*Triticum aestivum*) cover. Trees and shrubs are excluded from these areas but are often present in adjacent fencerows. Fallow fields are dominated by Johnsongrass, but also often include panicgrass, knotroot (*Stachys affinis*), bristlegrass (*Setaria paviiflora*), tall fescue, and Bermudagrass (Figure 3.4-16). Forbs are also common in the herbaceous layer, including docks, pigweed (*Amaranthus* spp.), spurges (*Euphorbia* spp.), morning glory (*Ipomoea* spp.), and black-eyed Susan. This herbaceous cover stands at an average of 22 inches in the spring, with an average canopy cover of approximately 47 percent.



Figure 3.4-16. Improved Pasture Within the LBCR Footprint

Tree Savanna

Tree savannas in the reservoir footprint, comprising 132 acres, have sparse tree and shrub canopies and abundant herbaceous cover. Tree canopy cover within this cover type averages 12 percent, consisting primarily of large lone trees. These trees are most often cedar elms, bois d'Arc, or eastern red cedars. Shrub canopy cover is also low in these areas, averaging about nine percent. The shrub and vine species commonly seen in these areas include gum bumelia, coralberry, greenbrier, poison ivy, and southern dewberry (*Rubus trivialis*).

Herbaceous cover in tree savannas within the project area is both diverse and abundant, averaging 89 percent cover. Species frequently occurring in the herbaceous layer include ironweed, western ragweed, sedges, flatsedge, Bermudagrass, panicgrass, king ranch bluestem, Indian plantain (*Arnoglossum* spp.), prairie plantain (*Plantago* spp.), croton (*Croton* spp.), and docks.

The proposed North Water Treatment Plant of Alternatives 1 and 2 that would receive raw water from the LBCR is located within a previously disturbed area. This site and the surrounding area are primarily used for livestock grazing and hay production. The site spans 662 acres and is divided by County Road 4965. Vegetation on the proposed site consists mainly of upland herbaceous vegetation with wooded areas along riparian corridors and along fence lines (Alan Plummer Associates, 2010).

Under Alternatives 1 and 2, the proposed project includes 35 miles of new 90-96 inch diameter pipeline. This pipeline would transport untreated (raw) water from the Lower Bois d'Arc Reservoir to the North Water Treatment Plant near the City of Leonard, Fannin County. The proposed pipeline would have a permanent easement width of 50 feet and a temporary construction easement width of 70 feet (for a total temporary width during construction of 120 feet). The pipeline is entirely in Fannin County and vegetational cover types of this area are dominated by agriculture. Most lands within the 120-foot wide limits of the proposed pipeline corridor are either cultivated for crops or managed as improved pasture for livestock (Alan Plummer Associates, 2008). The only trees and shrubs that occur are located in riparian zones at stream crossings or along fence rows.

The entire affected area of the proposed raw water pipeline, WTP, TSR, intake pump station (IPS), electrical substation sites, TSR rail spur, and discharge pipeline/outfall is approximately 875 acres. Included in this acreage are 23 acres of upland deciduous forest, 16 acres of evergreen forest, three acres of shrubland, 500 acres of cropland, 314 acres of grassland/old field, and eight acres of riparian woodland/bottomland hardwood.

Native Prairie Remnant

Native prairie remnant is not listed with other upland habitats in Table 3.4-2, but according to TPWD, a review of new data on the Texas Natural Diversity Database (TXNDD) indicates that a native prairie remnant (Element Occurrence ID 11932) may occur within the footprint of the LBCR. Native prairie habitats are a rare resource in Texas. Although based on the best information available to TPWD regarding rare species or habitats, TXNDD data are not a definitive answer as to the presence, absence or condition of special species, natural communities, or other significant features at the proposed project site of Alternatives 1 and 2, and cannot take the place of on-the-ground surveys (Melinchuk, 2015).

3.4.3 Aquatic Biota

Human presence in the Bois d'Arc Creek watershed has altered aquatic and riparian habitats, and consequently the biota that use or reside in these habitats. The Bois d'Arc Creek has been altered over the past 100 years primarily due to agricultural practices and channelization. Channelization and bank stabilization, non-native species introductions, timber harvesting, and agricultural practices have contributed to changes in aquatic habitats and biota from historical conditions. In 2000 and on more recent site visits, observers noted channelization and losses to the riparian corridor and associated stream bank vegetation indicated by highly exposed root systems (Figure 3.4-17), siltation of the stream, bank caving, and elevated stream water temperatures.



**Figure 3.4-17. Bois d'Arc Creek Bank
Showing Newly Exposed Roots**

The Instream Flow Study included in Appendix M is a compilation of multiple studies that includes hydrology, geomorphology, biology, and water quality. This study's main purpose was to "characterize baseline stream conditions within the proposed reservoir site and downstream, develop predictions of conditions in the reservoir pool, and develop a proposed instream flow regime to maintain a sound ecological environment downstream of the dam". The interagency team that conducted the 2010 Instream Flow Study included participants from USFWS, USACE, USEPA, USFS, TWDB, TPWD, TCEQ, RRA, NTMWD, and FNI.

Four mesohabitats were identified within the Bois d'Arc Creek study area and its tributaries: runs, riffles, structures and areas such as large woody debris and root wads that provide cover for aquatic species, and pools. The frequent change of water flow in Bois d'Arc Creek from low flows (0 to 1 cfs) to high flows (>1,000 cfs) affects both the aquatic habitats and species diversity.

Fish

There is little baseline information on the stream fisheries of Bois d'Arc Creek. Although there have been several collections in the mainstem Red River, with studies in the 1950s conducted throughout the Red River basin (Bonn, 1957), these studies provide a compilation of collected species and do not identify specific tributaries for individual collections. Only one study that documented collection was found to be specific to Bois d'Arc Creek (Red River Authority (RRA), 1999).

Fish species composition was found to be consistent with recorded occurrences for the Red River drainage basin (Thomas et al., 2007), as were index of biotic integrity (IBI) scores (RRA, 1999). IBIs are developed from statistical analysis, based upon a quantitative assessment of changes in the composition of biologic communities that may be collected during field sampling events over time. IBIs are developed to accurately reflect the ecological complexity of a system or identify impacts on the health of a biological system. At least 191 freshwater fish species have the potential to occur in the Red River Basin (Hubbs et al. 2008; Texas A&M, no date). In 1982, approximately 20 fish species were collected by Texas Parks and Wildlife Division (TPWD) in Bois d'Arc Creek (Appendix M); in 1998, 11 species were collected by the RRA in the Red River Basin for their assessment of the eastern Red River Basin (RRA, 1999). Fish in lower Bois d'Arc Creek were also sampled in 2009 (Figure 3.4-18) for the 2010 Instream Flow Study (Appendix M) conducted in support of NTMWD's Water Right permit application.



Figure 3.4-18. Electrofishing and Seine Hauls During Interagency Biological Sampling along Lower Bois d'Arc Creek

Table 3.4-3 lists the historic fish species collected from various lakes and the reservoir project area during the 1982, 1998, and 2010 (Appendix M) studies. The table also identifies fish species occurrences in lacustrine areas, or inland depressions or channels containing standing water (Cowardin, 1979).

Table 3.4-3. Fish Species Documented in Bois d'Arc Creek and Red River Basin, 1982, 1998, and 2010

Common Name	Scientific Name	1982 Study (Bois d'Arc Creek) *	1998 Study (Red River Basin)*	2010 Bois d'Arc Creek Instream Flow Study (number of observations)	Species Occurrence From Local Reservoirs *	Lacustrine Occurrence
American gizzard shad	<i>Dorosoma cepedianum</i>			69		
Bigscale lonperch	<i>Percina macrolepidia</i>			1		
Black crappie	<i>Pomoxis nigromaculatus</i>			2		
Blackstripe topminnow	<i>Fundulus notatus</i>		*	33		Yes
Blacktail shiner	<i>Cyprinella venusta</i>			21		
Blacspot shiner	<i>Notropis atrocaudalis</i>			1		
Black bullhead	<i>Ameiurus melas</i>			20		
Bluegill	<i>Lepomis macrochirus</i>			151	*	
Brook silverside	<i>Labidesthes sicculus</i>			7		
Bullhead minnow	<i>Pimephales vigilax</i>		*	147		Yes
Central stonewaller	<i>Campostoma anomalum</i>			20		
Channel catfish	<i>Ictalurus punctatus</i>	*		39	Lake Bonham, Lake Texoma, Coffee Mill Lake, Lake Crockett	Yes
Common carp	<i>Cyprinus carpio</i>	*	*	0	Lake Bonham, Lake Texoma, Coffee Mill Lake, Lake Crockett	Yes
Common lonperch	<i>Percina caprodes</i>			10		
Carp and minnow hybrids	<i>Cyprinella hybrid</i>			3		
Dusky darter	<i>Percina sciera</i>			22		
Flathead catfish	<i>Pylodictis olivaris</i>			10		
Freckled madtom	<i>Noturus nocturnus</i>			9		
Freshwater drum	<i>Aplodinotus grunniens</i>			1	Lake Bonham, Lake Texoma, Coffee Mill Lake	Yes
Golden redhorse	<i>Moxostoma erythrurum</i>			1		

Common Name	Scientific Name	1982 Study (Bois d'Arc Creek) *	1998 Study (Red River Basin)*	2010 Bois d'Arc Creek Instream Flow Study (number of observations)	Species Occurrence From Local Reservoirs *	Lacustrine Occurrence
Golden shiner	<i>Notemigonus crysoleucas</i>	*				Yes
Green sunfish	<i>Lepomis cyanellus</i>			154		
Largemouth bass	<i>Micropterus salmoides</i>	*	*	37	Lake Bonham, Lake Texoma, Coffee Mill Lake, Lake Crockett	Yes
Longear sunfish	<i>Lepomis megalotis</i>		*	421		
Longnose gar	<i>Lepisosteus osseus</i>			1		
Orange-spotted sunfish	<i>Lepomis humilis</i>			28		
Red shiner	<i>Cyprinella lutrensis</i>			1,417		Yes
Redear sunfish	<i>Lepomis microlophus</i>			24		
Ribbon shiner	<i>Lythrurus fumeus</i>			25		
River carpsucker	<i>Carpiodes carpio</i>			4	Lake Texoma	Yes
Sand shiner	<i>Notropis stramineus</i>			27		
Slenderhead darter	<i>Percina phoxocephala</i>			1		
Smallmouth buffalo	<i>Ictiobus bubalus</i>	*		2	Lake Texoma	Yes
Slough darter	<i>Etheostoma gracile</i>			2		
Suckermouth minnow	<i>Phenacobius mirabilis</i>			26		
Spotted gar	<i>Lepisosteus oculatus</i>	*		1	Coffee Mill Lake	Yes
Spotted bass	<i>Micropterus punctulatus</i>			3		
Sunfish hybrid	<i>Lepomis hybrid</i>	*		18		
Tadpole madtom	<i>Noturus gyrinus</i>			2		
Texas shiner	<i>Notropis amabilis</i>		*	27		Yes
Threadfin shad	<i>Dorosoma petenense</i>			1		
Warmouth	<i>Lepomis gulosus</i>		*	12		

Common Name	Scientific Name	1982 Study (Bois d'Arc Creek) *	1998 Study (Red River Basin)*	2010 Bois d'Arc Creek Instream Flow Study (number of observations)	Species Occurrence From Local Reservoirs *	Lacustrine Occurrence
White crappie	<i>Pomoxis annularis</i>		*	5	Lake Bonham, Lake Texoma, Coffee Mill Lake, Lake Crockett	Yes
Western mosquitofish	<i>Gambusia affinis</i>	*	*	247		Yes
Yellow bullhead	<i>Ameiurus natalis</i>			112	Lake Bonham, Lake Crockett	Yes

* Indicates presence

Note: Survey reports from the Statewide Freshwater Fisheries Monitoring and Management Program for Lake Coffee Mill, Lake Crockett, Lake Texoma, and Lake Bonham were reviewed to determine if species have also been documented from local reservoirs; 73 percent of the fish found in Bois d'Arc Creek have also been documented in these reservoirs.

Sources: Appendix L, Appendix M

As referenced in the 2010 Instream Flow Study, data collection occurred from March to July 2009 and researchers collected a total of 3,138 fish, representing 42 species from 11 families at Bois d'Arc Creek (Table 3.4-4).

Table 3.4-4. Fish Species Collected in Bois d'Arc Creek for the 2010 Instream Flow Study

Family	Common Name	Scientific Name	TOTAL	Relative Abundance
Lepisosteidae	Spotted gar	<i>Lepisosteus oculatus</i>	1	0.03%
	Longnose gar	<i>Lepisosteus osseus</i>	1	0.03%
Clupeidae	American gizzard shad	<i>Dorosoma cepedianum</i>	69	2.20%
	Threadfin shad	<i>Dorosoma petenense</i>	1	0.03%
Cyprinidae	Central stoneroller	<i>Campostoma anomalum</i>	20	0.64%
	Red shiner	<i>Cyprinella lutrensis</i>	1,417	45.16%
	Blacktail shiner	<i>Cyprinella venusta</i>	21	0.67%
	Hybrid shiner	<i>Cyprinella hybrid</i>	3	0.10%
	Ribbon shiner	<i>Lythrurus fumeus</i>	25	0.80%
	Blackspot shiner	<i>Notropis atrocaudalis</i>	1	0.03%
	Sand shiner	<i>Notropis stramineus</i>	27	0.86%
Catostomidae	Suckermouth minnow	<i>Phenacobius mirabilis</i>	26	0.83%
	Bullhead minnow	<i>Pimephales vigilax</i>	147	4.68%
	River carpsucker	<i>Carpionodes carpio</i>	4	0.13%
Ictaluridae	Smallmouth buffalo	<i>Ictiobus bubalus</i>	2	0.06%
	Golden redbone	<i>Moxostoma erythrurum</i>	1	0.03%
	Black bullhead	<i>Ameiurus melas</i>	20	0.64%
	Yellow bullhead	<i>Ameiurus natalis</i>	112	3.57%
Ictaluridae	Channel catfish	<i>Ictalurus punctatus</i>	39	1.24%
	Tadpole madtom	<i>Noturus gyrinus</i>	2	0.06%

Family	Common Name	Scientific Name	TOTAL	Relative Abundance
	Freckled madtom	<i>Noturus nocturnus</i>	9	0.29%
	Flathead catfish	<i>Pylodictis olivaris</i>	10	0.32%
Atherinopsidae	Brook silverside	<i>Labidesthes sicculus</i>	7	0.22%
Fundulidae	Blackstripe topminnow	<i>Fundulus notatus</i>	33	1.05%
Poeciliidae	Mosquitofish	<i>Gambusia affinis</i>	247	7.87%
Centrarchidae	Green sunfish	<i>Lepomis cyanellus</i>	154	4.91%
	Warmouth	<i>Lepomis gulosus</i>	12	0.38%
	Orangespotted sunfish	<i>Lepomis humilis</i>	28	0.89%
	Bluegill	<i>Lepomis macrochirus</i>	151	4.81%
	Longear sunfish	<i>Lepomis megalotis</i>	421	13.42%
	Redear sunfish	<i>Lepomis microlophus</i>	24	0.76%
	Hybrid sunfish	<i>Lepomis hybrid</i>	18	0.57%
	Spotted bass	<i>Micropterus punctulatus</i>	3	0.10%
	Largemouth bass	<i>Micropterus salmoides</i>	37	1.18%
	White crappie	<i>Pomoxis annularis</i>	5	0.16%
	Black crappie	<i>Pomoxis nigromaculatus</i>	2	0.06%
Percidae	Slough darter	<i>Etheostoma gracile</i>	3	0.10%
	Common logperch	<i>Percina caprodes</i>	10	0.32%
	Bigscale Logperch	<i>Percina macrolepida</i>	1	0.03%
	Slenderhead darter	<i>Percina phoxocephala</i>	1	0.03%
	Dusky darter	<i>Percina sciera</i>	22	0.70%
Sciaenidae	Freshwater drum	<i>Aplodinotus grunniens</i>	1	0.03%
		TOTAL NUMBER	3,138	
		Number of Species	42	

Source: Appendix M

Biological analyses considered both field sampling data from the 2010 Instream Flow Study and previous studies conducted within the watershed and associated ecoregions. The stream fish assemblage collected during the Instream Flow Study was dominated by headwater colonizer species (i.e., smaller-bodied and short-lived fish). A previous study conducted by Linam et al. (2002) collected a total of 47 fish taxa from the Central Texas Plains and the Texas Blackland Prairies ecoregions. Resident species in streams similar to Bois d'Arc Creek are generally adapted to extreme environmental variation (Rahel and Hubert, 1991) and illustrate rapid post-disturbance recolonization (Schlosser, 1987). Prairie streams such as Bois d'Arc Creek have been described as lacking spatial heterogeneity in aquatic habitat and substrata (Osting et al., 2004) and are dominated by pools and backwater areas with silty-clay substrate. There is generally little cobble or gravel substrate in Bois d'Arc Creek, and subsequently no true riffle habitat (as defined according to standard methods; Arend, 1999). Aquatic systems with these characteristics are often dominated by generalist fish taxa (Poff and Allan, 1995), and recent studies conducted in neighboring watersheds have found that assemblage structure was not strongly linked to physical habitat measurements (Gelwick and Li, 2002; Osting et al., 2004).

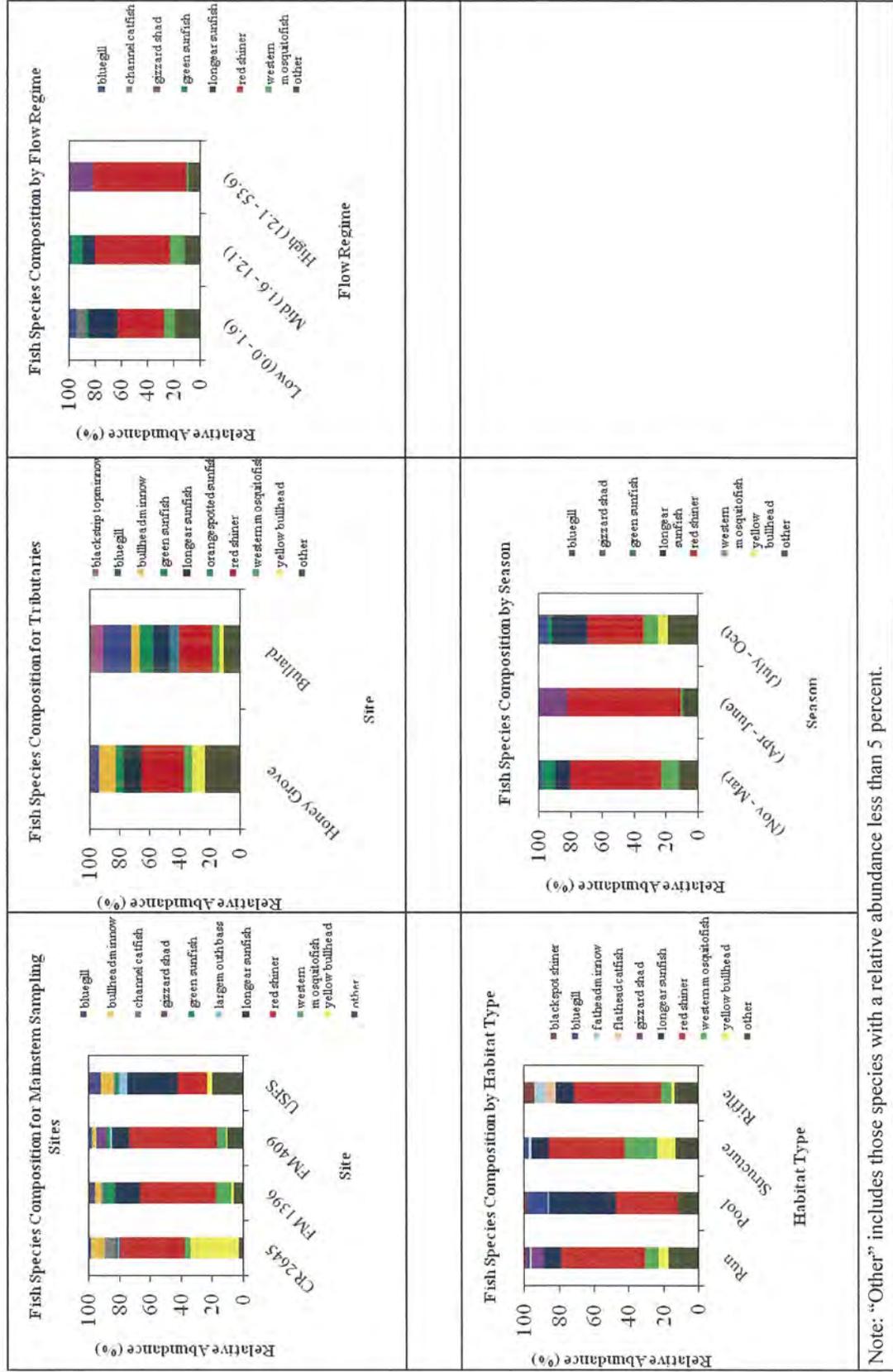
The most abundant families noted in the 2010 Instream Flow Study were Cyprinidae (59% in percent total relative abundance), followed by Centrarchidae (20%), Poeciliidae (8%), Ictaluridae (6%), and Clupeidae (3%). The remaining 3% of species assemblage included members of the families Percidae, Fundulidae, Catostomidae, Atherinopsidae, Lepisosteidae, and Sciaenidae. The relative abundance from all sampling events is shown in Appendix B of the Supplemental Instream Flow Study (Appendix M).

Species relative abundance across site, mesohabitat, flow, and season exhibited dominance of generalist species able to survive in both riverine and lacustrine habitats species (Figure 3.4-20 and Appendix M). Seventy-eight percent of the fish collected during the May 2009 sampling event for the instream flow study (Appendix M) were two generalist species: red shiner and longear sunfish (listed in Table 3.4-3 and shown in Figure 3.4-19). The 2010 Instream Flow Study exhibited similar results: 81 percent of the species collected were generalist species, with red shiner (50 percent total relative abundance) and longear sunfish (13.7 percent) being the most abundant of the generalist species. Only a few of the species collected are characteristically found only in flowing water or are considered fluvial specialists (central stoneroller, ribbon shiner, blackspot shiner, sand shiner, suckermouth minnow, freckled madtom, slough darter, and dusky darter). Species composition for tributary sites was similar to the mainstem sites, although abundance scores were more evenly distributed across species.



Figure 3.4-19. Longear Sunfish (*Lepomis megalotis*)

Across flow regimes, relative abundance of longear sunfish, bluegill, green sunfish, and western mosquitofish declined at higher flows, while red shiner abundance increased. There was no distinguishable seasonal pattern, except that red shiner was particularly abundant in the summer. Gizzard shad were only collected during the spring sampling event, which may have been associated with migratory spawning behavior. There was no apparent pattern across mesohabitat, except that Centrarchid (sunfish) species were more abundant in pool habitats. Detailed species accounts are presented in Appendix M.



Note: "Other" includes those species with a relative abundance less than 5 percent.

