TCEQ Interoffice Memorandum

TO: Office of the Chief Clerk
Texas Commission on Environmental Quality

THRU: Chris Kozlowski, Team Leader
Water Rights Permitting Team

FROM: Sarah Henderson, Project Manager
Water Rights Permitting Team

DATE: December 30, 2020

SUBJECT: City of San Angelo
WRPERM 13741
CN600251615, RN111117529
Application No. 13741 for a Water Use Permit
Texas Water Code §§ 11.121, 11.042, Requiring Mailed Notice
Concho River, Concho River Basin
Tom Green County

The application and partial fees were received on October 15, 2020. Additional fees were received on December 14, 2020. The application was declared administratively complete and accepted for filing with the Office of the Chief Clerk on December 30, 2020. Limited mailed notice to the downstream water right holders of record within the Concho River Basin is required pursuant to Title 30 Texas Administrative Code § 295.161(a).

All fees have been paid and the application is sufficient for filing.

Sarah E Henderson
_____
Sarah Henderson, Project Manager
Water Rights Permitting Team
Water Rights Permitting and Availability Section

OCC Mailed Notice Required **X YES** **□NO**

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 30, 2020

Ms. Allison Strube
Water Utilities Director
City of San Angelo
301 W. Beauregard Avenue
San Angelo, Texas 76903

VIA EMAIL

RE: City of San Angelo
WRPERM 13741
CN600251615, RN111117529
Application No. 13741 for a Water Use Permit
Texas Water Code §§ 11.121, 11.042, Requiring Mailed Notice
Concho River, Concho River Basin
Tom Green County

Dear Ms. Strube:

This acknowledges receipt, on December 14, 2020, of additional fees in the amount of $ 14,555.30 (Receipt Nos M407546A/B, copies attached).

The application was declared administratively complete and filed with the Office of the Chief Clerk on December 30, 2020. Staff will continue processing the application for consideration by the Executive Director.

Please be advised that additional information may be requested during the technical review phase of the application process.

If you have any questions concerning this matter please contact me via email at sarah.henderson@tceq.texas.gov or by telephone at (512) 239-2535.

Sincerely,

Sarah E Henderson

Sarah Henderson, Project Manager
Water Rights Permitting Team
Water Rights Permitting and Availability Section

Attachments

TCEQ 16-DEC-20 04:15 PM

TCEQ - A/R RECEIPT REPORT BY ACCOUNT NUMBER

Fee Description	Fee Code / Account# / Account Name	Ref#1 / Ref#2 / Paid In By	Check Number / Card Auth. / User Data	CC Type / Tran Code / Rec Code	Slip Key / Document#	Tran Date	Tran Amount
NOTICE FEES-WUP-WATER USE PERM	PTGU	M107546B	680273		BS00084571	16-DEC-20	-$253.80
	PTGU	13741	121620	N	D1801689		
	NOTICE FEES WUP WATER USE PERMITS	SAN ANGELO, CITY OF	VHERNAND	CK			

Total (Fee Code): -$253.80

S. Henderson

TCEQ 16-DEC-20 04:15 PM

TCEQ - A/R RECEIPT REPORT BY ACCOUNT NUMBER

Fee Description	Fee Code / Account# / Account Name	Ref#1 / Ref#2 / Paid In By	Check Number / Card Auth. / User Data	CC Type / Tran Code / Rec Code	Slip Key / Document#	Tran Date	Tran Amount
WTR USE PERMITS	WUP	M107546A	680273		BS00084571	16-DEC-20	-$14,301.50
	WUP	13741	121620	N	D1801689		
	WATER USE PERMITS	SAN ANGELO, CITY OF	VHERNAND	CK			
				Total (Fee Code):			-$14,301.50
				Grand Total:			-$31,986.56

S. Henderson

From: Sarah Henderson
To: [redacted]
Subject: City of San Angelo WRPERM No. 13741
Date: Friday, November 20, 2020 4:50:00 PM
Attachments: San Angelo_13741_RFI_20Nov2020.pdf

Ms. Strube,

Please find the attached, a response is requested by December 22, 2020.

Feel free to contact me with any questions.

Sincerely,

Sarah

Sarah Henderson
Water Rights Permitting Team
Water Availability Division
Texas Commission on Environmental Quality
P.O. Box 13087/MC-160
Austin, TX 78711-3087
(P) 512.239.2535
(F) 512.239.4770

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

November 20, 2020

Ms. Allison Strube
Water Utilities Director
City of San Angelo
301 W. Beauregard Avenue
San Angelo, Texas 76903

VIA EMAIL

RE: City of San Angelo
WRPERM 13741
CN600251615, RN111117529
Application No. 13741 for a Water Use Permit
Texas Water Code §§ 11.121, 11.042, Requiring Mailed Notice
Concho River, Concho River Basin
Tom Green County

Dear Ms. Strube:

This acknowledges receipt, on October 15, 2020, of the referenced water use permit application and fees in the amount of $112.50 (Receipt No. M101796, copy attached).

Additional fees are required before the application can be declared administratively complete. Remit fees in the amount of **$14,555.30** as described below. Please make checks payable to the TCEQ or Texas Commission on Environmental Quality.

Filing Fee (10,001–250,000 acre-ft)	$ 1,000.00
Recording Fee	$ 25.00
Use Fee (13,389 ac-ft x $1.00)	$ 13,389.00 *
Notice Fee (270 WR holders x $0.94)	$ 253.80
Total Fees	$ 14,667.80
Fees Received	$ 112.50
Fees Due	$ 14,555.30

*Pursuant to Title 30 Texas Administrative Code (TAC) §295.133(b), the Applicant is only required to submit half of the Use fees upon filing in order to be considered administratively complete. If the applicant wants to remit the required application fees pursuant to this rule, only $7,860.8 will be due instead of the above amount. The remaining $6,694.50 in required Use fees are then required to be remitted to the TCEQ within 180 days after notice is mailed to the applicant that the permit is granted.

Please provide the requested information by December 22, 2020 or the application may be returned pursuant to Title 30 TAC § 281.18.

If you have any questions concerning this matter please contact me via email at sarah.henderson@tceq.texas.gov or by telephone at (512) 239-2535.

Sincerely,

Sarah E Henderson

Sarah Henderson, Project Manager
Water Rights Permitting Team
Water Rights Permitting and Availability Section

Attachment

TCEQ 20-OCT-20 11:48 AM

TCEQ - A/R RECEIPT REPORT BY ACCOUNT NUMBER

Fee Description	Fee Code / Account# / Account Name	Ref#1 / Ref#2 / Paid In By	Check Number / Card Auth. / User Data	CC Type / Tran Code / Rec Code	Slip Key / Document#	Tran Date	Tran Amount
WTR USE PERMITS	WUP WUP WATER USE PERMITS	M101796 WR13741 JT HILL & CO	1482 101920 VHERNAND	 N CK	BS00083218 D1800579	20-OCT-20	-$112.50
	WUP WUP WATER USE PERMITS	M101797A SNIDER, JON	285 101920 VHERNAND	 N CK	BS00083218 D1800579	20-OCT-20	-$526.00
				Total (Fee Code):			-$638.50
				Grand Total:			-$1,820.84

RECEIVED
OCT 21 2020
Water Availability Division

TCEQ 20-OCT-20 11:48 AM

TCEQ - A/R RECEIPT REPORT BY ACCOUNT NUMBER

Fee Description	Fee Code / Account# / Account Name	Ref#1 / Ref#2 / Paid In By	Check Number / Card Auth. / User Data	CC Type / Tran Code / Rec Code	Slip Key / Document#	Tran Date	Tran Amount
WTR USE PERMITS	WUP WUP WATER USE PERMITS	M101796 WR13741 JT HILL & CO	1482 101920 VHERNAND	 N CK	BS00083218 D1800579	20-OCT-20	-$112.50
	WUP WUP WATER USE PERMITS	M101797A SNIDER, JON	285 101920 VHERNAND	 N CK	BS00083218 D1800579	20-OCT-20	-$526.00
				Total (Fee Code):			-$638.50
				Grand Total:			-$1,820.84

RECEIVED
OCT 21 2020
Water Availability Division

JT HILL
LAND | WATER | LAW

WWW.JTHILL.COM

[redacted]

(512) 806-1060

October 15, 2020

Chris Kozlowski
Water Rights Permitting and Availability (MC-160)
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087
chris.kozlowski@tceq.texas.gov

RE: City of San Angelo Application for Authorization to Convey, Divert, and Reuse New Discharges into a Watercourse

Dear Chris:

The people of the City of San Angelo are no strangers to water supply challenges. Considered by many to sit within the heart of the devastating drought of the mid-20th Century, San Angelo has responded to the lessons learned from that historic period by developing one of the most diversified water supply portfolios in Texas. Over the many decades following the 1950s, San Angeloans have diligently planned ahead to provide their future generations with water security.

Leaders of the City of San Angelo today are applying the same forward-thinking approach as that of their predecessors. As a product of those efforts, the City has developed an indirect reuse project that would provide greater reliability and diversity to its water supplies. Known as the *Concho River Project*, the City proposes to beneficially reuse flows discharged from its proposed new outfall at what will be an upgraded wastewater treatment plant. This indirect reuse plan will rely on treated effluent that will not have been discharged into the Concho River prior to this effort. The project involves new TPDES permitting to authorize the discharges and a bed-and-banks authorization to convey, divert, and reuse the discharged flows. The enclosed application contains the City's bed-and-banks authorization request.

The City's drinking water sources, and therefore its resulting wastewater effluent, may at any time be comprised of varying percentages of groundwater and

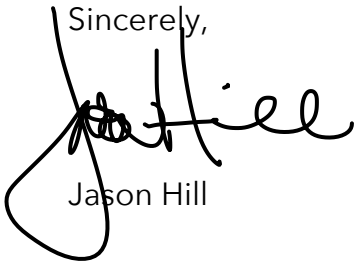
surface water. This application accordingly includes a request to transport and divert wastewater flows comprised of a mix of the two types of water.

The City's treated effluent has historically been directly applied to agricultural irrigation uses. The flows that are the subject of this application will therefore be new to the Concho River. Because these flows would not otherwise exist in the river but for the City's discharge efforts, the diversions requested in this application should be authorized without being subject to downstream calls.

To be clear, the City is not requesting any new appropriation of water nor the right to divert any water to which downstream water rights owners are lawfully entitled. This application is strictly limited to a request for authorization to convey, divert, and reuse flows the City creates from discharges it makes at the proposed outfall, less carriage losses. The City's comprehensive water accounting plan, combined with its conservatively calculated transportation losses, will ensure that water rights holders and the environment will not be negatively impacted by the requests contained in this application.

The Concho River Project is a significant component of the City's efforts to meet its future water demands. This application is one of the cornerstones of that initiative. On behalf of the San Angelo City Council and Staff, please accept this application for processing, review, and ultimate approval.

Sincerely,



Jason Hill

encl.

cc: The Honorable Brenda Gunter, *Mayor of the City of San Angelo*
Daniel Valenzuela, *City Manager of the City of San Angelo*
Allison Strube, *City of San Angelo Water Utilities Director*

LIST OF APPENDICES

CITY OF SAN ANGELO APPLICATION FOR AUTHORIZATION TO CONVEY, DIVERT, AND REUSE NEW DISCHARGES INTO A WATERCOURSE

A TCEQ Form 10214b, Administrative Information Report

B TCEQ Form 10214c, Technical Information Report – Water Rights Permitting

- Worksheet 1.0 – Quantity, Purpose and Place of Use
- Worksheet 3.0 – Diversion Point (or Diversion Reach) Information
- Worksheet 4.0 – Discharge Information
- Worksheet 4.1 – Discharge Point Information
- Worksheet 5.0 – Environmental Information
- Worksheet 6.0 – Water Conservation/Drought Contingency Plans
- Worksheet 7.0 – Accounting Plan Information Worksheet
- Worksheet 8.0 – Calculation of Fees

C Maps

D Gain/Loss Analysis of Concho River for City of San Angelo Bed and Banks Permit Application

E Addendum to Worksheet 5.0 – Photographs

F City of San Angelo Water Conservation Plan

G City of San Angelo Drought Contingency Plan
(*pages 61-65 of City of San Angelo Water Conservation Plan*)

APPENDIX A

TCEQ Form 10214b, Administrative Information Report

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

TCEQ WATER RIGHTS PERMITTING APPLICATION

ADMINISTRATIVE INFORMATION CHECKLIST

Complete and submit this checklist for each application. See Instructions Page. 5.

APPLICANT(S): CITY OF SAN ANGELO, TEXAS

Indicate whether the following items are included in your application by writing either Y (for yes) or N (for no) next to each item (all items are not required for every application).

Y/N		Y/N	
Y	**Administrative Information Report**	Y	**Worksheet 3.0**
N	Additional Co-Applicant Information	N	Additional W.S 3.0 for each Point
N	Additional Co-Applicant Signature Pages	Y	Recorded Deeds for Diversion Points
Y	Written Evidence of Signature Authority	Y	Consent For Diversion Access
Y	**Technical Information Report**	Y	**Worksheet 4.0**
Y	USGS Map (or equivalent)	N	TPDES Permit(s)
Y	Map Showing Project Details	Y	WWTP Discharge Data
Y	Original Photographs	N	24-hour Pump Test
N	Water Availability Analysis	N	Groundwater Well Permit
Y	**Worksheet 1.0**	N	Signed Water Supply Contract
N	Recorded Deeds for Irrigated Land	Y	**Worksheet 4.1**
N	Consent For Irrigation Land	Y	**Worksheet 5.0**
N	**Worksheet 1.1**	N	Addendum to Worksheet 5.0
N	Addendum to Worksheet 1.1	Y	**Worksheet 6.0**
Y	**Worksheet 1.2**	Y	Water Conservation Plan(s)
N	Addendum to Worksheet 1.2	Y	Drought Contingency Plan(s)
N	**Worksheet 2.0**	Y	Documentation of Adoption
N	Additional W.S 2.0 for Each Reservoir	Y	**Worksheet 7.0**
N	Dam Safety Documents	N	Accounting Plan
N	Notice(s) to Governing Bodies	Y	**Worksheet 8.0**
N	Recorded Deeds for Inundated Land	Y	Fees
N	Consent For Inundation Land		

For Commission Use Only:
Proposed/Current Water Right Number: _____
Basin: _____ Watermaster area Y/N: _____

ADMINISTRATIVE INFORMATION REPORT

The following information **is required** for **all** new applications and amendments.

****Applicants are strongly encouraged to schedule a pre-application meeting with TCEQ Staff to discuss Applicant's needs prior to submitting an application. Call the Water Rights Permitting Team to schedule a meeting at* (512) 239-4691.

1. TYPE OF APPLICATION (Instructions, Page. 6)

Indicate, by marking X, next to the following authorizations you are seeking.

_____New Appropriation of State Water

_____Amendment to a Water Right *

X Bed and Banks

If you are seeking an amendment to an existing water rights authorization, you must be the owner of record of the authorization. If the name of the Applicant in Section 2, does not match the name of the current owner(s) of record for the permit or certificate or if any of the co-owners is not included as an applicant in this amendment request, your application could be returned. If you or a co-applicant are a new owner, but ownership is not reflected in the records of the TCEQ, submit a change of ownership request (Form TCEQ-10204) prior to submitting the application for an amendment. See Instructions page. 6. Please note that an amendment application may be returned, and the Applicant may resubmit once the change of ownership is complete.

Please summarize the authorizations or amendments you are seeking in the space below or attach a narrative description entitled "Summary of Request."

The City of San Angelo historically has disposed of effluent from its Wastewater Treatment Plant (WWTP)either through evaporation or by agricultural irrigation. As part of its overall plan for implementing new water supply strategies, the City is proposing to develop a reuse project that will consist of discharging a maximum of 13,389 acre-feet per year of effluent from the WWTP into the Concho River, and then, after conveying the effluent down the river for a distance of about eight miles, diverting the effluent, less carriage losses, from the river for subsequent treatment and reuse for municipal potable purposes. This project requires a bed and banks permit under TWC §11.042. This Application is being filed for that purpose.

2. APPLICANT INFORMATION (Instructions, Page. 6)

a. Applicant

Indicate the number of Applicants/Co-Applicants 1
(Include a copy of this section for each Co-Applicant, if any)

What is the Full Legal Name of the individual or entity (applicant) applying for this permit?

City of San Angelo, Texas

(If the Applicant is an entity, the legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal documents forming the entity.)

If the applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=cust.CustSearch

CN : 600251615 (leave blank if you do not yet have a CN).

What is the name and title of the person or persons signing the application? Unless an application is signed by an individual applicant, the person or persons must submit written evidence that they meet the signatory requirements in *30 TAC § 295.14*.

First/Last Name: Daniel Valenzuela

Title: City Manager

Have you provided written evidence meeting the signatory requirements in 30 TAC § 295.14, as an attachment to this application? Yes.

What is the applicant's mailing address as recognized by the US Postal Service (USPS)? You may verify the address on the USPS website at https://tools.usps.com/go/ZipLookupAction!input.action.

Name: City of San Angelo, Texas

Mailing Address: 72 W. College Avenue

City: San Angelo State: Texas ZIP Code: 76903

Indicate an X next to the type of Applicant:

____Individual	____Sole Proprietorship-D.B.A.
____Partnership	____Corporation
____Trust	____Estate
____Federal Government	____State Government
____County Government	X City Government
____Other Government	____Other_____

For Corporations or Limited Partnerships, provide:
State Franchise Tax ID Number: _____SOS Charter (filing) Number: _____

3. APPLICATION CONTACT INFORMATION (Instructions, Page. 9)

If the TCEQ needs additional information during the review of the application, who should be contacted? Applicant may submit their own contact information if Applicant wishes to be the point of contact.

First and Last Name: Allison Strube

Title: Water Utilities Director

Organization Name: City of San Angelo

Mailing Address: 301 W. Beauregard Avenue

City: San Angelo State: TX ZIP Code: 76903

Phone No.: (325) 657-4209 Extension: N/A

Fax No.: N/A E-mail Address: [redacted]

4. WATER RIGHT CONSOLIDATED CONTACT INFORMATION (Instructions, Page. 9)

NOT APPLICABLE

This section applies only if there are multiple Owners of the same authorization. Unless otherwise requested, Co-Owners will each receive future correspondence from the Commission regarding this water right (after a permit has been issued), such as notices and water use reports. Multiple copies will be sent to the same address if Co-Owners share the same address. Complete this section if there will be multiple owners and **all** owners agree to let one owner receive correspondence from the Commission. Leave this section blank if you would like all future notices to be sent to the address of each of the applicants listed in section 2 above.

I/We authorize all future notices be received on my/our behalf at the following:

First and Last Name:

Title:

Organization Name:

Mailing Address:

City: State: ZIP Code:

Phone No.: Extension:

Fax No.: E-mail Address:

5. MISCELLANEOUS INFORMATION (Instructions, Page. 9)

a. The application will not be processed unless all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ are paid in accordance with the Delinquent Fee and Penalty Protocol by all applicants/co-applicants. If you need assistance determining whether you owe delinquent penalties or fees, please call the Water Rights Permitting Team at (512) 239-4691, prior to submitting your application.

1. Does Applicant or Co-Applicant owe any fees to the TCEQ? **Yes / No** N

   If **yes**, provide the following information:
   Account number: Amount past due:

2. Does Applicant or Co-Applicant owe any penalties to the TCEQ? **Yes / No** N

   If **yes**, please provide the following information:
   Enforcement order number: Amount past due:

b. If the Applicant is a taxable entity (corporation or limited partnership), the Applicant must be in good standing with the Comptroller or the right of the entity to transact business in the State may be forfeited. See Texas Tax Code, Subchapter F. Applicant's may check their status with the Comptroller at https://mycpa.cpa.state.tx.us/coa/

   Is the Applicant or Co-Applicant in good standing with the Comptroller? **Yes / No** N/A

c. The commission will not grant an application for a water right unless the applicant has submitted all Texas Water Development Board (TWDB) surveys of groundwater and surface water use – if required. See TWC §16.012(m) and 30 TAC § 297.41(a)(5).

Applicant has submitted all required TWDB surveys of groundwater and surface water? **Yes / No** Y

6. SIGNATURE PAGE (Instructions, Page. 11)

Applicant:

I, Daniel Valenzuela City Manager

(Typed or printed name) (Title)

certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under Title 30 Texas Administrative Code §295.14 to sign and submit this document and I have submitted written evidence of my signature authority.

Signature: _____ Date: October 14, 2020

(Use blue ink)

Subscribed and Sworn to before me by the said

on this 14th day of October, 20 20.

My commission expires on the 2nd day of October, 20 22.

Sarah Lynn Tackett

Notary Public

[SEAL]

Tom Green

County, Texas

SARAH LYNN TACKETT
My Notary ID # 129979399
Expires October 2, 2022

If the Application includes Co-Applicants, each Applicant and Co-Applicant must submit an original, separate signature page

Signature authorization resolution is attached below as **Attachment 1**.

APPENDIX B

TCEQ Form 10214c, Technical Information Report – Water Rights Permitting

Worksheet 1.0 – Quantity, Purpose and Place of Use

Worksheet 1.2 – Notice. "The Marshall Criteria"

Worksheet 3.0 – Diversion Point (or Diversion Reach) Information

Worksheet 4.0 – Discharge Information

Worksheet 4.1 – Discharge Point Information

Worksheet 5.0 – Environmental Information

Worksheet 6.0 – Water Conservation/Drought Contingency Plans

Worksheet 7.0 – Accounting Plan Information Worksheet

Worksheet 8.0 – Calculation of Fees

APPENDIX B

TECHNICAL INFORMATION REPORT
WATER RIGHTS PERMITTING

This Report is required for applications for new or amended water rights. Based on the Applicant's responses below, Applicants are directed to submit additional Worksheets (provided herein). A completed Administrative Information Report is also required for each application.

Applicants are strongly encouraged to schedule a pre-application meeting with TCEQ Permitting Staff to discuss Applicant's needs and to confirm information necessary for an application prior to submitting such application. Please call Water Availability Division at (512) 239-4691 to schedule a meeting.
Applicant attended a pre-application meeting with TCEQ Staff for this Application? **YES**

(If yes, date: **Sept. 16, 2020**).

1. New or Additional Appropriations of State Water. Texas Water Code (TWC) § 11.121 (Instructions, Page. 12)

NOT APPLICABLE

State Water is: *The water of the ordinary flow, underflow, and tides of every flowing river, natural stream, and lake, and of every bay or arm of the Gulf of Mexico, and the storm water, floodwater, and rainwater of every river, natural stream, canyon, ravine, depression, and watershed in the state. TWC § 11.021.*

a. Applicant requests a new appropriation (diversion or impoundment) of State Water? **NO**

b. Applicant requests an amendment to an existing water right requesting an increase in the appropriation of State Water or an increase of the overall or maximum combined diversion rate? **NO**

(If yes, indicate the Certificate or Permit number: _____)

If Applicant answered yes to (a) or (b) above, does Applicant also wish to be considered for a term permit pursuant to TWC § 11.1381? **N/A**

c. Applicant requests to extend an existing Term authorization or to make the right permanent?
NO (If yes, indicate the Term Certificate or Permit number: _____)

If Applicant answered yes to (a), (b) or (c), the following worksheets and documents are required:

- **Worksheet 1.0 - Quantity, Purpose, and Place of Use Information Worksheet**
- **Worksheet 2.0 - Impoundment/Dam Information Worksheet** (submit one worksheet for each impoundment or reservoir requested in the application)
- **Worksheet 3.0 - Diversion Point Information Worksheet** (submit one worksheet for each diversion point and/or one worksheet for the upstream limit and one worksheet for the downstream limit of each diversion reach requested in the application)
- **Worksheet 5.0 - Environmental Information Worksheet**
- **Worksheet 6.0 - Water Conservation Information Worksheet**
- **Worksheet 7.0 - Accounting Plan Information Worksheet**
- **Worksheet 8.0 - Calculation of Fees**
- **Fees calculated on Worksheet 8.0 -** see instructions **Page. 34.**
- **Maps -** See instructions **Page. 15.**
- **Photographs -** See instructions **Page. 30.**

Additionally, if Applicant wishes to submit an alternate source of water for the project/authorization, see Section 3, Page 3 for Bed and Banks Authorizations (Alternate sources may include groundwater, imported water, contract water or other sources).

Additional Documents and Worksheets may be required (see within).

2. Amendments to Water Rights. TWC § 11.122 (Instructions, Page. 12)

NOT APPLICABLE

This section should be completed if Applicant owns an existing water right and Applicant requests to amend the water right. ***If Applicant is not currently the Owner of Record in the TCEQ Records, Applicant must submit a Change of Ownership Application (TCEQ-10204) prior to submitting the amendment Application or provide consent from the current owner to make the requested amendment.*** **See instructions page. 6.**

Water Right (Certificate or Permit) number you are requesting to amend: _____

Applicant requests to sever and combine existing water rights from one or more Permits or Certificates into another Permit or Certificate? **Y / N** (if yes, complete chart below):

List of water rights to sever	Combine into this ONE water right

a. Applicant requests an amendment to an existing water right to increase the amount of the appropriation of State Water (diversion and/or impoundment)? **Y / N**

If yes, application is a new appropriation for the increased amount, complete ***Section 1 of this Report PAGE. 1) regarding New or Additional Appropriations of State Water.***

b. Applicant requests to amend existing Term authorization to extend the term or make the water right permanent (remove conditions restricting water right to a term of years)? **Y / N**

If yes, application is a new appropriation for the entire amount, complete ***Section 1 of this Report PAGE. 1) regarding New or Additional Appropriations of State Water.***

c. Applicant requests an amendment to change the purpose or place of use or to add an additional purpose or place of use to an existing Permit or Certificate? **Y / N**
If yes, submit:
- **Worksheet 1.0 - Quantity, Purpose, and Place of Use Information Worksheet**
- **Worksheet 1.2 - Notice: "Marshall Criteria"**

d. Applicant requests to change: diversion point(s); or reach(es); or diversion rate? **Y / N**

If yes, submit: **Worksheet 3.0 - Diversion Point Information Worksheet** (submit one worksheet for each diversion point or one worksheet for the upstream limit and one worksheet for the downstream limit of each diversion reach)

e. Applicant requests amendment to add or modify an impoundment, reservoir, or dam? **Y / N**

If yes, submit: **Worksheet 2.0 - Impoundment/Dam Information Worksheet** (submit one worksheet for each impoundment or reservoir)

f. Other - Applicant requests to change any provision of an authorization not mentioned above**? Y / N**
If yes, call the Water Availability Division at (512) 239-4691 to discuss.

Additionally, all amendments require:
- **Worksheet 8.0 - Calculation of Fees; and Fees calculated - see instructions Page.34**
- **Maps - See instructions Page. 15.**
- **Additional Documents and Worksheets may be required (see within).**

3. Bed and Banks. TWC § 11.042 (Instructions, Page 13)

a. Pursuant to contract, Applicant requests authorization to convey stored or conserved water to the place of use or diversion point of purchaser(s) using the bed and banks of a watercourse? TWC § 11.042(a). **NO**

If yes, submit a signed copy of the Water Supply Contract pursuant to 30 TAC §§ 295.101 and 297.101. Further, if the underlying Permit or Authorization upon which the Contract is based does not authorize Purchaser's requested Quantity, Purpose or Place of Use, or Purchaser's diversion point(s), then either:

1. *Purchaser must submit the worksheets required under Section 1 above with the Contract Water identified as an alternate source; or*
2. *Seller must amend its underlying water right under Section 2.*

b. Applicant requests to convey water imported into the state from a source located wholly outside the state using the bed and banks of a watercourse? TWC § 11.042 (a-1). **NO**

If yes, submit: worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 7.0, 8.0, Maps and fees from the list below.

c. Applicant requests to convey Applicant's own return flows derived from privately owned groundwater using the bed and banks of a watercourse? TWC § 11.042(b).

This application is for conveying treated wastewater effluent that previously has not been discharged to a watercourse but has instead been applied to agricultural irrigation. The original source of the effluent to be conveyed may be either surface water or groundwater that has been used for municipal purposes, returned at the City's municipal wastewater treatment plant (WWTP), and then subsequently treated to applicable water quality standards. The City diverts surface water for municipal use as authorized under multiple water rights owned by the City in the Concho River Basin. The City also uses groundwater from its Hickory sands aquifer well field in McCulloch, Menard, and Concho Counties and additional surface water delivered by pipeline under contract with the Colorado River Municipal Water District. With the proposed bed and banks permit, effluent from the WWTP will be discharged into the Concho River for continued beneficial use. The relative mix of surface water and groundwater discharged by the City at any given time will be a function of water supply conditions and availabilities.

If yes, submit: worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 7.0, 8.0, Maps, and fees from the list below.

d. Applicant requests to convey Applicant's own return flows derived from surface water using the bed and banks of a watercourse? TWC § 11.042(c). **See responses to Item C above and 4.0 b.1 below.**

If yes, submit: worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, Maps, and fees from the list below.

Please note, if Applicant requests the reuse of return flows belonging to others, the Applicant will need to submit the worksheets and documents under Section 1 above, as the application will be treated as a new appropriation subject to termination upon direct or indirect reuse by the return flow discharger/owner.

e. Applicant requests to convey water from any other source, other than (a)-(d) above, using the bed and banks of a watercourse? TWC § 11.042(c). **NO**

If yes, submit: worksheets 1.0, 2.0, 3.0, 4.0, 5.0, 7.0, 8.0, Maps, and fees from the list below.