Figure 3.4-20. Relative Abundance of Fish Taxa by Sample Site, Location, Flow Regime, Mesohabitat, and Season (Appendix M)

Fish Trophic Structure

There was no clear pattern of trophic structure across sites, though there were some apparent patterns across flow, mesohabitat, and season. More top-level predators (i.e., sunfish) were collected from pools, particularly in the low flow summer sampling event. Generalist species with opportunistic feeding strategies such as red shiner and sunfish species (particularly longear) mostly forage in the form of benthic grazing or water surface predation. These feeding strategies are a response to Bois d'Arc Creek's turbid waters and general lack of favorable microhabitat. Sunfish species are likely to thrive under these conditions compared to fluvial specialists. The only other apparent pattern was that more filter feeders-planktivores were collected during the spring high flow sampling event, which is likely a result of increased primary productivity and increased movement associated with spawning.

Fish Reproduction

Literature review of reproductive strategies for collected fishes revealed that most of the species collected are largely opportunistic, dominated by speleophilic and polyphilic spawners. Speleophils (i.e., crevice spawners) will deposit eggs in submerged structures, but have no specific structural requirements. Polyphilic species deposit eggs directly onto stream bed substrates, and generally lack a specific substrate preference. Similar to structural patterns found with functional feeding groups, sunfish species (largely polyphils) dominated pool habitats and were particularly abundant during the low flow summer sampling event. Speleophils dominated reproductive strategy across all categories, as the pervasive red shiner is a speleophilic spawner.

Physical habitat requirements and reproductive timing for fish taxa observed in Bois d'Arc Creek were identified from published literature. Fluvial specialist species, particularly members of the families Cyprinidae and Percidae, require specific current velocities, depths, or specific substrates for reproduction. Literature review identified typically shallow depth (i.e., < 3 feet), swifter current velocities (i.e., > 1 feet/sec), and gravel or cobble substrate preference for these fluvial specialist species. However, the reproductive cues of fishes of Bois d'Arc Creek appear to be largely temperature dependent. Dominant species (as determined by the relative abundance analyses) spawn from February to October with the largest proportion in the months of May and June. Detailed information on these species may be found in the 2010 Instream Flow Study (Appendix M). After mid-June, Bois d'Arc Creek experiences little to no flow, indicating unfavorable spawning conditions for fluvial specialists that require flowing water for spawning. However, the generalist species (or those that do not require flowing water for spawning) may find suitable spawning habitat in persistent pools along Bois d'Arc Creek channel.

Biological Integrity

Biotic, or biological, integrity is defined as the ability of an aquatic ecosystem to support and maintain a balanced, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitats within a region. The biological integrity score of two study areas of Bois d'Arc Creek were determined with the use of Rapid Bioassessment Protocols. These protocols are a compilation of methods employed by various state water resource agencies. They were designed to be used as a screening tool to determine if a stream is supporting or not supporting a designated aquatic life use. The protocols can be used to: 1) characterize the existence and severity of impairment to a water resource, 2) help identify sources and causes of impairment, 3) evaluate the effectiveness of control actions and restoration activities, 4) support use attainability studies and cumulative impact assessments, and 5) characterize regional biotic attributes of reference conditions (USEPA, 2012a).

The Red River Authority conducted *An Assessment of the Biological Integrity of the Eastern Red River Basin in Texas* in 1998 (RRA, 1999) and the Instream Flow Study (Appendix M) conducted a regionalized Index of Biotic Integrity (IBI) (TPWD, 2002) analysis. The regionalized IBI is a measure of fish communities that includes components of species composition, trophic composition, and abundance

and condition (Linam et al., 2002). It is typically used as a water quality indicator, with higher scores indicating better water quality. Scores in the 2010 Instream Flow Study were higher than the intermediate designation reported in the 1999 RRA study. The 2010 Instream Flow Study IBI scores for fish community structure were intermediate to high (mean: 43.83) and increased longitudinally within the mainstem of Bois d'Arc Creek as shown in Figure 3.4-21. Mainstem site scores ranged from 33 (limited) to 49 (high), and tributary scores were also in the high range (i.e., 46 and 43, Honey Grove and Bullard Creek, respectively). These scores indicate that the ability of the habitat to support the expected full range of native aquatic life varies within the Bois d'Arc Creek system from marginal to reasonably good. Given the degraded condition of the creek, as a result of channelization and the unnatural (largely agricultural) surrounding landscape, the biotic integrity of the aquatic system is surprisingly high.

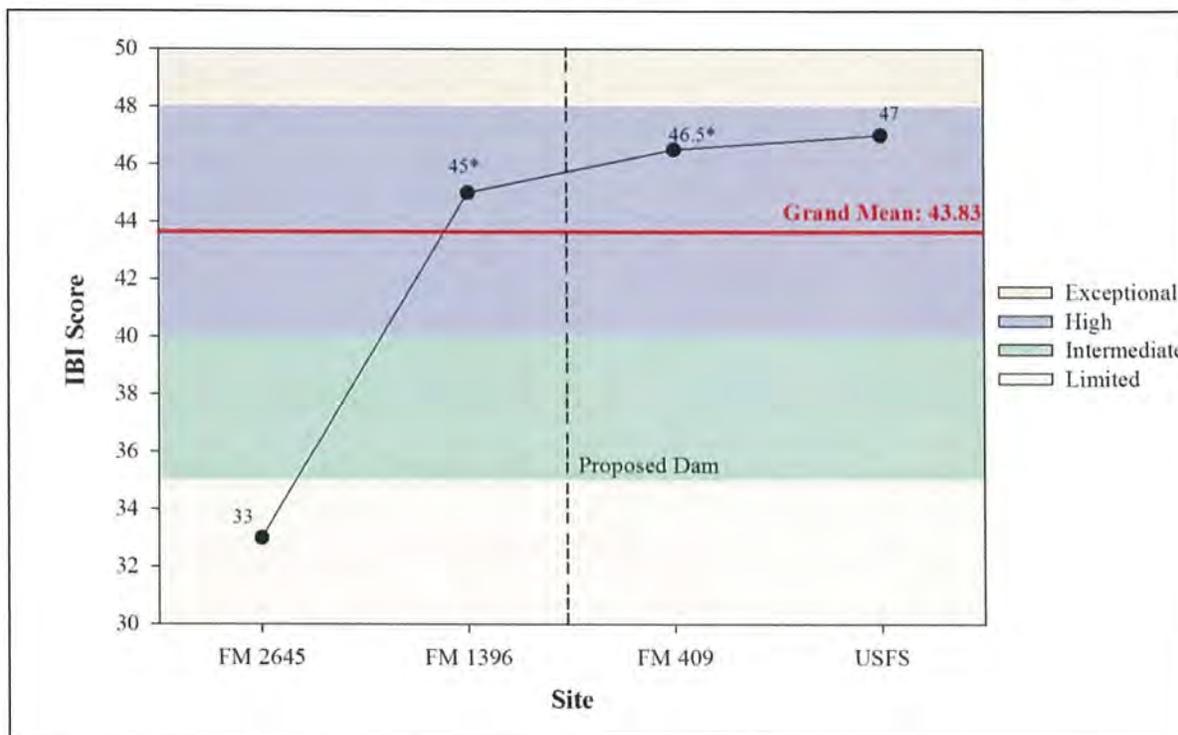


Figure 3.4-21. Fish Index of Biological Integrity, 2010 Bois d'Arc Instream Flow Study (Upstream to Downstream) (Appendix M)

*Indicates averages IBI from multiple collections (i.e., FM 1396: 49, 41; FM 409: 45, 48)

Benthic Macroinvertebrates

Benthic macroinvertebrates are animals without backbones that are visible without a microscope and that live on or in the bottom or substrate of water bodies. They are valuable to aquatic ecosystems and provide various functions including serving as secondary consumers in numerous food chains (Healy, 1984) and serving as recyclers of organic matter (Merritt et al., 1984). They are also important food sources for many species of fish. The macroinvertebrate community of streams, rivers, and lakes typically includes some or all of the following: insects, flatworms, crustaceans, and mollusks.

During the 2010 Instream Flow Study (Appendix M) a total of 2,621 aquatic and terrestrial insects, including 103 identified genus and 46 taxonomic families, were collected from March to July 2009. The relative abundance of functional feeding groups was calculated to evaluate macroinvertebrate trophic structure. Results indicated that collector-gatherers, predators, and scrapers dominate Bois d'Arc Creek

representing greater than 80% of the macroinvertebrate population, with few filter-feeding or shredder species. Collector-gatherers filter fine particulate organic matter and a high percentage (greater than 36%) indicates degradation (TCEQ, 2007), while a low to moderate percentage (4% to 15%) of predators, which feed on other consumers, reflect a balanced trophic structure. The trophic structure in Bois d'Arc Creek suggests an abundance of coarse particulate organic matter such as leaf litter and a healthy prey population. There was no apparent longitudinal pattern in benthic macroinvertebrate trophic structure across mainstem sampling stations as shown in Figure 3.4-22.

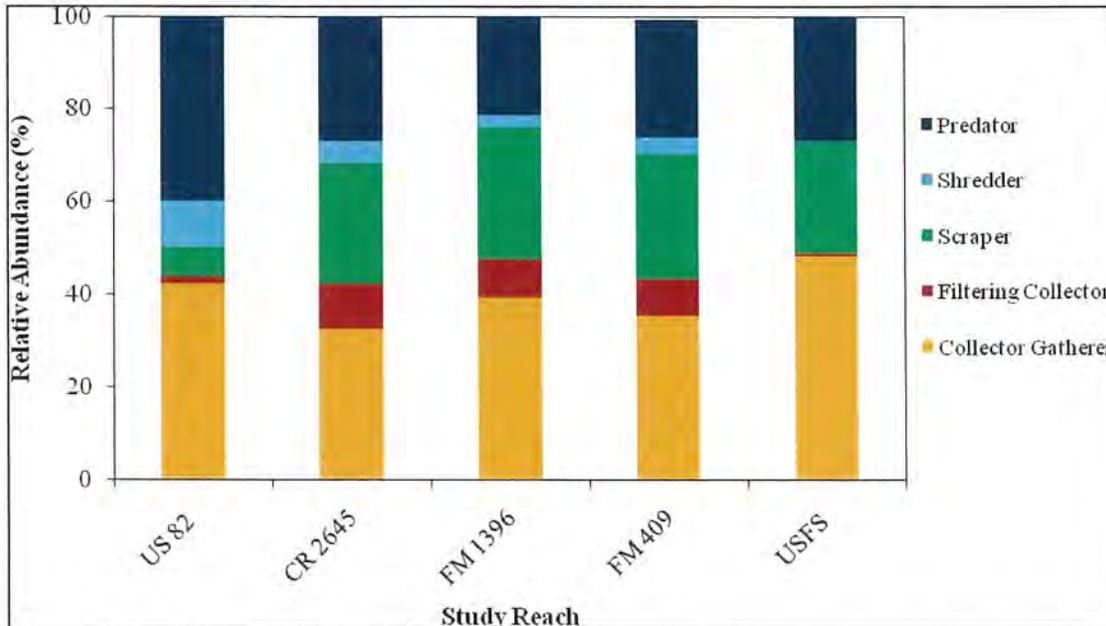


Figure 3.4-22. Bois d'Arc Creek Benthic Macroinvertebrate Trophic Structure (Appendix M)

During the 2010 Instream Flow Study, benthic macroinvertebrates were sampled using TCEQ 2007 SWQM Rapid Bioassessment Protocol (Texas RBA). Rapid bioassessments provide a standardized method for sampling and data analysis that can be used to provide a numerical value for the quality of a stream. The numerical scores determined from the Texas RBA are used to describe Aquatic Life Use categories for a stream (>36 is Exceptional, 29-36 is High, 22-29 is Intermediate, and <22 is Limited). As shown on Figure 3.4-23, the overall biological integrity of Bois d'Arc Creek's macroinvertebrate community was at the higher end of the intermediate range (mean: 28.9) and the scores decrease from upstream to downstream. Mainstem sampling site scores ranged from 22 (intermediate) to 37 (high). These results are consistent with previous studies (RRA, 1999; Hamilton, 2009). Tributaries of Bois d'Arc Creek had lower scores than mainstem sites; Bullard and Honey Grove creeks had scores of 25 and 28, respectively, in the intermediate range.

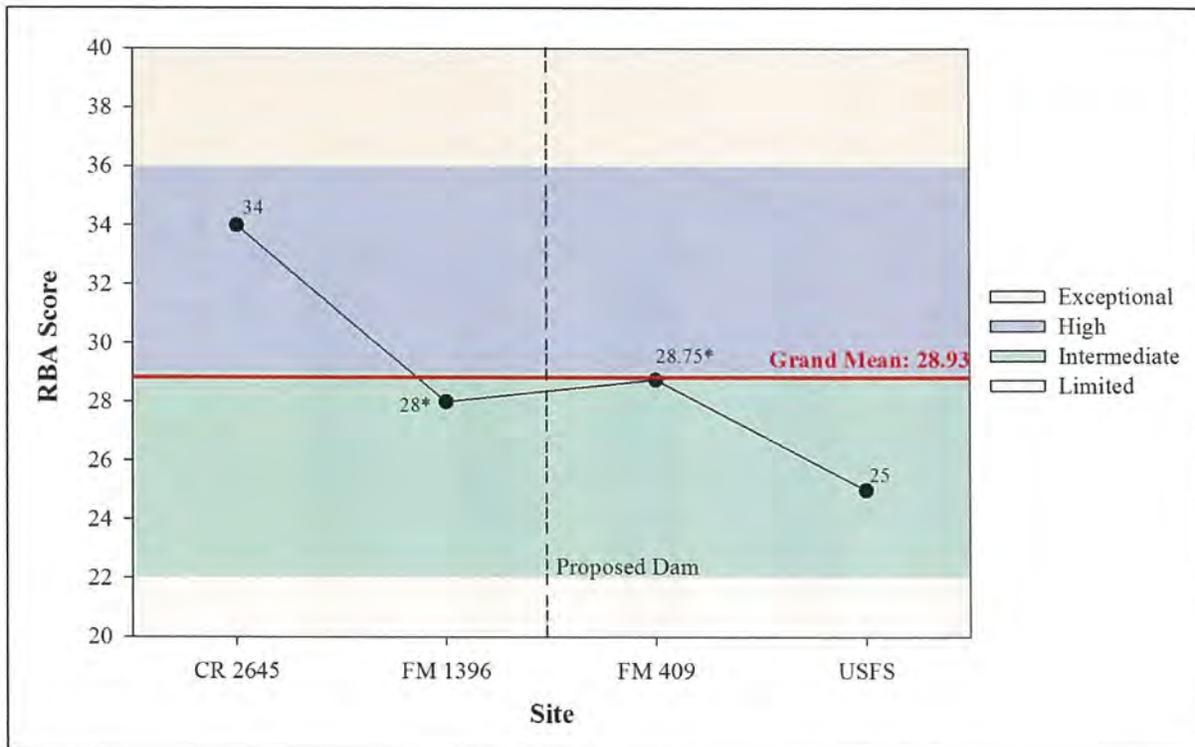


Figure 3.4-23. Biological Integrity of Bois d'Arc Creek's Macroinvertebrate Community According to Rapid Bioassessment, Upstream to Downstream (Appendix M)

*Indicates average metric score from multiple collections (i.e., CR 2645: 31, 37; FM 1396: 31, 22, 31, 29; FM 409: 25, 31, 28, and 31).

Unionid mussels (the largest taxonomic family of freshwater mussels) are important indicators of water quality and stream health and play an important role in freshwater ecosystems. Freshwater mussels mediate the transfer of nutrients between the water column and stream bottom and are a food source for some fishes, mammals and birds. Mussels are very sensitive to changes in the aquatic environment; therefore, declining populations of mussels indicates that a stream's health is deteriorating. Therefore, particular attention is given to the status of mussel species in stream studies. Of the 52 mussel species known to occur in Texas, 15 were listed as state-threatened in 2009 because of declines in their distribution and abundance.

Although efforts were not made to specifically collect mussels from Bois d'Arc Creek, mussels were collected or photographed when they were encountered during other data collection efforts. A total of six species were collected or photographed when they were encountered during the 2010 Instream Flow Study (Appendix M). Figure 3.4-24 shows an example of one of the six species of mussel encountered. The six mussel species that were encountered are listed in Table 3.4-5. No federally listed threatened or endangered mollusk species occur in Fannin County (USFWS, 2015a) and none were identified in Bois d'Arc Creek during the Instream Flow Study (Appendix M).

However, in comments submitted to the USACE in January 2010, following the December 2009 agency scoping meeting for the EIS, TPWD observed that habitat may exist at the site of the proposed LBCR (both alternatives) for four mussel species that had been approved for state threatened status. These included the **Louisiana pigtoe** (*Pleurobema riddellii*), **sandbank pocketbook** (*Lampsilis satura*), **Texas**

heelsplitter (*Potamilus amphichaenus*), and **Texas pigtoe** (*Fusconaia askewi*). On January 17, 2010 these four species were officially listed as state-threatened (Melinchuk, 2015).



Figure 3.4-24. Live Yellow Sandshell Mussels Collected During Instream Flow Study (Appendix M)

Table 3.4-5. Mussel Species Collected on Bois d'Arc Creek

Common Name	Scientific Name	Habitat
Bleufer	<i>Potamilus purpuratus</i>	Streams, rivers, and reservoirs
Fragile Papershell	<i>Leptodea fragilis</i>	Streams, rivers and potentially reservoirs
Mapleleaf	<i>Quadrula</i>	Large streams, rivers, and lakes
Pink Papershell	<i>Potamilus ohioensis</i>	Large rivers and possibly reservoirs
Washboard	<i>Megaloniaias nervosa</i>	Rivers, lakes, and reservoirs
Yellow Sandshell	<i>Lampsilis teres</i>	Streams, rivers, and oxbow lakes

Source: Appendix M

By this time, surveys for the Instream Flow Study (Freese and Nichols, 2010a) had already been completed (from March-July 2009), so that no targeted surveys were conducted specifically for these state-threatened mussels. However, as noted above in Table 3.4-5, six mussel species were documented incidentally during the other data collection activities (e.g., sampling for fish and benthic invertebrates). While none of these six were state-threatened mussels, the incidental collection of six mussel species during other data collection efforts is a good indication that Bois d'Arc Creek in the vicinity of the proposed reservoir of Alternatives 1 and 2 supports mussel habitat (Melinchuk, 2015).

According to TPWD records (TPWD, 2010c), in Texas, the **Louisiana pigtoe** is found in streams and moderate-sized rivers within the Sabine, Neches, and (historically) Trinity River basins, generally in

flowing waters on substrates of mud, sand, and gravel. It is not generally known to be found in impoundments. According to TPWD's range map dated 10/14/2010, while this species has not been documented in Fannin County, it has "potential or known presence" in adjacent Hunt and Collin counties to the south and southwest (TPWD, 2010c).

According to TPWD records (TPWD, 2010d), in east Texas (Sulphur River south through San Jacinto River basins and Neches River), the **sandbank pocketbook** is found in small to large rivers on substrates of gravel, gravel-sand, and sand. According to TPWD's range map dated 10/14/2010, while this species has not been detected in Fannin County, it does have "potential or known presence" in adjacent Hunt County to the south (TPWD, 2010d).

According to TPWD records (TPWD, 2010e), in Texas, the **Texas heelsplitter** is found in quiet waters (including reservoirs) in mud or sand, within the Sabine, Neches, and Trinity River basins. According to TPWD's range map dated 10/14/2010, while this species has not been documented in Fannin County, it has "potential or known presence" in adjacent Hunt, Collin, and Grayson counties to the south, southwest, and west (TPWD, 2010e).

According to TPWD records (TPWD, 2010f), in east Texas basins – including the Sabine, Trinity, and San Jacinto – the **Texas pigtoe** occurs in rivers with mixed mud, sand, and fine gravel; it prefers protected areas associated with fallen trees or other structures. According to TPWD's range map dated 1/22/2013, while this species has not been documented in Fannin County, it does have "potential or known presence" in adjacent Hunt County to the south (TPWD, 2010f).

3.4.4 Wildlife

Regional Wildlife

Mammals that are generally distributed throughout the state include but are not limited to the silver-haired bat (*Lasionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), hoary bat (*L. cinereus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), eastern cottontail (*Sylvilagus floridanus*), American beaver (*Castor canadensis*), white-footed mouse (*Peromyscus leucopus*), deer mouse (*P. maniculatus*), coyote (*Canis latrans*), common gray fox (*Urocyon cinereoargenteus*), common raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and white-tailed deer (*Odocoileus virginianus*) (Davis and Schmidly, 1994).

With over 600 species of birds, the state of Texas has the highest avian diversity of any state in the country (TPWD, 2016). Water-related birds include ducks, geese, herons, egrets, bitterns, and rails. Upland bird species found in the Blackland Prairie and Post-oak Savannah Ecoregions include bobwhite quail (*Colinus virginianus*), mourning dove (*Zenaida macroura*), and wild turkey (*Meleagris gallipavo*).

The proposed project (Alternatives 1 and 2) and its connected actions are within the Texan Biotic Province (TPWD, no date-a). Common mammals in this province include the Virginia opossum (*Didelphis virginiana*), eastern mole (*Scalopus aquaticus*), fox squirrel (*Sciurus niger*), Louisiana pocket gopher (*Geomys breviceps*), fulvous harvest mouse (*Reithrodontomys fulvescens*), white-footed mouse, hispid cotton rat (*Sigmodon hispidus*), eastern cottontail, and swamp rabbit (*S. aquaticus*). Mammals common to the grasslands of the Texan Biotic Province include the thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), hispid pocket mouse (*Chaetodipus hispidus*), deer mouse, and black-tailed jackrabbit (*Lepus californicus*).

Amphibian species common to this province include the Hurter's spadefoot (*Scaphiopus hurteri*), Gulf Coast toad (*Bufo valliceps*), Woodhouse's toad (*Bufo woodhousii*), gray treefrog (*Hyla*

versicolor/chrysosecelis), green treefrog (*Hyla cinerea*), bullfrog (*Rana catesbeiana*), Southern leopard frog (*Rana sphenocephala*), and eastern narrowmouth toad (*Microhylla carolinensis*) (Brazos G, 2006).

Lower Bois d'Arc Creek Site

Wildlife in the Lower Bois d'Arc Creek project area is discussed below by habitat type.

Bottomland Hardwood Forest (Deciduous Forested Wetlands) Habitat

Fauna of the bottomland hardwood forests on the site include white-tailed deer, squirrels, wild turkey, raptors, colonial waterbirds, and other migratory birds. Common birds observed in the area during the HEP field studies include the indigo bunting (*Passerina cyanea*), white-eyed vireo (*Vireo griseus*), yellow-billed cuckoo (*Coccyzus americanus*), American crow (*Corvus brachyrhynchos*), Carolina wren (*Thryothorus ludovicianus*), barred owl (*Strix varia*), egret (Family: Ardeidae), Carolina chickadee (*Poecile carolinensis*), and northern cardinal (*Cardinalis cardinalis*). Evidence of mammalian residents included raccoon tracks, hog tracks, and beaver chew marks on trees. Reptiles such as the ornate box turtle (*Terrapene ornata*) (Figure 3.4-25) and unidentified frogs (Order: Anura) were also found in these forests, as were numerous invertebrate species, including crayfish (Family: Cambaridae) and land snails (Class: Gastropoda) (Freese and Nichols, 2008a).



Figure 3.4-25. Ornate Box Turtle

Upland Woods (Deciduous Forest) Habitat

Bird species observed in upland deciduous forest habitat include northern cardinal, blue-grey gnatcatcher (*Poliophtila caerulea*), downy woodpecker (*Picoides pubescens*), yellow-billed cuckoo, great blue heron (*Ardea herodias*), American crow, brown-headed cowbird (*Molothrus ater*), Carolina chickadee, and barred owl. Also observed in these areas are various reptiles such as turtles (Order: Testudines), frogs (Order: Anura), snakes such as racers (*Coluber constrictor*), and mammals including the eastern fox squirrel.