Worksheets and information:

- **Worksheet 1.0 - Quantity, Purpose, and Place of Use Information Worksheet**
- **Worksheet 2.0 - Impoundment/Dam Information Worksheet** (submit one worksheet for each impoundment or reservoir owned by the applicant through which water will be conveyed or diverted)
- **Worksheet 3.0 - Diversion Point Information Worksheet** (submit one worksheet for the downstream limit of each diversion reach for the proposed conveyances)

- **Worksheet 4.0 - Discharge Information Worksheet** (for each discharge point)
- **Worksheet 5.0 - Environmental Information Worksheet**
- **Worksheet 6.0 - Water Conservation Information Worksheet**
- **Worksheet 7.0 - Accounting Plan Information Worksheet**
- **Worksheet 8.0 - Calculation of Fees; and Fees calculated - see instructions Page. 34**
- **Maps -** See instructions **Page. 15.**
- **Additional Documents and Worksheets may be required (see within).**

4. General Information, Response Required for all Water Right Applications (Instructions, Page 15)

a. Provide information describing how this application addresses a water supply need in a manner that is consistent with the state water plan or the applicable approved regional water plan for any area in which the proposed appropriation is located or, in the alternative, describe conditions that warrant a waiver of this requirement *(not required for applications to use groundwater-based return flows).* Include citations or page numbers for the State and Regional Water Plans, if applicable. Provide the information in the space below or submit a supplemental sheet entitled "Addendum Regarding the State and Regional Water Plans":

In Section 5D.5 (page 5D-22) of the 2016 Region F Water Plan prepared by the Region F Water Planning Group, one of the recommended water supply strategies for the City of San Angelo is Direct and/or Indirect Reuse for Municipal Use. Pending studies being conducted by the City at the time the Plan was being developed, it was assumed for purposes of the 2016 Region F Water Plan that this would be a Direct Reuse project and that it would yield, following reverse osmosis treatment, approximately 8,300 acre-feet per year of additional potable water supply for the City. However, since completion of the 2016 Region F Water Plan, the studies have been completed by the City, and now the City is pursuing the Indirect Reuse project that is the subject of this Application, and not Direct Reuse. Development of the 2021 Region F Water Plan currently is underway, and the City will include the proposed Indirect Reuse project as a recommended strategy for the City in this new Plan.

b. Did the Applicant perform its own Water Availability Analysis? **NO**

If the Applicant performed its own Water Availability Analysis, provide electronic copies of any modeling files and reports.

c. Does the application include required Maps? (Instructions **Page. 15)** **YES**

WORKSHEET 1.0
Quantity, Purpose and Place of Use

1. New Authorizations (Instructions, Page. 16)

Submit the following information regarding quantity, purpose and place of use for requests for new or additional appropriations of State Water or Bed and Banks authorizations:

Quantity (acre-feet) *(Include losses for Bed and Banks)*	**State Water Source (River Basin) or Alternate Source** *each *alternate source (and new appropriation based on return flows of others) also requires completion of Worksheet 4.0*	**Purpose(s) of Use**	**Place(s) of Use** **requests to move state water out of basin also require completion of Worksheet 1.1 Interbasin Transfer*
13,443	**Colorado River Basin**	**Municipal**	**City of San Angelo service area and wholesale customers**

13,443 AFY less 53.772 AFY in losses, for a total of 13,389.228 AFY Total amount of water (in acre-feet) to be used annually *(include losses for Bed and Banks applications)*

If the Purpose of Use is Agricultural/Irrigation for any amount of water, provide: **N/A**

1. Location Information Regarding the Lands to be Irrigated
   i) Applicant proposes to irrigate a total of _____ acres in any one year. This acreage is all of or part of a larger tract(s) which is described in a supplement attached to this application and contains a total of _____ acres in _____ County, TX.
   ii) Location of land to be irrigated: In the _____Original Survey No. _____, Abstract No. _____.

A copy of the deed(s) or other acceptable instrument describing the overall tract(s) with the recording information from the county records must be submitted. Applicant's name must match deeds. If the Applicant is not currently the sole owner of the lands to be irrigated, Applicant must submit documentation evidencing consent or other documentation supporting Applicant's right to use the land described. Water Rights for Irrigation may be appurtenant to the land irrigated and convey with the land unless reserved in the conveyance. 30 TAC § 297.81.

2. Amendments - Purpose or Place of Use (Instructions, Page. 12)

NOT APPLICABLE

a. Complete this section for each requested amendment changing, adding, or removing Purpose(s) or Place(s) of Use, complete the following:

Quantity (acre-feet)	Existing Purpose(s) of Use	Proposed Purpose(s) of Use*	Existing Place(s) of Use	Proposed Place(s) of Use**

** If the request is to add additional purpose (s) of use, include the existing and new purposes of use under "Proposed Purpose(s) of Use."*

***If the request is to add additional place(s) of use, include the existing and new places of use under "Proposed Place(s) of Use."*

Changes to the purpose of use in the Rio Grande Basin may require conversion. 30 TAC § 303.43.

b. For any request which adds Agricultural purpose of use or changes the place of use for Agricultural rights, provide the following location information regarding the lands to be irrigated:

i) Applicant proposes to irrigate a total of _____ acres in any one year. This acreage is all of or part of a larger tract(s) which is described in a supplement attached to this application and contains a total of _____ acres in _____ County, TX.

ii) Location of land to be irrigated: In the _____Original Survey No. _____, Abstract No. _____.

A copy of the deed(s) describing the overall tract(s) with the recording information from the county records must be submitted. Applicant's name must match deeds. If the Applicant is not currently the sole owner of the lands to be irrigated, Applicant must submit documentation evidencing consent or other legal right for Applicant to use the land described.

Water Rights for Irrigation may be appurtenant to the land irrigated and convey with the land unless reserved in the conveyance. 30 TAC § 297.81.

c. Submit Worksheet 1.1, Interbasin Transfers, for any request to change the place of use which moves State Water to another river basin.

d. See Worksheet 1.2, Marshall Criteria, and submit if required.

e. See Worksheet 6.0, Water Conservation/Drought Contingency, and submit if required.

WORKSHEET 3.0
DIVERSION POINT (OR DIVERSION REACH) INFORMATION

This worksheet **is required** for each diversion point or diversion reach. Submit one Worksheet 3.0 for **each** diversion point and two Worksheets for **each** diversion reach (one for the upstream limit and one for the downstream limit of each diversion reach).

The numbering of any points or reach limits should be consistent throughout the application and on supplemental documents (e.g. maps).

1. Diversion Information (Instructions, Page. 24)

a. This Worksheet is to add new (select 1 of 3 below):
   1. __x__ Diversion Point No. __1__
   2. ___ Upstream Limit of Diversion Reach No.
   3. ____ Downstream Limit of Diversion Reach No.

b. Maximum Rate of Diversion for **this new point** 27.85 cfs (cubic feet per second) or 12,500 gpm (gallons per minute)

c. Does this point share a diversion rate with other points? **Y / N** N
*If yes, submit Maximum **Combined** Rate of Diversion for all points/reaches* _____ cfs or_____ gpm

d. For amendments, is Applicant seeking to increase combined diversion rate? **Y / N** N

** *An increase in diversion rate is considered a new appropriation and would require completion of Section 1, New or Additional Appropriation of State Water.*

e. Check (x) the appropriate box to indicate diversion location and indicate whether the diversion location is existing or proposed:

Check one		Write: Existing or Proposed
	Directly from stream	
x	From an on-channel reservoir	Existing
	From a stream to an on-channel reservoir	
	Other method (explain fully, use additional sheets if necessary)	

f. Based on the Application information provided, Staff will calculate the drainage area above the diversion point (or reach limit). If Applicant wishes to also calculate the drainage area, you may do so at their option.

Applicant has calculated the drainage area. **Y / N** N

If yes, the drainage area is_____ sq. miles.
(If assistance is needed, call the Surface Water Availability Team at (512) 239-4691 prior to submitting application)

2. Diversion Location (Instructions, Page 25)

a. On watercourse (USGS name): **Concho River, Colorado River Basin**

b. Zip Code: **76861**

c. Location of point: In the **German Emigration Company** Original Survey No. **351** Abstract No. **A-314, Tom Green** County, Texas.

A copy of the deed(s) with the recording information from the county records must be submitted describing tract(s) that include the diversion structure. For diversion reaches, the Commission cannot grant an Applicant access to property that the Applicant does not own or have consent or a legal right to access, the Applicant will be required to provide deeds, or consent, or other documents supporting a legal right to use the specific points when specific diversion points within the reach are utilized. Other documents may include, but are not limited to: a recorded easement, a land lease, a contract, or a citation to the Applicant's right to exercise eminent domain to acquire access.

February 10, 2005 Special Warranty Deed is attached below as ATTACHMENT 2.

d. Point is at:
Latitude **31.533732**° N, Longitude **100.244074**° W
Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places

e. Indicate the method used to calculate the location (examples: Handheld GPS Device, GIS, Mapping Program): **Google Earth map software**

f. Map submitted must clearly identify each diversion point and/or reach. See instructions Page. 38. **See APPENDIX C.**

g. If the Plan of Diversion is complicated and not readily discernable from looking at the map, attach additional sheets that fully explain the plan of diversion.

WORKSHEET 4.0
DISCHARGE INFORMATION

This worksheet required for any requested authorization to discharge water into a State Watercourse for conveyance and later withdrawal or in-place use. Worksheet 4.1 is also required for each Discharge point location requested. **Instructions Page. 26.** ***Applicant is responsible for obtaining any separate water quality authorizations which may be required and for insuring compliance with TWC, Chapter 26 or any other applicable law.***

a. The purpose of use for the water being discharged will be **Municipal Purposes**.

b. Provide the amount of water that will be lost to transportation, evaporation, seepage, channel or other associated carriage losses **0.4** % and explain the method of calculation:

See accompanying report titled GAIN/LOSS ANALYSIS OF CONCHO RIVER FOR CITY OF SAN ANGELO BED AND BANKS PERMIT APPLICATION dated July 6, 2020 in Appendix D

Is the source of the discharged water return flows? **See response No. 1 below.** If yes, provide the following information:

1. The TPDES Permit Number(s). **N/A** (attach a copy of the current TPDES permit(s))

The water to be conveyed and diverted will be comprised of varying ratios of groundwater and surface water. The use of the diverted flows related to this bed-and-banks application will be a continuation of the City's beneficial use and consumption of those flows, not an appropriation of the unconsumed byproduct of final use of the water or the use of abandoned or surplus water. The volumes conveyed and diverted are necessary for the City's continued beneficial use. The plan to apply this water to the currently authorized beneficial use is the product of reasonable intelligence and reasonable diligence on the City's part in its efforts to conserve and maximize its water supplies. None of the water to be discharged, conveyed, and diverted that is relevant to this Application has been historically discharged into a State watercourse. Treated effluent from the City's municipal wastewater reclamation facility historically has been applied to agricultural irrigation. In coordination with this project, the City will be submitting an application to the TCEQ for a TPDES permit to authorize the discharge of the treated effluent from the WWTP into the Concho River at the proposed discharge point referenced in this Application.

2. Applicant is the owner/holder of each TPDES permit listed above?

The City will be the owner of the TPDES permit, if granted by the TCEQ, required to discharge the flows that are the subject of this Application.

PLEASE NOTE: If Applicant is not the discharger of the return flows, the application should be submitted under Section 1, New or Additional Appropriation of State Water, as a request for a new appropriation of state water. If Applicant is the discharger, then the application should be submitted under Section 3, Bed and Banks.

3. Monthly WWTP discharge data for the past 5 years in electronic format. (Attach and label as "Supplement to Worksheet 4.0"). **N/A**

4. The percentage of return flows from groundwater, surface water.

The water to be conveyed and diverted pursuant to the City's requested authorization will, at any given time, be comprised of 0-100% groundwater or 0-100% surface water. The

relative mix of surface water and groundwater discharged at any given time will be a function of water supply conditions and availabilities.

5. If any percentage is surface water, provide the base water right number(s)

Certificate of Adjudication Nos. 14-1325, 14-1319, 14-1401, 14-1318, 14-1298B, and 14-1190B.

c. Is the source of the water being discharged groundwater? **YES** If yes, provide the following information:

1. Source aquifer(s) from which water will be pumped: **HICKORY**

2. Any 24 hour pump test for the well if one has been conducted. If the well has not been constructed, provide production information for wells in the same aquifer in the area of the application. See http://www.twdb.texas.gov/groundwater/data/gwdbrpt.asp. Additionally, provide well numbers or identifiers.

3. Indicate how the groundwater will be conveyed to the stream or reservoir.

4. A copy of the groundwater well permit if it is located in a Groundwater Conservation District (GCD) or evidence that a groundwater well permit is not required.

ci. Is the source of the water being discharged a surface water supply contract? **Y / N** **Y** If yes, provide the signed contract(s).

City of San Angelo Water Supply Facilities and Services Contract is attached below as ATTACHMENT 3.

cii. Identify any other source of the water: **None**

WORKSHEET 4.1
DISCHARGE POINT INFORMATION

This worksheet is required for **each** discharge point. Submit one Worksheet 4.1 for each discharge point. If there is more than one discharge point, the numbering of the points should be consistent throughout the application and on any supplemental documents (e.g. maps). **Instructions, Page 27.**

For water discharged at this location provide:

a. The amount of water that will be discharged at this point is **a maximum of 13,443** acre-feet per year. The discharged amount should include the amount needed for use and to compensate for any losses.

b. Water will be discharged at this point at a maximum rate of **27.85** cfs or **12,500** gpm.

c. Name of Watercourse as shown on Official USGS maps: **Concho River**

d. Zip Code: **76905**

f. Location of point: In the **J. Peters** Original Survey No. **338**, Abstract No. **A-1771**, **Tom Green County**, Texas.

g. Point is at:

Latitude **31.484744** °N, Longitude **100.319989** °W.
Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places

h. Indicate the method used to calculate the discharge point location (examples: Handheld GPS Device, GIS, Mapping Program): **Google Earth map software**

Map submitted must clearly identify each discharge point. See instructions Page. 15.

WORKSHEET 5.0
ENVIRONMENTAL INFORMATION

This worksheet is required for new appropriations of water in the Canadian, Red, Sulphur, and Cypress Creek Basins. The worksheet is also required in all basins for: requests to change a diversion point, applications using an alternate source of water, and bed and banks applications. **Instructions, Page 28.**

1. New Appropriations of Water (Canadian, Red, Sulphur, and Cypress Creek Basins only) and Changes in Diversion Point(s)

Description of the Water Body at each Diversion Point or Dam Location. (Provide an Environmental Information Sheet for each location),

a. Identify the appropriate description of the water body.

- [X] Stream
- [ ] Reservoir

Average depth of the entire water body, in feet: ~5.0

- [ ] Other, specify: _____

b. Flow characteristics

If a stream was checked above, provide the following. For new diversion locations, check one of the following that best characterize the area downstream of the diversion (check one).

- [ ] Intermittent - dry for at least one week during most years
- [ ] Intermittent with Perennial Pools - enduring pools
- [X] Perennial - normally flowing

Check the method used to characterize the area downstream of the new diversion location.

- [X] USGS flow records
- [ ] Historical observation by adjacent landowners
- [ ] Personal observation
- [ ] Other, specify: _____

c. Waterbody aesthetics

Check one of the following that best describes the aesthetics of the stream segments affected by the application and the area surrounding those stream segments.

- [ ] Wilderness: outstanding natural beauty; usually wooded or unpastured area; water clarity exceptional
- [X] Natural Area: trees and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity discolored
- [ ] Common Setting: not offensive; developed but uncluttered; water may be colored or turbid
- [ ] Offensive: stream does not enhance aesthetics; cluttered; highly developed; dumping areas; water discolored

d. Waterbody Recreational Uses

Are there any known recreational uses of the stream segments affected by the application?

- [X] Primary contact recreation (swimming or direct contact with water)
- [ ] Secondary contact recreation (fishing, canoeing, or limited contact with water)
- [ ] Non-contact recreation

Submit the following information in a Supplemental Attachment, labeled Addendum to Worksheet 5.0:

1. Photographs of the stream at the diversion point or dam location. Photographs should be in color and show the proposed point or reservoir and upstream and downstream views of the stream, including riparian vegetation along the banks. Include a description of each photograph and reference the photograph to the map submitted with the application indicating the location of the photograph and the direction of the shot. **See APPENDIX E**
2. Measures the applicant will take to avoid impingement and entrainment of aquatic organisms (ex. Screens on the new diversion structure).

The intake for the pump to be installed on the Concho River to facilitate diversions will be covered with no greater than 1/4-inch mesh screen to prevent impingement and entrainment of aquatic organisms.

3. If the application includes a proposed reservoir, also include: **N/A**
   i. A brief description of the area that will be inundated by the reservoir.
   ii. If a United States Army Corps of Engineers (USACE) 404 permit is required, provide the project number and USACE project manager.
   iii. A description of how any impacts to wetland habitat, if any, will be mitigated if the reservoir is greater than 5,000 acre-feet.

2. Alternate Sources of Water and/or Bed and Banks Applications

For all bed and banks applications:

a. Indicate the measures the applicant will take to avoid impingement and entrainment of aquatic organisms (ex. Screens on the new diversion structure).

The intake for the pump to be installed on the Concho River to facilitate diversions will be covered with no greater than 1/4-inch mesh screen to prevent impingement and entrainment of aquatic organisms.

b. An assessment of the adequacy of the quantity and quality of flows remaining after the proposed diversion to meet instream uses and bay and estuary freshwater inflow requirements.

The same quantity of discharged flows will be diverted from the Concho River at the downstream end of the proposed conveyance reach, less conservatively calculated carriage losses. As a result, the proposed bed and banks project will result in a net gain of water flowing in the Concho River within the proposed conveyance reach downstream of the discharge point. Flows in the river downstream of the proposed diversion point and inflows to the Colorado River estuary and Matagorda Bay will not negatively change as a result of the proposed bed and banks operation. Daily accounting records for discharged flows and diversions will be maintained by the City of San Angelo in accordance with provisions of the proposed bed and banks permit, and the Concho River Watermaster will provide overall administration and monitoring of the proposed bed and banks operation.

If the alternate source is treated return flows, provide the TPDES permit number: **N/A**

The discharged flows to be conveyed pursuant to this Application have not been previously discharged into a State watercourse. Treated effluent from the City's municipal wastewater reclamation facility historically has been applied to agricultural irrigation. In coordination with this project, the City will be submitting an application to the TCEQ for a TPDES permit to authorize the discharge of the treated effluent from the WWTP into the Concho River at the proposed discharge point referenced in this Application.

If groundwater is the alternate source, or groundwater or other surface water will be discharged into a watercourse provide: **N/A**

a. Reasonably current water chemistry information including but not limited to the following parameters in the table below. Additional parameters may be requested if there is a specific water quality concern associated with the aquifer from which water is withdrawn. If data for onsite wells are unavailable; historical data collected from similar sized wells drawing water from the same aquifer may be provided. However, onsite data may still be required when it becomes available. Provide the well number or well identifier. Complete the information below for each well and provide the Well Number or identifier.

Parameter	Average Conc.	Maximum Conc.	No. of Samples	Sample Type	Sample Date/Time
Sulfate, mg/L					
Chloride, mg/L					
Total Dissolved Solids, mg/L					
pH, standard units					
Temperature*, degrees Celsius					

* Temperature must be measured onsite at the time the groundwater sample is collected.

b. If groundwater will be used, provide the depth of the well **N/A** and the name of the aquifer from which water is withdrawn: **N/A**.

WORKSHEET 6.0
Water Conservation/Drought Contingency Plans

The City of San Angelo's Water Conservation Plan is attached as APPENDIX F.

This form is intended to assist applicants in determining whether a Water Conservation Plan and/or Drought Contingency Plans is required and to specify the requirements for plans. **Instructions, Page 31.**

The TCEQ has developed guidance and model plans to help applicants prepare plans. Applicants may use the model plan with pertinent information filled in. For assistance submitting a plan call the Resource Protection Team (Water Conservation staff) at 512-239-4691, or e-mail wras@tceq.texas.gov. The model plans can also be downloaded from the TCEQ webpage. ***Please use the most up-to-date plan documents available on the webpage.***

1. Water Conservation Plans

a. The following applications must include a completed Water Conservation Plan (30 TAC §295.9) for each use specified in 30 TAC, Chapter 288 (municipal, industrial or mining, agriculture - including irrigation, wholesale):

1. Request for a new appropriation or use of State Water.
2. Request to amend water right to increase appropriation of State Water.
3. Request to amend water right to extend a term.
4. Request to amend water right to change a place of use.
   **does not apply to a request to expand irrigation acreage to adjacent tracts.*
5. Request to amend water right to change the purpose of use.
   **applicant need only address new uses.*
6. Request for bed and banks under TWC § 11.042(c), when the source water is State Water
   **including return flows, contract water, or other State Water.*

b. If Applicant is requesting any authorization in section (1)(a) above, indicate each use for which Applicant is submitting a Water Conservation Plan as an attachment:

1. __x__ Municipal Use. See 30 TAC § 288.2. **
2. ____ Industrial or Mining Use. See 30 TAC § 288.3.
3. ____ Agricultural Use, including irrigation. See 30 TAC § 288.4.
4. ____ Wholesale Water Suppliers. See 30 TAC § 288.5. **

** If Applicant is a water supplier, Applicant must also submit documentation of adoption of the plan. Documentation may include an ordinance, resolution, or tariff, etc. See 30 TAC §§ 288.2(a)(1)(J)(i) and 288.5(1)(H). Applicant has submitted such documentation with each water conservation plan? **Y / N** Y

c. Water conservation plans submitted with an application must also include data and information which: supports applicant's proposed use with consideration of the plan's water conservation goals; evaluates conservation as an alternative to the proposed appropriation; and evaluates any other feasible alternative to new water development. See 30 TAC § 288.7.

Applicant has included this information in each applicable plan? **Y / N** Y

2. Drought Contingency Plans

The City of San Angelo's Drought Contingency Plan is attached as APPENDIX G.

a. A drought contingency plan is also required for the following entities if Applicant is requesting any of the authorizations in section (1) (a) above - indicate each that applies:

1. __x__ Municipal Uses by public water suppliers. See 30 TAC § 288.20.

2. ____ Irrigation Use/ Irrigation water suppliers. See 30 TAC § 288.21.

3. ____ Wholesale Water Suppliers. See 30 TAC § 288.22.

b. If Applicant must submit a plan under section 2(a) above, Applicant has also submitted documentation of adoption of drought contingency plan *(ordinance, resolution, or tariff, etc. See 30 TAC § 288.30)* **Y /N** **Y**

WORKSHEET 7.0
ACCOUNTING PLAN INFORMATION WORKSHEET

The following information provides guidance on when an Accounting Plan may be required for certain applications and if so, what information should be provided. An accounting plan can either be very simple such as keeping records of gage flows, discharges, and diversions; or, more complex depending on the requests in the application. Contact the Surface Water Availability Team at 512-239-4691 for information about accounting plan requirements, if any, for your application. **Instructions, Page 34.**

An Accounting Plan will be submitted after the Application has been reviewed by and discussed with TCEQ Staff.

1. Is Accounting Plan Required

Accounting Plans are generally required:

- For applications that request authorization to divert large amounts of water from a single point where multiple diversion rates, priority dates, and water rights can also divert from that point;
- For applications for new major water supply reservoirs;
- For applications that amend a water right where an accounting plan is already required, if the amendment would require changes to the accounting plan;
- For applications with complex environmental flow requirements;
- For applications with an alternate source of water where the water is conveyed and diverted; and
- For reuse applications.

2. Accounting Plan Requirements

a. A **text file** that includes:
   1. an introduction explaining the water rights and what they authorize;
   2. an explanation of the fields in the accounting plan spreadsheet including how they are calculated and the source of the data;
   3. for accounting plans that include multiple priority dates and authorizations, a section that discusses how water is accounted for by priority date and which water is subject to a priority call by whom; and
   4. Should provide a summary of all sources of water.

b. A **spreadsheet** that includes:
   1. Basic daily data such as diversions, deliveries, compliance with any instream flow requirements, return flows discharged and diverted and reservoir content;
   2. Method for accounting for inflows if needed;
   3. Reporting of all water use from all authorizations, both existing and proposed;
   4. An accounting for all sources of water;
   5. An accounting of water by priority date;
   6. For bed and banks applications, the accounting plan must track the discharged water from the point of delivery to the final point of diversion;
   7. Accounting for conveyance losses;
   8. Evaporation losses if the water will be stored in or transported through a reservoir. Include changes in evaporation losses and a method for measuring reservoir content resulting from the discharge of additional water into the reservoir;
   9. An accounting for spills of other water added to the reservoir; and
   10. Calculation of the amount of drawdown resulting from diversion by junior rights or diversions of other water discharged into and then stored in the reservoir.

WORKSHEET 8.0
CALCULATION OF FEES

This worksheet is for calculating required application fees. Applications are not Administratively Complete until all required fees are received. **Instructions, Page. 34**

Any additional fees will be paid upon request from TCEQ.

1. NEW APPROPRIATION NOT APPLICABLE

	Description	Amount ($)
Filing Fee	Circle fee correlating to the total amount of water* requested for any new appropriation and/or impoundment. Amount should match total on Worksheet 1, Section 1. Enter corresponding fee under **Amount ($).** In Acre-Feet	
	a. Less than 100 $100.00 b. 100 - 5,000 $250.00 c. 5,001 - 10,000 $500.00 d. 10,001 - 250,000 $1,000.00 e. More than 250,000 $2,000.00	
Recording Fee		$25.00
Agriculture Use Fee	Only for those with an Irrigation Use. Multiply 50C x Number of acres that will be irrigated with State Water. **	
Use Fee	Required for all Use Types, **excluding Irrigation Use.** Multiply $1.00 x Maximum annual diversion of State Water in acre-feet. **	
Recreational Storage Fee	Only for those with Recreational Storage. Multiply $1.00 x acre-feet of in-place Recreational Use State Water to be stored at normal max operating level.	
Storage Fee	Only for those with Storage, excluding Recreational Storage. Multiply 50C x acre-feet of State Water to be stored at normal max operating level.	
Mailed Notice	Cost of mailed notice to all water rights in the basin. Contact Staff to determine the amount (512) 239-4691.	
	TOTAL	$

2. AMENDMENT *OR* SEVER AND COMBINE NOT APPLICABLE

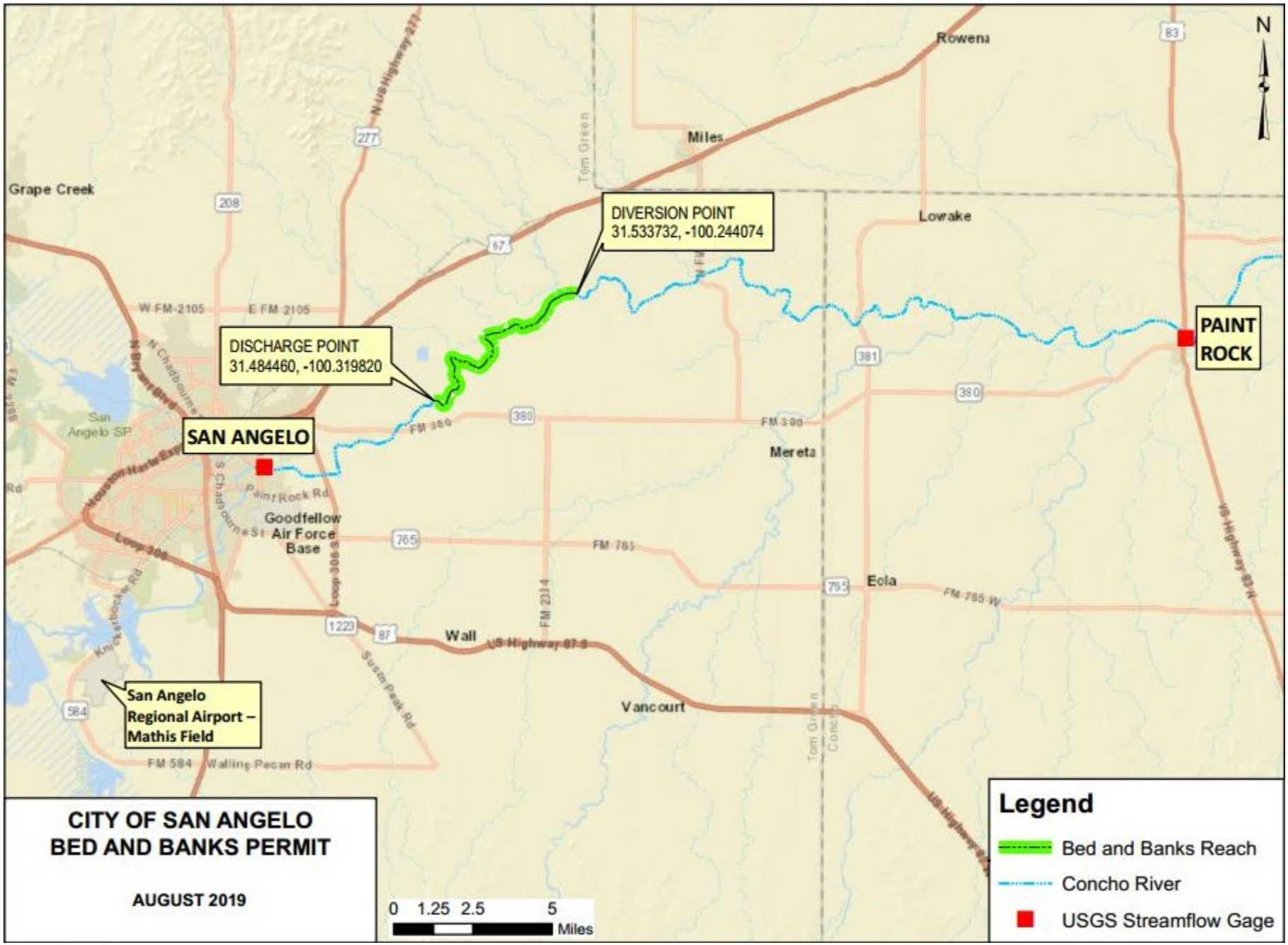
	Description	Amount ($)
Filing Fee	Amendment: $100	
	OR Sever and Combine: $100 x _____ of water rights to combine	
Recording Fee		$12.50
Mailed Notice	Additional notice fee to be determined once application is submitted.	
	TOTAL INCLUDED	$