Upland Juniper Woods (Evergreen Forest) Habitat

Bird species observed in evergreen forest habitat of the project area include tufted titmouse (*Baeolophus bicolor*), northern cardinal, painted bunting (*Passerina ciris*), Carolina chickadee, pileated woodpecker (*Dryocopus pileatus*), and American crow.

Emergent / Herbaceous Wetland Habitat

Many species of birds are found in emergent/herbaceous wetlands, including the northern cardinal, American crow, indigo bunting, tufted titmouse, great blue heron, great egret (*Ardea alba*), red-tailed

hawk (*Buteo jamaicensis*), and northern harrier (*Circus cyaneus*). Other wildlife observed in this habitat include several mammals, such as raccoon, beaver, feral hog (*Sus scrofa*), and white-tailed deer, and aquatic species including frogs, mosquitofish (*Gambusia affinis*), crayfish, and clams (Class: Bivalvia); and plentiful flying insects such as butterflies (Order: Lepidoptera), bees (Order: Hymenoptera) and dragonflies (Order: Odonata).

Shrub Wetland Habitat

Birds observed in shrub wetland habitat of the project area included northern cardinal, painted bunting, American crow, great egret, solitary warbler (Family: Parulidae), and common yellow throat (*Geothlypis trichas*). Evidence of mammalian residents includes tracks of raccoons and bite marks of beavers. Also observed in the shrub wetlands were the southern leopard frog and crayfish.

Shrubland Habitat

Wildlife observed in shrubland habitat include the northern cardinal, painted bunting, American crow, bluejay (*Cyanocitta cristata*), and white-eyed vireo. The racer snake and garden orbweaver spider (*Argiope aurantia*) were also observed.

Grassland/Oldfield Habitat

Bird species observed in grassland/old field areas include the downy woodpecker, yellow-billed cuckoo, tufted titmouse, Carolina chickadee, northern cardinal, white-eyed vireo, painted bunting, great blue heron, and American crow. Turtle eggs (Order: Testudines) were also observed in this cover type.

Cropland Habitat

Croplands support wildlife populations primarily by providing food sources, and are especially valuable when located adjacent to tree or shrub cover. Bird species observed in the croplands of the project area include the wild turkey, northern cardinal, painted bunting, white-eyed vireo, tufted titmouse, and blue-gray gnatcatcher (*Polioptila caerulea*).

Tree Savanna Habitat

Bird species observed in tree savannas included the Carolina chickadee, yellow-billed cuckoo, painted bunting, white-eyed vireo, northern cardinal, brown-headed cowbird, and downy woodpecker.

3.4.5 Threatened and Endangered Species

This section addresses federal and state listed species found at the proposed dam and reservoir site, pipeline routes, water treatment facility site, and mitigation site of Alternatives 1 and 2.

Federally Listed Species

The Endangered Species Act (ESA) of 1973 and amendments provide for the conservation of threatened and endangered (T&E) species of animals and plants and their habitats. The USFWS technical assistance website and TPWD rare, threatened, and endangered species website were reviewed for information on T&E species in Fannin County (USFWS, 2013; TPWD, 2010b, 2011c, 2014, 2017a). Table 3.4-6 lists the federally-listed species potentially occurring in Fannin County according to the USFWS technical assistance website.

Table 3.4-6. Federally-listed Species Potentially Occurring in Fannin County

Species	Status
Bald Eagle (<i>Haligeetus leucocephalus</i>)	Recovery
Interior Least Tern (<i>Sterna antillarum athalassos</i>)	Endangered
Black Bear (<i>Ursus americanus luteolus</i>)	Threatened/ Similarity of Appearance ^a

^a S/A = similarity of appearance with the Louisiana black bear (*U. americanus luteolus*).

Source: USFWS, 2013

The bald eagle was formerly listed as federally threatened, but this species has been delisted and is in recovery. The project area contains no nesting and limited foraging habitat for interior least terns, because they require relatively large, bare or mostly bare beaches of sand or gravel, which are lacking at the project site. While potential habitat for black bears does occur within the reservoir footprint, none have ever been documented on-site.

State Listed Species

Table 3.4-7 lists state-listed species potentially occurring in Fannin County according to the TPWD rare, threatened, and endangered species website. The Texas state-threatened blackside darter, blue sucker, creek chubsucker, paddlefish, shovelnose sturgeon, timber/canebrake rattlesnake, Texas horned lizard and alligator snapping turtle may occur locally. These species and their habitats are described below.

Blackside darter (*Percina maculata*)

The blackside darter (Figure 3.4-26) is a state threatened species of Fannin County that reaches 4.3 inches in length. The darter has large black rectangular blotches on its sides and a less conical snout, not extending beyond its upper lip. Within the U.S., the species is wide ranging from the Great Lakes southwards through the Mississippi basin. In Texas, the darter is restricted to the Red River basin in the northeast part of the state. The species is currently stable and although it is one of the most common and widespread darters, it is seldom found in large populations. The habitat of the blackside darter includes small to medium rivers. This species is highly intolerant to certain organic pollutants, such as mine waste. Another threat to the species includes damming of rivers (TSU, no date-a).

Table 3.4-7. TPWD-listed Species Potentially Occurring in Fannin County

Species	State Status
American Peregrine Falcon (<i>Falco peregrinus anatum</i>)	T
Arctic Peregrine Falcon (<i>Falco peregrinus tundrius</i>)	No state status
Bald Eagle (<i>Haligeetus leucocephalus</i>)	T
Eskimo Curlew (<i>Numenius borealis</i>)	E
Interior Least Tern (<i>Sterna antillarum athalassos</i>)	E
Peregrine Falcon (<i>Falco peregrinus anatum</i>)	T
Whooping Crane (<i>Grus americana</i>)	E
Wood Stork (<i>Mycteria americana</i>)	T
Piping Plover (<i>Charadrius melodus</i>)	T
Black Bear (<i>Ursus americanus</i>)	T
Red Wolf (<i>Canis rufus</i>)	E
Blackside darter (<i>Percina maculata</i>)	T

Species	State Status
Blue sucker (<i>Cycleptus elongatus</i>)	T
Creek chubsucker (<i>Erimyzon oblongus</i>)	T
Paddlefish (<i>Polyodon spathula</i>)	T
Shovelnose sturgeon (<i>Scaphirhynchus platyrhynchus</i>)	T
Alligator snapping turtle (<i>Macrochelys temminckii</i>)	T
Texas horned lizard (<i>Phrynosoma cornutum</i>)	T
Timber/Canebrake rattlesnake (<i>Crotalus horridus</i>)	T
American burying beetle (<i>Nicrophorus americanus</i>)	No state status

Notes: Species listed in state by TPWD.

E = endangered; T = threatened

Sources: TPWD, 2010b, 2011c, 2014



Figure 3.4-26. Blackside Darter

Photo credit: Thomas, Bonner, and Whiteside 2007; www.txstate.edu

Blue Sucker (*Cycleptus elongatus*)

The blue sucker is a state threatened fish species that is olive blue or slate olive on the dorsum and sides of the body. The sucker can reach 32.5 inches in length and has 40-45 relatively large teeth per bone, arranged in a comb-like fashion. It has an elongate body and the eye is closer to the back of the head rather than to the tip of the snout. Throughout its range, it inhabits large, deep rivers and deeper zones of lakes (TSU, no date-b). The blue sucker is found in larger portions of major rivers in Texas, usually in channels and flowing pools with a moderate current. Adults winter in deep pools and move upstream in spring to spawn on riffles (TPWD, 2010b). The species has declined due to impoundments, pollution, and reduced water flows in water systems where it occurs. Threats to the blue sucker include destruction, modification, or curtailment of its habitat or range as well as other natural or manmade factors affecting its continued existence. Dams may contribute to blocking spawning migration and spawning areas, contributing in part to the decline of this species (TSU, no date-b).

Creek Chubsucker (*Erimyzon oblongus*)

The creek chubsucker is a state listed threatened fish with a cylindrical body that can reach 16.5 inches in length. This fish's coloration pattern consists of narrow vertical bars. The upper sides of the fish have a bluish green to brown coloration, the sides of the fish are more yellow or gold, and the underside is white to yellow (TSU, no date-c). The creek chubsucker is found in eastern Texas in the tributaries of the Red, Sabine, Neches, Trinity, and San Jacinto rivers. Its habitat consists of small rivers and creeks of various types and it spawns in river mouths or pools, riffles, lake outlets, and upstream creeks. Preferring

headwaters, it is seldom found in impoundments (TPWD, 2010b). Threats to the creek chubsucker include siltation and pollution, including pollution from agricultural runoff (NatureServe, 2010).

Paddlefish (*Polyodon spathula*)

The paddlefish is a state threatened species that can grow up to 87 inches long and typically weighs 10 to 15 pounds, though some have weighed as much as 200 pounds. The paddlefish's body is gray and shark-like with a deeply forked tail, and a long, flat blade-like snout. They eat by swimming with their mouth wide open, ingesting plankton. Paddlefish like to live in slow moving water of large rivers or reservoirs. The paddlefish's native range in Texas includes the Red River's tributaries, Sulphur River, Big Cypress Bayou, Sabine River, Neches River, Angelina River, Trinity River, and the San Jacinto River. Threats to the paddlefish include construction of dams and reservoirs. Paddlefish need large amounts of flowing water to reproduce. Dams and reservoirs decrease water flow and interrupt spawning. The eggs of paddlefish are also threatened by poaching and are used for caviar (TPWD, 2009).

Shovelnose sturgeon (*Scaphirhynchus platyrhynchus*)

The shovelnose sturgeon is a state listed threatened species that can reach 42.5 inches in length. The top and sides of the fish are light brown in color and the underside is white. The sturgeon is flat with a shovel-shaped snout. The fish is threatened by damming of rivers within its range resulting in flow alteration and habitat fragmentation (TSU, no date-d). Habitat in Texas includes open, flowing channels with bottoms of sand or gravel. The shovelnose sturgeon spawns over gravel or rocks in an area with a fast current. It is found in parts of the Red River and as a rare occurrence in the Rio Grande (TPWD, 2010b).

Timber/Canebrake Rattlesnake (*Crotalus horridus*)

The timber/canebrake rattlesnake is a state threatened species in Fannin County (TPWD, 2010b). The snake has a horny rattle or button on the end of its tail, and numerous small scales on the top of its head. The head is broader than the neck and the color pattern varies geographically. Most have dark crossbands with a yellow, black, or gray background color. The snake grows to approximately 60 inches long. In the South, the snake's habitat includes hardwood forests found in many river bottoms, swampy areas and floodplains, wet pine flatwoods, river bottoms and hydric hammocks, and hardwood forests and cane fields of alluvial plain and hill country. Threats to the snake include habitat destruction, particularly from housing developments, market hunting, snake hunting, shading over, logging, and road mortality (NatureServe, 2010).

Texas Horned Lizard (*Phrynosoma cornutum*)

The state-threatened Texas horned lizard or "horny toad" is a flat-bodied, brownish lizard with two rows of fringed scales on either side of its body. Its head has numerous prominent horns, with two central head spines substantially longer than all the others. It is the only horned lizard with dark brown stripes radiating downward from the eyes and across the top of the head. The Texas horned lizard prefers arid and semiarid habitats in open areas with sparse plant cover. Because it digs to hibernate, nest and insulate itself, it is commonly are found in loamy soils or loose sands. This species ranges from the south-central U.S. to northern Mexico, throughout much of Texas, Oklahoma, Kansas and New Mexico (TPWD, no date-b).

Alligator Snapping Turtle (*Macrochelys temminckii*)

The state-threatened alligator snapping turtle is found in perennial water bodies and the deep water of rivers, canals, lakes, and oxbows. It also occurs in swamps, bayous, and ponds near deep running water. Usually, it is found in water with a mud bottom and abundant aquatic vegetation. Sometimes it enters brackish coastal waters. It may migrate several miles along rivers and is active from March to October. It breeds from April to October. Its known range includes Fannin County (TPWD, 2005).

3.4.6 Invasive Species

Invasive species of both plants and animals are an enormous problem in Texas and throughout the United States. According to the U.S. Department of the Interior (DOI, no date), invasive species are one of most significant – and growing – threats faced by ecosystems, human and animal health, infrastructure, the economy, and cultural resources in the U.S.

Invasive Wildlife Species

Invasive animal species are generally considered harmful to native species and ecosystems because they displace, prey upon, infect, parasitize, or outcompete native fauna, thus compromising indigenous biodiversity. They may also be costly or harmful to human interests, such as by increasing maintenance or management costs. They are typically non-native, that is, they usually originate in other continents and are brought inadvertently or deliberately by human activity to given geographic areas in the U.S. However, some invasives originate in other parts of North America and increase their ranges or jump into new regions, often facilitated by human actions that have modified terrestrial and aquatic environments and habitats.

Invasive wildlife species that might be found within the LBCR footprint include the following:

- Asian clam (*Corbicula fluminea*). Originating in Eurasia, it is currently found across much of the country. In Texas, it has been documented in the Red River drainage and other locations. The threat it poses to native ecosystems is uncertain, but it is known to have economic impacts as a biofouler of many electrical and nuclear power plants across the country, clogging raw water service pipes (TexasInvasives, 2011a).
- Eurasian Collared Dove (*Streptopelia decaocto*). Originally native to the Bay of Bengal region of Asia, it is now found throughout most of the U.S., including northern Texas. This species is extremely successful at colonizing new ranges, and some scientists believe it to be outcompeting native North American doves, although this has yet to be conclusively demonstrated (TexasInvasives, 2011e).
- European Starling (*Sturnis vulgaris*). Originating in Europe, the starling is now widespread across the United States. It tends to displace cavity-nesting native birds, including the bluebird, purple martin, tree swallow, tufted titmouse, and woodpeckers. Starlings frequently commandeer the nests of native birds, expelling the occupants, and their eggs or nestlings (TexasInvasives, 2011b).
- Feral hog (*Sus scrofa*). Originating in Europe, they are now found in much of the U.S., including Texas and the project area. Feral hogs can have detectable adverse effects on native fauna and flora as well as domestic crops and livestock. Their rooting habits may cause extensive disturbance of vegetation and soils, sometimes resulting in a shift in plant succession. They also tend to outcompete, and thereby reduce the populations of, several species of native wildlife (TexasInvasives, 2012).
- Nutria (*Myocastor coypus*). Originally found in South America, this large, dark-colored, semiaquatic rodent was imported into North America by fur ranchers. They can adapt to diverse conditions and habitats and persist in areas once thought to be unsuitable. Nutria damage sugar cane and rice crops as well as water management facilities like levees (TexasInvasives, 2011c).

In addition, the non-native, invasive zebra mussel (*Dreissena polymorpha*), originally from Russia and Eurasia, while not documented in Bois d'Arc Creek yet, has been rapidly expanding its range in North America over the past couple of decades and may arrive shortly. In North Texas, it has already infested Lake Texoma and Lake Ray Roberts and has been documented in Lake Lavon, Lake Ray Hubbard, the

Red River below Lake Texoma, the Elm Fork of the Trinity River below Lake Ray Roberts, and Sister Grove Creek. Zebra mussels can cause marked decreases in populations of fish, birds and native mussels. In addition, they can disrupt water supply system by colonizing the insides of pipelines and restricting water flow (TexasInvasives.org, 2011d).

Invasive Plant Species

Aquatic and terrestrial plant species not native to Texas may compete with native plants for nutrients and habitat. Executive Order 13112–Invasive Species directs federal agencies to make efforts to prevent the introduction and spread of invasive plant species, detect and monitor invasive species, and provide for the restoration of native species. Texas Parks and Wildlife Department (TPWD) Code §66.0007 and Texas Department of Agriculture (TDA) Code §71.152 prohibit a person from selling, distributing, or importing into Texas the plants listed under this code.

The Parks and Wildlife Code now also addresses aquatic plants under §66.0071 (Removal of Harmful Aquatic Plants) and in §66.0072 (Exotic Harmful or Potentially Harmful Aquatic Plants). The list of harmful or potentially harmful exotic plants is found in Texas Administrative Code §57.111.

To determine possible invasive plant species within the proposed LBCR area, the Invasive Plant Atlas of the United States (2017), a cooperative interagency effort, was reviewed. This atlas is a collaborative effort between the National Park Service and the University of Georgia Center for Invasive Species and Ecosystem Health; it aims to provide individuals with the identification, early detection, prevention, and management of invasive species (Invasive Plant Atlas, 2017). Species prohibited by TDA and TPWD are identified in Table 3.4-8. While the species listed in Table 3.4-8 have been detected in Fannin County, are non-native, and present a problem somewhere in the United States, they are not known to be problematic in Fannin County at this time.

Table 3.4-8. TDA and TPWD Invasive, Prohibited, and Exotic Species

Common Name	Scientific Name
Upland Species	
Mimosa	<i>Albizia julibrissin</i>
Stinking chamomile	<i>Anthemis cotula</i>
Thymeleaf sandwort	<i>Arenaria serpyllifolia</i>
Giant reed	<i>Arundo donax</i>
Field brome	<i>Bromus arvensis</i>
Rescuegrass	<i>Bromus catharticus</i>
Rye Brome	<i>Bromus secalinus</i>
Hare’s ear	<i>Bupleurum rotundifolium</i>
Smallseed falseflax	<i>Camelina microcarpa</i>
Sheperd’s-purse	<i>Capsella bursa-pastoris</i>
Field bindweed	<i>Convolvulus arvensis</i>
Barnyardgrass	<i>Echinochloa crus-galli</i>
Korean lespedeza	<i>Kummerowia stipulacea</i>
Sericea lespedeza	<i>Lespedeza cuneata</i>
Chinese privet	<i>Ligustrum sinense</i>
Sweet breath of spring	<i>Lonicera fragrantissima</i>
Japanese honeysuckle	<i>Lonicera japonica</i>

Common Name	Scientific Name
Black medic	<i>Medicago lupulina</i>
Yellow sweet clover	<i>Melilotus officinalis</i>
Dallisgrass	<i>Paspalum dilatatum</i>
White poplar	<i>Populus alba</i>
Mourningbride	<i>Scabiosa atropurpurea</i>
Johnsongrass	<i>Sorghum halepense</i>
Common chickweed	<i>Stellaria pallida</i>
moth mullein	<i>Verbascum blattaria</i>
Hairy vetch	<i>Vicia villosa</i>
Lilac chastetree	<i>Vitex agnus-castus</i>
Aquatic and Wetland Species	
Dotted Duckweed	<i>Landoltia punctata</i>
Salvinia	All species in genus <i>Salvinia</i>
Floating Waterhyacinth	<i>Eichhornia crassipes</i>
Rooted Waterhyacinth	<i>Eichhornia azurea</i>
Waterlettuce	<i>Pistia stratiotes</i>
Hydrilla	<i>Hydrilla verticillata</i>
Lagarosiphon	<i>Lagarosiphon major</i>
Eurasian Watermilfoil	<i>Myriophyllum spicatum</i>
Alligatorweed	<i>Alternanthera philoxeroides</i>
Paperbark (Melaleuca)	<i>Melaleuca quinquenervia</i>
Torpedo grass	<i>Panicum repens</i>
Water Spinach	<i>Ipomoea aquatic a</i>
Ambulia (Asian Marshweed)	<i>Limnophila sessiflora</i>
Narrowleaf False Pickerelweed	<i>Monochoria hastata</i>
Heartshaped False Pickerelweed	<i>Monochoria vagina/is</i>
Duck-lettuce	<i>Ottelia alismoides</i>
Wetland Nightshade	<i>Solanum tampicense</i>
Exotic Bur-reed	<i>Sparganium erectum</i>
Brazilian Peppertree	<i>Schinus terebinthifolius</i>
Purple Loosestrife	<i>Lythrum salicaria</i>

Sources: TPWD, 2011a; TPWD, no date-d; TDA, no date

Invasive species are usually destructive, difficult to control or eradicate, and generally cause ecological and economic harm. A noxious weed is any plant designated by a federal, state, or county government as injurious to public health, agriculture, recreation, wildlife, or property. These species may spread by non-intentional means such as by wind, floods, wildlife, and accidental transport on vehicles including recreational watercraft and construction vehicles.

Aquatic invasive plants are defined as introduced plants that have adapted to living in, on, or next to water, and that can grow either submerged or partially submerged in water (USDA, 2011). Emergent, rooted floating, and submerged species such as giant salvinia can grow into thick mats that displace native vegetation, clog waterways, restrict oxygen levels of water, increase sedimentation, and prevent drainage

(TexasInvasives, 2007a). Aquatic plants can travel from one watershed to another by way of boat propellers, bilges, and livewells.

The control of these species is often very difficult once they become established. As described in Chapter 1 of this EIS, TPWD is the state agency responsible for managing fish and wildlife resources in Texas. TPWD has been increasing public awareness and education for these species and provides information on prevention of introduction (TPWD, no date-c).

3.5 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

3.5.1 Air Quality

Because air quality is measured and regulated on a regional level, the air quality analysis in this Revised DEIS utilizes air quality data from the Metropolitan Dallas Fort Worth Intrastate Air Quality Control Region (AQCR 215) (40 CFR 81.39). AQCR 215 encompasses 19 counties and includes those portions of Fannin County where Alternatives 1 and 2 would occur.

U.S. EPA Region 6 and the TCEQ regulate air quality in Texas. The Clean Air Act (CAA) (42 United States Code (USC) 7401-7671q), as amended, gives the EPA the responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) that set acceptable concentration levels for seven criteria pollutants: fine particulate matter (PM₁₀), very fine particulate matter (PM_{2.5}), sulfur dioxide (SO₂), carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O₃), and lead. O₃ is a strong photochemical oxidant that is formed when NO reacts with volatile organic compounds (VOCs, also referred to as hydrocarbons), and oxygen in the presence of sunlight. O₃ is considered a secondary pollutant because it is not directly emitted from pollution sources but is formed in the ambient air.

Short-term standards (1-, 8-, and 24-hour periods) have been established for criteria pollutants that contribute to acute health effects, while long-term standards (annual averages) have been established for pollutants that contribute to chronic health effects. Each state has the authority to adopt standards stricter than those established under the federal program; however, Texas accepts the federal standards. AQCRs that exceed the NAAQS are designated as *nonattainment* areas and those in accordance with the standards are designated as *attainment* areas. EPA has designated Fannin County as an attainment area for all criteria pollutants (40 CFR 81.39). Because the project is in an attainment area, the General Conformity Rule² requirements do not apply.

The EPA monitors levels of criteria pollutants at representative sites in each region throughout the U.S.; however, Fannin County does not have a monitoring station. Therefore, data from the two closest air monitoring stations were used to provide a baseline for air quality emissions in the area surrounding the proposed reservoir site. The two monitoring stations are the Hunt County regional air monitor (approximately 35 miles from the proposed reservoir site) and the Collin County monitor (approximately 51 miles from the proposed reservoir site). Due to their locations, these monitoring stations provide the best available data on historical air emissions in the area surrounding the proposed reservoir site. Table 3.5-1 shows the monitored concentrations of O₃ for 2013 to 2015 for these two stations as well as the primary and secondary air quality standards for O₃. No other criteria pollutants are monitored at these locations. As shown in Table 3.5-1, Collin County did not meet the ozone standard in 2013, 2014, or

² Established under the Clean Air Act, the General Conformity Rule ensures that the actions taken by federal agencies do not interfere with a state's plans to attain and maintain the National Ambient Air Quality Standards. According to the rule, if a project takes place in an area that is in attainment then the general conformity requirements do not apply to the project.