3. BED AND BANKS

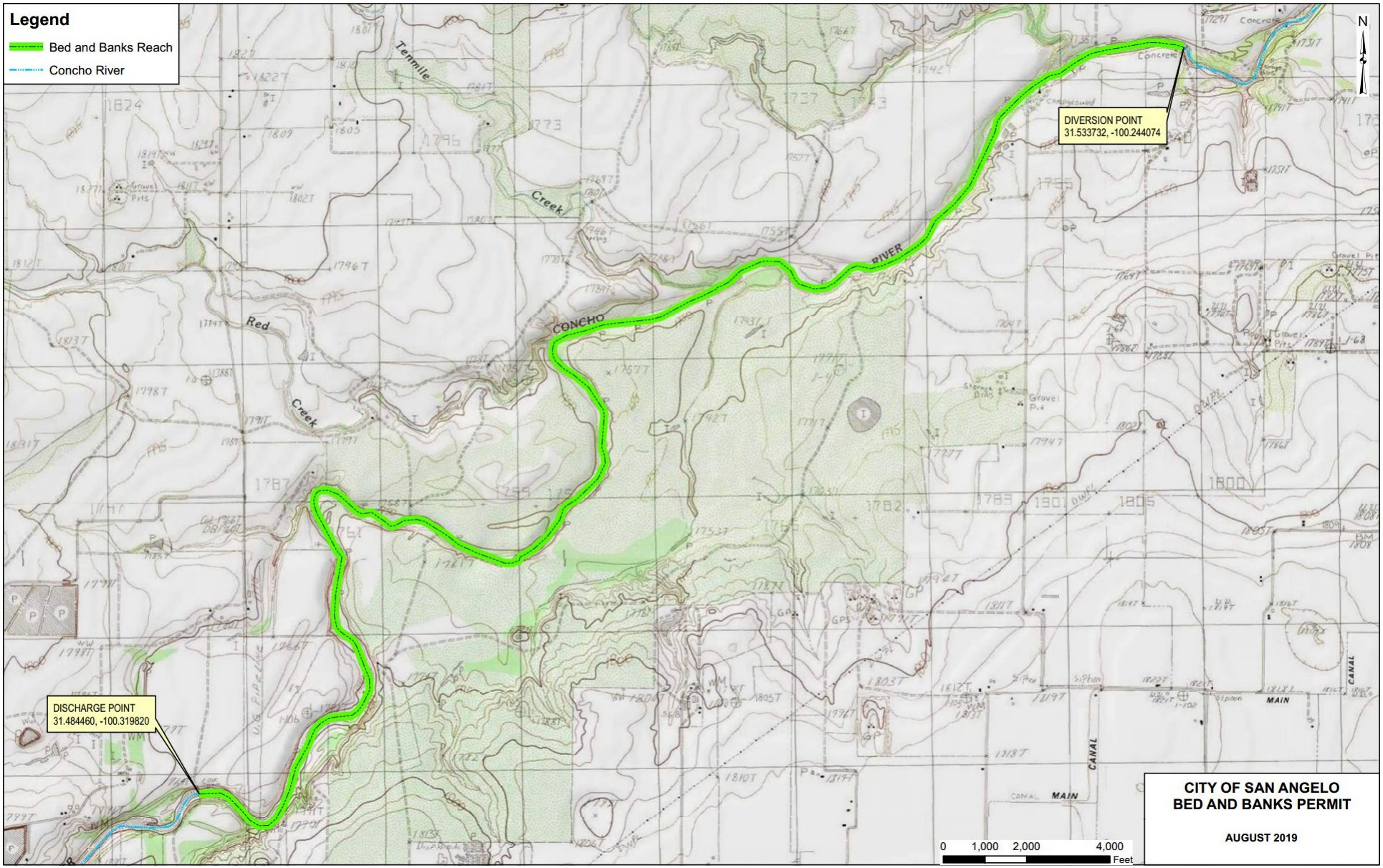
	Description	Amount ($)
Filing Fee		$100.00
Recording Fee		$12.50
Mailed Notice	Additional notice fee to be determined once application is submitted.	
	TOTAL INCLUDED	**$112.50**

APPENDIX C

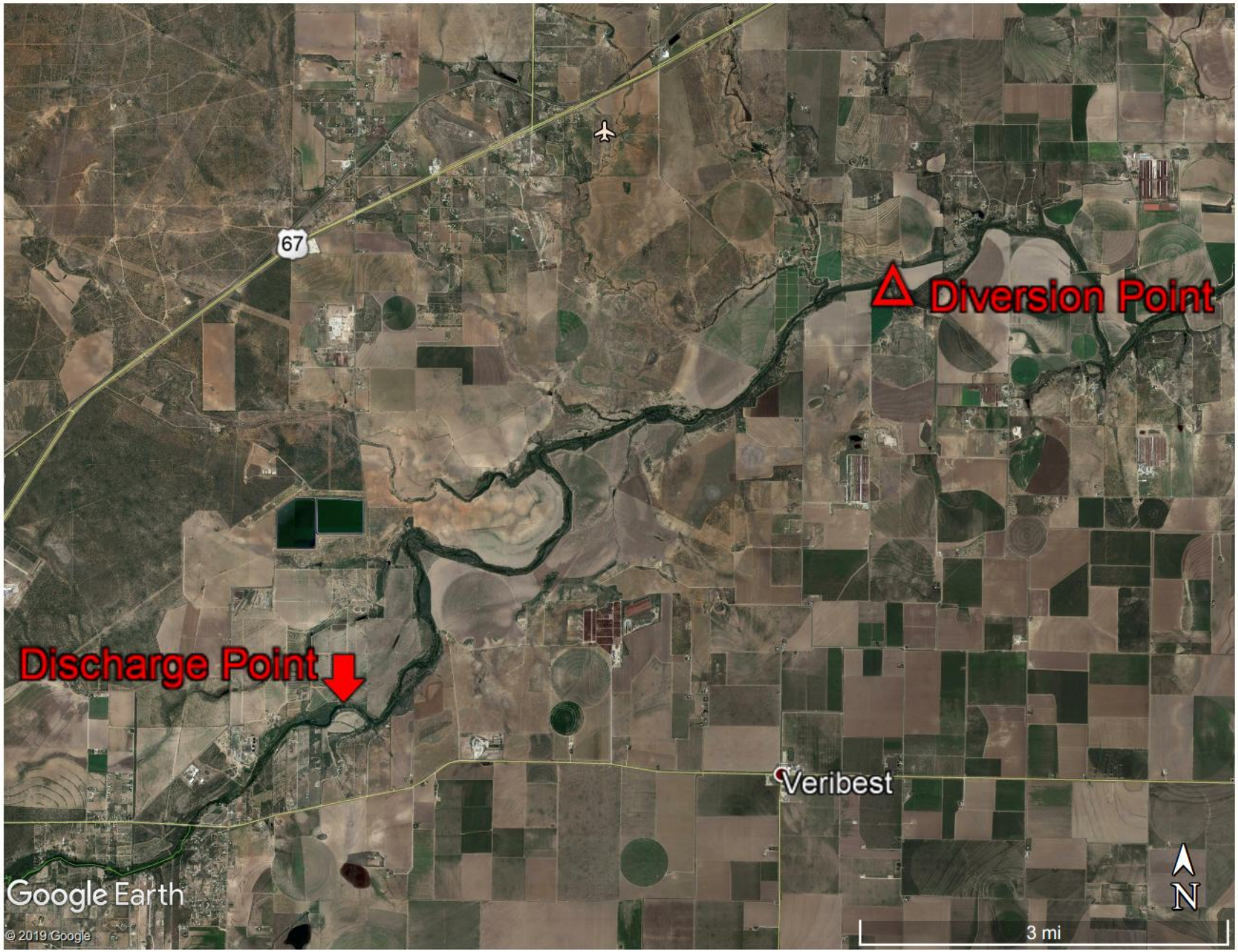
Maps



Map 1 – General Location Map Showing Bed and Banks Conveyance Reach of Concho River



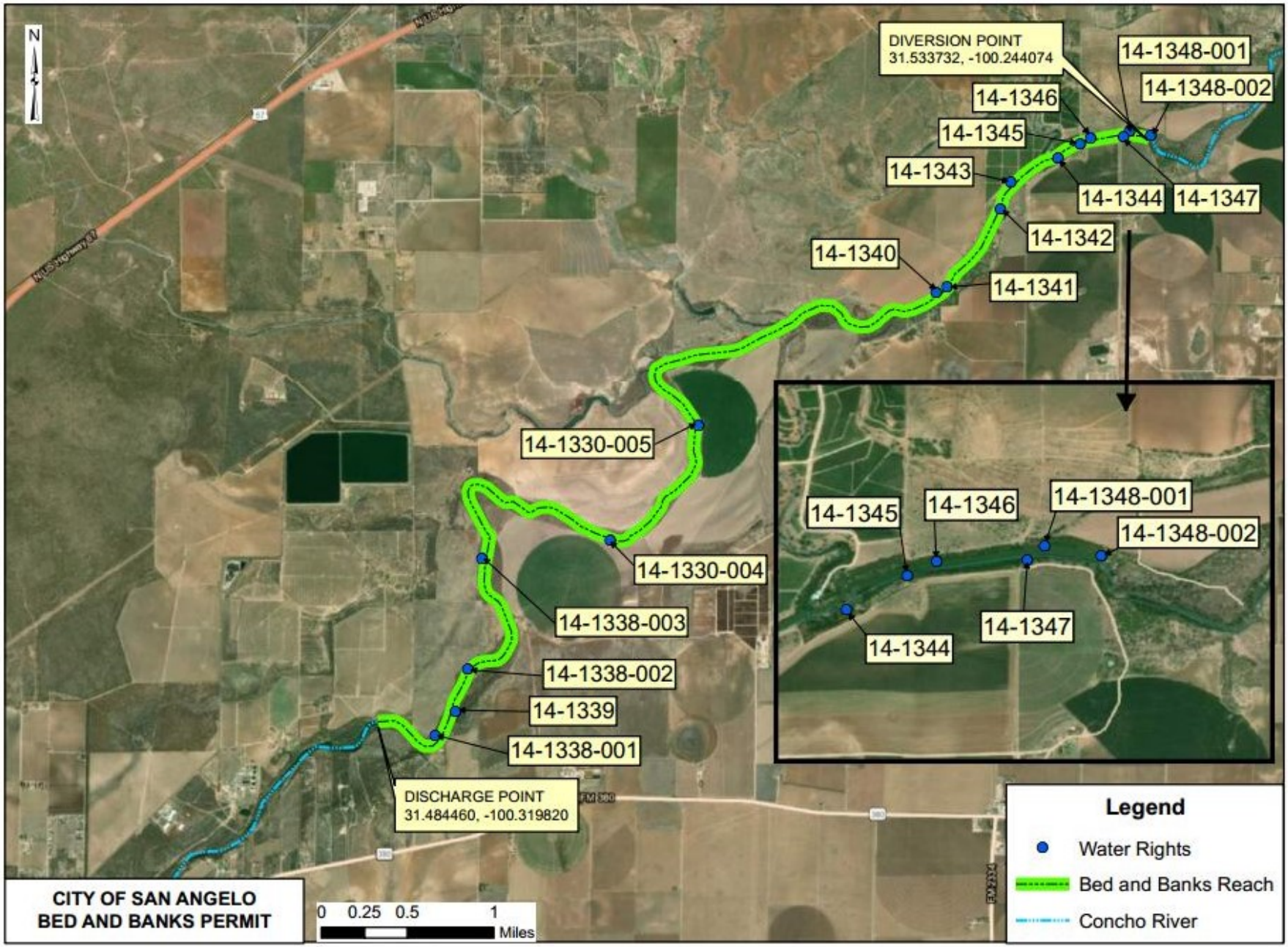
Map 2 – Bed and Banks Conveyance Reach of Concho River on USGS Base Map



Map 3 – Aerial View of Bed and Banks Conveyance Reach

Map 4 – Discharge Point at Upstream End of Bed and Banks Conveyance Reach

Map 5 – Diversion Point at Downstream End of Bed and Banks Conveyance Reach



Map 6 – Water Rights Within Bed and Banks Conveyance Reach of Concho River

APPENDIX D

Gain/Loss Analysis of Concho River for City of San Angelo Bed and Banks Permit Application

GAIN/LOSS ANALYSIS OF CONCHO RIVER
FOR CITY OF SAN ANGELO BED AND BANKS PERMIT APPLICATION

July 6, 2020

1.0 INTRODUCTION

The City of San Angelo ("City") is proposing to reuse the treated effluent from its municipal wastewater reclamation facility for potable use to help meet the future water needs of its customers. As part of this project, the treated effluent is to be discharged into the Concho River, conveyed downstream for approximately 8.1 miles, and then diverted from the river and transferred via pipeline back upstream to the City's Lone Wolf Water Treatment Plant where it will be treated further and distributed for use within the City. The location of the segment of the Concho River proposed for conveying the treated effluent, referred to herein as the "conveyance reach", is shown on the map of the region in Figure 1.

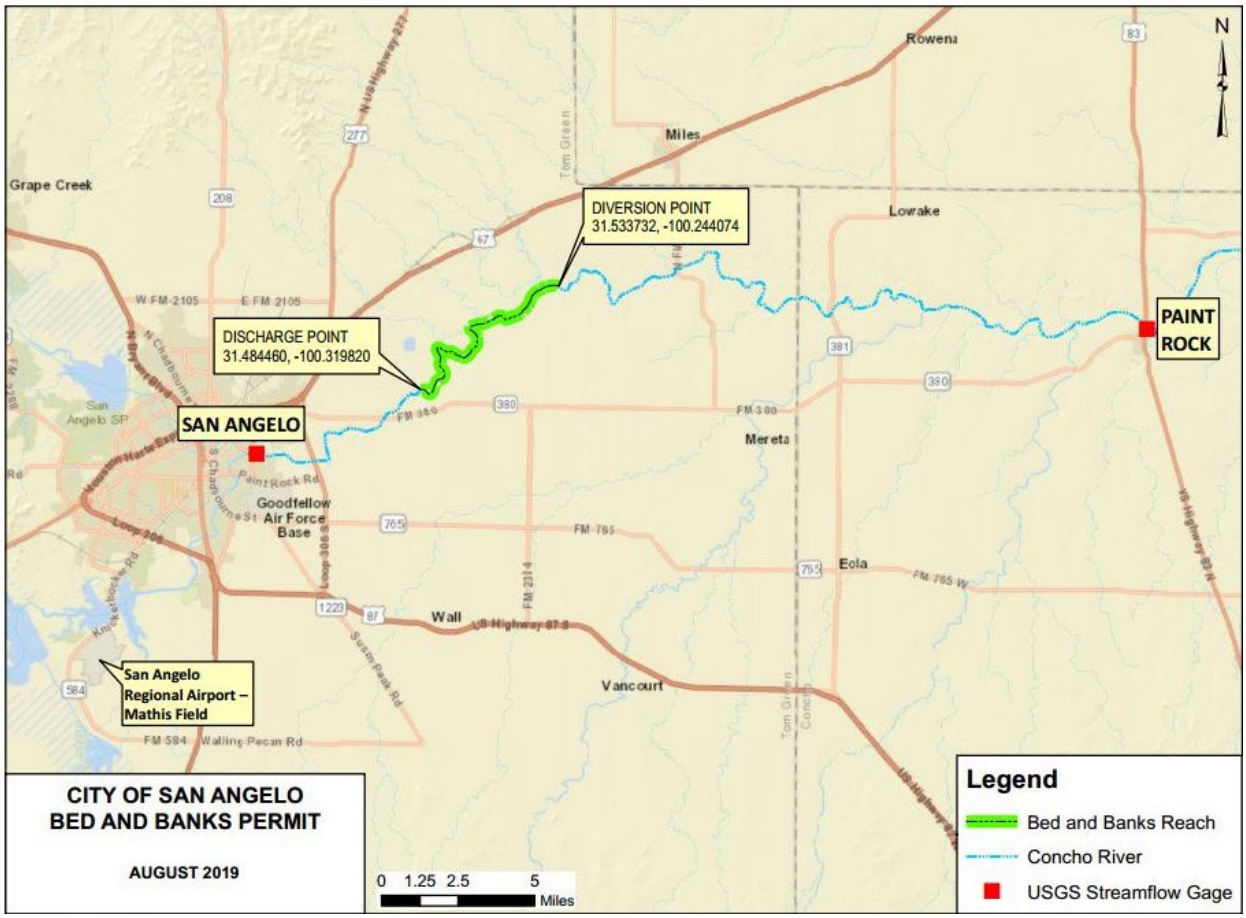


Figure 1 General Location Map for City of San Angelo Reuse Project

Conveyance of the treated effluent along a segment of the Concho River will require a bed and banks permit (TCEQ Rule §297.16) from the Texas Commission on Environmental Quality ("TCEQ"). This permit authorizes the permittee to convey water (treated effluent or otherwise) along a designated segment of a watercourse provided that no more water is withdrawn from the watercourse than was discharged into the watercourse after accounting for carriage losses. Hence, it is necessary that the magnitude of the carriage losses, if any, along the proposed conveyance reach be determined as part of the bed and banks permitting process. This report provides an assessment of the potential carriage losses for the designated segment of the Concho River that is proposed for conveying the City's treated effluent.

2.0 CONCHO RIVER BED AND BANKS SEGMENT

The discharge point at the upper end of the proposed conveyance reach of the Concho River is located approximately 5.4 river miles downstream from Loop 306 on the east side of San Angelo. It is immediately below an existing dam authorized under Certificate of Adjudication No. 14-1337 that is owned by the City. From this point downstream to the diversion point at the lower end of the conveyance reach, the river is characterized as a relatively shallow and meandering stream with multiple alternating reaches of riffles and deeper natural pools that extend for hundreds of feet along the river. Based on an examination of current aerial photography, at normal flow conditions, the average width of this segment of the river is about 55 feet, but it varies from less than 30 feet through the narrow riffle areas up to about 130 feet in the widest pools. Almost the entire banks on both sides of the river along this segment are covered with trees, shrubs and other vegetation. Although there are remnants of old concrete dams within the conveyance reach, none of these impound water and create pools. The only dam that impounds water within the conveyance reach is located at the downstream end, and it is owned by the City and is authorized under Certificate of Adjudication No. 14-1348.

Within the 8.1 miles of the proposed conveyance reach, there are 12 water rights identified in the TCEQ's current water rights master file and its GIS-based Water Rights Viewer. These water rights authorize the diversion of a total of 1,829.9 acre-feet per year of water from the Concho River, primarily for irrigation use. Five of these water rights also authorize impoundments, with a total combined storage capacity of 717 acre-feet; however, as noted above, there is only one existing dam structure that is actually impounding water, and it is the City's dam at the downstream end of the conveyance reach. The 12 water rights, represented as 16 water right records reflecting multiple owners and/or authorizations, that are located within the proposed conveyance reach are listed and described in Table 1. These water right records are identified on the aerial photograph of this segment of the river in Figure 2.

Streamflows in the Concho River are continuously measured at gages 41.9 river miles apart located upstream and downstream of the City's proposed bed and banks conveyance reach. The U. S. Geological Survey ("USGS") gage referred to as the Concho River at San Angelo gage (No. 8136000) is located upstream at the Bell Street bridge within the city of San Angelo. This gage is approximately 7.6 miles upstream from the upper end of the proposed conveyance reach. The Concho River at Paint Rock gage (No. 8136500) is located on the U. S. Highway 83 bridge near the city of Paint Rock, which is approximately 26.2 river miles downstream from the lower end of the proposed conveyance reach.

Table 1 Water Rights Located on Concho River Within Proposed Conveyance Reach

Certificate of Adjud. No.	Water Right Record No. (Map Label)	Owner	Diversion Amount ac-ft/yr	Type of Use	Priority Date	Storage Amount ac-ft
14-1330	14-1330-004 14-1330-005	Veribest Cattle Feeders, Inc. Quicksand Partners, Ltd.	295 443	Ag - Irrigation	12/31/1955	- -
14-1338	14-1338-001 14-1338-002 14-1338-003	Sandra Birnie Allison Carson Devereaux	500.0	Ag - Irrigation	12/19/1914	- -
14-1339	14-1339	Lewis C Roach	48.0	Ag - Irrigation	03/31/1966	- -
14-1340	14-1340	Hudson Management, Ltd.	310.0	Ag - Irrigation	06/27/1914	54.0
14-1341	14-1341	Gladys M Lewis	115.0	Ag - Irrigation	05/13/1916	400.0
14-1342	14-1342	Don Ferguson Jennifer C. Ferguson	32.0	Ag - Irrigation	05/13/1916	- -
14-1343	14-1343	Mary Scott Brown	211.9	Ag - Irrigation	12/22/1917	- -
14-1344	14-1344	Kelvin L Noland Monica A Noland	94.0	Ag - Irrigation	12/22/1917	86.0
14-1345	14-1345	Veribest Ag Supplies, Inc.	188.0	Ag - Irrigation	12/31/1918	- -
14-1346	14-1346	Wilma Faye Crownover	86.0	Ag - Irrigation	03/31/1911	- -
14-1347	14-1347	Linda A. Schwertner Steven A. Schwertner	110.0	Ag - Irrigation	02/28/1925	55.0
14-1348	14-1348-001 14-1348-002	City Of San Angelo	135.0	Municipal - Domestic Ag - Irrigation	03/31/1911	55.0 67.0
		Totals	1,829.9			717.0

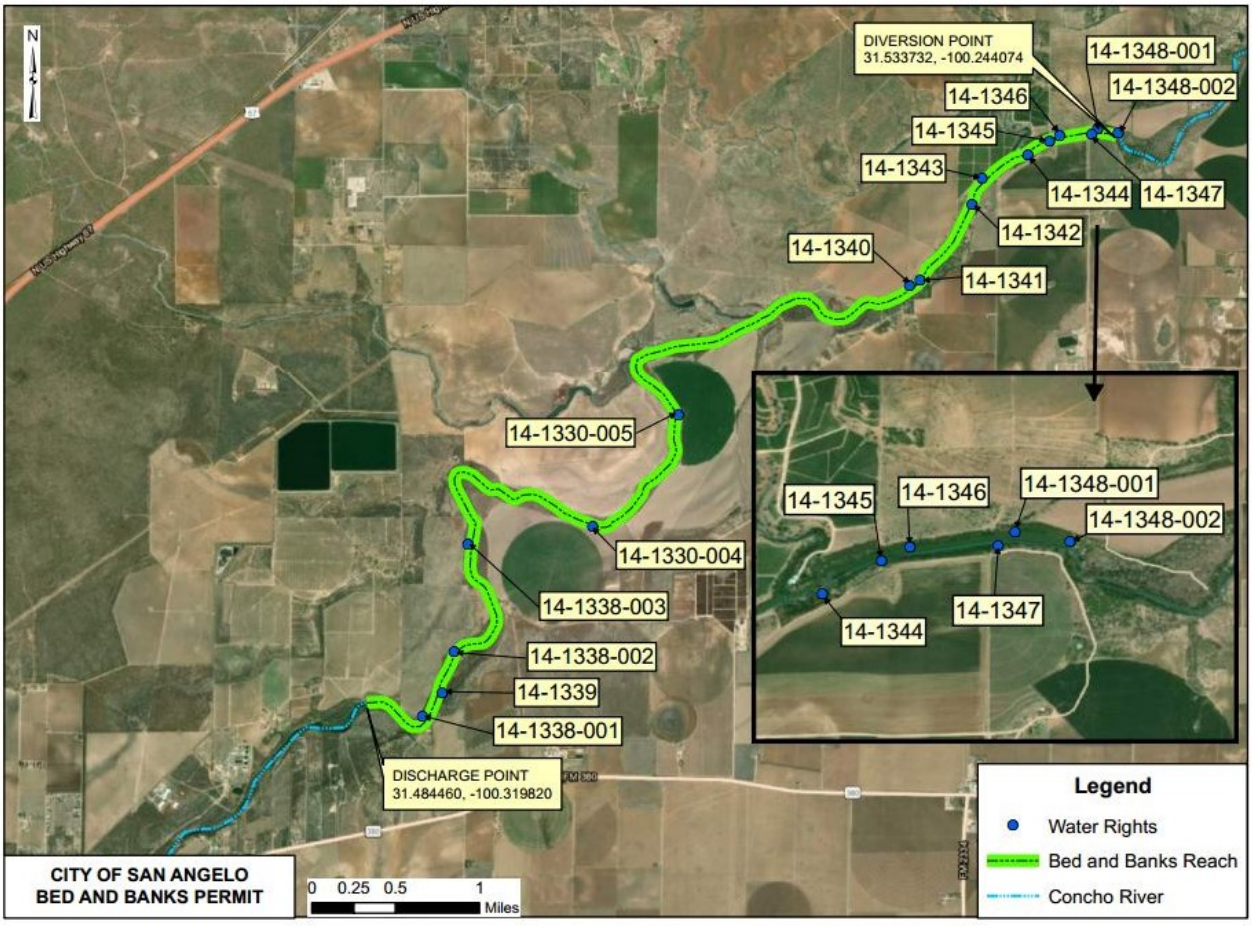


Figure 2 Water Rights Located on Concho River Within Proposed Conveyance Reach

Statistical parameters describing the streamflows measured at the San Angelo and Paint Rock gages for the 1990-2018 period are summarized in Table 2. As shown, the additional 1,032 square miles of drainage area between the two gages is reflected in the higher flows at Paint Rock.

Table 2 1990-2018 Streamflow Statistics for Concho River at San Angelo and Paint Rock Gages

Parameter	San Angelo Gage	Paint Rock Gage
Average Mean Daily Flow (cfs)	16.6	50.0
Median Mean Daily Flow (cfs)	5.8	15.5
Maximum Mean Daily Flow (cfs)	2,810.0	13,000.0
Minimum Mean Daily Flow (cfs)	0.0	0.0
Average Annual Flow (ac-ft)	12,046	36,205
Median Annual Flow (ac-ft)	11,430	23,074
Maximum Annual Flow (ac-ft)	33,652	189,531
Minimum Annual Flow (ac-ft)	3,115	5,432

3.0 CONCHO RIVER GAIN/LOSS ANALYSIS

Studies undertaken in 2001 during the original development of the water availability model (WAM) for the Colorado River Basin determined that the 42-mile reach of the Concho River between the San Angelo and Paint Rock gages was a gaining stream based on analyses of the measured streamflows from the gages with adjustments for the corresponding historical diversions from the river by water rights holders. However, recognizing that there were certain background losses of streamflow due to evaporation and evapotranspiration that generally occurred all of the time, a streamflow loss rate of 0.05 percent per mile of river channel was established for water availability modeling purposes for the San Angelo-to-Paint Rock reach. This loss rate was based on reported values from research studies undertaken by the Upper Colorado River Authority for water uptake by salt cedar that were known to exist along many watercourses in the upper Colorado Basin above O. H. Ivie Reservoir. These salt cedar water uptake values were extended to a streamflow loss rate based on assumed widths of salt cedar growth along the Concho River and historical river flows measured at the San Angelo and Paint Rock gages prior to the year 2000. The resulting streamflow loss rate of 0.05 percent per mile translates to a total loss rate for the entire San Angelo-to-Paint Rock reach of the Concho River equal to 2.1 percent. For just the 8.1 miles of the proposed bed and banks conveyance segment, this loss rate translates to a total streamflow loss value of 0.4 percent.

During a field inspection of the Concho River during August 2019, no stands of salt cedar were observed along the banks of the river within the proposed conveyance reach, and most of the vegetation lining the river channel consisted of low brush and mesquite and juniper trees, with some scattered oak trees. Based on this observation, the total streamflow loss value of 0.4 percent that has been calculated for the proposed bed and banks conveyance reach based on dense growths of salt cedar along the entire river channel is likely a conservatively high estimate of losses.

As a check on the results from the original WAM study to determine if the San Angelo-to-Paint Rock reach of the Concho River still is a gaining stream, additional gain/loss analyses have been performed using more recent gaged streamflows. For these analyses, historical streamflows from the San Angelo and Paint Rock gages for the 2006-2018 period have been used[1]. An Excel spreadsheet program was developed that uses water balance calculations to determine the monthly gain or loss in the measured streamflows from the San Angelo gage to the Paint Rock gage, taking into consideration historical rainfall and runoff conditions and actual diversions by intervening water rights within the San Angelo-to-Paint Rock reach of the river. As structured, this analysis of the streamflow gain or loss between the gages for a particular month has been limited to only times when the rainfall measured at the San Angelo Mathis Field Airport weather station was less than certain specified values for both the current month being analyzed and the previous month. These rainfall criteria were selected to only represent low rainfall conditions in order to minimize or even eliminate the possibility of tributary inflows to the Concho River between the gages so these inflows would not have to be accounted for in the gain/loss water balance calculations. Monthly values of the 2006-2018 diversions by all water right holders within the reach of the Concho River from San Angelo to Paint Rock were provided by the Concho Watermaster's office. There are 68 authorized diversions associated with existing water rights on the Concho River between San Angelo and Paint Rock, with the total authorized diversion amount for all of the water rights equal to 7,788 acre-feet per year.