2015 while Hunt County exceeded the standards in 2013, but reduced emissions to below the standard in 2014 and 2015. These data are consistent with EPA's list of counties currently designated as nonattainment areas which shows Collin County as a nonattainment area for O₃ (USEPA, 2017a).

**Table 3.5-1. Ozone Standards and Ambient Air Concentrations
Near Lower Bois d'Arc Reservoir**

Pollutant	2013		2014		2015		Federal Standards	
	Collin	Hunt	Collin	Hunt	Collin	Hunt	Primary ^a	Secondary ^b
8-hour highest ^c (ppm)	0.082	0.075	0.083	0.064	0.083	0.064	0.070	0.070
8-hour 2 nd highest (ppm)	0.081	0.074	0.075	0.063	0.082	0.063	0.070	0.070

ppm = parts per million

Notes:

^a National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

^b National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects from a pollutant.

^c Not to be exceeded by the 3-year average of the annual 4th highest daily maximum 8-hour average.

Source: USEPA, 2016

3.5.2 Greenhouse Gas Emissions

It is well documented that the Earth's climate has fluctuated throughout its history from entirely natural causes. However, recent scientific evidence indicates a correlation between increasing global temperatures over the past century and the worldwide increase in anthropogenic (human) greenhouse gas (GHG) emissions. Climate change associated with global warming is predicted to produce negative environmental, economic, and social consequences across the globe in the coming years.

The direct environmental effect of GHG emissions is an increase in GHG atmospheric concentrations and average global temperatures, which indirectly causes numerous environmental and social effects. Therefore, the analysis domain for proposed GHG impacts would be global. These cumulative global impacts would be manifested as impacts on resources and ecosystems in Texas.

Greenhouse Gas Emissions and Effects

GHGs are gases that trap heat in the atmosphere by absorbing outgoing infrared radiation. GHG emissions occur from natural processes and human activities. Water vapor is the most important and abundant GHG in the atmosphere. However, human activities produce only a small amount of the total atmospheric water vapor. The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO₂), methane, and nitrous oxide. The main source of GHGs from human activities is the combustion of fossil fuels, such as oil, coal, and natural gas. Other examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydrofluorocarbons and perfluorocarbons) and sulfur hexafluoride. The main sources of these man-made GHGs are refrigerants and electrical transformers.

Each GHG is assigned a global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO₂, which is given a value of one. For example, methane has a GWP of 28, which means that it has a global warming effect 28 times greater than CO₂ on an equal-mass basis (IPCC, 2013). To simplify GHG analyses, total GHG emissions from a source are often expressed as a CO₂ equivalent, which is calculated by multiplying the emissions

of each GHG by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs. While methane and nitrous oxide have much higher GWPs than carbon dioxide, carbon dioxide is emitted in such greater quantities that it is the predominant contributor to global CO₂ equivalent emissions from both natural processes and human activities.

Numerous studies document the recent trend of rising atmospheric concentrations of carbon dioxide. The longest continuous record of carbon dioxide monitoring extends back to 1958 (Keeling, 1960; Scripps, 2017). These data show that atmospheric CO₂ levels have risen an average of 1.5 parts per million per year over the last 56 years (NOAA, 2017). As of 2014, carbon dioxide levels are about 30 percent higher than the highest levels estimated for the 800,000 years preceding the industrial revolution, as determined from carbon dioxide concentrations analyzed from air bubbles in Antarctic ice core samples (USGCRP, 2014).

Recent observed changes due to climate change include rising temperatures, shrinking glaciers and sea ice, thawing permafrost, a lengthened growing season, and shifts in plant and animal ranges. International and national organizations independently confirm these findings (IPCC, 2013; USGCRP, 2014).

3.6 ACOUSTIC ENVIRONMENT (NOISE)

This section discusses the existing conditions of the acoustic environment that would be affected by Alternatives 1 and 2. A brief discussion on what sound is and how it is measured as well as applicable noise guidelines are also provided.

3.6.1 Noise Overview

Sound is a physical phenomenon consisting of vibrations that travel through a medium, such as air, and are sensed by the human ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities essential to a community's economy and quality of life, such as construction, vehicular traffic, or even music, which may be pleasing to some ears, but too loud (noisy) for others.

Sound varies by both intensity and frequency. Sound pressure level, described in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz (Hz) are used to quantify sound frequency. The human ear responds differently to different frequencies. *A-weighting*, measured in A-weighted decibels (dBA), approximates a frequency response expressing the perception of sound by humans. Table 3.6-1 includes sounds encountered in daily life and their dBA levels.

Table 3-6.1. Common Sounds and Their Level

Outdoor Sound	Sound Level (dBA)	Indoor Sound
Automobile horn	120	Loud rock concert
Power mower at 3 feet	110	Power saw at 3 feet
Motorcycle	100	Subway train, pneumatic drill
Tractor, bulldozer, excavator	90	Garbage disposal
Downtown (large city)	80	Ringling telephone
Freeway traffic	70	TV audio

Outdoor Sound	Sound Level (dBA)	Indoor Sound
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Source: Harris, 1998

The dBA noise metric describes steady noise levels, although very few noises are, in fact, constant. Therefore, Day-Night Sound Level (DNL) has been developed. DNL is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels (10 p.m. to 7 a.m.). It is a useful descriptor for noise because 1) it averages ongoing yet intermittent noise, and 2) it measures total sound energy over a 24-hour period. In addition, Equivalent Sound Level (L_{eq}) is often used to describe the overall noise environment. L_{eq} is the average sound level in dB.

3.6.2 Noise Guidelines

The Noise Control Act of 1972 (PL 92-574) directs federal agencies to comply with applicable federal, state, interstate, and local noise control regulations. In 1974, the EPA provided information suggesting that continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals. However, in 1982, the EPA transferred the primary responsibility of regulating noise to state and local governments. Fannin County and the State of Texas do not have noise laws or regulations. The city of Bonham has a nuisance noise ordinance that addresses common noises such as car radios, but not construction noise (City of Bonham Code of Ordinances Sec. 8.06.002).

3.6.3 Affected Acoustic Environment

Different types of land uses and the human activities associated with them have different sensitivities to changes in ambient noise levels. In order to characterize land uses and activities in the project area, aerial maps were reviewed and a visual survey of the project area was performed. In general, the area is rural, and the properties within the area are typically low-density residential. The majority of the project area is in undeveloped and underdeveloped portions of Fannin County; however, there are some residences located near the project area. There are no sensitive receptors (e.g., daycares, hospitals, schools) in the immediate project area.

Existing sources of noise near the proposed project sites include typical noise sources associated with ranching and activities associated with Caddo National Grasslands and surrounding recreation areas including: rural roadway traffic, high-altitude aircraft overflights, small craft motorized boating activities, farm equipment, and natural noises such as the rustling of leaves and bird vocalizations. In general, noise levels are typical of a rural setting, and existing noise is predominantly due to secondary roadways. Existing noise levels (L_{eq} and DNL) were estimated for the surrounding area using the techniques specified in the *American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound Part 3: Short-term measurements with an observer present* (ANSI, 2003) and are presented in Table 3.6-2.

Table 3.6-2. Estimated Existing Noise Levels in the Project Area

Land Use	Estimated Existing Sound Levels (dBA)		
	DNL ^a	L _{eq} ^b (Daytime)	L _{eq} ^b (Nighttime)
Very quiet suburban and rural residential	45	43	37

DNL = day-night sound level; L_{eq} = equivalent continuous noise level

Source: ANSI, 2003

3.7 RECREATION

The analysis of recreational resources identifies aspects of the proposed activities related to visitation, revenue, and the recreational experience that are sensitive to changes and that may be affected by the proposed alternatives. The analysis specifically considers how Alternatives 1 and 2 might affect recreational opportunities, resources, and values to individuals and communities in the area. The reservoir, 35-mile raw water pipeline, WTP, and TSR – components of both Alternatives 1 and 2 – would be located in Fannin County. The 25-mile pipeline from Lake Texoma to the balancing reservoir – a component of Alternative 2 – would be located in Grayson County. Changes to visitation, revenue, and the recreational experience would be felt most by individuals, communities and outfitters in Fannin and Grayson counties, and as such are the primary focus for potential direct impacts. Visitation and the recreational experience at other nearby, regional reservoirs may also be affected and therefore are considered for indirect impacts as appropriate throughout the section.

The 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation revealed that 6.3 million Texas residents and nonresidents participated in fishing, hunting, or wildlife watching. The most popular activity was wildlife watching, followed by fishing and then hunting (USDOJ et al., 2011). The importance of wildlife observation and fishing to recreation in Texas is particularly salient when analyzing the impacts of a recreational reservoir. This Revised DEIS considers popular water- and land-based activities in the project area, including fishing, hunting, wildlife watching (observing and photographing wildlife), boating (motorized and non-motorized), swimming, picnicking, camping, and enjoying the scenic quality of nature.

3.7.1 Bois d'Arc Creek

There are no designated public recreation areas within the reservoir footprint of either Alternative 1 or 2. Private landowners and their guests access the Bois d'Arc Creek for recreation activities such as boating, fishing, trapping, hunting, wildlife observation, birding, and the enjoyment of scenic natural beauty (Graves, 2010).

3.7.2 Legacy Ridge Country Club

The Legacy Ridge Country Club is a semi-private golf course in the immediate vicinity of the proposed reservoir. It includes a clubhouse, golf center, real estate currently under or planned for construction, driving range, and a par-72, 18-hole golf course which winds into the wetlands of Bois d'Arc Creek. Eighty percent of the revenue at this golf course comes from out of town golfers (NTEN, 2010).

The 18-hole golf course consists of two distinctly different nines. The “front nine” starts high and weaves through lakes and waterfalls, transitioning into a parkland-style route highlighted by pecans and oaks. The wetlands of Bois d'Arc Creek line the “back nine” fairways, keeping water in play most of the nine (Golf Texas, 2017). The golf course is currently partially protected by berms, but the “back nine” of the

golf course is below the 100-year flood plain level at 541 feet MSL, and experiences intermittent flooding after heavy rain events (NTEN, 2010).

3.7.3 Caddo National Grasslands Wildlife Management Area

The Caddo National Grasslands Wildlife Management Area (WMA) is administered by the US Forest Service (USFS) and is managed under a cooperative agreement with Texas Parks and Wildlife. It is made up of two separate units – the 13,360-acre Bois d'Arc Creek Unit and the 2,780-acre Ladonia Unit. The Bois d'Arc Unit is near Honey Grove and can be accessed from FM 100. It is located directly northeast of the proposed dam and spillway under both Alternatives 1 and 2. The Ladonia Unit is located near Ladonia in the southeastern portion of Fannin County, and can be accessed from SH 34.

The Caddo National Grasslands WMA is open year-round and provides opportunities for recreation such as camping, hiking, fishing, hunting, horseback riding, mountain biking, picnicking, wildlife viewing and photography (USFS, No Date). Recreational facilities include camping sites, boat launches, swimming sites, group shelters, picnic units, vistas/overlooks, and wildlife viewing sites (USFS, 2009). As shown in Figure 3.7-1, most of the recreational facilities are located in the larger Bois d'Arc Unit.

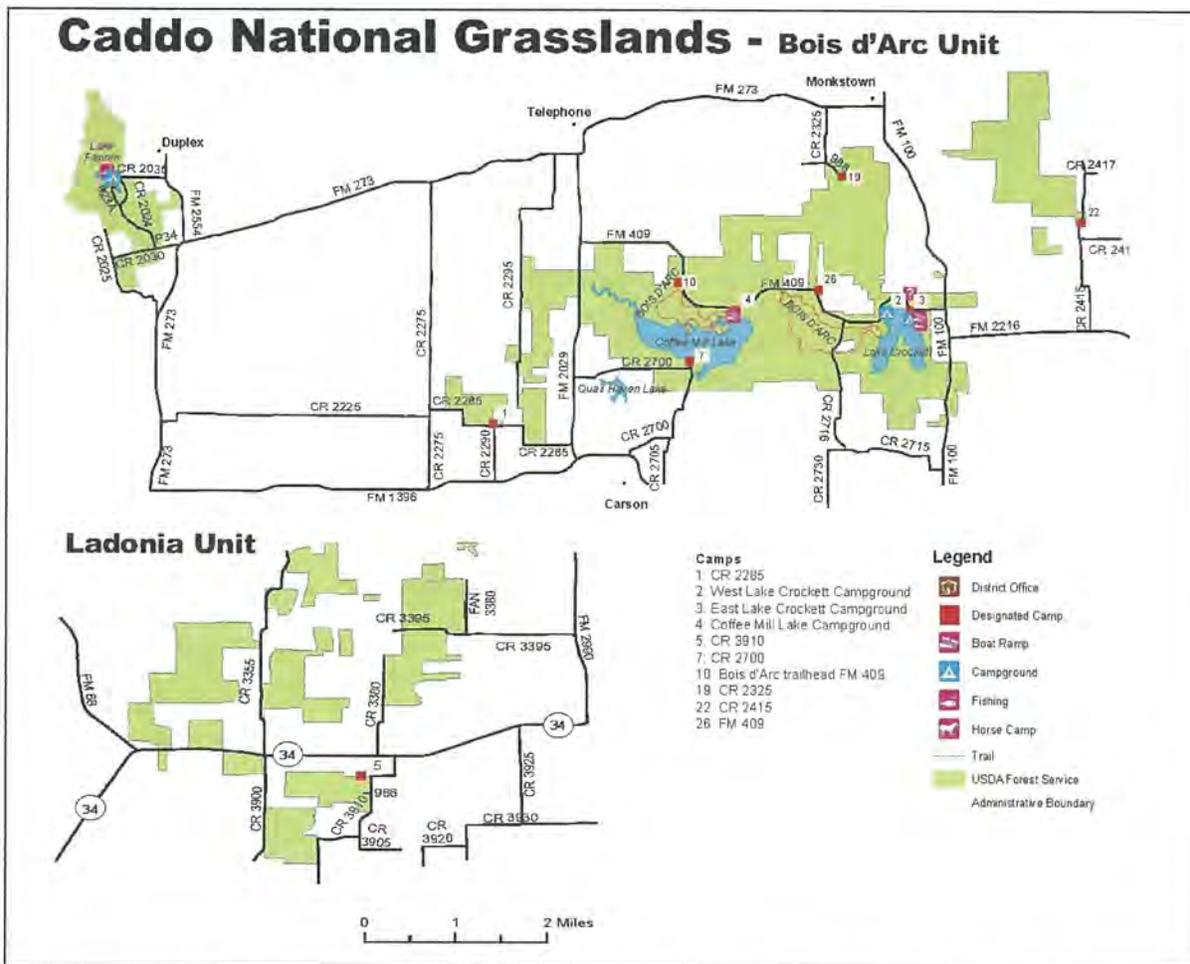


Figure 3.7-1. Developed Recreation Sites in Caddo National Grasslands WMA

Source: USFS, 2016.

Recreational fishing is available at all three lakes in the Bois d'Arc Unit: Lake Crockett, Coffee Mill Lake, and Lake Fannin. Lake Fannin is further removed from the other recreational fishing lakes – about nine miles from Coffee Mill Lake and 13 miles from Lake Crockett. Coffee Mill Lake and Lake Crockett, located directly northeast of the proposed dam and spillway, offer fishing for perch, crappie, catfish and largemouth bass; and Lake Crockett also offers fishing for Florida largemouth bass. Fishing is regulated under the state of Texas fishing rules and regulations. There is one boat ramp at Coffee Mill Lake and one at Lake Crockett (TPWD, no date-e).

Other recreation activities at Caddo National Grasslands WMA include camping, hiking, horseback riding, mountain biking, wildlife viewing and photography. Camping occurs in designated campsites that are owned and operated by the USFS. Multi-use trails shown in Figure 3.7-2 below are shared by bicyclists, hikers, and horseback riders (TPWD, no date-e).

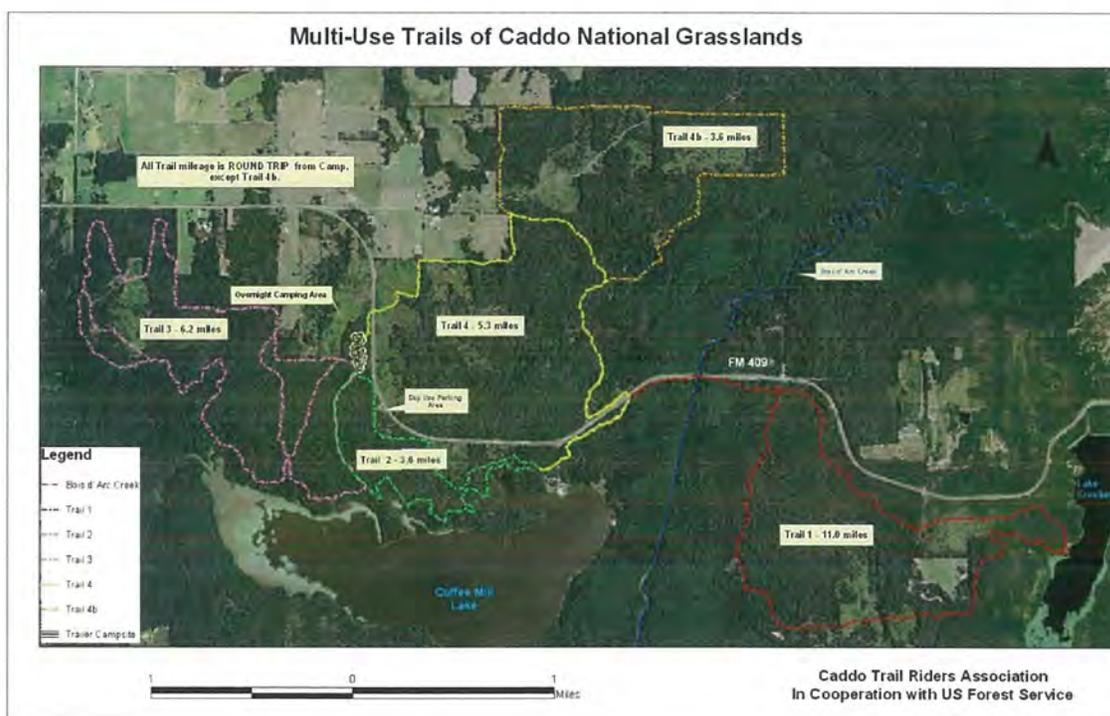


Figure 3.7-2. Multi-Use Trails in Bois d'Arc Unit, Caddo National Grasslands WMA

Source: Pons, No Date.

Most hunting at Caddo National Grasslands WMA occurs on the Bois d'Arc Unit, and includes white-tailed deer, squirrel, and waterfowl (among others). Limited dove and quail hunting occurs on the Ladonia Unit (TPWD, no date-e). Hunting opportunities at Caddo National Grasslands WMA and on public lands in surrounding counties are summarized in Table 3.7-1 below.

Table 3.7-1. Hunting Opportunities Near the Proposed Project Area

Unit #	Unit Name	County	Acres	Species Hunted
901N	Bois d'Arc Unit – Caddo National Grasslands WMA	Fannin	13,370	Deer, feral hog, turkey, dove, teal, waterfowl, other migratory birds, squirrel, rabbit, coyotes, furbearers
901S	Ladonia Unit – Caddo	Fannin	2,780	Dove and quail

Unit #	Unit Name	County	Acres	Species Hunted
	National Grasslands WMA			
501	Ray Roberts Public Hunting Lands	Cooke/Denton/Grayson	41,303	Feral hog, dove, teal, waterfowl, other migratory birds, quail, squirrel, rabbit
731	Cooper WMA (next to Jim Chapman Lake)	Delta/Hopkins	14,160	Deer, feral hog, dove, teal, waterfowl, other migratory species, squirrel, rabbit,
708	Tawakoni WMA	Hunt/ Rains/ Van Zandt	39,125	Deer, feral hog, dove, teal, waterfowl, other migratory birds, squirrel, rabbit, furbearers
705	Pat Mayse WMA	Lamar	8,925	Deer, feral hog, dove, teal, waterfowl, other migratory birds, quail, squirrel, rabbit, furbearers

Source: TPWD, 2017b.

Texas Parks and Wildlife manages the wildlife hunting opportunities at Caddo National Grasslands WMA. Hunters are required to possess a valid hunting license, the appropriate tags and stamps, and a public hunting permit or an Annual Public Hunting permit to hunt on public lands (TPWD, no date-e). Hunting regulations comply with Texas Hunting and Fishing Regulations for outdoor annual hunting and vary based on the animal (game animal, upland game birds, migratory game birds, other animals) and the special seasons (archery-only, falconry, muzzleloader deer, youth only) (TPWD, 2017c).

3.7.4 Regional Lakes and Reservoirs

Natural lakes and man-made reservoirs offering recreation in the region are shown in Table 3.7-2. Lakes and reservoirs located in Fannin and Grayson counties (and therefore close to the proposed LBCR) include Bonham City Lake, Bonham State Park Lake, Lake Texoma, Lake Ray Roberts and in the Caddo National Grasslands WMA Coffee Mill Lake, Lake Fannin, and Lake Crockett. Big Creek Reservoir, Jim Chapman Lake, Lake Crook, Pat Mayes Lake, Lake Lavon, and Lake Tawakoni are located in the surrounding counties.

Bonham City Lake is located three miles northeast of Bonham off of FM 273, and is the lake closest to the proposed reservoir. It has two access points: Bonham City Lake Recreation Area and North Ramp. Bonham City Lake Recreation Area is located on the south shore at the east end of the lake, and can be accessed via FM 273 and Recreation Road 3. The North Ramp is located approximately two miles north of Recreation Road 3 off of FM 273. It can be accessed via Fannin County Road 2524 and Boat Ramp Road. Bonham City Lake has a surface area of 1,020 acres and offers facilities for picnicking, camping, boating, fishing, and swimming. Predominant fish species include largemouth bass, channel and blue catfish, and crappie (TPWD, no date-f).

Table 3.7-2. Lakes and Reservoirs with Recreation Near the Proposed Project Area

Lake/Reservoir	County	Managing Authority
Bonham City Lake	Fannin	City of Bonham
Bonham State Park Lake	Fannin	Texas Parks and Wildlife
Coffee Mill Lake	Fannin (Caddo National Grasslands)	US Forest Service
Lake Fannin	Fannin (Caddo National Grasslands)	US Forest Service
Lake Crockett	Fannin (Caddo National Grasslands)	US Forest Service
Lake Texoma	Grayson	US Army Corps of Engineers
Lake Ray Roberts	Grayson	Texas Parks and Wildlife*
Big Creek Reservoir	Delta	Delta County Clerk
Jim Chapman Lake	Delta	Texas Parks and Wildlife*

Lake/Reservoir	County	Managing Authority
Lake Crook	Lamar	City of Paris
Pat Mayse Lake	Lamar	US Army Corps of Engineers
Lake Lavon	Collin	US Army Corps of Engineers
Lake Tawakoni	Hunt	Sabine River Authority; Texas Parks and Wildlife*

^a USACE is the managing authority of these lakes/reservoirs, but TPWD manages recreational properties associated with them.

Sources: TPWD, no date-f; USFS, no date

The location of recreational lakes and state parks in relation to the reservoir, pipeline, and water treatment facility for Alternative 1 are shown in Figure 3.7-3. Bonham City Lake, Bonham State Park Lake, and in the Caddo National Grasslands WMA Coffee Mill Lake and Lake Crockett, are located closest to the proposed LBCR. Bonham State Park Lake is approximately three miles away from the proposed LBCR. Lake Crockett is a little over a mile away and Coffee Mill Lake is about a half mile away. Bonham City Lake is immediately adjacent to the proposed LBCR.

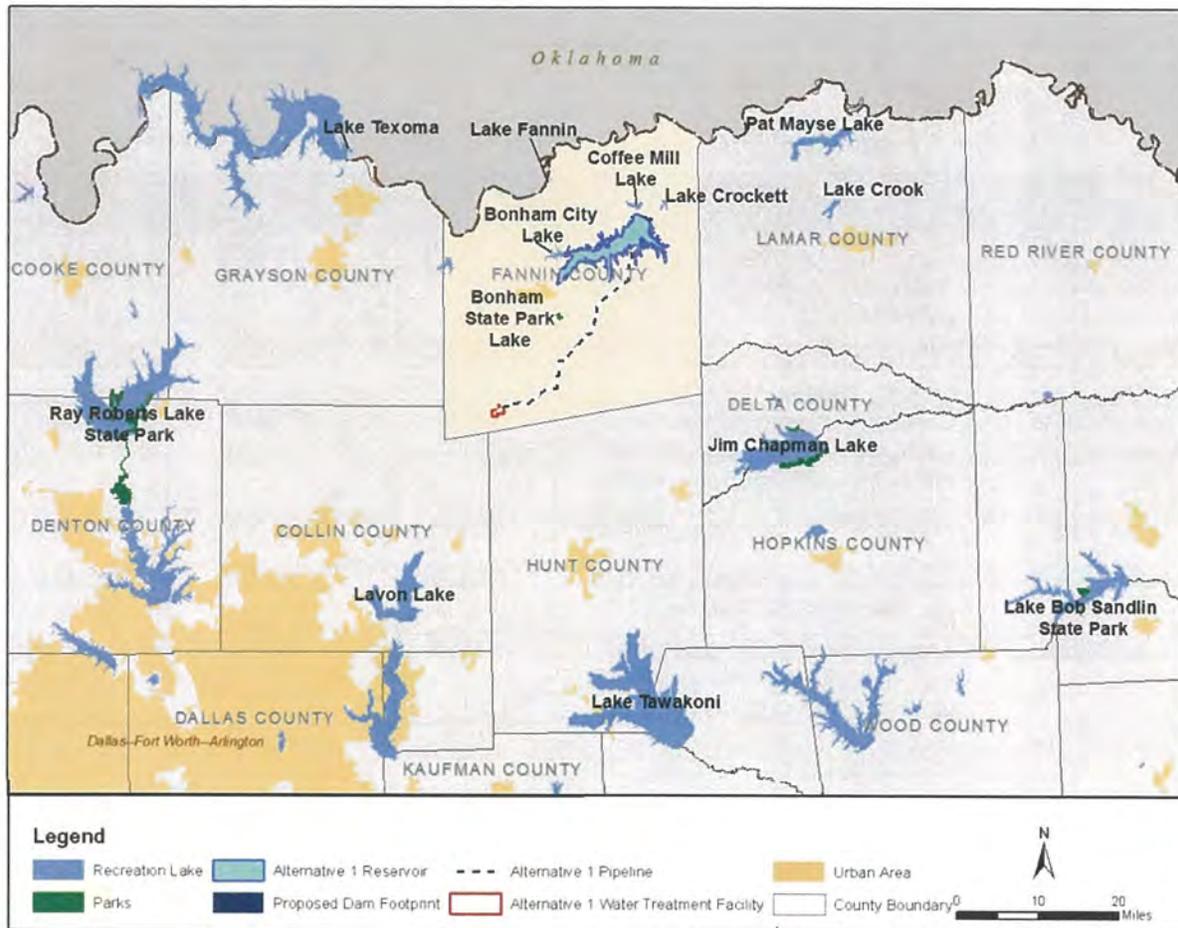


Figure 3.7-3. Location of Regional Lakes and Reservoirs Relative to Alternative 1

Source: TWDB, 2014

Visitation

Visitation, surface area, recreational facilities and opportunities, and water fluctuation for USACE and TPWD-managed lakes are presented in Table 3.7-3 (data for lakes managed by cities or counties are not available and as such are not included). The Gateway website provides USACE Lake Level Reports for FY 2012. The visitation data were derived from the Operations and Maintenance Business Information Link (OMBIL) and the Visitation Estimation and Reporting System (VERS) databases with 2012 data. A “visit” is defined as the entry of one person onto a USACE site to engage in one or more recreational activities regardless of the length of stay. A “person trip” is equivalent to a “visit.”

Texas Parks and Wildlife Department (TPWD) provided visitation for FY 2016, estimated using a combination of collection and calculation methods. Visitation data is collected for each person entering a park during regular business hours, and entered manually into the “TXParks” software. After-hours visitation is calculated using collected vehicle data, the park’s unique visitation multiplier (based on year-long surveys measuring the number of vehicles, overnight visitors, day users, etc.), and payment information received from visitors arriving after-hours (Cater, 2017).

TPWD characterizes water fluctuation as minimal, moderate, or considerable. These descriptors, included in Table 3.7-3 below, are based on general visual or measured observations, and are not uniquely categorized or defined for scientific purposes. This information is provided by TPWD for the benefit of the general public interested in a lake’s conditions, and is provided here to help describe each lake’s conditions (Cater, 2017).

Table 3.7-3. Visitation and Other Characteristics of Regional Lakes and Reservoirs

Lake/Reservoir	Recreational Facilities and Opportunities	Surface Area (acres)	Annual Visitation (Person-trips)	Water Fluctuation
Bonham State Park Lake	Camping (campground), swimming, fishing, hiking, playground, boating, picnicking	65	51,663 ^a	Minimal
Pat Mayse Lake	Fishing, dock, picnic areas, camping, hunting	5,940	214,202 ^b	Moderate
Jim Chapman Lake	Camping (campground), shelters, cabins, beaches, picnic areas, boat ramps, lighted fishing piers, hunting	19,305	295,842 ^b	Moderate
Lavon Lake	Fishing, dock, picnic areas, camping	21,400	1,204,742 ^b	Moderate
Lake Ray Roberts	Fishing, camping, picnic areas, boat gas, courtesy docks, hunting	25,600	1,188,694 ^b	Moderate
Lake Tawakoni	Fishing, camping, RV sites, motels, boat ramps, bait and tackle shops, water sports, hunting, trails	37,879	75,724 ^a	Considerable
Lake Texoma	Fishing, camping, RV sites, picnicking, resorts, cabin/lake house/condo rentals, inns, motels, sailing, golfing, hunting, trails	74,686	5,073,550 ^b	Considerable

^a Visitors to TPWD-managed lakes reported for FY 2016

^b Visitors to USACE-managed lakes reported for FY 2012

Sources: TPWD, no date-f; Cater, 2016; USACE, 2012

Despite considerable water fluctuation, Lake Texoma receives the greatest number of visitors, with over five million in FY 2012. It also has the largest surface area of the regional lakes, and the lake is stocked with largemouth bass, smallmouth bass, white bass, hybrid striped bass, white crappie, black crappie, channel catfish, flathead catfish and blue catfish. It is one of the few reservoirs in the United States where striped bass reproduces naturally, and is known as the “Striper Capital of the World” (USACE, no date-c). Lake Texoma is also bordered by the 12,000-acre Hagerman National Wildlife Refuge (NWR) at the Big Mineral Arm, a popular destination for sports fishermen seeking catfish, sand bass, stripers, crappie, and pan fish year-round (USFWS, 2015b). In addition to water-based activities, Lake Texoma offers 90,000 acres of public land for game hunting, including deer, turkey, small game, dove and other migratory game birds, waterfowl and feral hogs (USACE, no date-c). Hagerman NWR provides additional hunting opportunities for white-tailed deer, feral hogs, and wild turkey through a lottery permit system. Hunting for small game including squirrel and rabbit and dove hunting is also available (USFWS, 2015c). There are several options for overnight stays (i.e. resorts, cabin/lake house/condo rentals, inns, motels). The recreation area also includes 10 campgrounds and 25 miles of equestrian and hiking trails, including the scenic Cross Timbers hiking trail (USACE, no date-c). The number, type and quality of recreational facilities and opportunities offered at Lake Texoma likely contribute to its popularity, and explain why it has been dubbed the “Playground of the Southwest.”

In contrast to Lake Texoma, despite minimal water fluctuation, Bonham State Park Lake received the least number of visitors, with 51,663 in FY 2016. It is also the smallest of the lakes and does not offer facilities conducive to overnight stays. In the case of Lake Tawakoni, considerable water fluctuation may contribute to its low visitation. Considering its relatively large surface area and despite offering some facilities conducive to overnight stays (i.e., RV sites and motels) as well as hunting opportunities (summarized above in Table 3.7-1), it only received about 80,000 visitors in FY 2012. Said otherwise, Lake Tawakoni has about half the surface area of Lake Texoma, but received less than one percent of the visitors Lake Texoma received in FY 2012.

Generally speaking, the number and type of recreational facilities and opportunities, surface area, and water fluctuation all seem to be related to visitation at the regional reservoirs, though it is difficult to tell in these cases if any one factor directly increases or decreases visitation. A study on the effect of Tennessee Valley Authority (TVA) reservoir water levels on recreational fishing concluded that while water levels were not a major barrier to participation, levels did affect the number of trips taken by anglers. In the case of the TVA reservoirs, lower water levels left many coves and boat ramps landlocked for much of the year, restricting the ability of reservoir anglers to launch boats (Jakus et al., 2000). With the information at hand, considerable water fluctuation does not appear to deter visitors from Lake Texoma; and minimal water fluctuation does not appear to attract visitors to Bonham State Park Lake. Considerable water fluctuation would appear to deter visitors to Lake Tawakoni, though other factors could include the quality of developed recreational facilities, biological or geological factors, and proximity to population centers.

Economic Impacts

The money spent by visitors to USACE lakes on trip expenses adds to the local and national economies by supporting jobs and generating income. The Gateway website provides visitor spending, jobs, labor income, and value added within 30 miles of USACE lakes. Spending profiles were estimated from a national visitor spending survey that was conducted in 1999/2000 and price indexed to 2012 dollars using the Consumer Price Index by sectors. Impact Analysis for Planning (IMPLAN), an input-output modeling system uses recreation spending and visitor use estimates to estimate capture rates and economic multipliers. Spending averages were computed and multiplied by visitation statistics to estimate total annual visitor spending. Generalized spending profiles were developed for two sets of visitor segments: 1) campers, other overnight visitors and day users, and 2) boaters and non-boaters.

These profiles were applied to recreation use data gathered from the visitation use survey and from the OMBIL and VERS to estimate total spending by each segment (USACE, 2016).

Visitor spending represents a sizable component of the economy in many communities around USACE lakes. For example, at Lavon Lake, 1.2 million visits and almost \$4 million in visitor spending within 30 miles of the lake created about 250 jobs, \$8.4 million in labor income (salaries, wages, and work benefits), and \$12.5 million in value added to the local economy (i.e., the contribution to the overall wealth of the economy). The economic impacts within 30 miles of USACE-managed lakes (Pat Mayse Lake, Jim Chapman Lake, Lavon Lake, Lake Ray Roberts, and Lake Texoma) are summarized in Table 3.7-4 below. The economic impacts of both local and non-local visitor spending within 30 miles of a USACE lake are reported for FY 2012. The economic impacts of non-local visitor spending within 20 miles of TWPD lakes are reported for FY 2014.

Table 3.7-4. Economic Impacts of Regional Lakes and Reservoirs

Reservoir	Visitor Spending	Labor Income	Value Added	Jobs
Managed by US Army Corps of Engineers (FY 2012)				
Pat Mayse Lake	\$6,121,000	\$974,000	\$1,632,000	48
Jim Chapman Lake	\$10,540,000	\$1,761,000	\$2,916,000	84
Lavon Lake	\$39,739,000	\$8,444,000	\$12,596,000	263
Lake Ray Roberts	\$40,318,000	\$7,522,000	\$11,602,000	291
Lake Texoma	\$169,135,000	\$29,157,000	\$47,514,000	1,680
Managed by Texas Parks and Wildlife (FY 2014)				
Bonham State Park Lake	\$528,362	\$201,607	\$362,964	7.2
Lake Tawakoni	\$1,304,145	\$376,971	\$945,505	19.1

Sources: USACE, 2012 and Jeong and Crompton, 2014.

Note: Economic impacts for USACE-managed lakes are reported for FY 2012, and TWPD-managed lakes are reported for FY 2014.

That said, compared to other industries in the counties where these lakes are located, recreation-related industries account for relatively small portions of total industry compensation. Total industry compensation provides a good picture of relative sizes of market-related or business activity performed in a county, and it is reported in terms of employee compensation for work in a sector. Compensation includes salaries and wages as well as employer contributions for employee retirement funds, social security, health insurance, and life insurance. This income is not always received by a person living in the county, because a person from a neighboring county may cross county lines to go to work. Employee compensation by industry is a measure of economic activity generated in a county, regardless of where the employee resides.

Table 3.7-5 shows the employee compensation for the Art, Entertainment, and Recreation and Accommodation and Food Services industries as well as the percent of total industry compensation for the counties in which the regional lakes are located. Tables 3.12-9 and 3.12-14 in the Socioeconomics section in Chapter 3 show total employee compensation by industry in Fannin and Grayson Counties, respectively, in 2010.

Table 3.7-5. Total Employee Compensation for Recreation-Related Industries (2010)

County	Art, Entertainment, and Recreation		Accommodation and Food Services	
	Employee Compensation	Percent of Total Industry Compensation	Employee Compensation	Percent of Total Industry Compensation
Fannin	\$644,000	0.2	\$6,372,000	2.3
Grayson	\$16,073,000	0.7	\$77,613,000	3.8
Collin	\$106,211,000	0.5	\$585,617,000	3.0
Hunt	\$2,054,000	0.1	\$34,691,000	2.3
Lamar	\$4,794,000	0.5	\$25,804,000	3.0
Delta	(D)	n/a	(D)	n/a

(D) = Not shown to avoid disclosure of individual confidential information; n/a = not available.

Source: BEA, 2011a.

3.8 VISUAL RESOURCES

3.8.1 Terminology and Methodology

A visual resource is the interaction between a human observer and the landscape he or she is observing. The subjective response of the observer to the various natural and artificial elements of a given landscape is fundamental to visual resources impacts analysis (USDA, 2007). A viewshed is the view of an area from a specific location. The limits of a viewshed are defined as the visual limits of the views from a specific location (Caltrans, no date).

Federal land management agencies such as the Bureau of Land Management (BLM), USFS, and the National Park Service are concerned with the management of visual resources. Visual resource management (VRM) is a system developed by the BLM for minimizing the visual impacts of surface-disturbing activities and maintaining scenic values for the future. While the VRM was developed for application on the public lands managed by BLM, it is a useful tool to assess impacts on private lands as well. VRM consists of two stages – inventory (visual resource inventory) and analysis (visual resource contrast rating).

VRM's visual resource inventory consists of rating the visual appeal of a tract of land, measuring public concern for scenic quality, and determining whether the tract of land is visible from travel routes or observation points. Once the inventory is completed, the area's visual resources are assigned to management classes, Class I to Class IV, with Class I being the most highly valued visually³. Each management class has established management objectives (BLM, 2017):

- Class I Objective – Preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.
- Class II Objective – Retain the existing character of the landscape. The level of change to the characteristic landscape should be low.
- Class III Objective – Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.

³ Determining the value of an area's visual resources is a subjective process that factors in the scenic quality of the area and the sensitivity of the area.

- Class IV Objective – Provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

VRM's analysis stage involves determining whether the potential visual impacts from proposed surface-disturbing activities or developments will meet the management objectives established for the area, or whether design adjustments will be required.

The first step in the VRM visual resource inventory is the scenic quality evaluation. Scenic quality is a measure of the visual appeal of a tract of land. In the visual resource inventory process, the landscape under evaluation is rated as A, B, or C (most to least scenic) based on its aggregate score in the seven rating criteria (landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications [BLM, no date]). The next step in the VRM visual resource inventory is the sensitivity level analysis. Sensitivity levels are a measure of public concern for scenic quality. The landscape being inventoried is assigned high, medium, or low sensitivity levels by analyzing the various indicators of public concern (e.g., type of users, amount of use, public interest, and adjacent land use) (BLM, 1986a).

The VRM described above was used to evaluate the affected environment for the proposed project. The area within the proposed dam and reservoir footprint (Alternatives 1 and 2) was chosen for analysis because the dam and reservoir would be the dominant feature of the project and would represent the largest potential for impacts to visual resources. It was determined that the proposed dam and reservoir would primarily be visible from portions of the Caddo National Grasslands and roadways in and around the reservoir footprint (specifically FM 1396). Therefore, for purposes of analysis, the viewshed of individuals visiting the Caddo National Grasslands and individuals utilizing FM 1396 was used to evaluate the potential impacts to visual resources under each alternative (see Section 4.10).

The pipeline from the proposed reservoir to the WTP (Alternatives 1 and 2) and the pipeline from Lake Texoma to the WTP (Alternative 2 only) were not included in the analysis because most of the pipeline(s) would be buried and; therefore, would have a much smaller potential to impact visual resources. The WTP and TSR were not included because they are much smaller than the proposed dam and reservoir and would be constructed next to an area that has already been developed and therefore would have a much smaller potential to impact visual resources. Section 3.8.2 provides a summary of the VRM results.

3.8.2 Visual Resource Management Results

The proposed reservoir footprint would have a maximum area of 16,641 acres of various land use types. The Bois d'Arc Creek, surrounding wetlands, and riparian areas comprise 36 percent (5,991 acres) of the land affected. Cropland, grassland, and old field succession account for another 38 percent (6,324 acres) of the affected area. The remaining area is predominantly forested land, with a small area used for transportation and scattered single family homes. The elevations within the proposed reservoir footprint range from 462 to 553.5 feet MSL, which is a 91.5-foot change in elevation. This change in elevation indicates a generally flat to gently sloping landscape.

Due to the large area affected by Alternatives 1 and 2, it was divided into three Scenic Quality Rating Units (SQRUs) for the visual resource inventory. According to the VRM guidelines, SQRUs are delineated on the basis of similar physiographic characteristics (land cover types), areas of similar visual patterns, texture, and color, and areas which have similar impacts from man-made modifications (BLM, no date). In this case, the project area was divided primarily based on land cover types: the Bois d'Arc Creek itself and the wetlands adjacent to the creek (SQRU-1); cropland, grassland, and old field succession (SQRU-2); and upland forest and woodlands, including deciduous forest, evergreen forest, tree savanna, and shrubland (SQRU-3). See Figure 3.8-1 for a map showing the project area and each SQRU.

Using the visual resource inventory methodology described above, each SQRU was given a management class rating. SQRU-1 was rated as a Class III area because, while the area predominantly consists of undeveloped wetlands with little aesthetic appeal (consistent with a Class IV rating), the area contains water which the VRM ranks as visually more appealing. Class III represents areas of moderate visual value. The areas within SQRU-2 were determined to not be visually appealing and were given a rating of Class IV. Class IV represents areas of the least visual value. The final area evaluated, SQRU-3, was also determined to not be visually appealing and was given a Class IV rating (least visual value). Overall, the three ratings for the entire proposed reservoir location range from Class III to Class IV, moderate to low visual quality.

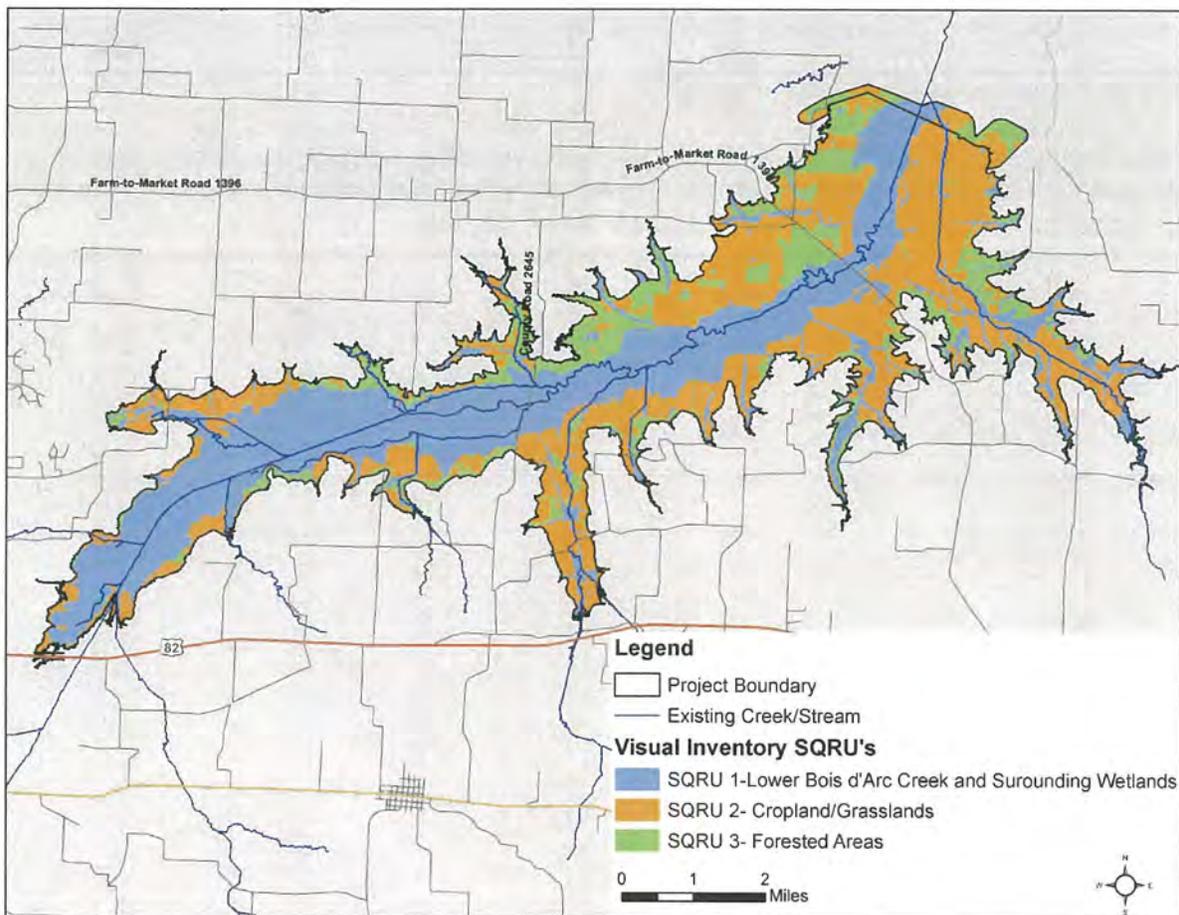


Figure 3.8-1. Proposed Dam and Reservoir Footprint with the SQRUs Designated

3.9 UTILITIES

The purpose of NTMWD constructing and operating a new reservoir would be to develop an additional and reliable water supply of at least 105,804 AFY by 2025. This new water source would provide water to NTMWD's member cities and customers. Because the operation of the proposed reservoir under Alternatives 1 and 2 would provide additional water supply that could stimulate population growth in the region, the utilities in the surrounding area were considered when analyzing the potential impacts of each alternative. The utilities considered include electrical transmission lines, gas/petroleum pipelines, and other minor utilities.