With the data organized and incorporated into the spreadsheet program, the monthly streamflow loss or gain for the San Angelo-to-Paint Rock reach of the river was calculated for each rainfall-qualifying month during the 2006-2018 period using the following equation, with negative values representing losses:

GAIN/LOSS = PAINT ROCK FLOW + TOTAL DIVERSIONS – SAN ANGELO FLOW

Results from this analysis for eight different combinations of assumed rainfall criteria, referred to as "runs", are summarized below in Table 3. As shown, for the eight runs, the limit on the previous month's rainfall ranges from 0.4 to 1.3 inches, and the limit on the current month's rainfall ranges from 0.1 to 1.0 inch. For each run, of the total of number of months analyzed for the 2006-2018 period (156 events), the number of months, or qualifying events, that satisfied the rainfall criteria is shown in Row 5. The number of qualifying events with calculated gains for each run is shown in Row 6, with the average percentage gain for each of these runs presented in Row 7. As shown, most of the calculated percentage gains are substantial, indicating that there was probably some inflow to the river not accounted for in the gain/loss calculations, most likely from localized rainfall on the watershed between San Angelo and Paint Rock not reflected by the measured rainfall at the San Angelo Mathis Field Airport station.

The number of qualifying events (months) with calculated losses for each run is shown in Row 8 of Table 3, with the average percentage loss for each of the runs presented in Row 9. The months when each of the losses occurred during the 2006-2018 period are indicated for each run in Rows 11 through 16, and the values in Row 10 represent the volume of the calculated loss for the last of the specific loss months listed for each of the runs in Rows 11 through 16. It is significant to note

[1] The selection of this period was dictated by the availability of diversion and water use records for water rights from the Concho Watermaster. These records are necessary for the gain/loss calculations.

that for each run, the number of events with losses in Row 8 is significantly less than the number of events with gains in Row 6. This suggests that the Concho River between San Angelo and Paint Rock is likely still a gaining stream as was previously determined in 2001 during the original development of the Colorado WAM.

Table 3 Results from Calculated Gain/Loss Analysis of Concho River

	PARAMETERS	RUN ID							
		1	2	3	4	5	6	7	8
(1)	**RAINFALL CRITERIA (Inches)**								
(2)	Previous Month's Rainfall < or = to:	0.40	0.50	0.50	1.30	1.30	1.30	1.30	1.30
(3)	Current Month's Rainfall < or = to:	0.10	0.10	0.50	0.50	0.60	0.70	0.90	1.00
(4)	**RESULTS**								
(5)	Total Number of Qualifying Events (Months)	6	8	15	23	24	28	34	38
(6)	Number of Qualifying Events with Gain	6	7	13	20	20	23	28	32
(7)	Average Calculated % Gain	80.3%	77.9%	1202.2%	954.8%	954.8%	644.3%	387.7%	355.8%
(8)	Number of Qualifying Events with Loss	0	1	2	3	4	5	6	6
(9)	Average Calculated % Loss	- -	-96.9%	-79.3%	-62.6%	-67.2%	-63.5%	-64.9%	-64.9%
(10)	Volume of New Calculated Loss (ac-ft)	0	305	200	224	359	153	244	- -
(11)	Date of Event with Loss		Jul-11	Jul-11	Jul-11	Jul-11	Jul-11	Jul-11	Jul-11
(12)	Date of Event with Loss			Apr-14	Apr-14	Apr-14	Apr-14	Apr-14	Apr-14
(13)	Date of Event with Loss				Sep-15	Sep-15	Sep-15	Sep-15	Sep-15
(14)	Date of Event with Loss					Jul-12	Jul-12	Jul-12	Jul-12
(15)	Date of Event with Loss						Jul-18	Jul-18	Jul-18
(16)	Date of Event with Loss							Aug-12	Aug-12

The percentage loss values in Row 9 of Table 3 are all considered to be relatively high with respect to what would normally be considered typical natural percentage losses for alluvial channel streams similar to this segment of the Concho River. For this reason, further investigations of the circumstances of these losses have been undertaken to assess whether there are other factors that may have contributed to the calculated high streamflow losses. The fact that there are 20 reservoirs of varying sizes authorized on the San Angelo-to-Paint Rock segment of the Concho River suggests that storage of river flows in these reservoirs could have affected the amount of flow that reached Paint Rock, particularly for rain-generated flows that occurred after prolonged dry periods of low flow when reservoirs levels naturally would have been drawn down below their full condition. This periodic storage of river water in the reservoirs during dry periods certainly could have produced the calculated flow losses shown in Row 10 of Table 3.

To test the potential significance of storing flood flows in the 20 reservoirs along the San Angelo-to-Paint Rock reach of the Concho, which have a combined storage capacity of 3,775 acre-feet, a simulation of the historical storage behavior of these reservoirs has been performed using a simple time-series Excel-based reservoir water balance model. This reservoir model has been structured to simulate the monthly storage variations in a single reservoir with 3,775 acre-feet of storage capacity, subject to monthly inflows based on the average of the monthly Concho River flows at the San Angelo and Paint Rock gages for the 2006-2018 period, with corresponding monthly net

evaporation losses based on rainfall and lake evaporation data for Quadrant 607 from the Texas Water Development Board. For these simulations, it also has been assumed that there are no diversions from this reservoir, which obviously produces conservatively high simulated reservoir storage since there are numerous diversions along this segment of the river, several of which are associated with reservoirs.

The results from this reservoir simulation analysis are plotted on the graph in Figure 3 in terms of the end-of-month storage in the reservoir over the 2006-2018 simulation period. As expected, the simulated storage varies in response to wet-dry conditions reflected in the specified river inflows, with the lowest level of storage occurring during the severe drought of 2011. The six specific months when the gain/loss analysis produced calculated losses as noted in Rows 11 through 16 of Table 3 are identified as red circular data points at their respective points in time on the trace of the reservoir storage.

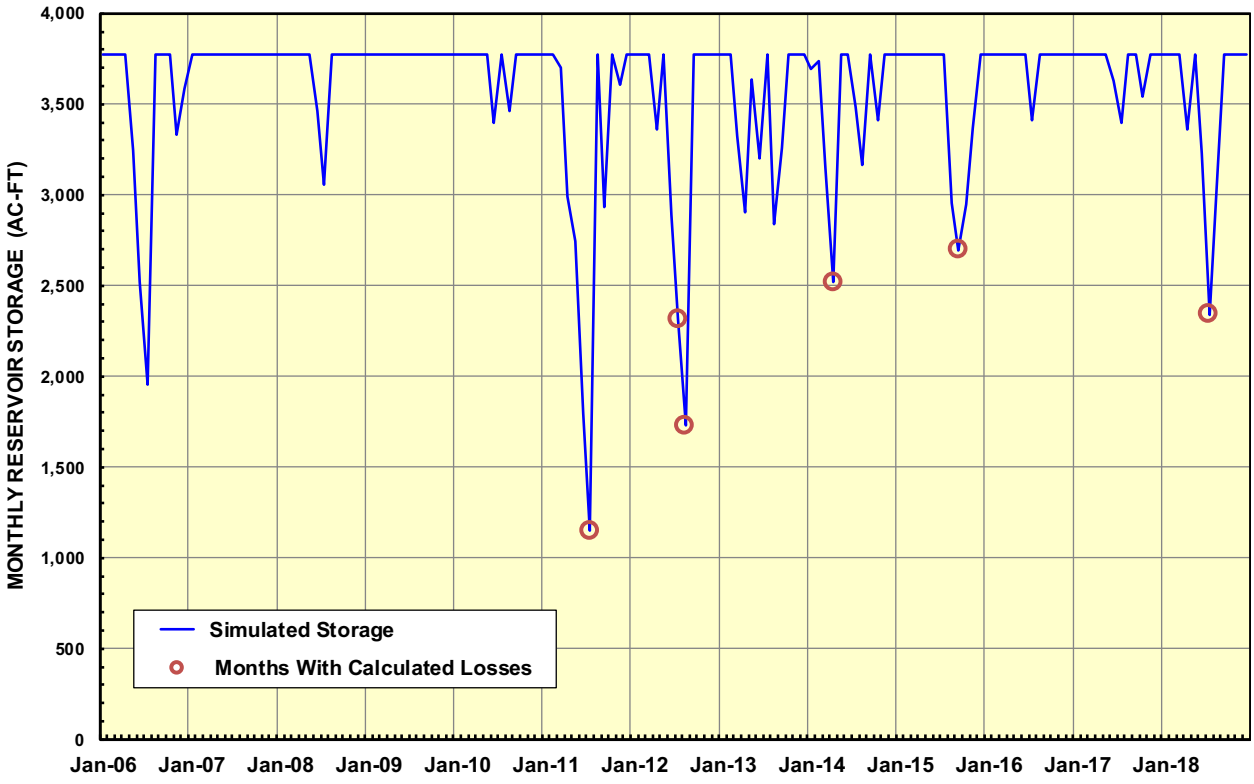


Figure 3 Simulated Monthly Storage in Combined Reservoirs on Concho River Between San Angelo and Paint Rock

As shown, each one of these months with a calculated loss falls at or near the lowest storage level during specific dry periods when storage in the reservoir was significantly drawn down from its full condition. Furthermore, the volume of storage drawdown from the full condition of the reservoir for each of the calculated loss months, the smallest of which is over 1,000 acre-feet for the September 2015 loss month, in each case is significantly greater than the volume of the calculated losses listed in Row 11 of Table 3. These results demonstrate that the calculated losses listed in Table 3 most likely were the result of storing high rainfall-generated flows in the 20 reservoirs located along the San Angelo-to-Paint Rock segment of the Concho River after their

storage levels had been significantly drawn down during dry periods, rather than the result of streamflow losses into the underlying alluvium. This further supports the conclusion from the 2001 original Colorado WAM study that this reach of the river is a naturally gaining stream. Furthermore, these results support the use of the conservative 0.4-percent loss value for accounting for streamflow losses along the proposed bed and banks conveyance reach.

In summary, results from the gain/loss analyses presented above for the San Angelo-to-Paint Rock segment of the Concho River confirm that the river today is still a naturally gaining stream, which is consistent with the conclusions reached during the 2001 study as part of the original development of the Colorado Basin WAM. Furthermore, any reductions in flow that may occur at Paint Rock, aside from those due to diversions by water rights holders, are likely due to the storage of river flows in the multiple reservoirs located along this segment during dry periods when the storage in these reservoirs is drawn down below their full condition. Therefore, for purposes of accounting for losses for the 8.1-mile reach of the Concho River that is being proposed for the bed and banks conveyance of the City's wastewater effluent, the loss rate of 0.4 percent, which is based on the WAM loss analyses for this reach of the river, is proposed to be used. While this rate is considered to be appropriate for this purpose, it also is considered to be somewhat conservative because it is based on assumptions regarding salt cedar growth along the Concho River that appear to be overstated with respect to the vegetation that currently lines the river banks in this area.

Finally, it is important to note that there are five reservoirs authorized by existing water rights that are located within the reach of the Concho River that is being proposed for the City's bed and banks conveyance of wastewater effluent. However, as noted earlier, field inspection of this 8.1-mile reach of the Concho River indicates that there is only one dam structure that is impounding water, and it is located at the downstream end of the reach and is owned by the City. This is the reservoir from which diversions will be made for the City's proposed bed and banks operation. Even with this reservoir drawn down during low-flow periods, any diversions from this reservoir by the City under authority of the requested bed and banks permit will be limited to the quantity of effluent discharged into the river at the head of the reach, less 0.4 percent for intervening losses.

APPENDIX E

Addendum to Worksheet 5.0 – Photographs

Photo 1 - Discharge Point Immediately Downstream of Dam (COA 14-1337)

Photo 2 - View of Pool Downstream of Discharge Point

Photo 3 – Entrance to Riffle Area

Photo 4 – Riffle Reach With Vegetated Banks

Photo 5 – Failed Dam Structure within Conveyance Reach

Photo 6 – Upper Reach of Reservoir at Downstream End of Conveyance Reach

Photo 7 – Upstream View of Reservoir above Dam at Diversion Point

Photo 8 – Dam at Diversion Point Viewed from North River Bank

Photo 9 –South Overflow Section of Dam near Diversion Point

Photo 10 – Diversion Point in Reservoir Upstream of North Section of Dam

Photo 11 – River Channel Downstream of Dam at Diversion Point

APPENDIX F

City of San Angelo Water Conservation Plan

2019 WATER CONSERVATION PLAN

CITY OF SAN ANGELO WATER UTILITIES

SEPTEMBER 3, 2019

Water Utilities Department l 301 W. Beauregard Ave., San Angelo, 76903 l 325-657-4209

Table of Contents

Importance of Water Conservation

Although many people see water as an abundant source it isn't. According to National Geographic, the Earth is covered in 70 percent water, but we can only drink three percent of that water, out of that three percent only one percent of that water is accessible, water can be trapped in glaciers and snowfields, or polluted. This small amount of water is meant to be shared with 7.7 billion people.

Due to geography, climate, engineering, regulation, and competition, water can be hard to come by at times. As recent as August 2018, San Angelo was in Drought Level 1 restrictions, meaning we had less than 24 months of water left. The United Nations estimates, that by 2025 an estimated two-thirds of the world's population will be living in water-stressed regions, as a result of use, growth, and climate change. According to Texas Living Waters, Texas' population is expected to double by 2050, unfortunately, we can't say the same about our water supply.

By conserving water now, using it effectively, and teaching the future generations to do the same we can help ensure there is enough water for us and future generations. Although it sounds like an impossible feat, it is possible. Many cities have made great strides to reducing their water consumption, and some studies show these cities are using 21% less water than we were in 2000! This is a great accomplishment considering how much the population has grown and the changes in Texas. This was made possible by legislative action that set standards on water products, municipalities starting and implementing water conservation plans, and everyday people doing their part.

The goal of our Water Conservation Plan is to ensure water use efficiency within San Angelo. We will talk about our goals, including how we want to reduce water consumption and water loss, we will talk about what we are currently doing to help reduce both of those, and finally what we hope to do to further reduce water consumption and water loss.

Introduction

The City of San Angelo lies in the midst of West Texas ranching country. Located in Tom Green County, the current population is approximately 100,119 people, with a predicted increase to over 148,090 people by 2070 (population provided by the 2021 Region F Water Plan). San Angelo is also home to three lakes, as well as the Concho River, which runs through the heart of the City.

The City provides water to approximately 37,000 residential, commercial, and wholesale accounts. In addition to water from local sources, including Lake Nasworthy, Twin Buttes Reservoir, O.C. Fisher Reservoir, and the Concho River system, the City purchases water from the Colorado River Municipal Water District's (CRMWD's) Lake E.V. Spence and Lake O.H. Ivie. The City also has groundwater rights in McCulloch, Concho, and Menard counties collectively referred to as the Hickory well field.

History and Context

The City has a long history of progressive water resource planning. In keeping with that tradition, and ensuring that future generations will have adequate water supplies, the City promotes water conservation and updates their Water Conservation Plan every five years as required by the Texas Water Development and Texas Commission on Environmental Quality. Conserving existing supplies can help to reduce and delay the need for additional water supplies. In order to reduce per capita demand in the future, the City promotes various water conservation programs designed to educate citizens on the benefits of efficiency.

The 2019 Water Conservation Plan takes into account new technology, new best management practices, and studies done on the City. Two studies were done since the last Water Conservation Plan; one in 2015 by Alan Plumber Associates, Inc. (APAI), and another in 2017 by Averitt and Associates. APAI evaluated the effectiveness of future conservation strategies. This evaluation consisted of feasibility, economic analysis, research, and recommendations. In accordance with our goals, a selected few are to be implemented as part of this Water Conservation Plan. Averitt & Associates, a consulting firm started by former Senator Kip Averitt, conducted a statewide study on water conservation goals and projections on behalf of the Texas Water Development Board.

The Water Conservation Coordinator included several programs in the 2014 Water Conservation Plan. The 2019 plan includes new and existing programs such as:

- The System Water Audits and Water Loss reports, allow us to reliably track water uses and provide the information to address unnecessary water and revenue losses;
- The Metering of All-New Connections and Retrofit of Existing Connections has been established to create billing equity among customers, have universal metering, reduce water waste, and reduce flows to wastewater facilities;
- The Automated Meter Reading Proactive Leak Investigation program has reliably gathered information regarding continuous flow and stopped leaks;

- The Water Conservation Pricing has been implemented to discourage the inefficient use of water, and to reward those who use less;
- The Prohibition on Wasting Water is aimed at customers who continue to waste water;
- Public Information affects water consumption as customers learn about water resources, the wise use of water, conservation programs, and change behavior;
- And finally, Bosque and Kirby Park have both been updated to have irrigation systems supplied by rain harvesting tanks.

Water Supply Summary

Lake Nasworthy, the oldest major water supply reservoir in the City's system, was completed in 1930. The City owns and operates the reservoir. Most of the drainage area of Nasworthy is controlled by Twin Buttes Reservoir, which was built by the Bureau of Reclamation in 1962. The storage in Twin Buttes is divided into two pools connected by a 3.22-mile equalization channel. Below elevation 1925.0 feet above sea level, the two pools function as separate reservoirs. In October of 2018, Twin Buttes' north and south pools reached "equalization", making it one pool; this was the first time the pools connected in 24 years. The City holds water rights in both Nasworthy and Twin Buttes. The U.S. Army Corps of Engineers owns the third major reservoir in the San Angelo system, O.C. Fisher, which was completed in 1951. The Upper Colorado River Authority (UCRA) holds all water rights in Fisher. In turn, the Fisher water rights are contracted to the City. In addition to the local supply, the City purchases water from two reservoirs owned and operated by Colorado River Municipal Water District (CRMWD): O.H. Ivie Reservoir and Lake E.V. Spence.

During the drought in the 1960s and early 1970s, the City began investigating sources of groundwater in the San Angelo area. As a result of this investigation, the City obtained groundwater rights associated with 37,633 acres of land in McCulloch, Concho, and Menard counties. The water is produced from the Hickory sandstone aquifer, which lies approximately 2,200 to 3,000 feet below the surface. The Hickory well field is located within the jurisdiction of the Hickory Underground Water Conservation District No. 1 (HUGWCD). The City received a permit from the District to produce and export water. The District has placed a one-mile spacing minimum and 500 gallons per minute capacity on the City's wells, as well as limits on the amount to be produced from the well system on an annual basis.

Once the effects of the 2011 drought were assessed, the decision was made to expand the production capacity of the Hickory well field. The City of San Angelo is in the process of

constructing facilities to expand its right to drill and produce water from the Hickory Aquifer in accordance with a permit issued by the HUGWCD. This will allow the City access to additional water for emergency conditions or in drought conditions.

The City is currently in the process of diversifying its water portfolio with the Concho River Project. The Concho River Project involves releasing highly treated water from the City's wastewater treatment plant into the Concho River. The water would travel through the "natural pipeline," where nature would act as an environmental buffer and will partially treat the water. The City will recoup the water farther downstream, then treat it to meet drinking standards. When completed, the project will produce about 7.5 million gallons a day. Upon completion, the City will have water supplied from surface water (from our reservoirs and lakes), groundwater (from Hickory Aquifer), and reclaimed water (from the Concho River Project).

Geography

Located in central Texas, San Angelo is considered to have a semi-arid climate. The lack of rain and surface water make water conservation ever more significant. Despite not always experiencing a drought, residents are always alerted to current water supply levels, watering restrictions, and rainfall patterns.

At times, the City has had to activate the drought contingency plan. Thankfully, the City of San Angelo made a successful effort to lower consumption during times of constrained water resources. As Corral-Verdugo et al., found in their 2002 study, water conservation is most effective when individuals are aware of water resources dilemmas.

Historical Monthly and Annual Rainfall Data

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2015	2.03	0.23	1.66	1.82	9.12	3.55	0.55	1.28	0.45	2.44	1.39	2.26	26.78
2016	0.03	0.77	3.33	5.1	6.4	7.02	-	2.87	5.24	1.49	2.73	0.74	35.72
2017	1.48	1.23	0.25	1.46	2.06	1.52	1.69	2.41	3.46	0.81	0.98	1.13	18.48
2018	0.01	1.36	1.2	0.13	6.03	0.56	0.64	3.6	6.66	11.37	0.03	2.47	34.06

Utility Profile

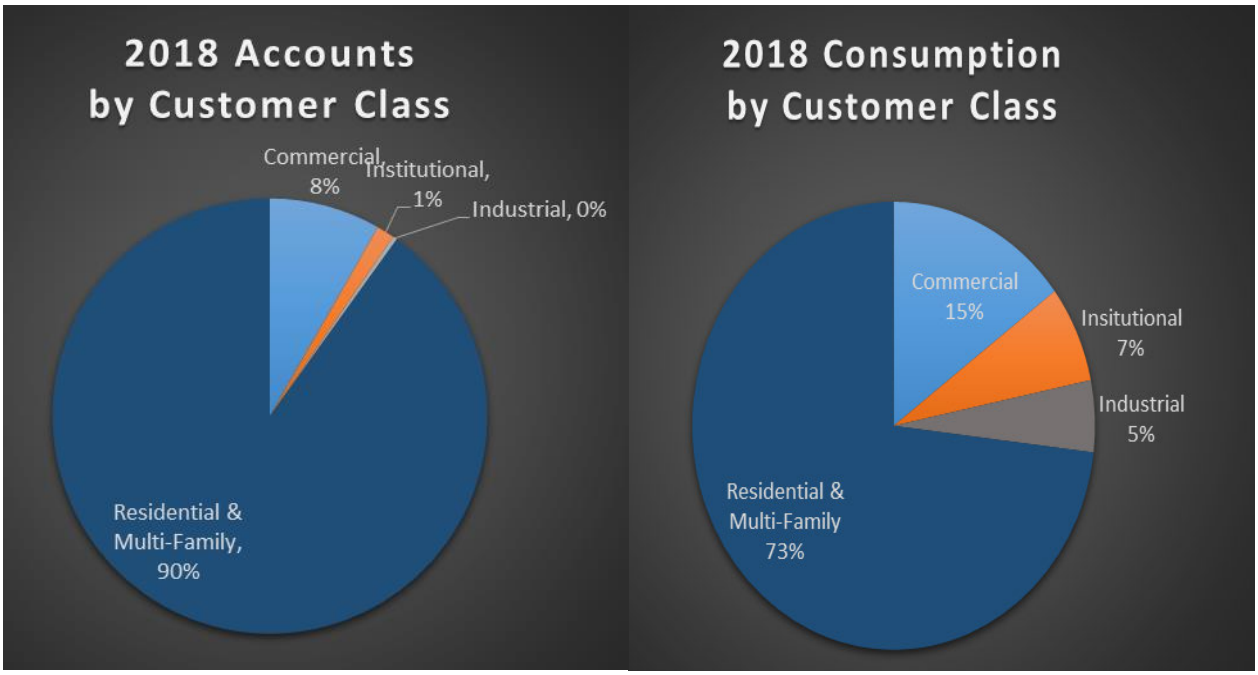
Water consumption in the City of San Angelo is driven by a wide variety of domestic, commercial, industrial, and institutional needs. With more than 35,000 accounts, the City is responsible for addressing a wide variety of factors that influence water availability and demand.

As such, the City analyzes consumption patterns and develops goals in order to prevent water supply shortfalls.

A. Consumption by Customer Class in Thousand Gallons

Although, residential and multi-family accounts make up 90 percent of all accounts they only consumed 73 percent of all water demanded in 2018. Commercial accounts only make up eight percent of accounts but account for 15 percent of consumption, institutional accounts make up one percent of all accounts and account for seven percent consumption, and industrial accounts make up less than one percent of accounts but account for five percent of consumption.

Consumption in Thousand Gallons				
Fiscal Year	2015	2016	2017	2018
Residential	2,025,793	2,009,983	2,196,878	2,085,576
Commercial	462,281	467,562	492,301	534,662
Multi-family	386,679	420,210	437,990	422,052
Institutional	378,822	383,884	438,404	349,522
Industrial	114,610	94,995	121,023	188,238
Agriculture	0	1,695	3,840	12,811
Total	**3,368,185**	**3,378,329**	**3,690,436**	**3,592,861**



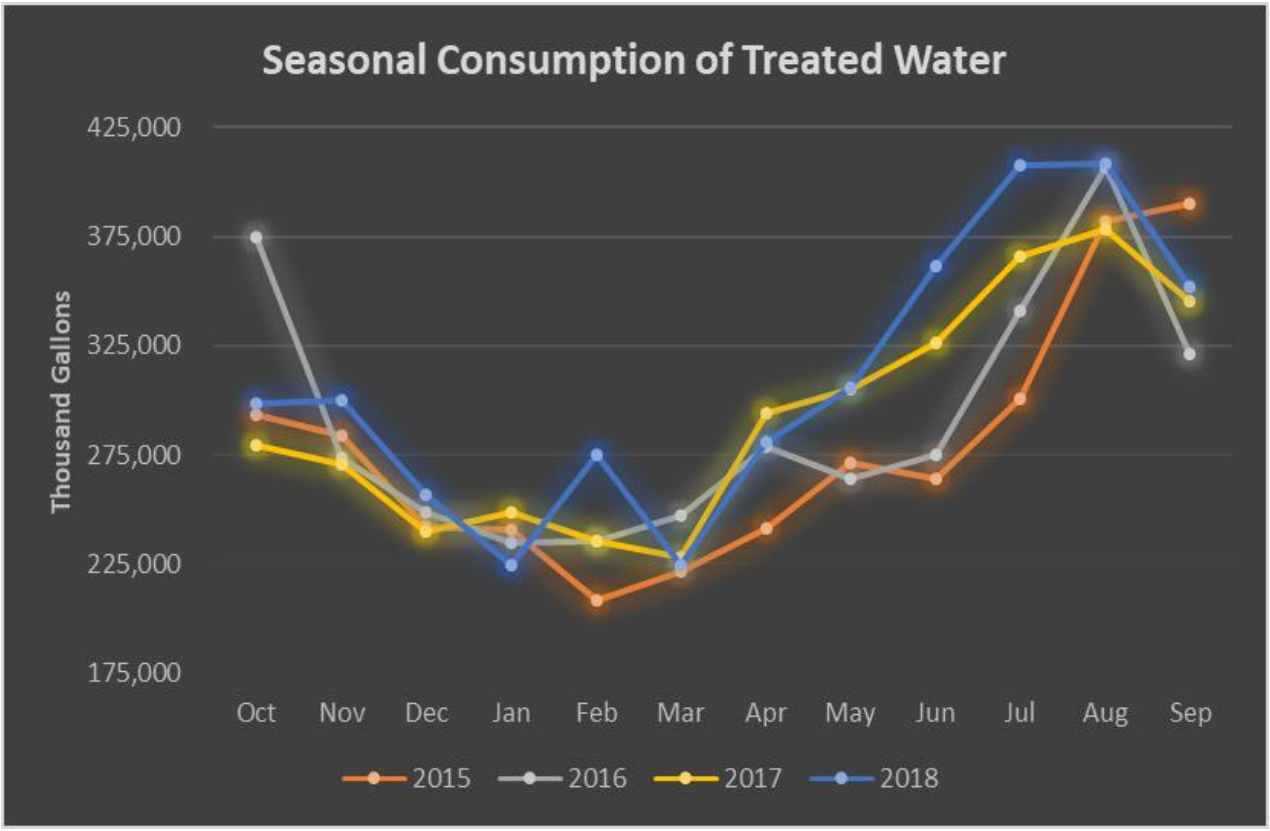
B. Accounts by Customer Class

In 2018, residential and multi-family accounts made up 90 percent of all accounts, commercial made up 8 percent, institutional 1 percent, and industrial less than 1 percent.

Fiscal Year	2015	2016	2017	2018
Residential	31,145	30,314	30,650	30,703
Commercial	2,930	2,889	2,898	2,900
Multi-Family	729	713	718	701
Institutional	465	485	471	474
Industrial	159	120	115	110
Agriculture	0	19	6	19
Total	35,428	34,540	34,858	34,907

C. Seasonal Water Demand

Like other Texas cities, the City's demand goes up during the summer months and lowers in the winter months. August is typically the hottest month and therefore the demand is the highest. August for the past four years has averaged at 389 million gallons consumed for the month. During January, the City sees a decline in water consumption, the average consumption for the month for the past four years has been 240 million gallons consumed. The annual daily average is 13 million gallons per day, during summer peak it is 22 million gallons per day, and winter 10 million gallons a day.



D. Targets and Goals

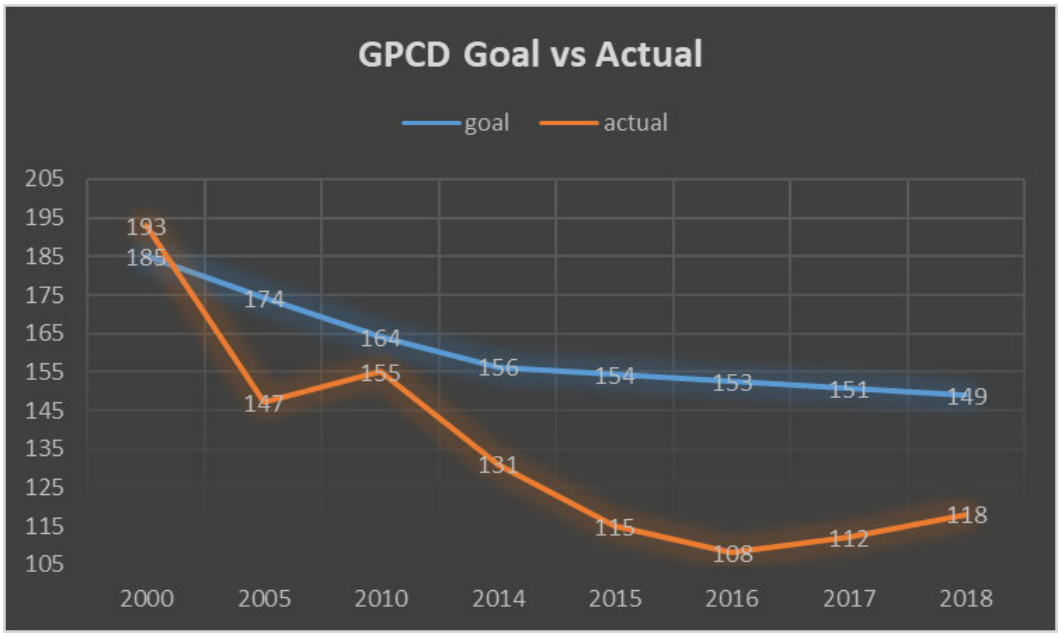
The City of San Angelo's Water Conservation Plan is focused on two efficiency goals. The first and most immediate goal is to reduce summertime peak pumping. The second goal is to reduce overall per capita consumption by 1.2 percent per year starting from the City's 2000 consumption of 185 gallons per capita per day (GPCD). This will assist the City with water supply constraints due to weather and hydrological challenges.

The table below shows recent per capita consumption and the goal of 137 GPCD by 2025, and 79 gallons by 2070. Goals have been met and exceeded in 2005, 2010 and 2015, as a result of a combination of conservation efforts, including public education and restrictions on outdoor water use, implemented as part of the City's Water Conservation Plan. Continuing to maintain this success is the principle goal of the City's conservation efforts. Total GPCD represents all water pumped, less wholesale customer usage, divided by the total population.

Due to future expected economic and population growth we kept the city's previous goal of water consumption reduction by 1.2 percent annually starting from the City's 2000 consumption of 185 gallons per capita per day (GPCD). We also took into account the possibility of future expansion of commercial industries, which increase population and water demand.

Water Consumption Goals (GPCD)

Year	2005	2010	2015	2020	2025
Goal	174	163	152	140	137
Actual	147	137	115	-	-



Averitt & Associates Study

In 2017 Averitt & Associates conducted a study to estimate how much water had been conserved due to conservation efforts and project future conservation and goals. Averitt & Associates used 2015 as the baseline to determine and project the conservation amount the City of San Angelo benefitted from due to conservation activities and compared it to our regional goals.

The study found that the City will exceed their conservation goals until 2070, the last year they projected. The City is currently exceeding goals in GPCD, and we should exceed our goals until 2024, the last year the study projected. They estimated that we would fall short 2022 to 2024 for water loss GPCD, the last years projected, but we are actually exceeding their projected goals, so a shortfall is not anticipated by us for those years. Due to water loss reduction, we had a savings of 110 million gallons (MG) in 2015. Due to water rate increases, we had 126 MG savings and it is expected to have continuous growth.

Averitt & Associates suggestion to save more water was to provide an advanced metering infrastructure (AMI) customer engagement portal. The portal would provide customers with their water use data and allow them to compare it to other customers' usage. They believe this would change customers' behavior and would provide an estimate of 20% savings.

On-Going Best Management Practices

Water consumption in the City of San Angelo is driven by a wide variety of domestic, commercial, industrial, and institutional needs. Best Management Practices (BMPs) have been developed to both improve water use efficiency for the San Angelo Water Utilities and for programs to assist the City's water customers to efficiently use water. BMPs have been implemented as part of the City's ongoing water conservation effort. Future BMPs will be evaluated and implemented as a condition of a positive evaluation.

1. System Water Audit and Water Loss Reports

A. Description

Water loss audits and water loss reports are effective methods of accounting for all water usage by a utility within its service area. The City of San Angelo performs an annual estimate of system water efficiency by comparing water delivered to the treatment plant, potable water produced, and water sold. This audit includes estimates of water loss to leaks in the system and water used in firefighting.

Performing a reliable water audit is the foundation of production-side water resource management and loss control in public drinking water systems. The structured approach of a water audit allows the utility to address unnecessary water and revenue losses. The resulting information from a water audit will be valuable in setting performance indicators, goals, and priorities to cost-effectively minimize water losses.

B. Implementation

Compiling a water audit is a two-step approach, a top-down audit followed by a bottom-up audit.

The first step, the top-down audit, is a desktop audit using existing records and some estimation to provide an overall picture of water losses. Representatives from management, distribution, production, customer service, and conservation have an essential role to play in this program. This working group is responsible for gathering relevant data and identifying current practices.

The second step of the audit, the bottom-up approach, involves a detailed investigation into actual policies and practices of the utility. This involves a more detailed review of utility policies that affect water losses. It will better explore methods for developing better estimates of water use by the fire department and for line flushing. The utility will also evaluate leakage repair records.

C. Schedule

No less than once every five years, and more often if the internal water audit standard is not achieved, the utility will:

- Gather the necessary information for conducting the audit;
- Review the Texas Water Development Board's new guidelines for water audits;
- Consider new water audit standards based upon keeping real water losses below a specific percent or to achieve an infrastructure leakage index (ILI) below three.

This is a long process that encompasses the whole utility revising meter testing and repair practices, reducing unauthorized water use, improving accounting for unbilled water, and implementing effective water loss management strategies.

D. Documentation

To track this program, the Water Utilities will collect and maintain the following documentation:

- A copy of each annual system audit,
- The ILI and percentage losses for each year,
- A list of actions taken in response to audit recommendations, and
- The annual revenue lost to water losses.

E. Determination of Water Savings

Potential water savings are an integral part of the water loss audit process and can be tracked by comparing trends from the annual water loss audits. Based on the results of the audit, the utility sets goals for reducing its losses.

Total Water Loss as a Percentage

Year	2015	2016	2017	2018
Losses	14.32%	8.29%	3.33%*	12.86%

*When calculating the 2017 water loss, a calculation error was encountered and was not discovered until 2018. The water loss percentage should be about 8.86%

Although water losses have been fluctuating over the years, there are many factors that could affect such a discrepancy. These include total precipitation for the year, the growing nature of the City, and aging of pipes and infrastructure. Efforts are being made to reduce waste through the audit and loss reports and analysis.

F. Cost-Effectiveness Considerations

Direct costs that should be considered in implementing this program include the initial and ongoing administrative costs for performing and updating the water audits and capital costs for items such as leak detection equipment and billing system upgrades.

A recommended method to make cost-effectiveness decisions is based on the economic value of real losses and apparent losses. Real losses are losses due to leaks and are valued at actual costs to produce and deliver the water. The amount of lost revenue due to real losses, based on the utility's marginal production cost, valued at the retail rate charged to customers, can be compared to the costs of reducing the sources of loss.

2. Metering of All-New Connections and Retrofit of Existing Connections

A. Description

The purpose of this program is to ensure that all aspects of meter installation, replacement testing, and repair are managed optimally for water use efficiency. The Water Utilities installs the meters; building inspection confirms that the building code is met. Metering all new connections and retrofitting existing connections it allows for universal metering of all users of municipally treated water. This program improves water consumption accountability.

The meter program has several elements:

- Required metering of all new connections and existing connections, excluding fire services.
- A policy for installation of adequate, proper-sized meters as determined by a customer's current or projected water use patterns.
- Direct utility metering of each new duplex, triplex, and fourplex unit, whether each is on its own separate lot or there are multiple buildings on a single lot.
- Metering of all utility and publicly owned facilities, as well as customers.
- Use of construction meters to account for water used in new construction.
- Implementation of the State requirements in HB 2404, passed by the 77th Legislature Regular Session and implemented through Texas Water Code 13.502, which requires all new apartments be either directly metered by the utility or submetered by the owner.

- Annual testing and maintenance of meters larger than two inches. Regular replacement of five-eighth and three-quarter inch meters that are 15 years or more in service.
- An effective monthly meter-reading program where readings are not estimated except due to inoperable meters or extenuating circumstances.

B. Implementation

A Meter Repair and Replacement Program following the methodology and frequency currently recommended in industry practices and specified by the AWWA is in place.

The Water Utilities ensures the maximum amount of water consumption is accounted for, and the high quality of metering is maintained, through the regular review of metering data and policies.

The City performs a proactive meter-testing program and repairs and identifies meters. The customer service staff also monitors irregularities in customers' water usage and notifies them when a leak is suspected.

C. Schedule

The utility maintains the program on an ongoing basis. At a minimum, an annual benchmark is in place for measuring implementation and effectiveness.

D. Documentation

To track the effectiveness of the Metering Program, the Water Utility gathers the following documentation:

- Copy of meter installation guidelines based upon customer usage levels;
- Copy of meter replacement policy;
- Records of number and size of meters replaced annually;
- Estimate of water accounted for through the meter replacement program and repair program;
- Monthly records of water pumped versus billed water consumption.

E. Determination of Water Savings

Every year the utility should estimate its annual water saving from the BMP. Savings can be estimated based upon a statistical sample analyzed as part of the meter-testing program. Project potential savings into future years and include in utility water savings targets and goals.

Every year the Water Utilities will estimate its annual water saving from analyzing customer consumption. Since customer consumption is reflected within their monthly statements, customers become aware of not only their spending but also their usage. The utility encourages low consumption through a tiered rate structure. As depicted below, the utility experiences a high count of customers using 3,000 gallons or less monthly:

Number of Accounts Receiving Conservation Credits

Year	2014	2015	2016	2017	2018
Jan	10,491	9,761	10,048	6,492	11,337
Feb	9,941	11,085	9,944	6,238	9,739
Mar	11,580	11,889	9,790	6,902	11,248
Apr	9,976	10,768	8,575	5,290	9,838
May	9,976	9,855	8,844	6,283	9,782
Jun	8,706	10,349	8,295	6,281	8,668
Jul	9,577	8,903	6,883	5,525	8,183
Aug	7,714	7,818	5,880	8,322	8,817
Sep	8,376	6,921	8,229	9,612	9,144
Oct	8,932	7,969	8,691	10,215	13,300
Nov	9,307	9,453	9,825	10,744	14,140
Dec	10,525	10,756	9,572	11,907	14,553

F. Cost-Effectiveness Considerations

Capital costs to the utility in implementing this program may include the costs of installing new meters and retrofitting older ones, as well as one-time or periodic costs such as the purchase of meter testing and calibration equipment. A replacement meter can run from as little as $50 for a residential meter to several thousand for larger compound meters. Meter testing and repair is done by utility staff. A typical residential meter test can be performed for $40 per the City Code of Ordinances.

3. Automated Meter Reading (AMR) Proactive Leak Investigation

A. Description

The City of San Angelo Water Utilities began the Automated Meter Reading (AMR) installation project in September 2010. Approximately 36,000 meters have been converted with the majority of these meters being 5/8". AMR's are an effective method of accounting for all water usage by a utility within its service area since it automatically reads meters continuously. This program improves reading of meters and leads to reduced "water loss" as leaks become easier to detect.

The Automated Meter Reading (AMR) software allows staff to investigate potential leaks. In 2017 customer service began proactive leak investigation. Using the software, staff search for unusual water flow patterns, notify customers promptly of possible leaks and provide them time to have the leak fixed before their usage becomes too high. With this program, the utility measures to determine and control water loss; therefore, experiencing a reduction of water loss from metered connections.

B. Implementation

The following describes the leak investigation process:

1. A Leak Event Report will be created using the AMR software monthly by route
2. A different route will be worked on a monthly basis.
   Example: (Month 1 – Route 1, Month 2 – Route 2, etc.)
3. Accounts listed on the report will be assigned to staff the beginning of every month to complete by the end of the month
4. Staff will investigate accounts and call customers to proactively notify them of a potential leak
5. If a voicemail is left for the customer, an additional mail notice will be delivered to the customer
6. Staff will update the customer account with action taken, notes and other pertinent information
7. Proactive leak investigations and notices will be reported to Supervisor monthly for review

C. Schedule

The utility implemented this program in 2017 and has maintained it on an ongoing basis with monthly proactive reports being run.

D. Documentation

For this program the utility will track:

- The number of continuously flowing meters
- The number of customers contacted
- The number of leak adjustments
- The number of leaks repaired
- The number of new readers installed

E. Determination of Water Savings

The water savings can be calculated by subtracting meter readings before the leak from meter readings after the leak.

F. Cost-Effectiveness Considerations

Evaluation of AMR Program

Quantity	Value
Number of AMR's	35,023
Number of Leaks Caught per Year	6,275
Number of Customers Contacted per Year	6,275
Total Annual Savings Potential (gal)	86,745,600
San Angelo Population	100,700
Per Capita Water Savings (gpcd)	2.4
Estimated Cost per AMR Installation	$415
Administrative Time Spent per Year (hours)	416
Administrative Cost per Hour	$15
Cost over Gallon Saved ($/gal)	$0.17

4. Water Conservation Pricing

A. Description

The City has a tiered rate structure for residential customers, also known as a volumetric charge, or an inclining block rate structure, which increases the cost as consumption rises. This is

designed to encourage water conservation. Non-residential customers have an increasing meter fee assessed with larger meter sizes. The non-residential schedule includes a seasonal increase in the rate for summer usage of landscape water. Conservation pricing provides incentives to customers to reduce both average and peak use.

B. Implementation

The City's priority is a rate design that encourages customers to reduce discretionary water use. To remain effective, the rates need to be reviewed and possibly adjusted periodically to take inflation into account, future increases in operating costs, and other relevant costs and expenses.

C. Schedule

The City's current water rates are tiered rate structured and were adopted as a part of the 2015-2016 Rate Study that implemented the five-year rate increase. Conservation rate structures are designed to promote efficient water use by customers.

D. Documentation

To track this program, the Water Utilities maintains the following documentation:

- A copy of the legally adopted rate ordinance;
- Billing and customer records that include annual revenues by customer class for the reporting period;
- Monthly customer count and water consumption by customer class.

E. Determination of Water Savings

In implementing a conservation pricing structure, consideration will be given to the factors that result in a reduction in water use. The Water Price Elasticity for Single Family Homes (TWDB, 1998) study found long-term price elasticity of -0.20 in three Texas cities, which translates into a reduction of two percent in water use for a 10 percent increase in price.

F. Cost-Effectiveness Considerations

The water conservation pricing is cost-effective because it assures the financial health of the utility while also discouraging high consumption. The City might face one-time costs when implementing this BMP.

5. Prohibition on Wasting Water

A. Description

Prohibited Water Wasting BMP is aimed to help users understand the value of water, and educate them on simple ways to conserve water. Water Waste Prohibition measures are enforceable actions aimed at preventing specific wasteful activities, including:

- Water waste during irrigation;
    a. Water running along the curb of the street for a distance of 150 feet;
    b. Irrigation heads or sprinklers spraying directly on paved surfaces such as streets, driveways, parking lots, and sidewalks;
    c. Operation of an irrigation system with broken heads;
    d. Spray irrigation during summer months between the hours of noon and 6 p.m.
- Failure to fix outside faucet leaks;
- Service line leaks (on the customer side of the meter); and
- Sprinkler system leaks.
- Watering frequency, the use of treated or raw city water, graywater or reclaimed water for watering lawns, landscaped areas, trees, gardens, golf courses (except greens), shrubs or other plants being grown outdoors (not in a nursery) shall be allowed at a frequency of twice every seven days during the period of April 1 through October 31 and once every seven days during the period of November 1 through March 31. Golf course greens may be watered once per day year round.

B. Implementation

The frequency of outside watering is restricted, depending upon the time of year, the time of day and the drought stage in effect. It is always a violation to allow water to run more than 150 feet down any street, gutter, alley or ditch. To report watering violations residents can call or report online.

Violations of any provisions of the water conservation and drought contingency plan may be enforced as follows, per the Code of Ordinances:

1. First violation. Any person or entity as defined under this chapter may be given a verbal or written warning.

2. Second and subsequent violations.

A. Violation of any provision of the water conservation and drought contingency plan constitutes a class C misdemeanor offense for which a citation may be issued.

B. Second and subsequent violations shall be punishable by a maximum fine of up to two thousand dollars ($2,000.00) per day per violation as provided by section 1.01.009 of the Code of Ordinances of the City.

C. Proof of a culpable mental state is not required for a conviction of an offense under this section. Each day any person or entity fails to comply with the water conservation and drought contingency plan is a separate violation.

3. Third and subsequent violations.

A. For third and subsequent violations of the water conservation and drought contingency plan, the Water Utilities Director shall, upon due notice to the customer, be authorized to discontinue water service to the premises where such violations occur. Services discontinued or disconnected under such circumstances shall be restored only upon payment of charges as provided for in article 11.02, division 2.

B. Compliance with any provision of the water conservation and drought contingency plan may be enforced by civil court action as provided by state and federal law.

C. Schedule

The first water waste provisions on San Angelo's City Ordinances were introduced in the mid-1980s. In 2014, the City instated prohibited watering hours and a limit on watering frequency.

D. Documentation

To track this program, the Water Utilities maintains the following documentation:

- Copy of water waste prohibition ordinances enacted in the service area; and
- Records of enforcement actions including public complaints of violations and utility responses.

E. Determination of Water Savings

Total water savings for this program can be estimated from each water-wasting measure eliminated through the actions taken under this program. The Water Utilities will continue developing tracking methods to determine overall water savings through the water waste prohibition efforts in future years.

F. Cost-Effectiveness Considerations

Evaluation of Prohibition on Wasting Water

Quantity	Value
Number of Households	28,839
Average Sprinkler Water Use (gpm)	3
Total Watering Days/Week	1
Total Violations per Year	97
Total Savings per Year (gallons)	907,920
San Angelo Population	100,700
Per Capita Reduction (gpcd)	0.02
Administrative Cost	$1,500
Estimated Admin Cost per Violation	$15
Cost over Gallons Saved ($/gal)	$0.01

6. Water Conservation Coordinator

A. Description

The City's Water Conservation Coordinator oversees and manages conservation efforts within the utility's service area. The Coordinator is responsible for creating and implementing the utility's water conservation and drought contingency plans by developing programs, designing marketing strategies, and promoting campaigns with staff and local partners.

Water conservation programs are directed to school children; and, to the general public through media awareness campaigns, public events, and partnership with other entities. Other duties include evaluation of the annual conservation budget; preparation and submittal of annual conservation status reports; implementation of the utility's conservation program; and management of the conservation staff, consultants, and contractors, when appropriate.

B. Implementation

Conservation Coordinator duties include the following:

- Manage and implement utility conservation programs;

- Prepare annual conservation budget;
- Document water conservation program status as it relates to state requirements;
- Develop public outreach and marketing strategies for water conservation;
- Communicate and promote water conservation practices to customers;
- Serve as media contact and public information spokesperson for the utility on conservation issues;
- Oversee consultants and contractors assisting in implementing water conservation programs;
- Coordinate with partnering agencies and utility staff;
- Participate in regional water planning conservation and drought period initiatives; and
- Assist in preparing presentations to the Water Advisory Board Council and City Council.

C. Schedule

The City of San Angelo Water Utilities first hired a Conservation Manager in 2004. The Water Utilities now employs a Conservation Coordinator on a permanent basis per Texas House Bill 1648, passed on May 26, 2017.

D. Documentation

The City of San Angelo Water Utilities gathers the following documentation:

1. Description of the Conservation Coordinator position;
2. Reports on progress of water conservation programs implementation, costs and water savings.

E. Determination of Water Savings

The Coordinator assists in the implementation of practices and is essential to the success of efforts the utility chooses to undertake. This practice can be quantified through the implementation of the whole range of conservation programs that are offered by the utility.

F. Cost-Effectiveness Considerations

Since the water savings are not quantified it is difficult to analyze the cost-effectiveness. There will be non-financial benefits as a result of hiring a Conservation Coordinator such as enhanced public image through increased outreach and visibility in emphasizing conservation programs. The salary and associated overhead expenses for the Coordinator are the primary costs incurred.

7. Public Information

A. Description

San Angelo Water Utilities employs several methods of media resources to present a compelling and consistent message about the importance of water use efficiency and the managing and sustaining of existing water supplies. The goal of the public information program is to positively change behavior and raise awareness among customers and citizens of regional water resources. One example of such efforts is the Water My Yard program thru the Texas AgriLife Extension Service that Water Utilities sponsors. The City tries to reach customers through all types of media be it by, television, radio, print campaigns (i.e. leaflets, inserts, etc.), and social media.

B. Implementation

San Angelo Water Utilities employs a multi-tiered media campaign to bring about water resources awareness and to instill the importance of conservation in the community. This includes, but is not limited to, budgeting funds for television, radio, and print campaigns (i.e. leaflets, etc.) promoting water use efficiency; and, airing conservation programming on local television channels, Facebook, YouTube, City website and City Channel 17.

C. Schedule

The multi-tiered media campaign was initiated in 2004 and continues as an ongoing effort. As technology and social media advance, the City adapts to use them to their advantage.

D. Documentation

To track the progress of this program, San Angelo Water Utilities gathers the following documentation:

- Number of outreach events and attendance;
- Number of news programs or advertisements;
- Total population in the service area and the estimated number of audience reached; and
- The total budget for water conservation public information.

E. Determination of Water Savings

Water savings due to public information efforts are difficult to quantify. Water savings for other public information programs that result in specific actions by customers such as changes in irrigation scheduling or reduction in water waste occurrences may be quantified through surveys or analysis of water waste reporting in future years.

F. Cost-Effectiveness Considerations

There will be non-financial benefits as a result of Public Information campaigns such as enhanced public image through increased outreach and visibility in emphasizing conservation programs. The publishing and marketing expenses are the primary costs incurred. In addition, administrative costs are associated with the program. If communication strategies are successful, participants could learn how individual actions make a difference. However, to track the program's effectiveness, a study or survey would have to be conducted.

8. School Education

A. Description

School education programs, although difficult to relate to a quantifiable water saving, nevertheless enhance a utility's public image, contribute to the attainment of Texas state education goals by students, increase customer goodwill, and increase the viability of the utility's overall water conservation efforts. The message conveyed by students to their families based upon greater knowledge of water sources and conservation can result in behavioral changes leading to both short- and long-term water savings.

B. Implementation

San Angelo Water Utilities historically participated in the Major Rivers education program. Piloted in 2004, the self-contained Major Rivers curriculum, incorporated into 4th-grade classes, met the requirements of Texas Essential Knowledge and Skills (TEKS). The program now correlates to the State of Texas Assessments of Academic Readiness test (STAAR) for 4th and 5th graders. The program educated students on water conservation, supply, treatment, distribution, and conservation. The program offered academic and hands-on activities in math, language arts, science, and social studies, with a teacher's guide geared to the interdisciplinary curriculum, as well as an introductory video and home information leaflets. The program included pre- and post-test evaluations. In addition, teachers received continuing education credits for participating in Major Rivers' workshops.

The Water Utilities department is working on building a partnership with the San Angelo Independent School District to seamlessly incorporate water conservation into new curriculums. The Water Conservation Coordinator will serve as a consultant to the School District and integrate water conservation lessons into the science curriculum of select grade levels.

C. Schedule

The San Angelo Water Utilities will continue to offer other types of educational programs on an ongoing basis, subject to available staffing and funding.

D. Documentation

To track the progress of this program, the utility collected the following documentation:

- Number of school presentations made during the reporting period;
- Number of students reached by presentations and by curriculum;
- Number and type of curriculum materials developed and/or provided by the utility;
- Results of evaluation tools used, such as pre- and post-tests, student surveys, teacher surveys;
- Copies of program marketing and educational materials; and
- The annual budget for school education programs related to conservation.

E. Determination of Water Savings

Water savings for school education programs are difficult to quantify. An attempt may be made to evaluate this program through surveys of participants.

F. Cost-Effectiveness Considerations

This program will offer many benefits at a low cost to the utility. The only associated cost will be the administrative cost for curriculum consulting. The partnership between the San Angelo Independent School District and the Water Utility will change behavior in school-age children. In turn, this will offer the opportunity for the students to teach their families about water conservation practices as well.

9. Park Conservation

A. Description

Park irrigation conservation practices, as well as the wise use of water in the operation and maintenance of park facilities, can effectively reduce water demands. Under this program, the City Parks Department coordinates irrigation and water use practices with Water Utilities to conserve water at City parks.

The City Parks Department developed water conservation policies and procedures that cover all irrigated parks under its jurisdiction. Under this program, the park manager implements a watering regimen that uses only the amounts of water necessary to maintain the viability of the turf and landscape material appropriate for the use of the park. Water is only applied to areas that are essential to the use of the park. Furthermore, there is substantial use of drip irrigation for the City's trees, shrubs, gardens, and some turf. The park manager may cease irrigation of areas that do not affect the use of the park by the public during times of drought or shortage. An ET Network weather station has been installed at the soccer field off Glenna St. for increased weather data collection.

All park facilities are metered. Water wasting during park irrigation is continually monitored, including water running in gutter, irrigation heads or sprinklers spraying directly on paved surfaces, operation of automatic irrigation systems without a functioning rain shut-off device, operation of an irrigation system with broken heads, and irrigation during summer months between the hours of noon and 6 p.m. The parks department has implemented a new irrigation central control system. With this new central control system, City staff is able to monitor irrigation systems from one central location in real time directly affecting the irrigation staffs ability to find and make repairs in a more efficient time frame.

Implementation of rain harvest tanks at the Bosque and Kirby Park are complete. Playground equipment and facilities such as recreational facilities, tennis courts, basketball courts, and park and pool buildings are cleaned with the amounts of water needed for human health and safety purposes. Faucets and toilets in park facilities are retrofitted with efficient fixtures whenever possible.

B. Implementation

Prior to changes of a specific park conservation plan, the Water Utilities participated in a series of planning meetings with park management to discuss water conservation issues and to prepare a scope of action for the plan. The Water Utilities works closely with City Parks Department staff to update the conservation plan as needed, including a water survey of selected park irrigation systems and practices. The water-use survey, at a minimum, should include measurement of the irrigated turf areas; irrigation system checks and distribution uniformity analysis and review of irrigation schedules or development of schedules as appropriate.

C. Schedule

To accomplish this program, the utility has developed a plan in conjunction with the Parks Department and maintains it on an ongoing basis.

D. Documentation

To track the progress of this program, the Water Utilities gathers the following documentation:

- Metered water readings before and after any changes are implemented;
- Changes to irrigation systems, retrofits, or upgrades, regular leak detection, and maintenance policies, and estimated water savings from conservation practices.
- Water savings attributable to changes implemented;
- Costs of irrigation system upgrades if applicable.

E. Determination of Water Savings

Water savings will be estimated from each water-wasting measure eliminated through the actions taken under this program. For the replacement of inefficient equipment, the water savings are the difference in use between the new or upgraded equipment and the inefficient equipment. For landscape water waste, the savings can be calculated based on estimated savings from each water waste incident. For an irrigation survey, water savings can be expected in the range of 15 percent to 25 percent for park irrigation operations.

F. Cost-Effectiveness Considerations

Benefits to the City would be a reduction in water, as well as reductions in energy consumption as a result of reduced pumping of groundwater or surface water.

Proposed Water Conservation Programs

As part of the 2015 Rate Study, Alan Plummer Associates, Inc. (APAI) performed a study regarding potential conservation programs. APAI evaluated the effectiveness of future conservation strategies. This evaluation consisted of feasibility, economic analysis, research, and recommendations. In accordance with our goals, a few are to be implemented as part of this Water Conservation Plan.

1. Showerhead and Aerator Distribution

A. Description

The City will distribute showerheads, kitchen and bathroom faucet aerators in the residential sector. Three types of low flow plumbing devices are included under this program: showerheads rated at 1.75 gallons per minute (gpm) or less; kitchen faucet aerators of 2.2 gpm or less; and bathroom faucet aerators of 1.5 gpm or less.

Given the expected life of a showerhead (approximately five years), it is unlikely that many showerheads with flow rates over 2.5 gpm still exist in San Angelo residences. Today, new high-efficiency showerheads use the Venturi effect, air induction, and other methods to provide higher-quality spray patterns at lower volumes. These high-efficiency showerheads operate at flow volumes ranging from 1.0 to 2.0 gpm.

B. Implementation

Under this program, the San Angelo Water Utilities will include the following possibilities:

- Develop a program to distribute plumbing devices in residential facilities or, alternatively, provide incentives or kits for installation;
- Identify single-family (SF) residences participating in the program.

Under this program, qualifying customers receive the following fixtures:

- Two high-efficiency showerheads
- Two lavatory faucet aerator
- One high-efficiency kitchen faucet aerator

In order to qualify for this program, customers must meet the following requirements:

- Customer must not have previously received free showerheads and aerators during the past five years.

- If the home is rented, the customer must complete and turn in a landlord consent form
- Customer must agree to have the showerheads and aerators installed within 30 days of receiving them.

In selecting a product for distribution, it will be necessary to solicit proposals from qualified vendors. In evaluating bids, it is extremely important that products be evaluated on quality and in terms of dollars per unit of water saved. A higher-cost product with higher water savings potential may have a lower cost per unit than a lower-cost unit with diminished water savings potential. Evaluating products based on cost per unit will ensure the greatest savings at the lowest cost per unit for the City of San Angelo. Each year 10 percent of eligible single-family homes and 10 percent of eligible multi-family units should be retrofitted to maintain program development. Continue until 50 percent of eligible single-family houses and multi-family units are retrofitted.