Specific utilities that could be impacted by project activities include an overhead electrical transmission line located inside the reservoir footprint (no other utilities are located within the reservoir footprint), utilities located along the proposed pipeline from the proposed reservoir to the proposed WTP (Alternatives 1 and 2), and utilities located along the proposed pipeline from Lake Texoma to the proposed WTP (Alternative 2 only). The utilities potentially impacted along the pipeline routes include electrical transmission lines, gas/petroleum pipelines, and other minor utilities. Other project components (e.g., the TSR and WTP) would not impact any existing utilities.

Figure 3.9-1 shows the electric power line located in the reservoir footprint that could be affected by the proposed reservoir. These power lines are classified as medium voltage distribution lines and are between one and 33 kilovolts. Medium voltage distribution lines are used for energy distribution in urban and rural areas (ESRI, 2010). These overhead power lines could either be raised above the conservation pool or could require deconstruction and relocation.

The other utilities that could be affected by the pipeline(s) would be of varying size and capacity. If necessary, these utilities would be crossed or bypassed according to the requirements of each facility's owner and permitted as required by the relevant permitting authority.

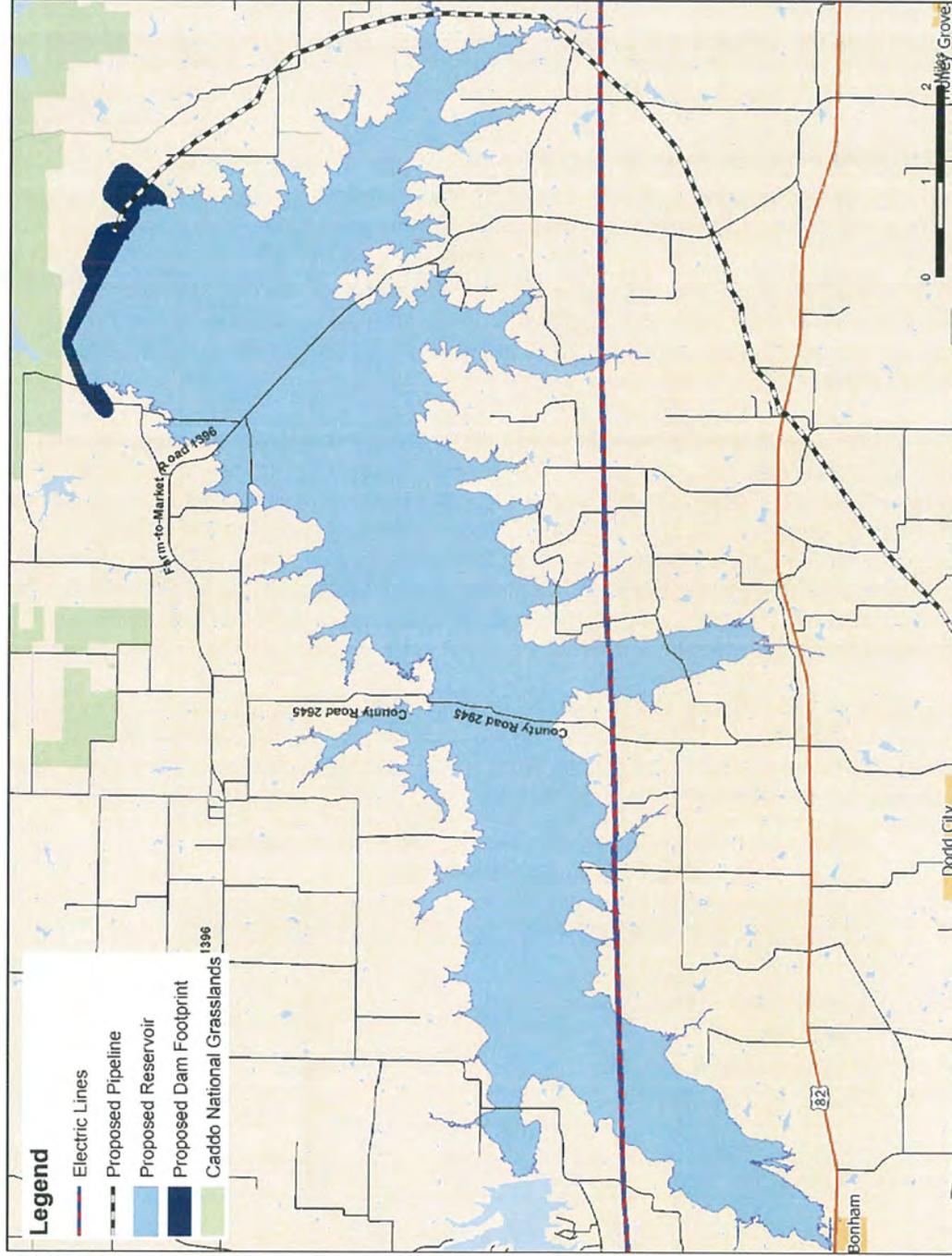


Figure 3.9-1. Aboveground Power Lines Within the Proposed Reservoir Footprint

3.10 TRANSPORTATION

This section provides a discussion of the existing transportation resources near the proposed reservoir site, including an overview of the regional and local traffic, airports, boating, and rail resources. The area can be accessed via many transportation modes, and Fannin County can be easily accessed from all directions except the north, where only one route, Highway 78, crosses the Red River from Oklahoma into the county.

3.10.1 Regional and Local Roads and Traffic

Transportation in and around the proposed project site is achieved mainly via road and street networks. The closest interstate is approximately 40 miles south: Interstate (I)-30, which runs east-west from Dallas-Fort Worth to Texarkana. I-35 travels north-south approximately 60 miles west of Fannin County and connects the Dallas-Fort Worth area to Oklahoma City. The transportation system serves local and regional traffic consisting of work commuters, general daily travel, and recreationists. Fannin County and its surrounding transportation area is within the Paris District of the Texas Department of Transportation (TxDOT) (TxDOT, 2010).

Because of the rural nature of the area surrounding the proposed reservoir site, the transportation network does not contain major roadways (i.e., interstates). As shown in Figure 3.10-1, a network of state highways and farm-to-market (FM) roads leads to the major interstates; however, there is no direct route to an interstate from the proposed site. The proposed dam development is between FM 1396 and FM 409, southwest of the Caddo National Grasslands. The closest towns to the proposed site are Allens Chapel approximately four miles to the south, and Telephone approximately five miles to the north. Due to Fannin County's rural location, public transit is unavailable and there is no cohesive network supporting non-motorized and pedestrian transportation.

The roadway most likely to be affected by the Proposed Action is FM 1396, which is adjacent to and crosses the proposed project site. A list of roads leading to major interstates that currently transect the 16,641-acre proposed reservoir area is presented in Table 3.10-1. Traffic on roadways surrounding the proposed development is free-flowing during both the a.m. and p.m. peak traffic periods.

Table 3.10-1. Roadways Within the Proposed Site Boundaries that Lead to Major Interstates

Road Name	Road Length (miles)
Farm-to-Market Road 1396	2.1
County Road 2945 & County Rd 2645	1.4
County Road 2655	1.0
County Road 2705	0.8
County Road 2950	0.6
County Road 2700	0.5
County Road 2610	0.3

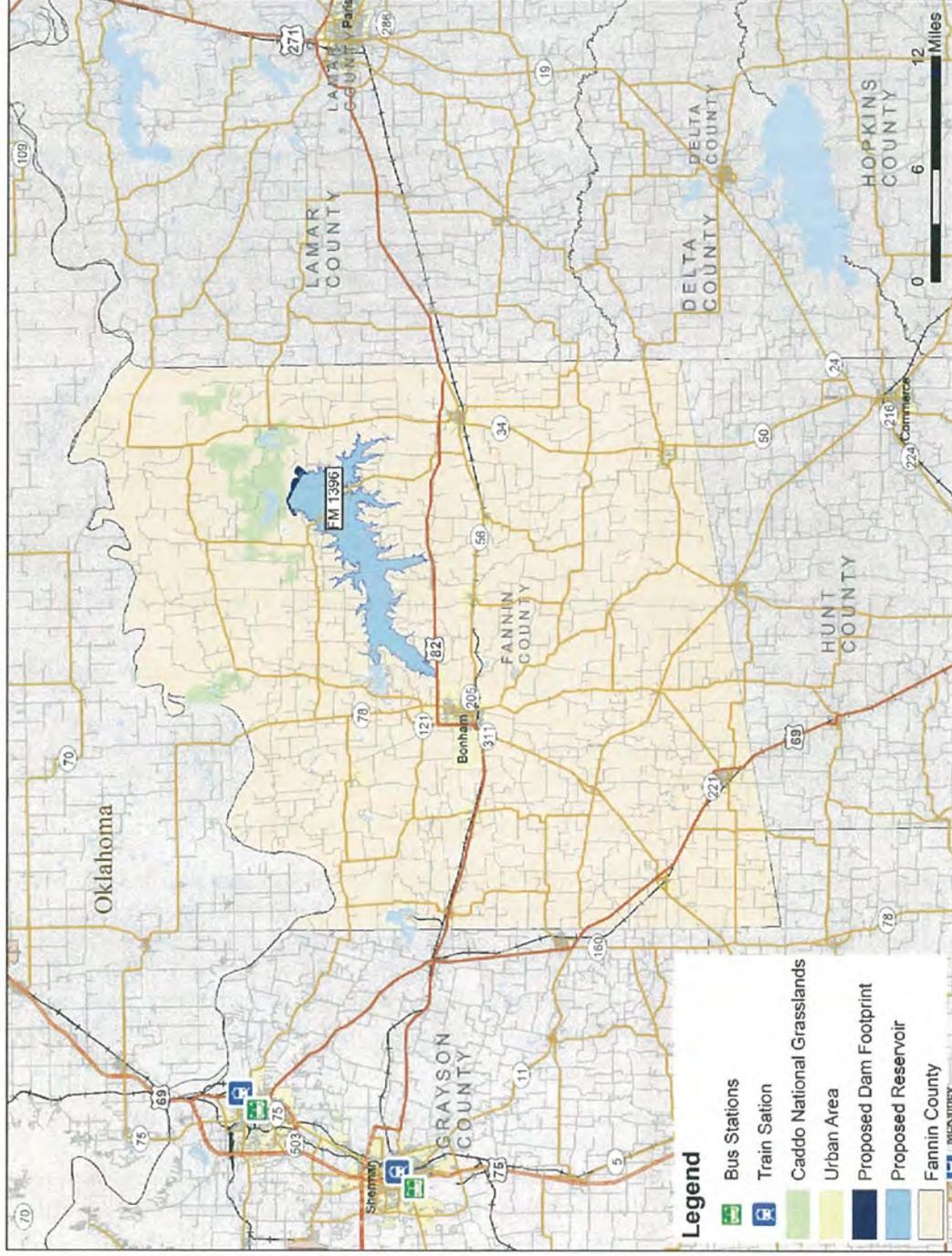


Figure 3.10-1. Road Network in Fannin County and Surrounding Areas

3.10.2 Air Transit, Rail, and Boating

The North Texas Regional Airport (GYI) is approximately 40 miles west of the proposed dam site. This airport was founded in 1941 as a training site for World War II pilots and as part of the Perrin Air Force Base. Grayson County currently owns and operates GYI, which averages 219 flights per day including single- and multi-engine propeller planes, small jets, helicopters, and ultralights (AirNav, 2017). The Dallas-Fort Worth International Airport (DFW) is approximately 80 miles southwest of the proposed dam site and provides passenger, commercial, and cargo services. DFW averages 1,853 flights per day (AirNav, 2017b).

There are many active rail spurs throughout the area. The Fannin Rural Rail Transportation District was developed to preserve railroad service in eastern Grayson, Fannin, and Lamar counties to meet present and future transportation requirements. The closest active rail spur runs east to west four miles south of the proposed site. Union Pacific and Texas Northeastern Division Railroad are the primary rail carriers in Fannin County. Amtrak does not provide direct passenger train service to Bonham, and the closest Amtrak passenger station is approximately 60 miles from the proposed site in Gainesville.

3.11 ENVIRONMENTAL CONTAMINANTS AND TOXIC WASTES

This section is based entirely on a preliminary desktop study conducted by the Applicant in 2010 (Freese and Nichols, 2010c). The purpose of this preliminary study was to broadly characterize environmental conditions at the proposed project site by evaluating factors such as land use, site history, obvious evidence of environmental contamination, and the presence of adjacent or nearby properties that could pose environmental concerns. The 2010 study was conducted in response to concerns raised during initial project scoping and consisted of an historical review of past land uses and a review of regulatory agency records for the site. No site visit was carried out as part of the study; however, it followed the desktop protocols outlined in the following regulations and standards:

- American Society of Testing and Materials (ASTM) Standard E-1527-05, Standard Practice for Phase I ESAs (2005), and
- Title 40 of the Code of Federal Regulations, Part 312 (40 CFR §312), Standards and Practices for All Appropriate Inquiries (AAI), Final Rule.

Site visits may be made to specific areas of concern at a later date, as appropriate.

Aerial photographs indicate that little development has taken place in the project area over the past half-century, other than an increase in agricultural land and homesteads on the outskirts of the proposed reservoir site. Heavy farming on agricultural lands is evident within the proposed reservoir site and environs over the past three decades. The Fannin County Clerk's Office did not have any environmental records for the proposed project area or surrounding areas. A review of regulatory database searches by Environmental Data Resources, Inc. (EDR) did not disclose any current or historical facilities or incidents that are likely to pose a problem.

Agricultural activities conducted in recent decades in the proposed project area have included livestock grazing, hay production, and row crop production. It is probable that agricultural chemicals such as fertilizers, herbicides and pesticides, and petroleum products have been used in the proposed project area. However, review of land use and records did not provide any indication of widespread inappropriate use, storage, or disposal of these chemicals. The desktop study found no documentation of the past presence of industrial facilities or commercial businesses within the proposed reservoir footprint or nearby.

In sum, the desktop study did not identify any recognized or potential environmental concerns in the project area. Since the desktop study was performed, there have been two environmental issues of concern in or near the proposed project area brought to NTMWD's attention by local residents: a tire disposal site and the closed City of Bonham landfill. These issues and the actions taken by NTMWD are discussed below.

3.11.1 Tire Disposal Sites

In March 2011, a local resident notified NTMWD of suspected illegal disposal and burning of tires on property already purchased by NTMWD and within the proposed LBCR footprint. On behalf of NTMWD, FNI staff conducted a site visit on March 14, 2011 to the tire disposal site, where they observed one open burn pit and several additional backfilled pits. The open pit was approximately 20 feet in diameter and 10 feet deep; it contained burned tires, tire scraps, wheel wire from radial tires, ash, and other debris. The debris inside the pit was still smoldering at the time of the site visit (Chambers, 2012).

The remaining pits and burn piles had already been backfilled and covered over with dirt. Thus, FNI was unable to determine the actual depths or lateral extent of each burn pit during this initial site visit. FNI staff observed three additional locations where surface disturbance may have indicated the presence of buried tires or additional burn pits. Large quantities of tires discarded on the ground surface were found in two locations. There were approximately 600 tires visible at one location, although no evidence of burning or subsurface disposal was found at this site. The other large surface pile contained approximately 50 tires, many of which had been cut into pieces but did not appear to have been burned.

In view of these preliminary observations, NTMWD retained FNI to conduct an environmental investigation of the site. A backhoe was used to determine the lateral and vertical extent of the tire pits, while soil borings and a temporary monitoring well were used to collect soil and groundwater samples to ascertain if potential chemicals of concern had migrated outside the physical limits of the tire pits. Samples were analyzed for a combination of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and RCRA heavy metals (Chambers, 2012).

Thirty-three soil samples from the pits and surrounding area were analyzed in a laboratory. VOCs and PAHs were considered to be potential chemicals of concern due to the burning of the rubber tires. Several of these organic chemicals were detected in many of the samples, however, all detected concentrations were below applicable Tier 1 protective concentration levels (PCLs)⁴. Several of the 33 samples from the tire pits and borings also contained heavy metals – in particular arsenic, barium, cadmium, lead, and selenium.

The investigation indicated that there was not widespread contamination at the site from the burning and dumping of tires. Soils in direct contact with tires or partially burned debris did contain slightly elevated concentrations of heavy metals in some locations. A groundwater sample was collected from a temporary monitoring well and, while ethylbenzene and naphthalene were detected, the concentrations were three orders of magnitude below their PCLs. Lead was detected at concentrations exceeding its PCL and a permanent monitoring well was installed at the site. Subsequent testing of the groundwater from the permanent well did not detect any lead. Overall, there did not appear to be significant soil or groundwater contamination outside the immediate footprint of the tire pits (Chambers, 2012).

Cleanup of the site is regulated by TCEQ under the Texas Risk Reduction Program (TRRP). Under the TRRP guidelines, the site was eligible for a pollution cleanup remedy in which the affected media are removed from the site to another location for storage, processing, or disposal in accordance with all

⁴ The Tier 1 PCLs are the default cleanup standards in the Texas Risk Reduction Program.

applicable requirements (TCEQ, 2008). If confirmation samples collected after excavation and removal of tire wastes were below PCLs, the site could obtain closure following submission of a report to TCEQ documenting investigation and excavation activities, thereby avoiding the requirement to prepare a comprehensive Affected Property Assessment Report. The illicit tire disposal and burning site was cleaned up by a contractor under the supervision of the Applicant in late 2012. A notice to proceed was issued by TCEQ on November 15, 2012 and the construction/cleanup activity was completed by December 14, 2012. The contractor recycled approximately 15.8 tons of tires and excavated, transported, and disposed of 2,071 tons of mixed soil and debris at the NTMWD landfill (Chambers, 2013).

All field investigations at the site were completed by early 2013. Results of tests conducted on soil and waste samples obtained at the former tire disposal/burning site indicate that it is eligible for "no further action" approval from TCEQ. In September 2013, FNI prepared and submitted a summary report on the investigation of the site and its cleanup to TCEQ; however, TCEQ has not responded (Chambers, 2013; NTMWD, 2014a).

3.11.2 City of Bonham Landfill

In early 2016, a local resident expressed concern about the possibility of leakage from the closed City of Bonham Landfill into the proposed reservoir due to its close proximity. The City of Bonham Landfill was a 122-acre Type 1 landfill that was capped and closed on March 1, 1996. In May of 2016, TCEQ performed an inspection of the City of Bonham Landfill by observing the surface of the landfill and the perimeter of the site (TCEQ, 2016b). TCEQ noticed several locations on the landfill with ponded water; multiple areas of ponded water were discolored and appeared to be impacted by leachate. TCEQ also observed stressed or no vegetation in some of these locations and evidence of trespassing (e.g., holes in the fence line and mechanized equipment tracks). On the southern edge of the property, multiple deep erosion rills were observed (see Figure 3.11-1); however, neither waste nor leachate was observed in the rills (TCEQ, 2016b).

As of January 2017, the City of Bonham has repaired the fence line and is in the process of addressing the low areas and erosion rills. Once the site work has been completed, TCEQ will be asked to perform an additional site investigation to verify that all previous findings have been addressed (Capehart, 2017).

In May of 2016, FNI reviewed available water quality data for Bois d'Arc Creek and permitting records for the Bonham Landfill to determine the likelihood that environmental contaminants from the landfill had contaminated the waters of Bois d'Arc Creek. In a report published on May 10, 2016, FNI determined that, because of the landfill's location outside the proposed reservoir project area and the 500-year floodplain, and the continuing TCEQ supervision over the closed landfill, there was no evidence that the landfill had negatively impacted the waters of Bois d'Arc Creek. This report was based on an evaluation of nine years of water quality testing data (Freese and Nichols, 2016c).



Figure 3.11-1. Erosion Rills on the Southern Edge of the City of Bonham Landfill

3.12 SOCIOECONOMICS

The analysis of socioeconomic resources identifies those aspects of the social and economic environment that are sensitive to change and that may be affected by actions associated with the construction and operation of the proposed dam, reservoir, pipeline, and water treatment facilities. Social impacts would be felt most by individuals, communities, residents, and workers in Fannin County, especially residents located in or adjacent to the dam and reservoir. Businesses, community services, and economic systems of Fannin and surrounding counties could change in response to the implementation of either of the action alternatives. The assessment specifically considers how these actions might affect individuals, surrounding communities, and the larger social and economic systems of Fannin County, the surrounding region, and the state of Texas as a whole.

As shown in Figure 3.12-1, Fannin County is surrounded by Hunt County to the south, Collin County to the southwest, Grayson County to the west, Lamar and Delta counties to the east; and the state of Oklahoma to the north. Temporary local economic impacts from dam, pipeline, and related infrastructure construction would be expected to occur in Fannin, Collin, Hunt, Lamar, Grayson, and Delta counties during the three- to four- year project construction period. Recurring annual local economic impacts would be expected to occur in Fannin County through the multi-decadal operational life of the project.

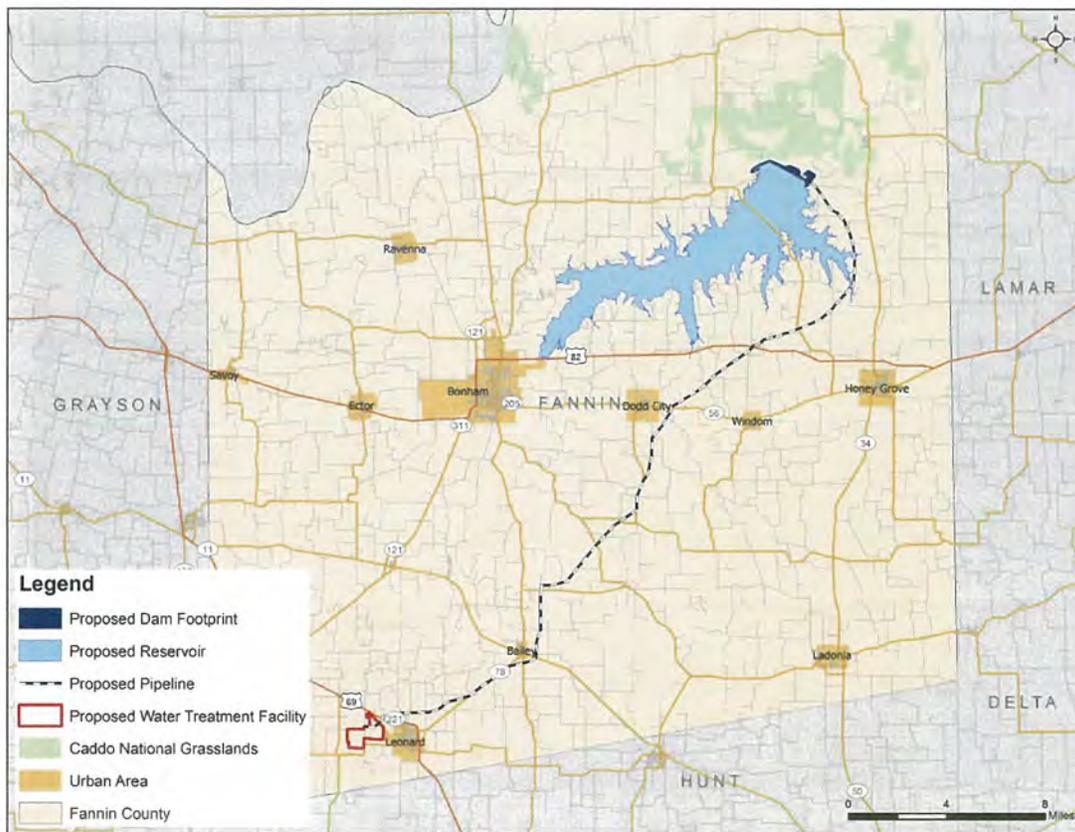


Figure 3.12-1. Map of Alternative 1, Fannin and Surrounding Counties

Because potential impacts with the greatest magnitude (based on severity, duration, size or physical extent, and likelihood) would occur in Fannin County, it represents the primary focus for any direct impacts that may be associated with implementation of Alternatives 1 and 2. In addition to Fannin County, the five directly adjacent counties – Collin, Hunt, Lamar, Grayson, and Delta – are included as the Region of Influence (ROI) since indirect impacts to individuals, communities, and economic systems are expected. Regional impacts would also be expected for the entire NTMWD service area (which includes Collin and Hunt counties), since the provision of needed water would allow for realization of projected long-term population and economic growth within the entire NTMWD service area as discussed in Chapter 1.