C. Schedule

During the first 12 months, the City will plan a program including stakeholder meetings as needed. The City will develop a plan for educating homeowners, apartment owners and managers, plumbers, and realtors about this program; and initiate the program.

D. Documentation

To track the progress of this BMP, the Water Utilities will gather the following documentation:

An inventory of the number of single-family and multi-family buildings completed prior to 1995, which are targeted by this BMP; and

For each year of implementation, the records of the number of showerheads, bathroom faucet aerators, kitchen faucet aerators installed in residences.

E. Determination of Water Savings

Based on existing showerhead flow rates of 2.5 gpm, 2.6 persons per home, 1.5 showerheads per home and seven minutes of shower time per person per day, annual water savings per showerhead are calculated at 6,643 gallons.

Based existing lavatory faucet flow rates of 2.2 gpm, 2.6 persons per home, 1.5 lavatories per home and five minutes of lavatory sink time per person per day, annual water savings per lavatory faucet aerator are calculated at 5,694 gallons.

Based on existing kitchen faucet flow rates of 2.2 gpm, one kitchen sink per home and a total of 10 minutes of use per day, annual water savings per kitchen faucet aerator are calculated at 2,555 gallons.

Based on an assumed participation of 3,000 residential units per year, total annual savings are estimated at 45,447,000 gallons per year.

Retrofit Device Savings Table

Device	Initial Savings (gpd per device)	Device Life Span (Savings)
Aerators	5.5 gpd	5 years

F. Cost-Effectiveness Considerations

Additional benefits to the City of San Angelo would be a reduction in water and wastewater treatment costs, as well as reductions in energy consumption as a result of reduced pumping of groundwater or surface water.

Evaluation of Residential Showerhead and Aerator Distribution

Quantity	Value
Number of Participating Residential Units per Year	3,000
Number of Residents per Account	2.6
Number of Showers per Resident per Day	1
Average Number of Minutes per Shower	7
Total Shower Minutes per Home per Day	18.2
Existing Showerhead Flowrate (gal/min)	2.5
Efficient Showerhead Flowrate (gal/min)	1.5
Potential Water Savings (gal/min)	1.0
Showerhead Savings per Account (gal/yr)	6,643
Lavatory Aerator Use per Resident in Minutes per Day	5
Total Lavatory Aerator Minutes per Home per Day	13
Existing Lavatory Faucet Flowrate (gal/min)	2.2
Efficient Lavatory Aerator Flowrate (gal/min)	1.0
Lavatory Faucet Savings per Account (gal/yr)	5,694
Kitchen Faucet Minutes per Day	10
Existing Kitchen Faucet Flowrate (gal/min)	2.2
Efficient Kitchen Aerator Flowrate (gal/min)	1.5
Kitchen Faucet Savings per Unit (gal/year)	2,555
Total Savings per Residential Unit (gal/yr)	14,892
Total Potential Savings (gal/yr)	44,676,000
Total Savings Potential (kgal/yr)	44,676
Product Cost ($/Kit)	$20.00
Admin Cost ($/Kit)	$5.00
Equipment Life (yr)	5
Kits per Residential Unit	1
Kits Distributed per Year	3,000
San Angelo Population	100,700
Per Capita Reduction Potential (gpcd)	1.2
Potential Water Savings (ac-ft/yr)	138
Product Cost	$60,000
Administrative Cost	$15,000
Unit Cost over Projected Life (5 years) ($/kgal)	$0.33

2. Residential High-Efficiency Toilet Rebate Program

A. Description

High-Efficiency Toilet (HET) replacement programs are an effective method of achieving water efficiency in the residential sector. HETs are toilets that use 1.6 gpf or less. Under this program,

the Water Utilities will develop and implement a program to replace existing toilets using 3.5 gpf or more in single-family and multi-family residences. It is estimated that approximately 70% of existing housing units have toilets that operate at 3.5 gpf or more. To accomplish this program, the Water Utilities staff will first identify single-family residences constructed during or prior to 1995.

In San Angelo, the median housing age for active, standard residential premises is about 40 years. This was estimated using the distribution of housing ages and the number of active residential accounts. Alan Plummer Associates Inc. estimates that there are approximately 53,000 toilets associated with residential units within the City of San Angelo. The average calculated flush volume across all residential toilets is 3.3 gallons per flush (gpf). This assumes that all toilets installed after 1994 operate at 1.6 gpf and that 20% of toilets installed prior to 1994 have already been replaced with units operating at 1.6 gpf or less.

It is further estimated that there are approximately 36,800 toilets with flush volumes equal to or greater than 3.5 gpf. Only these 36,800 toilets would be eligible for the toilet replacement rebate.

Estimated Housing Age for Active, Standard Residential Accounts

Years Constructed	Estimated Number of Units Constructed*	Estimated Number of Units Constructed (%)
1939 or earlier	3,561	9%
1940–1949	3,033	7.7%
1950–1959	6,389	16.2%
1960–1969	5,673	14.4%
1970–1979	7,872	20%
1980–1989	5,954	15.1%
1990–1994	1,670	4.2%
1994–1999	2,504	6.4%
2000–2004	1,902	4.8%
2005 or later	792	2%
Total	37,351	100.0%

B. Implementation

The Water Utility will budget for the program. It will set up an efficient method to market the program, and distribute applications. Once applications are submitted with all necessary information and receipts; the "rebate" or incentive credit will be applied to the customer's account.

C. Schedule

During the first 12 months, the City will plan a program including stakeholder meetings as needed. The City will develop a plan for educating homeowners, apartment owners and managers, plumbers, and realtors about this program; and initiate the program.

D. Documentation

To track this program, the Water Utilities will gather the following documentation:

- The eligible number of residences in the service area;
- The average number of toilets per residence;
- The average persons per household for residences;
- The number of HET installations credited to the program participant's replacement program, by year, including brand and model of toilets installed;
- Estimated cost per HET replacement, if applicable; and
- Estimated water savings per HET replacement.

E. Determination of Water Savings

Based on an average flow rate of 4.1 gpf and 2.6 persons per residential unit, the average annual savings per toilet replaced is calculated at 10,700 gallons per year.

F. Cost-Effectiveness Considerations

Replacing 1,000 units of existing high flow residential toilets with HETs (1.6 gallons per flush) is projected to conserve 50 acre-feet per year at product costs to the City of $90,000 and administrative processing cost of $3,000. These savings would be permanent: at the end of the useful life of the replaced toilets, only HETs or better will be available for purchase.

Additional benefits to the City of San Angelo would be a reduction in water and wastewater treatment costs, as well as reductions in energy consumption as a result of reduced pumping of groundwater or surface water.

Quantity	Value
Number of Units with Inefficient Toilets	24,533
Total Number of Inefficient Toilets	36,800
Number of Residents per House	2.6
Number of Flushes per Resident per Day	6
Current Flush Volume (gal/flush)	4.1
New Flush Volume (gal/flush)	1.28
Savings (gal/flush)	2.82
Total Savings Potential (gal/yr)	16,057,080
Total Savings Potential (kgal/yr)	16,057
Estimated Cost per HET	$90
Equipment Life in Years	20
San Angelo Population	100,700
Per Capita Reduction (gpcd)	.44
Number of Toilets Replaced	1,000
Potential Water Savings (ac-ft/yr)	50
Product Cost	$90,000
Administrative Cost	$15,000
Cost per kGal Saved Over Project Life (20 years) ($/kgal)	$0.33

3. Residential Efficient Washing Machine Rebate Program

A. Description

With this rebate, the Water Utilities encourages customers to purchase efficient clothes washers compliant with the Department of Energy's ENERGY STAR program. Certified clothes washers use six gallons per cubic feet of water per load, compared to the 13 gal/ft^3 used by an older machine.

Manufacturers started producing efficient clothes washer models in the late 1990s in anticipation of rules being adopted by the Department of Energy ("DOE") setting higher efficiency standards. Since 2012, the water efficiency of clothes washers has only improved. The energy savings are a result of more efficient motors, less energy required for heating hot water as less hot water is used, and shorter drying time because the spin cycle on efficient washers is much faster.

To be effective, the rebate offered should bridge at least one-half of the gap in the price difference between the efficient machines and conventional ones. The price difference is an important part of the buying decision for customers.

Incentives will only be given to those customers who install washers that qualify as water efficient. A list of efficient washers is maintained and regularly updated on the City of San Angelo website. Efficient washers are also labeled at major retailers.

B. Implementation

The program will be offered to customers in single-family homes (including duplexes and triplexes) that have in-unit washer connections. Organize stakeholder meetings. Develop a marketing plan for educating customers, appliance stores, and realtors about this program. Initiate the program.

Under the rebate program, customers would purchase a qualified machine from a list maintained and updated found at the City of San Angelo's website and the following link: https://www.energystar.gov/productfinder/product/certified-clothes-washers/results

After purchasing the machine, customers would send in their application with a copy of the original receipt and water bill. For verification purposes, receipts should include some information related to the brand and model number of the machine purchased as well as a TC number. This will help to ensure that the receipts are not shared between two or more customers. Upon approval, the customer would receive a rebate, which would be applied directly to their water bill.

C. Schedule

Based on the approach selected, the following schedule will be followed: Plan, implement, and market an efficient clothes washer incentive program within 12 months of adopting this program.

D. Documentation

To track this program, the Water Utilities will gather the following documentation:

- The number of single-family homes and multi-family units with in-unit washer connections;
- The average number of persons per household for single-family homes and for multi-family residences;

- The number of efficient clothes washer incentives issued each year, by year, including brand, model, and water factor of each efficient washer;
- Estimated water savings per efficient washer; and
- Average total washer sales per year in the service area.

E. Determination of Water Savings

Based on 2,160 participating customers, total potential water savings are estimated at 14 million gallons per year.

F. Cost-Effectiveness Considerations

Based on an assumed labor rate of $15 per hour, it is estimated that the residential clothes washer rebate program would require 300 hours of additional labor. At a total cost of $200,000, the residential clothes washer rebate program cost per gallon is calculated at $0.01. Additional benefits to the City of San Angelo would be a reduction in water and wastewater treatment costs as well as reductions in energy consumption as a result of reduced pumping groundwater or surface water.

Evaluation of Residential Clothes Washer Rebates

Quantity	Value
Number of Households	28,839
Number of Households with Older Machines (75%)	21,630
Average Cubic Feet per Machine	3.4
Total Loads per Household/Week	5
Avg. Water Factor of Existing Machine (gal/cubic foot)	13.3
Water Factor of New Machine (gal/cubic foot)	6
Total Savings per Load (gal/cubic foot)	7.3
Total Savings per Week (gallons)	124
Total Savings per Year (gallons)	6,453
Total Participants per Year	2,000
Total Annual Savings Potential (gal)	12,906,400
Total Savings Potential (kgal)	12,906
Estimated Rebate Cost per Washer	$100.00
Estimated Admin Cost per Rebate	$15.00
Equipment Life in Years	10
San Angelo Population	100,700
Per Capita Reduction (gpcd)	0.35
Number of Rebates per Year	2,163
Potential Water Savings (ac-ft/yr)	40
Rebate Cost	$216,300
Administrative Cost	$2,163
Cost per kGal Saved Over Project Life	$1.78

4. Landscape Irrigation Conservation and Incentives

A. Description

Landscape irrigation Conservation and Incentives is a BMP meant to reduce outdoor water usage, maintain a healthy landscape, and avoid run-off. Water Sense estimates, that 60 percent of household water usage in dry climates, is used outside. Of this 60 percent, they estimate that as much as 50 percent of water used to irrigate is wasted due to evaporation, wind, and runoff caused by inefficient irrigation methods and systems. Using this BMP, the Water Utilities may provide customers with customer support, education, incentives, and assistance in making their landscape water-use efficient.

In order to participate, customers would have to follow certain criteria including but not limited to the following, recommendation by APAI:

- No more than 50 percent of the landscape may be planted in turf. Turf can be Bermuda, buffalo, or zoysia varieties only. Turf requires the greatest percentage of a property's irrigation demand, and limiting the amount of turf will help to ensure anticipated water savings.
- The customer must sustain the conversion for a minimum period of time. Requiring the customers to sustain the landscape conversion is as important as requiring a customer to maintain a domestic fixture for which a rebate was provided.
- If a permanent irrigation system is installed, it must pass a free irrigation audit performed by the City of San Angelo prior to receiving a rebate. In many cases, the overwatering of a landscape has more to do with the irrigation system's inefficiencies than with the type of landscape installed. Requiring an irrigation system audit will help to significantly reduce overwatering of the newly installed landscape and will help to ensure that the irrigation system matches the new landscape as well.
- A minimum of four inches of soil must be present under the turf. Requiring a minimum of four inches of soil will significantly improve the landscapes moisture-holding capacity and help reduce the requirement for supplemental watering.
- Shrubs and flowers must be selected from an approved plant list.
- A minimum of one shade tree selected from an approved tree list for lots less than 6,000 sq. ft. and two shade trees in larger lots should be required.
- No more than five percent of the landscape may be planted in annuals or unapproved plants (including vegetables).

When appropriate, the Water Utilities will consider offering the following services:

- Training in efficiency-focused landscape maintenance and irrigation system design;
- Financial incentives (such as rebates, and grants) to improve irrigation system efficiency and to purchase and/or install water-efficient irrigation systems;
- Financial incentives to replace high water-use plants with low water use plants;
- Rebates and incentives to purchase rain sensors or soil-moisture sensors; and
- Notices at the start and end of the irrigation season alerting customers to check irrigation systems and to make repairs and adjustments as necessary.

B. Implementation

This BMP is aimed towards customers with large landscapes who use more than 20,000 gallons per month in the summer. The City will approach local media, as well as post on their social media to notify the public about the program. The City would also contact public/private non-

profit partnerships such as gardening clubs, and green industry businesses to help market the program and leverage resources.

The City would verify that interested customers know the requirements and have an interest in applying the suggested methods. Once they install the suggested methods water personnel would conduct an irrigation audit to make sure requirements for the landscape are being met. Evaluations and/or rebate processing could be done by the Water Utilities staff or be outsourced. If a Water Utilities chooses to perform the evaluations using in-house staff, they may take advantage of irrigation evaluation training programs provided by the Texas A&M School of Irrigation or the Irrigation Association. The Water Utilities will need to ensure that landscape irrigation system specifications are coordinated with local building codes.

One year after conducting an irrigation audit, the City may conduct a customer-satisfaction survey to gauge the implementation rate of recommended modifications and evaluate customer satisfaction.

C. Schedule

During the first 12 months, the City will plan to have stakeholder meetings as needed and educate homeowners on the program and requirements. Upon the City's approval of participants, they would landscape their homes according to set standards.

D. Documentation

To track this BMP, the Water Utilities will gather the following documentation:

- Number of surveys offered and number of surveys accepted and completed;
- Number, type, and dollar value of incentives, rebates, and loans offered to and accepted by customers;
- Estimated water savings achieved through customer surveys; and
- Estimated landscape area converted and water savings achieved through low water landscape design and conversion program.
- Number of customers who sustain the conversion for a minimum period of time.
- Number of permanent irrigation systems installed.

E. Determination of Water Savings

Landscape surveys as described in this document are assumed to result in a 15 percent reduction in water demand for landscape uses by surveyed accounts. The Water Utilities will provide estimates of water savings from landscape irrigation survey programs based upon actual metered data. The water budget calculation is as follows, provided by APAI:

Evaluation of Landscape Rebates

Quantity	Value
Number Households	28,839
Percentage of Homes that Exceed 8kGal/Mo in Summer	50%
Target Participation (% of Homes that Exceed 8 kGal/Mo in	10%
Participating Homes per Year	500
Converted Area (sq. ft. / home)	500
Weekly Irrigation Application Rate (in)	1.5
Estimated Water Savings (in.)	0.75
Estimated Water Savings (gal/week/home)	375
Number of Irrigable Weeks	24
Average Water Savings per Home (gal/yr)	9,000
Total Potential Savings (gal/yr)	4,500,000
Total Potential Savings (kGal/yr)	4,500
Rebate Cost ($/sq ft)	$0.25
Average Rebate per Home	$125
Estimated Admin Cost per Rebate	$15
Projected Life in Years	10
San Angelo Population	100,700
Per Capita Reduction Potential	0.2
Potential Water Savings (ac-ft/yr)	13.8
Rebate Total Cost	$62,500
Administrative Total Cost	$7,500
Unit Cost Over 10 year life($/kGal)	$1.56

F. Cost-Effectiveness Considerations

There may be other one-time costs such as purchase of leak detection equipment and meters. Marketing and outreach costs range from $5 to $15 per survey. Administrative and overhead costs range from 10 to 20 percent of labor costs.

5. Water Survey for Single-Family and Multi-Family Customers

A. Description

The Water Survey Program conducts surveys of single-family and multi-family customers and provides them suggestions and methods to reduce indoor water use. These methods can include but not limited to replacement of inefficient showerheads, toilets, aerators, clothes washers, and dishwashers, and automatic irrigation systems if applicable.

The most efficient way of starting the program would be to offer surveys to the highest water users in single-family and multi-family accounts. Multi-family accounts would be analyzed on usage per unit. Surveys can be conducted by trained Water Utilities staff, an outside contractor, or by customers using a printed or online survey.

For the indoor water use survey, a form can be used to provide the information on water reductions that would be achieved with each type of equipment change and the length of the payback period, taking into account any Water Utilities incentives that may be available. If it is an onsite survey, showerhead and faucet aerators may be changed during the survey.

B. Implementation

Under this program, the Water Utilities will identify single family and multi-family customers who average the highest in water usage. Once identifying possible participants the City would offer the survey via mail, telephone calls, electronically or other appropriate methods of communication. The incentives to participants would be to become more water-efficient, which in term would lower their monthly water bills. If any other incentives are going on like toilet rebates, or distribution of showerhead and aerator kit, etc., they would also be notified.

Once a customer agrees to participate, the utility staff will collect the following information in the survey:

1. Calculation of the ratio of summer to winter use based on a review of the customer water bills;
2. Number and flush volume for each toilet;
3. If any 1.6 gpf toilets are flushing at greater than 1.6 gpf due to the replacement of early closure flapper with standard flapper;
4. If any toilets are leaking around the flapper or over the overflow tube;
5. Showerhead and aerator flow rates in gallons per minute (“gpm”) when the valve is fully open;
6. Estimated capacity of current clothes washers;

7. If a customer has a swimming pool, the frequency, and duration of backwash. Check fill valve and float to determine if working properly. Ask the customer if they have noticed any leakage from the pool; and
8. Ask customer who is responsible for changing the schedule and how often that occurs, if the system is turned off in winter months and if turfgrass areas are overseeded in winter.

Based on the information from the survey, the utility will develop a list of recommended changes or improvements.

To assure that the water savings measures recommended during and after the survey are achieved, the Water Utilities will follow up with the customer to determine which were actually implemented.

C. Schedule

Based on the approach selected, the following schedule will be followed: Develop and implement a plan to target and market water-use surveys to residential customers using more than 20,000 gallons per month in summer months and multi-family customers in the first year after implementing this BMP. Marketing efforts will be repeated until goals are met.

D. Documentation

To track this BMP, the Water Utilities will gather the following documentation:

1. Number of residential customers;
2. Number of single-family customers using more than 20,000 gallons per month during summer months;
3. Number of multi-family customers;
4. Number of surveys offered and number of surveys completed by customer type; and

E. Determination of Water Savings

Saving should be based on measures implemented by each customer. Savings are calculated by multiplying the number of each type of measure implemented by the savings for that measure as listed below.

Single-Family Home

- Irrigation Audit: Actual Water Utilities survey results or 26 gallons per day (gpd") per house.
- Showerhead and aerator replacements: 5.5 gpd per person

Multi-Family Community

- Irrigation Audit: Actual Water Utilities survey results or 15 percent of outdoor water use or 208 gpd
- Showerhead and aerators: 5.5 gpd per person

Savings for resetting toilet tank levels, toilet leak repair, and flapper replacement will be estimated during the water survey.

F. Cost-Effectiveness Consideration

Surveys can be performed by City staff or by contractors. Labor costs for a single-family range from $50 to $150 and multi-family family surveys start off at $100. If showerhead, aerators, or flappers are installed cost should also be considered.

6. Rainwater Harvesting

A. Description

Rainwater harvesting (RWH) conservation programs are an effective method of reducing potable water usage while maintaining healthy landscapes and reducing problems due to excessive runoff. Using this BMP, the Water Utilities may provide customers with support, education, incentives, and assistance in proper installation and use of RWH systems. RWH systems will be most effective if implemented in conjunction with other water efficiency measures including water-saving equipment and practices. Incentives may include rebates for purchase and installation of water-efficient equipment.

B. Implementation

The Water Utilities will consider also approaching local weather announcers, radio gardening show hosts, and newspaper columnists for assistance in notifying the public about the program. Public/private partnerships with non-profits such as gardening clubs, neighborhood associations, and Tom Green Cooperative Extension office and/or with green industry businesses such as rainwater harvesting companies and local sustainable building groups are potential avenues to market the program and leverage resources.

Incentives may include rebates for RWH systems, recognition for RWH systems through signage, award programs, and certification of trained landscape company employees and volunteer representatives to promote the program.

The initial step in assisting customers with landscape irrigation systems is a thorough evaluation of the potential water capture of a RWH system. The water customers who participate in this program will need to maintain and operate their irrigation systems in a water-efficient manner.

The Water Utilities will ensure that RWH system specifications are coordinated with local building and plumbing codes. Water Utilities staff will also be trained to provide irrigation

audits. The American Rainwater Catchment Systems Association lists evaluation training for RWH programs.

C. Schedule

Based on the approach selected, the following schedule will be followed: Incentive approach in the first year, plan the program including stakeholder meetings as needed. Develop a plan for educating potential homebuyers, developers, plumbers, green industry trade groups, landscape architects and realtors about this program. After the first year, implement the program.

D. Documentation

To track this BMP, the Water Utilities will gather the following documentation for each year of operation:

- The number of new RWH developments for which design planning started after the adoption of this BMP;
- The number and type of RWH installations completed each year;
- The estimated rainwater and condensate use in each RWH installation;
- Aggregate water capacity of RWH sites;
- Number, type, and dollar value of incentives, rebates, or loans offered to and accepted by customers; and
- Estimated water savings achieved through customer surveys.

E. Determination of Water Savings

Based on 1,000 participants a year, with at least one 55 gallon size barrels, and an average of 20 inches of rain a year we expect at least 1.1 million gallons of water saved a year. Most rain barrels range between 35 to 150 gallons in size, 55 in a very low average so water savings will most likely be more.

F. Cost-Effectiveness Considerations

Based on an assumed labor rate of $15 per hour, it is estimated that the rainwater harvesting rebate program would require 300 hours of additional labor. At a total cost of $40,000 the rainwater harvesting rebate program cost per gallon is calculated at $0.02. Additional benefits to the City of San Angelo would be a reduction in water and storm sewer costs as well as reductions in energy consumption as a result of reduced pumping groundwater or surface water.

Evaluation of Residential Clothes Washer Rebates

Quantity	Value
Number of Houses	28.839
Average Roof Size (Sq. ft)	1,000
Average Rain Fall San Angelo (In)	20
Minimum Rain Barrel Size (Gal)	55
Number of Rebates	1000
Rebate per barrel	$25
Total Savings Potential per inch of rain	55,000
Total Savings Potential per year	1,100,000
Total Savings Potential (kgal/yr)	1,100
Total Rebate Cost	$25,000
Estimated Admin Cost per HET	$15
Total Admin Cost	$15,000
Equipment Life in Years	20
San Angelo Population	100,700
Per Capita Reduction (gpcd)	.03
Potential Water Savings (ac-ft/yr)	3
Cost per kGal Saved Over Project Life (20 years)	$1.82

7. New Construction Graywater

A. Description

Graywater has commonly been used in Texas. The most common example is using washing machine water for lawn or garden irrigation. Until 2003, Texas statutes contained very restrictive provisions for using graywater, primarily due to concerns about public health. In 2003, the Texas Legislature adopted House Bill (HB) 2661 which provides a more comprehensive definition of graywater and provisions for facilitating the use of graywater in a safe manner.

Graywater is defined in Texas as wastewater from clothes washers, showers, bathtubs, handwashing sinks, and lavatories not used for the disposal of hazardous or toxic ingredients. Graywater cannot include water from clothes washers used for washing diapers, sinks used for food preparation, toilets, or urinals.

HB 2661, passed by the 78th Legislature Regular Session, added a provision that allows graywater use without treatment of up to 400 gallons per day at a private house for landscape irrigation, gardening or composting as long as the graywater:

1. Is used by the occupants of the residence for gardening, composting, or landscaping;
2. Is collected using a system that overflows into a sewage collection system or on-site wastewater treatment and disposal system;
3. Is stored in tanks that are clearly labeled and that have restricted access;
4. Uses a purple pipe or purple tape around the pipe;
5. Is not allowed to pond or run off across property lines; and
6. Is distributed by a surface or subsurface system that does not spray into the air unless the graywater receives additional treatment.

HB 2661 also encourages builders of new homes to install dual piping that provides the capacity to collect graywater from allowable sources and to install subsurface graywater systems around the foundation of new houses to minimize foundation movement and cracking. This approach may also provide irrigation for landscaping planted up to four feet from the foundation.

New duplexes, triplexes, townhomes, condo units, and apartments may all be designed for utilization of graywater. Graywater generated from office buildings and other commercial buildings, primarily through faucet use, may be used for landscape irrigation. HB 2661 requires the Texas Commission on Environmental Quality to adopt rules for graywater use for commercial purposes as well as for industrial purposes.

In many cases, the quantity of water available as graywater is declining due to water efficiency gains from water conserving showerheads, faucet aerators, and clothes washers. In a new home, which would have efficient plumbing fixtures, the amount of graywater produced will range from 22 to 30 gallons per person per day. For an average size household of 2.7 persons that might be sufficient in most cases for both foundation stabilization and landscape irrigation in a four-foot strip around a 2,500 square foot house.

The suitability of graywater for irrigation will vary, and if graywater is the primary source for irrigation, a low water use landscape should be used. Irrigation systems should consider soil depth, soil permeability, and flooding characteristics. Application options include drip, flood and subsurface irrigation. It is not appropriate to use spray irrigation unless the graywater is highly treated.

B. Implementation

Implementation of this BMP includes following rules pertaining to graywater adopted by TCEQ as well as any local City or County Health Department rules. To promote this BMP, stakeholder meetings will be held with builders, developers, realtors, and other impacted groups. Under this BMP, the Water Utilities will consider;

1. Implementing an incentive plan to encourage builders and owners of new homes and/or multi-unit properties to install plumbing that separately collects graywater from eligible sources and distributes the graywater through a subsurface irrigation system around the foundation of the residence or building or for other landscape use. It may be effective for

2. This BMP to be part of a Green Builder type rating system that also includes WaterWise landscaping, adequate soil depth, and rainwater harvesting;

C. Schedule

In the first year, plan the program including stakeholder meetings as needed. Develop a plan for educating and training potential homebuyers, developers, plumbers, landscape professionals and realtors about this program. After the first year, implement the program.

D. Documentation

To track the progress of this BMP, the Water Utilities will gather the following documentation for each year of implementation:

1. Depending on which sectors the Water Utilities has decided to focus on, the number of new homes and/or multi-unit properties and/or certain new commercial developments such as office parks started and completed after the adoption of this BMP;

2. The number and type of graywater installations completed each year; and

3. The estimated graywater use in each graywater installation.

E. Determination of Water Savings

Water savings will vary depending on the type of installation and will likely be unique to each customer installing a graywater system. There may also be some cases where graywater use will provide more water for a purpose that is currently being met with potable water. Only the reduction in potable water use will be calculated as the actual savings. In general, calculate water savings as follows:

1. For single-family units, calculate gallons of potable water use replaced by graywater and multiply this estimated potable water savings per house times the number of houses installing a graywater system.

2. For commercial and other properties, calculate gallons of potable water use replaced by graywater. In some cases, water savings for commercial developments can be calculated based on the number of employees and graywater discharge per employee.

F. Cost-Effectiveness Considerations

This program would allow participants to lower their water and sewer bill since they are reusing water. It would also help lower costs for the City since they wouldn't have to retreat the water that participants are reusing. The only costs would be incurred by the participants installing graywater systems.

8. Conservation Programs for Industrial, Commercial, and Institutional Accounts

A. Description

27 percent of all water consumption for the City of San Angelo, comes from industrial, commercial, and institutional accounts (ICI). Therefore, it is important to have conservation programs and incentives in place for them to take advantage of. This BMP would start off by identifying the higher water usage customers and sectors with the highest conservation potential. Different industries have unique opportunities for water savings, but similarities of water use create an opportunity for an ICI Water Conservation Program.

The APAI evaluation suggested the City offer a rebate of $300 per acre-foot of water over the projected life of the equipment or 50 percent of the cost of the improvement whichever is less. ICI rebates in a year would be $100,000. This would allow the City to achieve and maintain annual savings of 33.3 acre-feet per year over a period of 10 years.

Since ICI customers have an array of use of water, APAI recommends implementation of a rebate program based on equipment life, installed costs of equipment, and achievable water savings. If the City follows these recommendations we can offer rebates based on the individual merits associated with each project.

B. Implementation

Implementation will consist of at least the following actions:

1. Identify ICI Accounts.
    a. Find the highest water users in each category.
2. Conduct water use surveys and implement incentives based on cost-effectiveness or ease of program implementation.
3. Adjust programs to achieve annual water-use savings.

C. Schedule

Based on the approach selected, the following schedule will be followed:

1. Within the first 12 months of implementing this BMP, identify industrial, commercial, and institutional accounts and sort them by water use; and
2. Offer water-use surveys to ICI accounts.

D. Documentation

To track this BMP, the Water Utilities will provide the following documentation:

1. The number of customers and amount of water used within the commercial, industrial, and institutional customer classes;
2. A description of the plan to market water-use surveys to ICI accounts;
3. The number of ICI customers offered water-use surveys during the reporting period and the number of water-use surveys completed during the reporting period;
4. The number of follow-ups completed during the reporting period;
5. The type and number of water-saving recommendations implemented; and
6. If utilizing other programs in lieu of the water-use survey and customer incentives program, a description of the programs and estimated water-use reductions achieved through these programs. The Water Utilities will document how savings were realized and the method and calculations for estimating savings.

E. Determination of Water Savings

Water savings will vary due to the industry and type of installations or retrofits completed.

F. Cost-Effectiveness Considerations

These calculations by APAI, are based on a $112,000 budget, they estimate that minimum savings are 10.9 million gallons per year. The water savings are based on 10-year equipment life, this would also reduce revenues by at least $229,114 per year at current water and wastewater rates according to APAI. Other benefits include a reduction of water and wastewater treatment costs for the City, as well as a reduction in energy consumption as a result of reduced pumping of groundwater and surface water.

Quantity	Value
Rebate Budget	$100,000
Maximum Unit Cost ($/ac-ft)	$300
Minimum Potential Savings (gal/year)	10,861,700
Minimum Potential Savings (kGal/year)	10,862
Equipment Life in Years	10
Number of Rebates	Variable
Potential Annual Water Savings (ac-ft/yr)	33.3
Annual Rebate Costs	$100,000
Annual Administrative Cost	$12,000
Unit Cost Over Project Life($/kGal)	$1.03

9. Partnerships with Nonprofit Organizations

A. Description

Organizations such as Texas A&M AgriLife, Master Gardeners, Master Naturalist, and other environmental organizations with water conservation sympathies can be a great resource to communicate water conservation education to their regular and expanded audiences. Organizations of all types can be included, even organizations that normally don't have water conservation goals. Organizations that help or target lower-income households or senior citizens can help their audiences by providing information on services that are available related to water conservation (for example, high-efficiency toilets and leak repairs).

B. Implementation

The first step to implementing this BMP would be to contact the organizations with volunteers and encourage them to deliver a packaged program. Another possibility which might be more effective in most cases would be to, communicate with the organization with a goal in mind and

work with them and volunteers to develop a package to meet the desired goals. Volunteers and organizations are great assets, since they know their target audience's capabilities and would know how best to approach the audience and work toward meeting the goal. Training should still be provided to volunteers to complement and enhance their skills.

Financial arrangements may only involve expenses and training materials. In order to ensure administrative attention and possibly accelerate progress, understaffed and/or cash-strapped groups should be provided with funds upfront and linked to audience contacts.

C. Schedule

If volunteer organizations are organized and already have operating educational goals in place, it is possible to expect recruitment, negotiations, contracting, training, and program results in 12 months.

D. Documentation

Documentation can vary from organization to organization depending on their goals and water conservation activities they hold. Documentation can include but isn't limited to:

- Number of audience contacts
- Number of newsletter sign-ups

E. Determination of Water Savings

Determination of water savings will vary from different needs the Water Utilities must provide for organizations. They will also vary on the type of program or outreach event they hold.

F. Cost-Effectiveness Considerations

Partnerships with volunteer organizations have the advantage of expanding the water conservation team. When volunteers are properly trained in conservation techniques and believe in water conservation, they can reach hundreds of other individuals with varying degrees of effectiveness. The cost of using volunteers is very low compared to the cost of paid staff. Well trained volunteers can be nearly as effective as paid staff.

Wholesale Customer Conservation

Summary

Communication will be maintained with wholesale customers to ensure that the City's retail and wholesale customers are being treated in an equitable fashion, and for optimum implementation of the plan. The City offers wholesale customers the opportunity to cosponsor conservation education and information activities.

Wholesale Customer Targets and Goals

The City of San Angelo serves three wholesale customers with treated water. Due to the fact that the City's wholesale customers have other sources of water in addition to the water provided by the City, we were unable to provide accurate targets and goals.

Metering, Monitoring and Records Management

The City meters all treated water delivered to its wholesale customers. The meters are read on a monthly basis for billing purposes.

A summary report is prepared, which aggregates all meter readings from wholesale treated water meters.

Leak Detection and Repair

The treated water wholesale customers are supplied from portions of the City's distribution system. The meter location is the point of sale after which the water enters the customer's system, which is the customer's responsibility to operate and maintain. The portions of the City's distribution system that serve these wholesale customers are subject to the same leak detection and repair program described in On-Going Best Management Practices-System Water Audit and Water Loss.

Contractual Requirements

The City has in place contracts with the various wholesale customers. All of these contracts contain language relating to water conservation in drought situations. Each contract has a section requiring the customer to accept shortages in supply, should natural or unforeseen circumstances prevent the City from delivering the water. One of these contracts is in force, as is for 40 years from the mid-seventies, prior to when the State had conservation planning requirements. As the need to modify each contract arises, the City will include contract language requiring conformance with applicable regulations concerning water conservation.

Targets and Goals

The City has no enforcement mechanism to impose conservation targets and goals upon its wholesale customers at this time. Achieving these goals must be through cooperative efforts to maintain and improve system efficiencies, to educate customers to the importance of conservation, and to enforce existing plumbing regulations within the municipal boundaries of each entity. To assist in meeting these goals, the City plays an active role in Region F water resource planning, working with wholesale customers on a voluntary basis on water conservation programs like those described in Public Information, School Education, and Water-wise Landscape Design and Conversion Program.

The City will assist its wholesale customers in voluntarily meeting goals through cooperative efforts like those mentioned above. All wholesale customers will be encouraged to operate efficiently and to keep water loss rates below 10 percent.

Drought Contingency Plan

Triggering a Drought Stage

Section 11.05 of the City of San Angelo Code of Ordinances contains provisions defining drought trigger stages and enforceable water management measures. When local reservoirs are below full but above drought condition levels, the local and non-local sources will be listed.

The required minimum daily groundwater production coupled with the total amount of surface water available, as determined by the Water Utilities Director, to the city from its developed water sources for drought level 1 is less than a 24-month supply, drought level 2 is less than 18-months, and drought level 3 is less than 12 months.

During drought conditions, the primary source of supply will be non-local sources, subject to the maximum amount available from each source, with the remaining amount of water coming from the local system or underground sources that the City may develop.

Whenever the total amount of water available to the City falls below the minimum criteria established for each Water Supply Stage Level, the City shall be deemed to have entered a Drought Stage for management of its water supplies.

In the event of a *water demand emergency*, the quantity of water usage from the city's water distribution system reaches a level that exceeds the amount which may be treated or safely delivered through the system, the Water Utilities Director shall notify the City Manager and the City Council of such an occurrence. The City Council shall be authorized to limit the use of water by the passage of a resolution outlining such limitations, which shall remain in effect until the water demand emergency can be met. Upon initiation of a water demand emergency, the Water Utilities Director shall provide notice to the Executive Director of the TCEQ and shall notify the news media.

In the event of a *water supply emergency*, a water system failure or emergency (i.e., pressure zone deficiencies, chemical spills, broken water mains, power outages, failures of storage tanks or other equipment, treatment plant breakdown and/or water contamination) which limits the amount of water which may be treated or safely delivered through the system, the Water Utilities Director shall notify the City Manager and City Council of such occurrence. The City Council shall be authorized to limit the use of water by the passage of a resolution outlining such limitations, which shall remain in effect until the water supply emergency can be met. Upon

initiation of a water supply emergency, the Water Utilities Director shall provide notice to the Executive Director of the TCEQ and shall notify the news media.

Water Supply Stages

Drought Level I.

- The minimum criteria for this drought stage shall be the following: The required minimum daily groundwater production coupled with the total amount of surface water available, as determined by the Water Utilities Director, to the city from its developed water sources is less than a 24-month supply.
- In addition to the conservation measures stated in section 11.05.002 of this article, the following additional water conservation measures shall be in force during Water Supply Stage - Drought Level I.
    - The use of treated or raw city water for watering lawns, gardens, landscaped areas, trees, shrubs, golf courses (except greens) or other plants being grown outdoors (not in a nursery) shall be prohibited at all times; provided, however, a person may do such watering which shall be once every seven days during the period of April 1 through October 31 and once every 14 days during the period of November 1 through March 31 except during the "prohibited watering hours" as stated in section 11.05.002.
    - Golf courses greens may be watered daily except during the "prohibited watering hours" as stated in section 11.05.002.
    - Watering of "new landscape" shall be allowed in accordance with the provisions as stated in section 11.05.002 for "new landscape."
- A multiplier shall be assessed to the volumetric water fees as set forth in section A8.002(a)(7) of this code.

Drought Level II

- The minimum criteria for this drought stage shall be the following: The required minimum daily groundwater production coupled with the total amount of surface water available, as determined by the Water Utilities Director, to the city from its developed water sources is less than an 18-month supply.

- In addition to the conservation measures stated in section 11.05.002 of this article, the following additional water conservation measures shall be in force during Water Supply Stage - Drought Level II:
    - The use of treated or raw city water for watering lawns, gardens, landscaped areas, trees, shrubs, golf courses (except greens) or other plants being grown outdoors (not in a nursery) shall be prohibited at all times; provided, however, a person may do such watering which shall be once every seven days during the period of April 1 through October 31 and once every 14 days during the period of November 1 through March 31 except during the "prohibited watering hours" as stated in section 11.05.002.
    - Golf course greens may be watered daily except during the "prohibited watering hours" as stated in section 11.05.002.
    - Watering of "new landscape" shall not be allowed as stated in section 11.05.002 for "new landscape."
- A multiplier shall be assessed to the volumetric water fees as set forth in section A8.002(a)(7) of this code.

Drought Level III

- The minimum criteria for this drought stage shall be the following: The required minimum daily groundwater production coupled with the total amount of surface water available, as determined by the Water Utilities Director, to the city from its developed water sources is less than a 12-month supply.
- In addition to the water conservation measures stated in section 11.05.002 of this article, the following water conservation measures shall be in force during Water Supply Stage - Drought Level III:
    - The use of treated or raw city water for watering of lawns, gardens, landscaped areas, golf courses (including greens), shrubs or other plants being grown outdoors is prohibited. Hand watering or drip irrigation of trees and foundations may be done on days and at times as established by the City Council.
    - The use of treated or raw city water to fill, refill or maintain the level of any fountain or swimming pool is prohibited.

- Washing of automobiles, trucks, trailers, boats, or other types of vehicles or mobile equipment is prohibited except, if the health, safety, and welfare of the public is contingent upon vehicle cleaning, as determined by the Director of City Health Services, then the washing of such vehicles shall be allowed.

- A multiplier shall be assessed to the volumetric water fees as set forth in section A8.002(a)(7) of this code.

Initiation and Termination Procedure

The Water Utilities Director shall notify the City Manager and City Council upon entering the threshold of a drought stage. The Council shall implement each stage by resolution. Such resolution shall be published one time in the local newspaper. The criteria for each stage and the water management measures which shall be enforced are listed in the Water Supply Stages section.

The Water Utilities Director for the City will act as the administrator of the water conservation and drought contingency plan. The administrator will oversee the execution and implementation of all elements of the program. The administrator will be responsible for supervising the promulgation and retention of adequate records for program verification.

The Water Conservation Plan will be maintained for the duration of the City's financial obligation to the Texas Water Development Board.

Targets and Goals

The San Angelo Drought Contingency Ordinance is designed to reduce water demand through the imposition of specific water use restrictions and the use of bill surcharges for customers depending upon the level of the reservoir system storage. At each successive condition, the water use reduction goals increase. More restrictive measures are mandated as reservoir storage decreases, the demand reduction measures are summarized in Drought Water Reduction Targets below.

Drought Water Reduction Targets

Level	Reservoir Storage Level	Target Demand Reduction
Level 1	24 months' supply	10%
Level 2	18 months' supply	15%
Level 3	12 months' supply	25%

Variance Procedures and Exceptions

Section 11.05.004 of the City code lays out the procedures for requesting and receiving a variance to the enforceable provision of Water Conservation and Drought Contingency Ordinance.

A person desiring an exemption from any provision of the restrictions must file a petition for a variance with the City Manager. All petitions for variances must be reviewed and acted upon by the City Council. The petition is required to contain certain specific information detailed by ordinance including alternative conservation measures implemented by the petitioner as a condition of receiving the variance. The City Council may also impose other requirements as a condition of granting the variance.

Enforcement and Wholesale Provisions

Section 11.05.002 of the ordinance provides for the Water Utilities Director of the City as the manager of the Water Conservation Plan.

Wholesale customers of the City are required to adopt applicable provisions of the City's Water Conservation and Drought Contingency Plan. Contracts for the sale of water already in effect will be revised to reflect the applicable provisions of the City's most current Water Conservation and Drought Contingency Plan when the contracts are renewed. Violations of the ordinance are misdemeanors under City code, and specific penalties are described in Section 11.05.006 of the code.

Informing and Educating the Public

The Water Utilities Director will provide reports to the news media with information regarding current water supply conditions, projected water supply, and demand conditions if the current drought conditions continue, and consumer information on water conservation measures and practices. Information describing each water supply stage trigger point and drought level restrictions on water use shall be prepared and published on the City's website.

Appendix A Utility Profile- Texas Water Development Board

Texas Water Development Board

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

CONTACT INFORMATION

Name of Utility: City of San Angelo

Public Water Supply Identification Number (PWS ID): TX2260001

Certificate of Convenience and Necessity (CCN) Number: 10242

Surface Water Right ID Number: 88, 407, 457, 1191, 1266, 1298-B, 1318-D, 1319-C, 1323, 1325-A, 1326, 1333-A, 1337-A, 1348-B, 1357-A, 1401, 2311

Wastewater ID Number: 20097

Contact: First Name: Allison Last Name: Strube

Title: Water Utilities Director

Address: 301 W. Beauregard City: San Angelo State: TX

Zip Code: 76903 Zip+4: Email: [redacted]

Telephone Number: 3256574209 Date: 4/26/2019

Is this person the designated Conservation Coordinator? ○ Yes ◉ No

Coordinator: First Name: Maria Last Name: Padilla

Title: Water Conservation Coordinator

Address: 301 W. Beauregard City: San Angelo Zip Code: 76903

Email: [redacted] Telephone Number: 325-657-4330

Regional Water Planning Group: F

Groundwater Conservation District:

Our records indicate that you:

☑ Received financial assistance of $500,000 or more from TWDB

☑ Have 3,300 or more retail connections

☑ Have a surface water right with TCEQ

A. Population and Service Area Data

1. Current service area size in square miles: 60

Texas Water Development Board

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

Attached file(s):

File Name	File Description
San Angelo Service Area.pdf	
GIS Map San Angelo.pdf	

2. Historical service area population for the previous five years, starting with the most current year.

Year	Historical Population Served By Retail Water Service	Historical Population Served By Wholesale Water Service	Historical Population Served By Wastewater Water Service
2018	100,119	1,400	88,605
2017	100,700	1,400	89,120
2016	100,450	2,175	88,898
2015	98,975	2,175	89,078
2014	97,492	3,200	87,743

3. Projected service area population for the following decades.

Year	Projected Population Served By Retail Water Service	Projected Population Served By Wholesale Water Service	Projected Population Served By Wastewater Water Service
2020	103,243	1,825	91,370
2030	116,437	1,931	103,047
2040	123,653	2,019	109,433
2050	131,315	2,097	116,214
2060	139,451	2,170	123,414

4. Described source(s)/method(s) for estimating current and projected populations.

2021 Regional Water Plan TWDB

Attached file(s):

File Name	File Description
2021 Regional Water Plan-Population Projections.pdf	2021 Regional Water Plan- Population Projections for 2020-2070

Texas Water Development Board

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

B. System Input

System input data for the previous five years.
Total System Input = Self-supplied + Imported – Exported

Year	Water Produced in Gallons	Purchased/Imported Water in Gallons	Exported Water in Gallons	Total System Input	Total GPCD
2018	4,434,688,889	0	129,812,467	4,304,876,422	118
2017	4,231,538,384	0	167,289,691	4,064,248,693	111
2016	4,124,193,939	0	153,548,958	3,970,644,981	108
2015	4,312,668,687	0	162,888,598	4,149,780,089	115
2014	4,706,251,513	0	203,218,000	4,503,033,513	127
Historic Average	4,361,868,282	0	163,351,543	4,198,516,740	116

C. Water Supply System

1. Designed daily capacity of system in gallons: 42,000,000

2. Storage Capacity

   2a. Elevated storage in gallons: 4,250,000

   2b. Ground storage in gallons: 12,900,000

Texas Water Development Board

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

D. Projected Demands

1. The estimated water supply requirements for the next ten years using population trends, historical water use, economic growth, etc.

Year	Population	Water Demand (gallons)
2020	103,243	5,840,552,302
2021	104,562	5,897,023,281
2022	105,882	5,953,493,250
2023	107,201	6,009,963,219
2024	108,521	6,066,433,188
2025	109,840	6,122,903,157
2026	111,159	6,179,373,126
2027	112,479	6,235,843,095
2028	113,798	6,292,313,064
2029	115,118	6,348,783,033

2. Description of source data and how projected water demands were determined.

We used the TWDB population and Water Demand projections

Attached file(s):

File Name	File Description
2021 Regional Water Plan-Population Projections.pdf	
Water Demand Projections San Angelo.pdf	

Texas Water Development Board

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

E. High Volume Customers

1. The annual water use for the five highest volume **RETAIL customers.**

Customer	Water Use Category	Annual Water Use	Treated or Raw
Goodfellow Air Force Base	Institutional	121,469,000	Treated
Robinson Premium Beef	Industrial	59,043,000	Treated
Shannon Medical Center	Institutional	53,178,000	Treated
Angelo State University	Institutional	43,844,000	Treated
Tom Green County Jail	Institutional	23,877,000	Treated

2. The annual water use for the five highest volume **WHOLESALE customers.**

Customer	Water Use Category	Annual Water Use	Treated or Raw
Upper Colorado River Authority	Municipal	60,093,000	Treated
Millersview-Doole	Municipal	2,406,000	Treated

F. Utility Data Comment Section

Additional comments about utility data.

Texas Water Development Board

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

Section II: System Data

A. Retail Water Supplier Connections

1. List of active retail connections by major water use category.

Water Use Category Type	Total Retail Connections (Active + Inactive)	Percent of Total Connections
Residential - Single Family	30,703	87.96 %
Residential - Multi-Family	701	2.01 %
Industrial	110	0.32 %
Commercial	2,900	8.31 %
Institutional	474	1.36 %
Agricultural	19	0.05 %
Total	34,907	100.00 %

2. Net number of new retail connections by water use category for the previous five years.

	Net Number of New Retail Connections						
Year	**Residential - Single Family**	**Residential - Multi-Family**	**Industrial**	**Commercial**	**Institutional**	**Agricultural**	**Total**
2018	53	0	0	0	3	7	63
2017	336	5	6	0	0	1	348
2016	0	0	0	0	6	5	11
2015	1,142	18	87	0	13	0	1,260
2014	621	0	5	97	132	0	855

Texas Water Development Board

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

B. Accounting Data

The previous five years' gallons of RETAIL water provided in each major water use category.

Year	Residential - Single Family	Residential - Multi-Family	Industrial	Commercial	Institutional	Agricultural	Total
2018	2,085,576,000	422,052,000	188,238,000	534,662,000	349,522,000	12,811,000	3,592,861,000
2017	2,196,878,000	437,990,000	121,023,000	492,301,000	438,404,000	3,840,000	3,690,436,000
2016	2,009,983,000	420,210,000	94,995,000	467,562,000	383,884,000	1,695,000	3,378,329,000
2015	2,025,793,000	386,679,000	114,610,000	462,281,000	378,822,000	0	3,368,185,000
2014	1,963,539,000	437,289,000	113,602,000	522,679,000	359,900,000	0	3,397,009,000

C. Residential Water Use

The previous five years residential GPCD for single family and multi-family units.

Year	Residential - Single Family	Residential - Multi-Family	Total Residential
2018	69	0	69
2017	72	0	72
2016	66	0	66
2015	67	0	67
2014	67	0	67
Historic Average	68	0	68

Texas Water Development Board

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

D. Annual and Seasonal Water Use

1. The previous five years' gallons of treated water provided to RETAIL customers.

Month	Total Gallons of Treated Water				
	2018	2017	2016	2015	2014
January	224,279,000	248,764,000	234,919,000	241,067,000	262,979,000
February	275,224,000	235,687,000	235,431,000	208,777,000	261,802,000
March	224,593,000	228,648,000	247,275,000	221,896,000	237,377,000
April	280,850,000	294,535,000	278,779,000	241,257,000	264,595,000
May	305,754,000	305,478,000	263,916,000	271,426,000	271,850,000
June	361,763,000	326,745,000	274,956,000	263,922,000	296,621,000
July	407,415,000	365,733,000	340,730,000	300,971,000	384,169,000
August	408,688,000	378,609,000	406,701,000	382,037,000	379,637,000
September	351,691,000	345,724,000	320,999,000	389,903,000	338,228,000
October	234,896,000	298,829,000	279,694,000	374,550,000	328,228,000
November	256,441,000	300,098,000	270,498,000	273,325,000	294,817,000
December	248,456,000	256,977,000	239,667,000	248,762,000	252,996,000
Total	3,580,050,000	3,585,827,000	3,393,565,000	3,417,893,000	3,573,299,000

Texas Water Development Board

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

2. The previous five years' gallons of raw water provided to RETAIL customers.

Month	Total Gallons of Raw Water				
	2018	2017	2016	2015	2014
January	345,510,000	293,163,000	326,994,000	340,179,000	336,775,000
February	295,820,000	268,664,000	339,826,000	299,895,000	315,750,000
March	347,457,000	348,730,000	354,549,000	341,298,000	356,830,000
April	384,613,000	351,760,000	345,124,000	357,110,000	368,666,000
May	409,643,000	406,160,000	362,786,000	359,360,000	376,995,000
June	500,996,000	441,526,000	370,712,000	407,329,000	377,926,000
July	542,583,000	477,303,000	490,453,000	454,506,000	480,087,000
August	448,083,000	406,861,000	435,066,000	557,146,000	500,818,000
September	346,833,000	391,084,000	336,414,000	500,882,000	422,317,000
October	333,866,000	376,706,000	366,820,000	431,913,000	437,507,000
November	322,587,000	333,749,000	308,967,000	351,536,000	348,637,000
December	306,401,000	308,997,000	296,109,000	335,298,000	336,922,000
Total	4,584,392,000	4,404,703,000	4,333,820,000	4,736,452,000	4,659,230,000

3. Summary of seasonal and annual water use.

	Summer RETAIL (Treated + Raw)	Total RETAIL (Treated + Raw)
2018	2,669,528,000	8,164,442,000
2017	2,396,777,000	7,990,530,000
2016	2,318,618,000	7,727,385,000
2015	2,365,911,000	8,154,345,000
2014	2,419,258,000	8,232,529,000
Average in Gallons	2,434,018,400.00	8,053,846,200.00

Texas Water Development Board

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

E. Water Loss

Water Loss data for the previous five years.

Year	Total Water Loss in Gallons	Water Loss in GPCD	Water Loss as a Percentage
2018	554,691,517	15	12.89 %
2017	135,326,134	4	3.33 %
2016	328,992,919	9	8.29 %
2015	594,050,838	16	14.32 %
2014	288,744,594	8	6.41 %
Average	380,361,200	10	9.05 %

F. Peak Day Use

Average Daily Water Use and Peak Day Water Use for the previous five years.

Year	Average Daily Use (gal)	Peak Day Use (gal)	Ratio (peak/avg)
2018	22,368,334	29016608	1.2972
2017	21,891,863	26051923	1.1900
2016	21,170,917	25202369	1.1904
2015	22,340,671	25716423	1.1511
2014	22,554,873	26296282	1.1659

G. Summary of Historic Water Use

Water Use Category	Historic Average	Percent of Connections	Percent of Water Use
Residential - Single Family	2,056,353,800	87.96 %	59.00 %
Residential - Multi-Family	420,844,000	2.01 %	12.07 %
Industrial	126,493,600	0.32 %	3.63 %
Commercial	495,897,000	8.31 %	14.23 %
Institutional	382,106,400	1.36 %	10.96 %
Agricultural	3,669,200	0.05 %	0.11 %

Texas Water Development Board

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

H. System Data Comment Section

Section III: Wastewater System Data

A. Wastewater System Data

1. Design capacity of wastewater treatment plant(s) in gallons per day: 13,200,000

2. List of active wastewater connections by major water use category.

Water Use Category	Metered	Unmetered	Total Connections	Percent of Total Connections
Municipal	28,269	0	28,269	91.49 %
Industrial	53	0	53	0.17 %
Commercial	2,311	0	2,311	7.48 %
Institutional	266	0	266	0.86 %
Agricultural	0	0	0	0.00 %
Total	30,899	0	30,899	100.00 %

3. Percentage of water serviced by the wastewater system: 88.50 %

Texas Water Development Board

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

4. Number of gallons of wastewater that was treated by the utility for the previous five years.

Month	Total Gallons of Treated Water				
	2018	2017	2016	2015	2014
January	226,316,000	226,316,000	246,471,000	263,413,000	248,250,000
February	223,085,000	213,997,000	240,006,000	234,242,000	227,922,000
March	247,252,000	232,368,000	258,145,000	260,196,000	242,936,000
April	222,112,000	224,457,000	254,744,000	248,146,000	231,483,000
May	272,455,000	222,524,000	252,924,000	264,765,000	266,670,000
June	242,683,000	236,054,000	285,367,000	262,835,000	242,752,000
July	242,295,000	232,751,000	252,709,000	271,769,000	253,776,000
August	243,369,000	248,408,000	246,409,000	271,176,000	267,441,000
September	259,241,000	251,813,000	252,944,000	260,569,000	262,995,000
October	329,803,000	235,204,000	240,936,000	268,844,000	259,609,000
November	274,558,000	230,549,000	238,111,000	251,833,000	257,650,000
December	272,733,000	226,236,000	230,637,000	260,755,000	250,103,000
Total	3,055,902,000	2,780,677,000	2,999,403,000	3,118,543,000	3,011,587,000

5. Could treated wastewater be substituted for potable water?

(●) Yes ( ) No

B. Reuse Data

1. Data by type of recycling and reuse activities implemented during the current reporting period.

Type of Reuse	Total Annual Volume (in gallons)
On-site Irrigation	
Plant wash down	
Chlorination/de-chlorination	
Industrial	
Landscape irrigation (park,golf courses)	
Agricultural	3,055,902,000
Discharge to surface water	
Evaporation Pond	
Other	
Total	3,055,902,000

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

C. Wastewater System Data Comment

Additional comments and files to support or explain wastewater system data listed below.

Appendix B Ordinance Language: City of San Angelo Water Conservation and Drought Contingency Plan

CERTIFICATE

STATE OF TEXAS	§	
	§	**KNOW ALL BY THESE PRESENTS**
COUNTY OF TOM GREEN	§	

I, Julia Antilley, City Clerk for the City of San Angelo, Texas, hereby certify that the City Council of the City of San Angelo, at its regular meeting on September 4, 2019, adopted the 2019 Water Conservation Plan, as recorded on Page 380 of Volume 2019 of the official City Council Minute Records.

IN WITNESS WHEREOF, I have hereunto set my hand and the seal of said City this 10th day of September, 2019.

THE CITY OF SAN ANGELO

JULIA ANTILLEY, CITY CLERK

ARTICLE 11.05 - WATER CONSERVATION AND DROUGHT CONTINGENCY PLAN[9]

Footnotes:

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State Law reference— Drought contingency plans, V.T.C.A., Water Code, sec. 11.1272.

Sec. 11.05.001 - Purpose

The purpose of the water conservation and drought contingency plan is to encourage water conservation at all times and to establish a procedure for identifying, classifying and handling a water supply and/or a water demand emergency effectively and efficiently.

- (Ordinance adopted 2-7-12)

Sec. 11.05.002 - Water conservation measures

The city will utilize the following strategies to encourage, promote and require citizens to conserve water at all times.

(1) *Conservation plan* . The "City of San Angelo Water Conservation Plan," as adopted by Council, on file in the office of the city clerk, and available for public inspection, is adopted and incorporated herein.

(A) *Implementation* . The director of water utilities will act as the administrator of the water conservation plan. The administrator will oversee the execution and implementation of all elements of the program and will be responsible for supervising the promulgation and retention of records for program verification.

(2) *Plumbing code* . The city plumbing code has provision for water-conserving plumbing devices. The city will enforce the requirements of the code to ensure the use of water-saving devices.

(3) *Universal metering* . All users of municipal treated water, except for fire sprinkler lines, will be metered.

(4) *Water supply meters* . The city metering devices will record water use with an accuracy of plus or minus five percent in order to measure and account for the amount of raw water diverted from the source of supply.

(5) *Restaurants* . Restaurants shall not serve water to their customers except when specifically requested by the customer.

(6) *Waste of water* . As defined below, shall be prohibited.

(A) Allowing treated or raw city water, greywater, reclaimed water or well water to run off property to a gutter, street, alley, ditch or drainage facility and drain for more than 150 feet downgrade of the point of entry into such gutter, street, alley, ditch or drainage facility.