Table 3.12-1 summarizes the type and location of socioeconomic concerns identified during scoping meetings, many of which were used to frame the discussion of socioeconomic impacts. Prime farmland is discussed under Section 3.1, Topography, Geology, and Soils.

Table 3.12-1. Potential Socioeconomic Concerns Identified During Scoping

Potential impact	Region of Influence (ROI)					
	Fannin County	Collin County	Lamar County	Hunt County	Delta County	Grayson County
Loss of prime farmland	✓	–	–	–	–	–
Loss of tax revenue	✓	–	–	–	–	–

Potential impact	Region of Influence (ROI)					
	Fannin County	Collin County	Lamar County	Hunt County	Delta County	Grayson County
Retain timber in impoundment area	✓	-	-	-	-	-
Loss of timber sales	✓	-	-	-	-	-
Removal of existing structures	✓	-	-	-	-	-
Relocate homes/ cemeteries	✓	-	-	-	-	-
Cost of relocation/ compensation	✓	-	-	-	-	-
Equipment and workers	✓	✓	✓	✓	✓	✓
Increase housing needs	✓	✓	✓	✓	✓	✓
Create temporary employment	✓	✓	✓	✓	✓	✓
Increase local/regional income and revenues	✓	✓	✓	✓	✓	✓
Provision of water from NTMWD	✓	✓	-	✓	-	-

The data supporting this analysis were collected from standard sources, including federal agencies such as the U.S. Census Bureau (USCB) and Bureau of Economic Analysis (BEA); state agencies such as the Texas Workforce Commission (TWC) and Texas Comptroller of Public Accounts (TCPA); local agencies such as Fannin County Appraisal District (FCAD); as well as other research institutes. Demographic and economic data are presented for Fannin, Delta, Lamar, Collin, Hunt, and Grayson counties and compared to the state of Texas overall. The most recent and best available data are presented throughout the section.

3.12.1 Population and Quality of Life

Sections 3.12.1.1 and 3.12.1.2 describe population changes for the ROI and the state of Texas overall. Past and existing population data is from the USCB, and projected population estimates are from the Texas Water Development Board (TWDB). Section 3.12.1.3 describes quality of life considerations, including recreational and aesthetic values and community cohesion. Demographic and economic indicators in Section 3.12.1.3 used to describe the level of community cohesion in Fannin County are from the USCB.

Existing Population

The 2010 estimated combined population of Fannin, Collin, Hunt, Lamar, Grayson, and Delta counties is 1,078,286, a net increase of 314,352 or 41 percent from the 2000 population of 763,934. As shown in Table 3.12-2, Collin County has the largest population of the five affected counties, and also experienced the largest percentage growth during this period (59 percent), significantly higher than the other six counties and Texas' 21 percent change. The total population of Collin County in 2010 was 782,341, the seventh largest county in the state and largest of the five affected counties. Hunt and Grayson counties experienced smaller, though still positive growth, at 12 and nine percent, respectively, over this same time period. Fannin County experienced positive growth at nine percent, while Lamar had the lowest positive growth at three percent. Delta County, the smallest in population size of the five counties experienced a two percent reduction in population (USCB, 2000 and 2010a).

Table 3.12-2. Population Change in ROI and Texas, 2000-2010

County	Population Estimates				
	2000	2010	Numeric Change	Percent Change	Texas Ranking
Fannin	31,242	33,915	2,673	8.6	88
Collin	491,675	782,341	290,666	59.1	7
Hunt	76,596	86,129	9,533	12.4	43
Lamar	48,499	49,793	1,294	2.6	63
Delta	5,327	5,231	-96	-1.8	203
Grayson	110,595	120,877	10,282	9.2	34
Total for Counties in ROI	763,934	1,078,286	314,352	41.1	n/a
All Counties in Texas	20,851,820	25,145,561	4,293,741	20.6	n/a

Sources: USCB, 2000 and 2010a.

Statewide, the population grew from 20,851,820 in 2000 to 25,145,561 in the 2010, a net increase of 4,293,741 or 21 percent. The Fannin, Hunt, Lamar, Grayson, and Delta county populations grew at rates slower than that of the state of Texas. The ten fastest-growing counties in Texas were either part of the Dallas-Fort Worth-Arlington, Houston-The Woodlands-Sugar Land, Austin-Round Rock, or the San Antonio-New Braunfels Metropolitan Statistical Areas. Of the thirteen counties that make up the Dallas Fort Worth Metroplex, three were in the top ten fastest-growing counties in the state: Rockwall, Collin, and Denton counties (USCB, 2000 and 2010a).

The USCB identifies two types of urban areas: Urbanized Areas (UAs) of 50,000 or more people and Urban Clusters (UCs) of at least 2,500 and less than 50,000 people. "Rural" encompasses all population, housing, and territory not included within an urban area (USCB, 2017). Nine of the ten fastest-growing counties in Texas are UAs, and one is an UC. Of the counties included in the ROI, Collin, Hunt, and Grayson counties are UAs, with populations greater than 50,000. Fannin, Delta, and Lamar counties are UCs, with populations between 2,500 and 50,000. None of the counties in the ROI are considered rural.

Figure 3.12-2 depicts population centers within Fannin County itself. The City of Bonham and Fannin County are both considered UCs, with populations greater than 2,500 and less than 50,000 people.

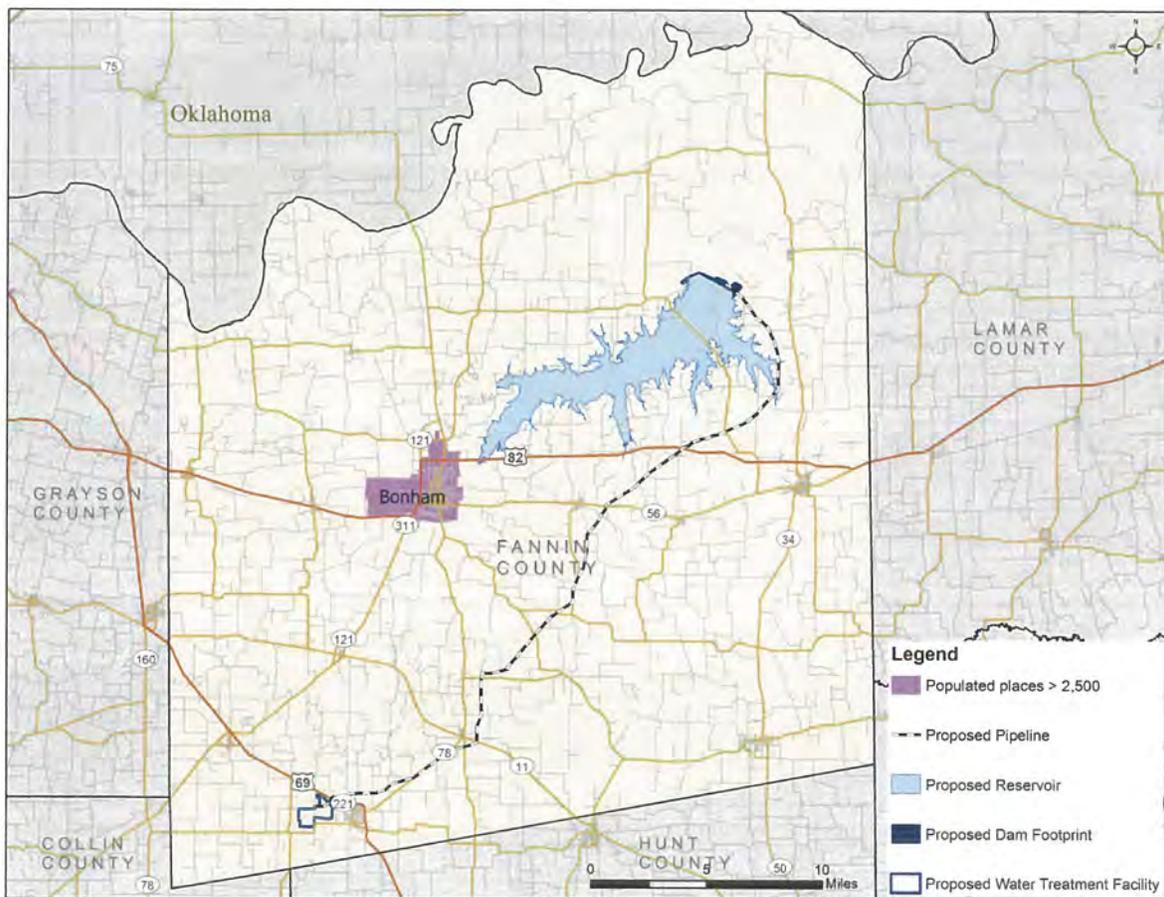


Figure 3.12-2. Population distribution in Fannin County

Projected Population Change

As seen in Table 3.12-3, the population of Texas is expected to increase from the 2010 level of 25.1 million to 46.3 million by 2060 (USCB, 2010a; TWDB, 2011a). Fannin County itself is expected to grow at a faster pace than the state over this same time span. The state population projections (not shown in Table 3.12-3) show the NTMWD's service population to increase from 1.5 million to 3.3 million by 2060 (TWDB, 2007).

The six-county ROI is expected to grow at a very fast pace well into the foreseeable future. As shown in Tables 3.12-3 and 3.12-4, Collin County is forecasted to be responsible for most of the six counties' growth. Collin County is expected to add over one million to its not-yet one million current population, an increase of 148 percent. Similarly, the population of Fannin County is expected to grow at over 156 percent in the next 50 years. Hunt County's population is expected to increase at the fastest rate: by 236 percent from the year 2010 to 2060. Currently, the outlook for Collin, Hunt, and Grayson counties' growths is at a considerably faster pace than the statewide growth. The other two counties would likely grow at a substantially slower rate than the statewide population over the six-decade interval. The projected percentage change in the ROI is expected to grow almost twice as fast as the projected statewide growth of 84 percent (USCB, 2010a; TWDB, 2011a).

Table 3.12-3. Projected ROI and Texas Populations, 2010-2060

County	Actual	Projected Population Levels				
	2010	2020	2030	2040	2050	2060
Fannin	33,915	42,648	49,775	60,659	74,490	86,970
Collin	782,341	1,046,601	1,265,373	1,526,407	1,761,082	1,938,067
Hunt	86,129	94,401	110,672	137,371	196,757	289,645
Lamar	49,793	56,536	60,286	64,036	64,036	64,036
Delta	5,231	6,244	6,744	7,244	7,244	7,244
Grayson	120,877	152,028	179,725	203,822	227,563	253,568
Total for Counties in ROI	1,078,286	1,398,458	1,672,575	1,999,539	2,331,172	2,639,530
All Counties in Texas	25,145,561	29,650,388	33,712,020	37,734,422	41,924,167	46,323,725

Sources: USCB, 2010a and TWDB, 2011.

Table 3.12-4. Projected Percentage Change in Population in ROI and Texas, 2010-2060

County	Projected Percentage Change in Population					
	2010-2020	2020-2030	2030-2040	2040-2050	2050-2060	2010-2060
Fannin	25.7	16.7	21.9	22.8	16.7	156.4
Collin	33.8	20.9	20.6	15.4	10.0	147.7
Hunt	9.6	17.2	24.1	43.2	47.2	236.2
Lamar	13.5	6.6	6.2	0	0	28.6
Delta	19.3	8.0	7.4	0	0	38.4
Grayson	25.8	18.2	13.4	11.6	11.4	109.8
Total for Counties in ROI	29.7	19.6	19.5	16.6	13.2	144.8
All Counties in Texas	17.9	13.7	11.9	11.1	10.5	84.2

Source: TWDB, 2011.

Quality of Life and Community Cohesion

Quality of life can be characterized as a person's well-being and happiness. Quality of life is a subjective measure and cannot be solidly defined. For this analysis, quality of life considerations focus on those elements that the public generally associates with a high quality of life: education, safety, recreation opportunities, access to transportation facilities, and a positive general living environment. Other factors, such as air quality and noise, could also contribute to a person's sense of quality of life. See sections 3.5, Air Quality and 3.6, Acoustic Environment (Noise) for more information about air quality and noise impacts.

Recreational and Aesthetic Values

The recreational value of natural resources can link residents to an area or attract new residents to an area. Environmental amenities like a reservoir can contribute to the region's identity, as well as the area's quality of life. Proximity to nature, in particular to public lands, can influence where people choose to live and how much people are willing to pay for housing (i.e., property values). Research indicates that

people make regional housing and labor market decisions based in part on the availability of and proximity to public lands, such as state parks, national forests, and recreational lakes. Living near public lands provides amenities such as convenient access to recreation and wildlife viewing. Population movement and migration into environmentally desirable areas can be explained by the presence of, and density of, natural resources and associated environmental amenities (Garber-Yonts, 2004; Hand et al., 2008).

Landscape appearance and scenery can be important public land amenities, not just as recreational opportunity settings, but also as elements of the region's identity. Factors such as clean air and water quality, scenery and natural landscape, open space, and the number of recreational opportunities can be economic assets for local communities. A more detailed description of recreation opportunities in and around the project area is included in Section 3.7 (Recreation).

Community Cohesion

Community cohesion is the degree to which residents have a sense of belonging to their neighborhood or community, including commitment to the community or a strong attachment to neighbors, institutions, or particular groups. What makes a community cohesive is subjective and cannot be solidly defined, though specific indicators include interaction among neighbors, use of community facilities and services, community leadership, participation in local organizations, desire to stay in the community and length of residency, satisfaction with the community, and the presence of families in communities (FDOT, 2000).

Cohesive communities are associated with specific social characteristics which may include long average lengths of residency, frequent personal contact, ethnic homogeneity, high levels of community activity, and shared goals. Some studies indicate that single family home ownership, working class families, ethnic group clusters, mothers working at home, and the elderly correlate with active community participation and high community cohesion. Residential stability and longevity can be a strong neighborhood link. Other indicators include things like Neighborhood Watch programs, pedestrian activity, children at play, predominance of single family dwellings or apartment with courtyards, shared parking lots and yards of a housing complex, condition of houses, parks and other community facilities. The intensity of controversy may be an indicator of potential community disruption (CDOT, 1997).

Cohesion can be greatly affected by the physical layout of the community. The book *Image of the City* describes elements that help define the physical layout of a community: paths, edges, districts, and landmarks. These elements can encourage or hinder the social interaction in a community and are described below (Lynch, 1960).

- *Paths* are linear features such as roads and trails along which people and vehicles travel. Paths can encourage cohesion or create a physical separation that decreases cohesion.
- *Edges* are linear elements that separate the landscape and can include boundaries between different types of land use, boundaries of large developments, or major roads.
- *Districts* are areas of the community that have a distinctive character or degree of unity. The presence of districts, such as a historic downtown, is often a good indicator of community cohesion.
- *Landmarks* are points of reference in the community with which people can identify.

Community Cohesion Indicators: Fannin County

As documented in the 2010 Scoping Report in Appendix B, several commenters were concerned that an influx of "outsiders" – especially workers during the construction phase – could erode community cohesion. There was also concern that the culture of the area would change against the wishes of longtime residents due to influx of outsiders who may not share the same values (USACE, 2010c). Based

on the community cohesion indicators discussed further below, news articles, and phone interviews with community leaders, Fannin County has a medium level of community cohesion.

Fifty-five percent of householders moved into their Fannin County unit after 2000. Said otherwise, 6,508 of the 11,824 occupied housing units in Fannin County were “newly” occupied in the last decade. Fannin County has a 74 percent homeownership rate and owner-occupied housing units (USCB, 2010b). Additionally, 71 percent of all households are family households (USCB, 2010a).

Of the 7,113 children under the age of 18 in Fannin County, 5,220 live with two parents. Approximately 36 percent of those children had only one parent in the labor force, and (presumably) one parent at home (USCB, 2010c). Additionally, 17 percent of Fannin County’s population is over the age of 65, a relatively high concentration compared to the state of Texas (USCB, 2010a).

Because social classes lack clear boundaries and overlap, there are no definite income thresholds for what is considered “working class.” Sociologist Leonard Beeghley identifies a combined household income of \$66,000 as a typical working-class family (Beeghley, 2004). Sociologists William Thompson and Joseph Hickey estimate an income range of roughly \$16,000 to 30,000 for the working class (Thompson and Hickey, 2005). The “working class” is typically associated with manual labor and a high school education. The 2010 median household income in Fannin County is \$42,605; 82.6 percent are high school graduates or higher and 15 percent have a bachelor’s degree or higher (USCB, 2010d; USCB, 2010e). Considering the two definitions described and for purposes of this analysis, Fannin County qualifies as a “working class” community.

Ethnic homogeneity, or monoculturalism, is a term used to describe an area whose population has a similar ethnic background. In Fannin County, over 80 percent of the population is identified as having “one race”; in this case, white (USCB, 2010a). As such, Fannin County is considered to be an area with ethnic homogeneity.

3.12.2 Labor

Because the NTMWD anticipates hiring local construction workers, civilian labor force, employment, and unemployment figures are presented for the ROI, as these would likely be directly affected by the implementation of either Alternative 1 or 2.

Labor Force

The size of a county’s labor force is measured as the sum total of those currently employed and unemployed. People are classified as unemployed if they do not have a job, are looking for a job, and are available to work (BLS, 2015). As can be seen in Table 3.12-5, from 2000 through 2010 only the Collin County labor force grew at a rate faster than the state’s. The labor forces of Fannin, Hunt, Lamar, and Grayson grew at small but still positive rates. Delta County’s labor force actually shrank by almost 11 percent. Overall the labor force in the ROI increased 30.8 percent from 2000 to 2010, much higher than the statewide 17.3 percent, due to the overriding influence and rapid growth of Collin County’s labor force within the ROI.

Table 3.12-5. Annual Labor Force Size in ROI and Texas, 2000-2010

County	Annual Labor Force			
	2000	2005	2010	Percent Change 2000-2010
Fannin	13,916	13,836	14,005	0.6
Collin	299,204	368,326	429,236	43.5
Hunt	38,797	38,608	39,708	2.3
Lamar	23,024	23,034	24,112	4.7
Delta	2,563	2,418	2,285	-10.8
Grayson	56,260	56,552	57,995	3.1
Total for Counties in ROI	433,764	502,774	567,341	30.8
All Counties in Texas	10,347,847	11,150,684	12,136,384	17.3

Source: TWC, 2011.

Employment

The unemployment rate is calculated based on the number of unemployed persons divided by the labor force, where the labor force is the number of unemployed persons plus the number of employed persons. Table 3.12-6 presents the annual employment levels in the six counties for the years 2000, 2005, and 2010. Collin County has the largest number of employed with 397,797 in 2010, representing a 36.9 percent increase from the 290,673 employed in 2000. Collin was the only county in the ROI to experience both a notable increase in employment overall as well as a positive percent change in employment consistently above the state's 12.6 percent. The number employed in Lamar County declined from 2000 to 2005, then increased from 2005 to 2010; with an overall 0.3 percent increase over the entire interval. The number employed in Fannin, Hunt, Delta, and Grayson counties decreased over the decade-long interval.

Table 3.12-6. Annual Employment in ROI and Texas

County	Number in Employment			
	2000	2005	2010	Percent Change 2000-2010
Fannin	13,238	12,957	12,698	-4.1
Collin	290,673	351,264	397,797	36.9
Hunt	37,149	36,510	33,365	-10.1
Lamar	21,880	21,610	21,942	0.3
Delta	2,432	2,285	2,082	-14.4
Grayson	53,970	53,524	53,071	-1.7
Total for Counties in ROI	419,342	478,150	520,955	24.2
All Counties in Texas	9,896,002	10,551,547	11,141,903	12.6

Source: TWC, 2011.

Unemployment Rates

From 2000 to 2010, Fannin and Lamar counties' annual unemployment rates have been consistently at or above the statewide averages. Collin County's unemployment rate has been consistently lower than the state's rate during this same time period. The unemployment rate in Grayson County was lower than the state level in 2000, and at or above the state level between 2001 and 2010. Hunt County's unemployment

rate was lower than that for the state until 2006, at which point the rate increased above the state rate. Delta County's unemployment rate was higher than that of the state in 2000, below between 2002 and 2004, then remained above the statewide rate until 2010. Unemployment rates in the ROI and for the state are shown in Figure 3.12-3.

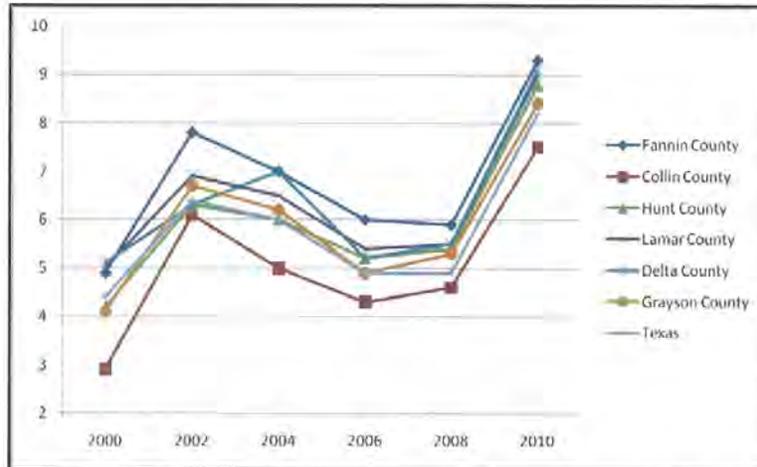


Figure 3.12-3. Annual Unemployment Rates in ROI and Texas, 2000-2010

Source: TWC, 2011

3.12.3 Earnings

Several measures are used to discuss earnings, including per capita personal income, total industry income, and compensation by industry. Personal income data are measured and reported for the county of residence. Per capita personal income is the personal income for county residents divided by the county's population. Compensation data, however, are measured and reported for the county of work location, and are typically reported on a per job basis. Compensation data indicate the wages and salaries for work done in a particular place (e.g., a county), but if the worker does not live in the county where the work occurred then a sizeable portion will be spent elsewhere. Most of the worker's expenditures will not remain in or flow back into that county's economy. Total compensation includes wages and salaries as well as employer contribution for employee retirement funds, social security, health insurance, and life insurance. Because the NTMWD anticipates hiring local construction workers, personal income and compensation data for the ROI are presented in the next several tables as they would likely be affected by Alternative 1 and 2.

Per Capita Personal Income

Personal income is the income received by all persons from all sources, or the sum of net earnings by a place of residence, property income, and personal current transfer receipts (BEA, 2011b). This includes earnings from work received during the period, interest and dividends received, and government transfer payments, such as social security checks. It is measured before the deduction of personal income taxes and other personal taxes and is reported in current dollars.

Table 3.12-7 contains per capita personal income for the ROI and Texas for the years 2000, 2005, and 2010. All dollar estimates are in current dollars (not adjusted for inflation). For 2010, of the six counties, Collin (\$48,229) had the highest personal income per capita. Grayson (\$32,225), Lamar (\$31,654), and Hunt (\$31,504) followed; with Delta (\$28,405) and Fannin (\$27,939) having the smallest per capita

personal incomes. All counties except Collin County had a smaller per capita income compared to the state average (BEA, 2011a).

Delta County experienced the largest percentage change in per capita income from 2000 to 2010 with an increase of 48.9 percent. All but Collin County had a percentage increase over the period greater than the state's. Not only was Collin the only one of the six counties with a percentage increase less than the 35.5 percent statewide increase, it experienced a comparably low percent change of 6.0 percent.

Table 3.12-7. Annual Per Capita Personal Income in ROI and Texas (in dollars)

County	Per Capita Personal Income			
	2000	2005	2010	Percent Change 2000-2010
Fannin	20,150	23,281	27,939	38.7
Collin	45,491	45,741	48,229	6.0
Hunt	23,055	26,888	31,504	36.6
Lamar	22,217	25,268	31,654	42.5
Delta	19,071	21,092	28,405	48.9
Grayson	23,285	26,532	32,225	38.4
All Counties in Texas	28,506	33,220	37,747	32.4

Note: not adjusted for inflation

Source: BEA, 2011a

Total Industry Compensation

Income is generated by economic activity through a variety of sectors related to business as well as government. "Total Industry Compensation," a term often used in economic data, is somewhat of a misnomer in that a portion of the "industry earnings" stem from government-related activity. Nevertheless, total industry compensation provides a good picture of the relative sizes of market-related or business activity performed in a county.

Total industry compensation is reported in terms of employee compensation for work in a sector. Compensation for work is broader than salaries and wages; it also includes employer contributions for employee retirement funds, social security, health insurance, and life insurance. These supplements to income comprise roughly 20 percent of total compensation. This income is not always received by a person in the county, because persons from neighboring counties may cross county lines to go to work. The employee compensation by industry is a measure of economic activity generated in the counties, regardless of where the employee resides. The 2010 total compensation of employees for each county in the ROI as well as all counties in the state of Texas is shown in Table 3.12-8. The compensation of employees working in Collin County is notably higher compared to the other five counties in the ROI.

Also, total compensation measures are presented "per job," meaning in terms of full-time and part-time wage and salary employment. Therefore, total average compensation per job is the compensation of employees received divided by total full-time and part-time wage and salary employment. In contrast, per capita personal income (discussed above in 3.12.3.1) includes government transfers to people who are not employed. 2010 total average compensation per job for each county in the ROI and for all counties in the state of Texas is also shown in Table 3.12-8 below.

Table 3.12-8. Total and Average Compensation of Employees in ROI, 2010

County	Average Compensation (\$000)	Total Compensation (\$000)
Fannin County	42,520	282,678
Collin County	64,285	19,663,877
Hunt County	50,585	1,482,862
Lamar County	42,256	849,167
Delta County	29,477	35,940
Grayson County	45,065	2,015,911
Total for Counties in ROI	45,698	24,330,435
All Counties in Texas	57,303	620,072,178

Source: BEA, 2011a

The counties in the ROI display a variety of business activity, and the sources of economic activity in the six counties are also individually discussed below. A table with 2010 compensation of employees by industry and the percent this compensation represents is included for each county in the pursuant sections.

Fannin County, Compensation by Industry

As shown in Table 3.12-9, Government and Government Enterprises account for a total of \$146.5 million of the annual compensation of employees in 2010. The city of Bonham – the county seat – is home to Texoma Medical Clinic (TMC) Bonham Hospital (formerly known as the Red River Regional Hospital), which serves the area and operates a branch of Grayson County College. As such, the Health Care and Social Assistance sector was the second highest in annual compensation. The city of Bonham, known for its affordable property taxes and rent, is also unofficially known as “booming Bonham.”

Table 3.12-9. Compensation of Employees by Industry in Fannin County, 2010

Industry Description	Compensation (\$000)	Percent
Government and Government Enterprises	146,492	51.8
Retail Trade	29,674	10.5
Manufacturing	23,828	8.4
Wholesale Trade	14,248	5.0
Other Services Except Public Administration	12,799	4.5
Finance and Insurance	10,711	3.8
Construction	7,727	2.7
Transportation and Warehousing	6,643	2.4
Accommodation and Food Services	6,372	2.3
Utilities	6,234	2.2
Professional, Scientific, and Technical Services	5,072	1.8
Farm	4,821	1.7
Mining	2,353	0.8
Forestry, Fishing, Related Activities	1,822	0.6
Information	1,671	0.6
Real Estate and Rental and Leasing	1,566	0.6
Arts, Entertainment, Recreation	644	0.2

Industry Description	Compensation (\$000)	Percent
Management of Companies	(D)	n/a
Administrative and Waste Services	(D)	n/a
Educational Services	(D)	n/a
Health Care and Social Assistance	(D)	n/a
Total Compensation of Employees	282,678	99.9

(D) Not shown to avoid disclosure of individual confidential information

*Note: Numbers may not add up to exactly 100 percent due to rounding

Source: BEA, 2011a

Like many rural counties in Texas, Fannin County saw its historical peak of economic activity around the turn of the 20th century. Cotton and corn production were the chief crops in an economy dominated by agricultural production. Later in the 20th century, dairy operations rose in prominence, but the county suffered tremendous economic losses during the depression years and after World War II (Clower, 2012). The only livestock to show promise during this time were beef cattle. The number of cattle increased considerably in the 1930s and continued to increase slowly during the rest of the century (TSHA, 2016).

Cotton production took a sharp decline during the 1950s, dropping by half to 24,928 bales in 1959. In 1987 only 337 bales were produced in the county. Corn steadily declined to only 496,557 bushels in 1987. Wheat, the only major agricultural product to increase in the late twentieth century in Fannin County, peaked in 1982 at 1,997,530 bushels. Peanuts and sorghum also increased production in the latter part of the twentieth century (TSHA, 2016).

The number of farms steadily decreased from its 1900 peak of 7,202 to only 1,533 in 1987. Stock farming moved from hogs and dairy cattle to beef cattle. Swine production slowly declined in the twentieth century to only a little over one thousand hogs in the 1980s. By 1987, Fannin County had nearly 65,000 beef cattle but only a few thousand dairy cattle. In 2002 the county had 1,976 farms and ranches covering 483,446 acres, 59 percent of which were devoted to crops, 32 percent to pasture, and 8 percent to woodland. That year farmers and ranchers in the area earned \$57,364,000; livestock sales accounted for \$37,683,000 of the total. Beef cattle, wheat, milo, corn, pecans, and hay were the chief agricultural products (TSHA, 2016).

Record-breaking droughts and temperatures in the last few years have compounded economic losses in Texas. The Texas AgriLife Extension Service economists reported that the 2011 drought caused agricultural losses totaling \$7.6 billion. Livestock accounted for \$3.23 billion in losses. Lost hay production was valued at \$750 million, cotton at \$2.2 billion, corn at \$763 million, wheat at \$314 million and sorghum at \$385 million. The losses represent about 43 percent of the average value of agricultural production over the last four years (AgriLife, 2012).

Much of the land that would be inundated by the reservoir under Alternative 1 is agricultural. Fannin County assesses taxable values for agricultural land according to the nature of the land, the use of the land, and irrigation status. These valuations range from \$65 per acre for native grasslands that are not irrigated to \$323 per acre for irrigated land or land in horticultural uses (Clower, 2012).

Collin County, Compensation by Industry

Table 3.12-10 displays the compensation of employees by industry for Collin County in 2010. Government and Government Enterprises generated more employee compensation than did other sectors, accounting for nearly \$2.3 billion. The Collin County Regional Airport, Collin Community College, and the Collin County Jail account for a large number of jobs. The manufacturing sector, a close second, is

dominated by durable goods and computer and electronic product manufacturing. Texas Instruments, a worldwide manufacturer of semiconductors and computer technology, moved their flight operations to Collin County Regional Airport around 2008.

Table 3.12-10. Compensation of Employees by Industry in Collin County, 2010

Industry Description	Compensation (\$000)	Percent
Government and Government Enterprises	2,314,273	11.8
Manufacturing	2,058,642	10.5
Professional, Scientific, and Technical Services	2,007,142	10.2
Finance and Insurance	1,959,089	10.0
Information	1,911,718	9.7
Health Care and Social Assistance	1,678,040	8.5
Retail Trade	1,408,688	7.1
Management of Companies	1,298,365	6.6
Wholesale Trade	1,198,676	6.0
Administrative and Waste Services	997,334	5.0
Construction	773,024	3.9
Accommodation and Food Services	585,617	3.0
Other Services Except Public Adm.	575,823	3.0
Real Estate and Rental and Leasing	346,340	1.7
Transportation and Warehousing	146,032	0.7
Mining	131,965	0.7
Arts, Entertainment, Recreation	106,211	0.5
Educational Services	105,045	0.5
Utilities	51,072	0.3
Farm	6,246	0.0
Forestry, Fishing, Related Activities	4,535	0.0
Total Compensation of Employees	19,663,877	99.7

*Note: Numbers may not add up to exactly 100 percent due to rounding.

Source: BEA, 2011a.

Hunt County, Compensation by Industry

Table 3.12-11 below displays the compensation of employees by industry for Hunt County in 2010. The manufacturing sector generated more employee compensation than did other sectors. Government and Government Enterprises, Health Care and Social Assistance, are the second and third sources of employee compensation. Greenville Municipal Airport is located in the City of Greenville, and the Hunt Regional Healthcare Hospital serves the county.

Table 3.12-11. Compensation of Employees by Industry in Hunt County, 2010

Industry Description	Compensation (\$000)	Percent
Manufacturing	641,387	43.3
Government and Government Enterprises	337,302	22.7
Health Care and Social Assistance	98,370	6.6

Industry Description	Compensation (\$000)	Percent
Retail Trade	95,350	6.4
Professional, Scientific and Technical Services	42,301	2.9
Wholesale Trade	41,929	2.8
Construction	39,312	2.7
Other Services Except Public Administration	38,817	2.6
Transportation and Warehousing	35,149	2.4
Accommodation and Food Services	34,691	2.3
Finance and Insurance	31,841	2.1
Utilities	14,214	0.1
Information	11,946	0.8
Real Estate and Rental and Leasing	9,331	0.6
Educational Services	4,636	0.3
Farm	4,232	0.3
Arts, Entertainment, Recreation	2,054	0.1
Forestry, Fishing, and Related Activities	(D)	n/a
Mining	(D)	n/a
Management of Companies	(D)	n/a
Administrative and Waste Services	(D)	n/a
Total Compensation of Employees	1,482,862	99.0

(D) Not shown to avoid disclosure of individual confidential information

*Note: Numbers may not add up to exactly 100 percent due to rounding.

Source: BEA, 2011a.

Lamar County, Compensation by Industry

Table 3.12-12 below displays the compensation of employees by industry for Lamar County in 2010. In 2010, manufacturing was the leader in employee compensation, totaling \$262.8 million. The county is home to several historic homes, in addition to a 65-foot high replica of the Eiffel Tower in the City of Paris, its county seat. Government and Government Enterprises and Health Care and Social Assistance are close second and third sources of employee compensation. Paris has one major hospital divided into two campuses: Paris Regional Medical Center South (formerly St. Joseph's Hospital) and Paris Regional Medical Center North (formerly McCuiston Regional Medical Center). It serves as the center for healthcare in much of Northeast Texas and Southeast Oklahoma. Both campuses are now operated jointly under the Paris Regional Medical Center, a division of Essent Healthcare. The health network is the largest employer in the Paris area.

Table 3.12-12. Compensation of Employees by Industry in Lamar County, 2010

Industry Description	Compensation (\$000)	Percent
Manufacturing	262,826	31.0
Government and Government Enterprises	150,171	17.7
Health Care and Social Assistance	126,284	14.9
Retail Trade	71,386	8.4
Construction	57,845	6.8

Industry Description	Compensation (\$000)	Percent
Finance and Insurance	34,102	4.0
Other Services Except Public Administration	25,958	3.1
Accommodation and Food Services	25,804	3.0
Administrative and Waste Services	22,206	2.6
Transportation and Warehousing	18,228	2.1
Utilities	18,200	2.1
Wholesale Trade	16,352	1.9
Information	6,848	0.8
Arts, Entertainment, Recreation	4,794	0.6
Real Estate and Rental and Leasing	4,004	0.5
Farm	3,061	0.4
Educational Services	1,098	0.1
Forestry, Fishing, Related Activities	(D)	n/a
Mining	(D)	n/a
Professional, Scientific, and Technical Services	(D)	n/a
Management of Companies	(D)	n/a
Total Compensation of Employees	849,167	100.0

(D) Not shown to avoid disclosure of individual confidential information

Source: BEA, 2011a.

Delta County, Compensation by Industry

As shown in Table 3.12-13, the three largest generators of compensation for employees in Delta County in 2010 are the 1) Government and Government Enterprises, and 2) Health Care and Social Assistance, and 3) Wholesale Trade sectors.

Table 3.12-13. Compensation of Employees by Industry in Delta County, 2010

Industry Description	Compensation (\$000)	Percent
Government and Government Enterprises	14,205	39.5
Health Care and Social Assistance	10,410	29.0
Wholesale Trade	9,629	26.8
Farm	1,000	2.8
Retail Trade	696	1.9
Mining	0	0
Educational Services	0	0
Construction	(D)	n/a
Forestry, Fishing, Related Activities	(D)	n/a
Manufacturing	(D)	n/a
Transportation and Warehousing	(D)	n/a
Utilities	(D)	n/a
Information	(D)	n/a

Industry Description	Compensation (\$000)	Percent
Real Estate and Rental and Leasing	(D)	n/a
Finance and Insurance	(D)	n/a
Professional, Scientific, and Technical Services	(D)	n/a
Management of Companies	(D)	n/a
Administrative and Waste Services	(D)	n/a
Arts, Entertainment, Recreation	(D)	n/a
Accommodation and Food Services	(D)	n/a
Other Services Except Public Administration	(D)	n/a
Total Compensation of Employees	35,940	100.0

(D) Not shown to avoid disclosure of individual confidential information

Source: BEA, 2011a.

Grayson County, Compensation by Industry

As shown in Table 3.12-14, the manufacturing sector led employee compensation, primarily manufacturing durable goods and computer and electronic products. In 2010, Manufacturing Consortium partnered with Grayson Community College – which operates a branch campus in Sherman - to provide job training using a Texas Workforce Commission (TWC) grant. Closely behind the manufacturing sector: Health Care and Social Assistance and Government and Government Enterprises. The Texas Department of Criminal Justice operates the Sherman District Parole Office in Sherman, and the United States Postal Service operates the Sherman Post Office.

Table 3.12-14. Compensation of Employees by Industry in Grayson County, 2010

Industry Description	Compensation (\$000)	Percent
Manufacturing	418,827	20.8
Health Care and Social Assistance	381,398	18.9
Government and Government Enterprises	332,764	16.5
Retail Trade	173,955	8.6
Construction	115,462	5.7
Finance and Insurance	113,282	5.6
Accommodation and Food Services	77,613	3.9
Other Services Except Public Administration	65,427	3.2
Administrative and Waste Services	61,915	3.1
Wholesale Trade	61,665	3.1
Transportation and Warehousing	48,387	2.4
Professional, Scientific, and Technical Services	38,248	1.9
Educational Services	25,469	1.2
Information	22,577	1.1
Utilities	21,131	1.0
Arts, Entertainment, Recreation	16,073	0.8
Real Estate and Rental and Leasing	16,004	0.8
Mining	13,730	0.7

Industry Description	Compensation (\$000)	Percent
Farm	6,543	0.3
Forestry, Fishing, Related Activities	3,697	0.2
Management of Companies	1,744	0.0
Total Compensation of Employees	2,015,911	99.8

(D) Not shown to avoid disclosure of individual confidential information

*Note: Numbers may not add up to exactly 100 percent due to rounding.

Source: BEA, 2011a.

3.12.4 Public Finance

The primary non-federal taxation in the local area is of property and retail sales. Property taxes are dependent upon the appraised value of the property for taxation purposes and on the property tax rates. In the short-term, the proposed project would affect taxable land that would be cleared for reservoir impoundment, including agricultural and timberlands. In the long-term, property taxation could change with new housing construction and business development and recruitment. As such, property taxation is discussed in 3.12.4.1 and 3.12.4.2.

Retail sales that are qualified for taxation are taxed at a state sales tax plus potential county and city tax rates. Part of these taxes helps fund schools in the local area. The proposed project could also affect retail sales and the associated taxable sales and local sales dollars returned to each county. In the short-term, these changes would be associated with the purchase of construction materials and construction worker spending in the ROI. In the long-term, these changes would be associated with non-local recreational spending as well as new permanent and weekend residents. As such, retail sales taxation is discussed in 3.12.4.3 and taxable sales and local sales dollars returned to the counties are discussed in 3.12.4.4.

Property Taxation

The FCAD is responsible for appraising properties within the county boundaries. The FCAD has jurisdiction over Fannin County; the cities in Fannin County (Bailey, Bonham, Dodd City, Ector, Honey Grove, Ladonia, Leonard, Pecan Gap, Savoy, Trenton, and Windom); and several Independent School Districts (ISDs), some of which are split with surrounding counties. The ISDs include Blue Ridge ISD (Split with Collin County), Bonham ISD, Dodd City ISD, Ector ISD, Fannindel ISD (Split with Delta County), Honey Grove ISD, Leonard ISD (Split with Hunt County), North Lamar ISD (Split with Lamar County), Savoy ISD, Sam Rayburn ISD, Trenton ISD (Split with Collin County), Whitewright ISD (Split with Grayson County), and Wolfe City ISD (Split with Hunt County).

As shown in Table 3.12-15, the district is comprised of 33,246 property accounts. Under the standards of the Property Tax Assistance Division (PTAD), properties are classified by type. Table 3.12-15 also shows the various property types and their percent of the overall parcel count and market value, respectively. Single Family Residences and Qualified Agricultural Land represent the largest property types, both in terms of size and market value (FCAD, 2012).

Table 3.12-15. Property Types Appraised in Fannin County Appraisal District (2012)

PTAD Classification	Property Type	Parcel Count	Market Value	Parcel Count (%)	Market Value (%)
A	Single Family Residences	9,424	\$596,211,346	28.3	35.3
B	Multi-family Residences	11	\$13,602,272	0.4	0.5
C	Vacant Lots	1814	\$14,082,180	5.5	0.5
D1	Qualified Ag Land	9,050	\$947,204,160	27.2	35.3
D2	Non-Qualified Ag Land	2,173	\$90,039,809	6.5	3.4
E	Farm Improvement	5,226	\$351,000,548	15.7	13.1
F1	Commercial Real Property	965	\$82,280,291	2.9	3.1
F2	Industrial Real Property	70	\$27,342,890	0.2	1.0
G1	Oil and Gas Properties	10	\$13,799	0.0	0.0
J	Utilities Properties	377	\$126,763,680	1.1	4.7
L1	Business Personal Property	1268	\$38,285,390	3.8	1.4
L2	Industrial Personal Property	234	\$34,462,050	0.7	1.3
M1	Manufactured Housing	284	\$3,755,980	0.9	0.1
O	Residential Inventory	256	\$2,121,810	0.8	0.1
S	Special Inventory	27	\$7,071,730	0.1	0.3
X	Exempt Property	1,951	\$346,005,650	5.9	12.9
	Total	33,246	\$2,680,243,585	100	100

Source: FCAD, 2012.

The Chief Appraiser certified market and taxable values to each taxing jurisdiction on July 17, 2012. The values are included in Table 3.12-16.

Table 3.12-16. Certified Market and Taxable Values by Jurisdiction (2012)

Entity	Parcel Count	Market Value	Net Taxable Value
City of Bailey	149	\$5,437,809	\$4,338,525
City of Bonham	4,925	\$448,303,779	\$289,201,349
City of Dodd City	294	\$14,814,190	\$9,622,624
City of Ector	386	\$22,479,559	\$15,569,568
City of Honey Grove	1,365	\$72,823,985	\$50,246,661
City of Ladonia	665	\$19,688,366	\$13,944,076
City of Leonard	1,168	\$82,203,744	\$59,758,643
City of Pecan Gap	11	\$570,260	\$528,170
City of Savoy	481	\$31,043,759	\$18,485,981
City of Trenton	616	\$47,949,936	\$29,422,380
City of Whitewright	2	\$108,870	\$108,870
Town of Windom	203	\$8,378,017	\$6,312,687
Fannin County	28,385	\$2,770,629,917	\$1,460,523,745

Entity	Parcel Count	Market Value	Net Taxable Value
Blue Ridge ISD in Fannin	46	\$4,211,740	\$1,678,251
Bonham ISD	10,823	\$1,078,126,529	\$580,839,424
Dodd City ISD	1,192	\$100,423,231	\$41,278,876
Ector ISD	951	\$109,484,211	\$36,928,595
Fannindel ISD	1,504	\$92,126,665	\$38,229,360
Honey Grove ISD in Fannin	4,424	\$389,882,037	\$157,819,502
Leonard ISD in Fannin	2,391	\$230,748,400	\$130,574,054
North Lamar ISD in Fannin	12	\$5,486,040	\$2,126,950
Sam Rayburn ISD	2,472	\$278,285,169	\$89,277,972
Savoy ISD	1,600	\$177,848,298	\$85,158,712
Trenton ISD in Fannin	2,393	\$239,055,258	\$141,774,513
Whitewright ISD in Fannin	464	\$45,666,853	\$20,972,870
Wolfe City ISD in Fannin	128	\$16,186,697	\$4,986,333

Source: FCAD, 2012.

As shown in Table 3.12-17, the total appraised value available for county taxation in Fannin County in 2012 was almost \$1.5 billion. Table 3.12-17 also includes the property tax rate for each county. Delta County has the highest property tax rate, with a rate of \$0.877440 of tax per \$100 of a property's assessed value. Next highest is Fannin County, with a rate of \$0.605100 per \$100; which is \$0.27 less per \$100 in assessed property value compared to Delta. Collin County has the lowest rate with \$0.24 of tax per \$100, which is more than \$0.60 less per \$100 in assessed property value than in Delta County.

Table 3.12-17. Total Appraised Property Value in ROI, 2012

County	Total Appraised Value Available for County Taxation	Total County Property Tax Rate*
Fannin	\$1,460,378,298	0.605100
Collin	\$74,583,795,911	0.24
Hunt	\$4,285,597,282	0.527534
Lamar	\$2,767,639,762	0.438700
Delta	\$201,037,738	0.877440
Grayson	\$6,631,509,595	0.4909

* Dollar per \$100 of assessed property value

Source: TCPA, 2012a and 2012b.

Agriculture and Timber

Fannin County assesses taxable values for agricultural land according to the use of the land, and the nature of the land and its irrigation status. In 2005, 37 percent of the parcels in Fannin County were appraised as agricultural land and 17 percent farm and ranch improvement. Most of the land that would be inundated with implementation of the proposed project is agricultural. These valuations range from \$65 per acre for native grasslands that are not irrigated to \$323 per acre for irrigated land or land in horticultural uses (Clower, 2012).

As discussed above and shown in Table 3.12-15, the FCAD appraised 33,246 property accounts, or parcels, in 2012. Sub-classifications for agricultural and timberland include irrigated cropland; dry land