(B) Failure to repair a controllable leak.

(7) *Prohibited watering hours* . The use of treated or raw city water, greywater or reclaimed water for watering lawns, gardens, landscape areas, trees, golf courses, shrubs or other plants being grown outdoors (not in a nursery) shall be prohibited between the hours of 12:00 noon and 6:00 p.m. daily from April 1 through October 31.

(8) *Watering frequency* . The use of treated or raw city water, greywater or reclaimed water for watering lawns, landscape areas, trees, gardens, golf courses (except greens), shrubs or other plants being grown outdoors (not in a nursery) shall be allowed at a frequency of twice every seven days during the period of April 1 through October 31 and once every seven days during the period of November 1 through March 31. Golf course greens may be watered once per day year round.

(9) *New landscape* . Watering of newly seeded or sodded lawns or newly planted trees, shrubs or landscape plants will be allowed at the following frequency provided written notification is given to the city code compliance division or water conservation division of the watering schedule:

(A) Days 1—14 from planting: three times per day every day of such period at any time of day.

(B) Days 15—28 from planting: twice per day every day of such period at any time of day.

(10) *Allowable application rates* . The maximum amount of treated or raw city water, greywater or reclaimed water applied to established lawns, landscape plants, golf courses (except greens) or shrubs shall not exceed one inch per week.

(11) *Drip irrigation* . Landscape or foundation watering with a drip irrigation system such as a soaker hose, deep root watering system, drip pipe or tape, or bubbler shall be permitted on any day and at any time of day provided that the total amount of water applied shall not exceed one inch per week. For the purpose of this article, drip irrigation shall mean a water-saving irrigation system designed to emit water at low volumes and low pressures directly onto or below the soil surface without airborne streams or droplets.

(12) *Hand watering* . Hand watering of lawns, gardens, landscape areas, trees, shrubs or other plants being grown outdoors or foundations may be done on any day, except during the prohibited watering hours, provided the allowable application rate is not exceeded. Hand watering shall be watering with a hose that is hand-held for the duration of the irrigation event, or watering with a container of five gallons or less.

(13) *Excessive usage of water* . Excessive usage of water as defined below shall be prohibited and shall be a violation of the water conservation and drought contingency plan:

(A) Any use of water by a customer in excess of the maximum allowable application rates under subsection (10) above.

(14) *Contracts with other political subdivisions, water supply corporations or water suppliers* . Any political subdivision, water supply corporation, or water supplier that contracts with the city for the purchase of water shall adopt applicable provisions of the city's water conservation and drought contingency plan. Contracts for the sale of water that are already in effect will be revised to reflect the applicable provisions of the city's most current water conservation and drought contingency plan when the contracts are renewed or extended. To the extent of the city's legal authority, the city shall require the city's wholesale customers to issue a public notice advising their water customers of required drought management measures declared in the city as follows in section 11.05.003.

(A) In the event that the triggering criteria specified in section 11.05.003(f) of the plan for Water Supply Stage - Drought Level III have been met, the city manager is hereby authorized to initiate allocation of water supplies on a pro rata basis in accordance with Texas Water Code section 11.039 and according to the following water allocation policies and procedures.

(B) A wholesale customer's monthly allocation shall be a percentage of the customer's water usage baseline. The percentage will be set by resolution of the city council based on the administrator's assessment of the severity of the water shortage condition and the need to curtail water diversions and/or deliveries and may be adjusted periodically by resolution of the city council as conditions warrant. Once pro rata allocation is in effect, water diversions by or deliveries to each wholesale customer shall be limited to the allocation established for each month.

(C) Upon initiation of pro rata water allocation, the water utility director shall provide notice, by certified mail, to each wholesale customer informing them of their monthly water usage allocations and shall notify the news media and the executive director of the state commission on environmental quality.

(15) *Water demand emergency* . In the event the quantity of water usage from the city's water distribution system reaches a level that exceeds the amount which may be treated or safely delivered through the system, the water utilities director shall notify the city manager and the city council of such an occurrence. The city council shall be authorized to limit the use of water by passage of a resolution outlining such limitations, which shall remain in effect until the water demand emergency can be met. Upon initiation of a water demand emergency, the water utility director shall provide notice, by certified mail, to the executive director of the state commission on environmental quality and shall notify the news media.

(16) *Water supply emergency* . In the event of a water system failure or emergency (i.e., pressure zone deficiencies, chemical spills, broken water mains, power outages, failures of storage tanks or other equipment, treatment plant breakdown and/or water contamination) which limits the amount of water which may be treated or safely delivered through the system, the water utilities director shall notify the city manager and city council of such occurrence. The city council shall be authorized to limit the use of water by passage of a resolution outlining such limitations, which shall remain in effect until the water supply emergency can be met. Upon initiation of a water supply emergency, the water utility director shall provide notice, by certified mail, to the executive director of the state commission on environmental quality and shall notify the news media.

(17) *Public information* . The water utilities director will provide regular public education and information about the importance of year-round water efficiency as delineated in the plan, and will provide general information about water supply conditions and drought plan provisions on at least an annual basis. The purpose of this effort shall be to keep the citizenry informed about the drought and conservation plans and their importance to the city's water supply.

- (Ordinance adopted 2-7-12; Ordinance adopted 2-21-12, § 1; Ordinance adopted 5-6-14; Ordinance adopted 11-4-14; Ordinance adopted 5-3-16, § 1)

Sec. 11.05.003 - Drought stages and water management measures

(a) *Water supply sources* . The city has several water supply sources that it can draw upon to meet its needs. Local surface water sources include Lake Nasworthy, Twin Buttes Reservoir, O.C. Fisher Reservoir and the South Concho River. Nonlocal surface water supplies are available to the city from O.H. Ivie Reservoir and Spence Reservoir. The city has a groundwater source in the Hickory Aquifer. When local reservoirs are full, the city's primary water supply will be from these reservoirs along with nonlocal or groundwater sources as needed. When local reservoirs are below full but above drought trigger points, the local sources may be utilized along with water brought in from nonlocal sources or groundwater sources. During drought conditions, the primary source of supply will be nonlocal sources, subject to the maximum amount available from each source, with the remaining amount of water coming from the local sources or groundwater sources that the city may develop.

(b) *Drought trigger point* . Whenever the total amount of water available to the city falls below the minimum criteria established for each water supply stage level, the city shall be deemed to have entered a drought stage for management of its water supplies. The water utilities director shall notify the city manager and city council upon entering the threshold of a drought stage. The council shall implement each stage by resolution. A notice of such resolution shall be published one time in the local newspaper. The criteria for each stage and the water management measures which shall be enforced are as follows in subsections (d) to (f).

(c) *Public information* . The water utilities director will provide reports to the news media with information regarding current water supply conditions, projected water supply and demand conditions if the current drought conditions continue, and consumer information on water conservation measures and practices. Information describing each water supply stage trigger point and drought level restrictions on water use shall be prepared and published on the city's website.

(d) *Water supply stage - Drought Level I* .

(1) The minimum criteria for this drought stage shall be the following: The required minimum daily groundwater production coupled with the total amount of surface water available, as determined by the water utilities director, to the city from its developed water sources is less than a 24-month supply.

(2) In addition to the conservation measures stated in section 11.05.002 of this article, the following additional water conservation measures shall be in force during Water Supply Stage - Drought Level I.

(A) The use of treated or raw city water for watering lawns, gardens, landscape areas, trees, shrubs, golf courses (except greens) or other plants being grown outdoors (not in a nursery) shall be prohibited at all times; provided, however, a person may do such watering which shall be once every seven days during the period of April 1 through October 31 and once every 14 days during the period of November 1 through March 31 except during the "prohibited watering hours" as stated in section 11.05.002.

(B) Golf courses greens may be watered daily except during the "prohibited watering hours" as stated in section 11.05.002.

(C) Watering of "new landscape" shall be allowed in accordance with the provisions as stated in section 11.05.002 for "new landscape."

(3) A multiplier shall be assessed to the volumetric water fees as set forth in section A8.002(a)(7) of this code.

(e) *Water supply stage - Drought Level II* .

(1) The minimum criteria for this drought stage shall be the following: The required minimum daily groundwater production coupled with the total amount of surface water available, as determined by the water utilities director, to the city from its developed water sources is less than an 18-month supply.

(2) In addition to the conservation measures stated in section 11.05.002 of this article, the following additional water conservation measures shall be in force during Water Supply Stage - Drought Level II:

(A) The use of treated or raw city water for watering lawns, gardens, landscape areas, trees, shrubs, golf courses (except greens) or other plants being grown outdoors (not in a nursery) shall be prohibited at all times; provided, however, a person may do such watering which shall be once every seven days during the period of April 1 through October 31 and once every 14 days during the period of November 1 through March 31 except during the "prohibited watering hours" as stated in section 11.05.002.

(B) Golf course greens may be watered daily except during the "prohibited watering hours" as stated in section 11.05.002.

(C) Watering of "new landscape" shall not be allowed as stated in section 11.05.002 for "new landscape."

(3) A multiplier shall be assessed to the volumetric water fees as set forth in section A8.002(a)(7) of this code.

(f) *Water supply stage - Drought Level III* .

(1) The minimum criteria for this drought stage shall be the following: The required minimum daily groundwater production coupled with the total amount of surface water available, as determined by the water utilities director, to the city from its developed water sources is less than a 12-month supply.

(2) In addition to the water conservation measures stated in section 11.05.002 of this article, the following water conservation measures shall be in force during Water Supply Stage - Drought Level III:

(A) The use of treated or raw city water for watering of lawns, gardens, landscape areas, golf courses (including greens), shrubs or other plants being grown outdoors is prohibited. Hand watering or drip irrigation of trees and foundations may be done on days and at times as established by the city council.

(B) The use of treated or raw city water to fill, refill or maintain the level of any fountain or swimming pool is prohibited.

(C) Washing of automobiles, trucks, trailers, boats, or other types of vehicles or mobile equipment is prohibited except, if the health, safety and welfare of the public is contingent upon vehicle cleaning, as determined by the director of city health services, then the washing of such vehicles shall be allowed.

(3) A multiplier shall be assessed to the volumetric water fees as set forth in section A8.002(a)(7) of this code.

- (Ordinance adopted 2-7-12; Ordinance adopted 2-21-12, § 2; Ordinance adopted 8-6-13; Ordinance adopted 5-3-16, § 1; Ordinance adopted 8-2-16)

Sec. 11.05.004 - Exceptions and variances

(a) *Authority of city council* . The city council may allow exceptions to any of the provisions of this article. The council may place conditions on any exception.

(b) *Exceptions to watering restrictions* . There shall be an exception to the prohibitions of this article regarding watering restrictions:

(1) Use of water for installing, testing and repairing sprinkler systems.

(2) Watering frequency and schedules for public parks, athletic facilities, schools, colleges and cemeteries shall be as approved by the city council.

(c) *Variances* .

(1) A person desiring an exemption from any provision of this article shall file a petition for variance with the city manager. All petitions for variances shall be reviewed and acted upon by the city council. The petition shall include at a minimum the following information:

(A) Name and address of the petitioner(s).

(B) Purpose and estimated amount of water use.

(C) Specific provision(s) of this article from which the petitioner is requesting an exemption.

(D) Detailed statement as to how the specific provision of this article adversely affects the petitioner or what damage or harm will occur to the petitioner or others if the petitioner complies with this article.

(E) Description of the relief requested.

(F) Period of time for which the variance is sought.

(G) Alternative water use restrictions or other measures the petitioner is taking or proposes to take to meet the intent of this article and the effective date of such other measures.

(H) Other pertinent information.

(I) A statement that petitioner has not within the last six months intentionally violated the current ordinance for which a variance is sought or, if such violations have occurred, a statement setting out all reasons why such ordinance was violated.

(2) The city council may grant a variance from the requirements of this article after determining that, because of special circumstances applicable to the applicant, compliance with this article:

(A) Cannot be technically accomplished during the expected duration of the water supply shortage or other condition for which this article is in effect;

(B) Will cause undue hardship on a program or service offered by a public entity; or

(C) Substantially threatens the applicant's primary source of income.

(3) Additionally, the city council may grant a variance from the requirements of this article if it determines that the applicant can implement alternative water use restrictions which meet or exceed the intent of this article. The city council shall approve specific alternative water use restrictions.

(4) Any variance granted by the city council may be revoked after a determination by the city council that revocation is necessary for the public health and safety or upon a finding that the

holder of a variance allowing alternative water use restrictions has not complied with such alternative restrictions.

- (Ordinance adopted 2-7-12; Ordinance adopted 9-27-12)

Sec. 11.05.005 - Implementation and service restrictions

(a) *Implementation* .

(1) The water utilities director for the city will act as the administrator of the water conservation drought contingency plan. The administrator will oversee the execution and implementation of all elements of the program. The administrator will be responsible for supervising the promulgation and retention of adequate records for program verification.

(2) The water conservation plan will be maintained for the duration of the city's financial obligation to the state under the state revolving loan fund program.

(b) *Contracts with other political subdivisions, water supply corporations or water suppliers* . Any political subdivision, water supply corporation, or water supplier that contracts with the city for the purchase of water shall adopt applicable provisions of the city's water conservation and drought contingency plan. Contracts for the sale of water that are already in effect will be revised to reflect the applicable provisions of the city's most current water conservation and drought contingency plan when the contracts are renewed.

(c) *Service restrictions* . The water conservation and drought contingency plan shall be enforced by the following service restrictions:

(1) Water service taps will not be provided to customers not meeting the plan requirements.

(2) The inclining block water rate structure should encourage retrofitting of old plumbing fixtures which use large quantities of water.

(3) Customers who do not pay their water bills shall be subject to discontinuance or disconnection of service.

(4) The building inspection department will not certify new construction which fails to meet the plan requirements.

- (Ordinance adopted 2-7-12)

Sec. 11.05.006 - Enforcement

(a) Violations of any provisions of the water conservation and drought contingency plan may be enforced as follows:

(1) *First violation* . Any person or entity as defined under this chapter may be given a verbal or written warning.

(2) *Second and subsequent violations* .

(A) Violation of any provision of the water conservation and drought contingency plan constitutes a class C misdemeanor offense for which a citation may be issued.

(B) Second and subsequent violations shall be punishable by a maximum fine of up to $2,000.00 per day per violation as provided by section 1.01.009 of the Code of Ordinances of the city.

(C) Proof of a culpable mental state is not required for a conviction of an offense under this section. Each day any person or entity fails to comply with the water conservation and drought contingency plan is a separate violation.

(3) *Third and subsequent violations* . For third and subsequent violations of the water conservation and drought contingency plan, the water utilities director shall, upon due notice to the customer, be authorized to discontinue water service to the premises where such violations occur. Services discontinued or disconnected under such circumstances shall be restored only upon payment of charges as provided for in article 11.02, division 2.

(b) Compliance with any provision of the water conservation and drought contingency plan may be enforced by civil court action as provided by state and federal law.

- (Ordinance adopted 2-7-12)

Appendix C Water Rates-Current Rate Structure

Section A8.002 - Monthly water rates; sanitary sewer discharge charges; industrial waste charges; sewer tap charges

All persons supplied with water by the city shall be billed for water at the following monthly rates for water supplied on or after January 1, 2016:

- *Rate schedule*:
    - Inside the city, fixed charge - meter size:

	2016	2017	2018	2019	2020
⅝"	$21.37	$23.88	$26.68	$28.62	$30.69
1"	$25.86	$28.90	$32.29	$34.63	$37.15
1½"	$30.38	$33.96	$37.94	$40.70	$43.65
2"	$40.07	$44.78	$50.04	$53.67	$57.56
3"	$117.01	$130.76	$146.13	$156.72	$168.08
4"	$146.09	$163.26	$182.44	$195.67	$209.85
6"	$212.67	$237.66	$265.59	$284.84	$305.49
8"	$288.28	$322.15	$360.01	$386.11	$414.10

    - Residential volumetric, rate per 1,000 gallons (single-family residence, duplex, or other individually metered residential unit. Residential usage shall be the combined usage of the building meter and any landscape meter(s) serving the tract.):

	2016	2017	2018	2019	2020
0—2	$2.74	$3.00	$3.30	$3.54	$3.80
3—5	$3.99	$4.38	$4.81	$5.16	$5.54
6—15	$4.66	$5.12	$5.62	$6.03	$6.47
16—39	$4.99	$5.48	$6.02	$6.45	$6.92
>39	$9.13	$10.03	$11.02	$11.82	$12.68

- Nonresidential volumetric, rate per 1,000 gallons (commercial, apartment, mobile home park, fire hydrants, industrial, hotel/motel, hospital, school, and government):

2016	2017	2018	2019	2020
$4.62	$5.27	$6.01	$6.45	$6.92

- Landscape volumetric, rate per 1,000 gallons:

	2016	2017	2018	2019	2020
Winter					
0—89	$4.46	$5.09	$5.81	$6.23	$6.68
>89	$9.98	$11.39	$12.99	$13.93	$14.94
Summer					

0—89	$4.66	$5.32	$6.07	$6.51	$6.98
>89	$10.43	$11.90	$13.58	$14.56	$15.62

* For all landscape meters at schools, colleges, parks, or other city-owned facilities all usage will be billed at the "0—89" rate.

- Manufacturing companies which depend on water use for the construction, manufacturing, assembly or processing of products, such as creameries, medical sutures, wood and cotton processing, packing plants, commercial laundries, and carwashes, shall pay the industrial water rate.
- Angelo State University, San Angelo Independent School District, Tom Green County, Goodfellow Air Force Base and the city shall pay the governmental/schools rate.
- Where the city pays all pumping and distribution costs of untreated water, an additional charge shall be added to the untreated water rate in an amount equal to the average cost per one thousand (1,000) gallons for pumping and distributing said water.
- The charge for fire sprinkler service shall be one dollar ($1.00) per inch diameter of the main fire service feed line. This charge shall be for each line service per month.
- The charge for water service to users outside the city limits shall be one and one-half (1½) times the rate charged to users within the city limits.
- The water rate schedule shall also be adjusted as set out below pursuant to section 11.05.002 of this code entitled "water conservation measures."
    - *Drought level 1*.
        - Residential

0-2	1.0
3-5	1.05
6-15	1.05
16-39	1.10
>39	1.20

        - Nonresidential: 1.05.
        - Landscape (winter and summer): 1.10.
        - Fire hydrants: 1.00.

- Untreated Water: 1.00.

- *Drought level 2*.
  - Residential:

0—2	1.10
3—5	1.10
6—15	1.20
16—39	1.20
>39	1.30

  - Nonresidential: 1.05.
  - Landscape (winter and summer): 1.20.
  - Fire hydrants: 1.00.
  - Untreated water: 1.10.

- *Drought level 3*.
  - Residential:

0—2	1.20
3—5	1.20
6—15	1.30
16—39	1.30
>39	1.40

- Nonresidential: 1.10.
- Landscape (winter and summer): 1.30.
- Fire hydrants: 1.00.
- Untreated water: 1.20.

Any person contributing wastewater to the city's sanitary wastewater system shall be billed for wastewater so contributed at the following monthly rates on or after January 1, 2016:

- *Base fee.*

Meter Size	2016	2017	2018	2019	2020
⅝"	$22.24	24.96	$28.02	$28.86	$29.72
1"	$25.74	28.89	$32.43	$33.40	$34.41
1½"	$29.27	32.86	$36.89	$37.99	$39.13
2"	$36.81	41.32	$46.38	$47.77	$49.20
3"	$96.71	108.56	$121.86	$125.52	$129.28
4"	$119.36	$133.98	$150.39	$154.90	$159.55
6"	$171.20	$192.18	$215.72	$222.19	$228.85
8"	$230.09	$258.28	$289.91	$298.61	$307.57

- *Usage fee.*
    - *Single-family residence* :
        - A fixed monthly amount of usage shall be established for each user by averaging the user's billed water consumption for the previous months of December, January, and February. The fixed monthly average shall be recalculated each year on March 1st. If a user does not have three months of water consumption history that can be used in the averaging, then the amount of data available will be utilized.

- Blocks (1,000 gallons):

	2016	2017	2018	2019	2020
4—15 (maximum)	$2.81	3.15	$3.54	$3.64	$3.75

The monthly usage fee shall be as stated above per each 1,000 gallons of average water usage above 4,000 gallons up to a maximum of 15,000 gallons average usage. This charge applies to wastewater that does not exceed the strength of normal domestic wastewater as defined in section 11.02.121 of this code.

- A user may separately meter usage of water for outside irrigation. Such separately metered water shall not be utilized in calculating wastewater fees.

o *Multifamily residence* (duplex, apartment house, mobile home park, boardinghouse), San Angelo public schools, Angelo State University, and Goodfellow Air Force Base.

- A fixed monthly amount of usage shall be established for each user by averaging the user's billed water consumption for the previous months of December, January, and February. The fixed monthly average shall be recalculated each year on March 1st. If a user does not have three months of water consumption history that can be used in the averaging, then the amount of data available will be utilized.
- Blocks (1,000 gallons):

	2016	2017	2018	2019	2020
4 and above	$2.81	3.15	$3.54	$3.64	$3.75

The monthly usage fee shall be as stated above per each 1,000 gallons of average water usage above 4,000 gallons. This charge applies to wastewater that does not exceed the strength of normal domestic wastewater as defined in section 11.02.121 of this code.

- A user may separately meter usage of water for outside irrigation. Such separately metered water shall not be utilized in calculating wastewater fees.

- *Commercial, industrial, hospitals, churches, hotels, motels, and governmental users* (with the exception of those governmental users in subsection (B) above).

  - Blocks (1,000 gallons):

	2016	2017	2018	2019	2020
4 and above	$2.81	3.15	$3.54	$3.64	$3.75

The monthly usage fee shall be as stated above per each 1,000 gallons of water usage above 4,000 gallons. This charge applies to wastewater that does not exceed the strength of normal domestic wastewater as defined in section 11.02.121 of this code.

- A user may separately meter usage of water that does not enter the sewer. Such separately metered water shall not be utilized in calculating wastewater fees.

- *Swimming pools* :

2016	2017	2018	2019	2020
$2.81	3.15	$3.54	$3.64	$3.75

Any user with a swimming pool will be charged as stated above per month for each swimming pool which discharges backwash waters or drainage water into the city's sanitary wastewater system.

Appendix D Water Conservation Plan 5 and 10 Year Goals for Water Savings

Water Conservation Plan Goals Table
TWDB Form No.1964
Revised 12/14/2012 1:53 PM

Texas Water Development Board

WATER CONSERVATION PLAN
5- AND 10-YR GOALS FOR WATER SAVINGS

Facility Name: COSA- Water Utilities

Water Conservation Plan Year: 2019

	Historic 5yr Average	Baseline	5-yr Goal for year 2024	10-yr Goal for year 2029
Total GPCD[1]	116	118	138	130
Residential GPCD[2]	68	69	68	65
Water Loss (GPCD)[3]	10	15	13	10
Water Loss (Percentage)[4]	9 %	13 %	9 %	8 %

1. Total GPCD = (Total Gallons in System ÷ Permanent Population) ÷ 365
2. Residential GPCD = (Gallons Used for Residential Use ÷ Residential Population) ÷ 365
3. Water Loss GPCD = (Total Water Loss ÷ Permanent Population) ÷ 365
4. Water Loss Percentage = (Total Water Loss ÷ Total Gallons in System) x 100; or (Water Loss GPCD ÷ Total GPCD) x 100

Due to future expected economic and population growth we kept the city's previous goal of water consumption reduction by 1.2 percent annually starting from the City's 2000 consumption of 185 gallons per capita per day (GPCD). We also took into account the possibility of future expansion of commercial industries, which increase population and water demand of Total GPCD while still reducing the residential GPCD and Water Loss GPCD over the next 10 years.

Appendix E Certificate of Convenience and Necessity

Public Utility Commission of Texas

By These Presents Be It Known To All That

CITY OF SAN ANGELO, TEXAS

having duly applied for certification to provide water utility service for the convenience and necessity of the public, and it having been determined by this Commission that the public convenience and necessity would in fact be advanced by the provision of such service by this Applicant, is entitled to and is hereby granted this

Certificate of Convenience and Necessity

numbered 10242 , to provide water utility service to that service area or those service areas designated by final Order or Orders duly entered by this Commission, which Order or Orders are on file at the Commission offices in Austin, Texas; and are matters of official record available for public inspection; and be it known further that these presents do evidence the authority and the duty of this Grantee to provide such utility service in accordance with the laws of this State and the Rules of this Commission, subject only to any power and responsibility of this Commission to revoke or amend this Certificate in whole or in part upon a subsequent showing that the public convenience and necessity would be better served thereby.

Issued at Austin, Texas, this 1st day of November, 1979.

Philip F. Ricketts
SECRETARY OF THE COMMISSION

APPENDIX G

City of San Angelo Drought Contingency Plan
(*pages 61-65 of City of San Angelo Water Conservation Plan*)

2019 WATER CONSERVATION PLAN

CITY OF SAN ANGELO WATER UTILITIES

SEPTEMBER 3, 2019

Water Utilities Department l 301 W. Beauregard Ave., San Angelo, 76903 l 325-657-4209

Drought Contingency Plan

Triggering a Drought Stage

Section 11.05 of the City of San Angelo Code of Ordinances contains provisions defining drought trigger stages and enforceable water management measures. When local reservoirs are below full but above drought condition levels, the local and non-local sources will be listed.

The required minimum daily groundwater production coupled with the total amount of surface water available, as determined by the Water Utilities Director, to the city from its developed water sources for drought level 1 is less than a 24-month supply, drought level 2 is less than 18-months, and drought level 3 is less than 12 months.

During drought conditions, the primary source of supply will be non-local sources, subject to the maximum amount available from each source, with the remaining amount of water coming from the local system or underground sources that the City may develop.

Whenever the total amount of water available to the City falls below the minimum criteria established for each Water Supply Stage Level, the City shall be deemed to have entered a Drought Stage for management of its water supplies.

In the event of a *water demand emergency*, the quantity of water usage from the city's water distribution system reaches a level that exceeds the amount which may be treated or safely delivered through the system, the Water Utilities Director shall notify the City Manager and the City Council of such an occurrence. The City Council shall be authorized to limit the use of water by the passage of a resolution outlining such limitations, which shall remain in effect until the water demand emergency can be met. Upon initiation of a water demand emergency, the Water Utilities Director shall provide notice to the Executive Director of the TCEQ and shall notify the news media.

In the event of a *water supply emergency*, a water system failure or emergency (i.e., pressure zone deficiencies, chemical spills, broken water mains, power outages, failures of storage tanks or other equipment, treatment plant breakdown and/or water contamination) which limits the amount of water which may be treated or safely delivered through the system, the Water Utilities Director shall notify the City Manager and City Council of such occurrence. The City Council shall be authorized to limit the use of water by the passage of a resolution outlining such limitations, which shall remain in effect until the water supply emergency can be met. Upon

initiation of a water supply emergency, the Water Utilities Director shall provide notice to the Executive Director of the TCEQ and shall notify the news media.

Water Supply Stages

Drought Level I.

- The minimum criteria for this drought stage shall be the following: The required minimum daily groundwater production coupled with the total amount of surface water available, as determined by the Water Utilities Director, to the city from its developed water sources is less than a 24-month supply.
- In addition to the conservation measures stated in section 11.05.002 of this article, the following additional water conservation measures shall be in force during Water Supply Stage - Drought Level I.
    - The use of treated or raw city water for watering lawns, gardens, landscaped areas, trees, shrubs, golf courses (except greens) or other plants being grown outdoors (not in a nursery) shall be prohibited at all times; provided, however, a person may do such watering which shall be once every seven days during the period of April 1 through October 31 and once every 14 days during the period of November 1 through March 31 except during the "prohibited watering hours" as stated in section 11.05.002.
    - Golf courses greens may be watered daily except during the "prohibited watering hours" as stated in section 11.05.002.
    - Watering of "new landscape" shall be allowed in accordance with the provisions as stated in section 11.05.002 for "new landscape."
- A multiplier shall be assessed to the volumetric water fees as set forth in section A8.002(a)(7) of this code.

Drought Level II

- The minimum criteria for this drought stage shall be the following: The required minimum daily groundwater production coupled with the total amount of surface water available, as determined by the Water Utilities Director, to the city from its developed water sources is less than an 18-month supply.

- In addition to the conservation measures stated in section 11.05.002 of this article, the following additional water conservation measures shall be in force during Water Supply Stage - Drought Level II:
    - The use of treated or raw city water for watering lawns, gardens, landscaped areas, trees, shrubs, golf courses (except greens) or other plants being grown outdoors (not in a nursery) shall be prohibited at all times; provided, however, a person may do such watering which shall be once every seven days during the period of April 1 through October 31 and once every 14 days during the period of November 1 through March 31 except during the "prohibited watering hours" as stated in section 11.05.002.
    - Golf course greens may be watered daily except during the "prohibited watering hours" as stated in section 11.05.002.
    - Watering of "new landscape" shall not be allowed as stated in section 11.05.002 for "new landscape."
- A multiplier shall be assessed to the volumetric water fees as set forth in section A8.002(a)(7) of this code.

Drought Level III

- The minimum criteria for this drought stage shall be the following: The required minimum daily groundwater production coupled with the total amount of surface water available, as determined by the Water Utilities Director, to the city from its developed water sources is less than a 12-month supply.
- In addition to the water conservation measures stated in section 11.05.002 of this article, the following water conservation measures shall be in force during Water Supply Stage - Drought Level III:
    - The use of treated or raw city water for watering of lawns, gardens, landscaped areas, golf courses (including greens), shrubs or other plants being grown outdoors is prohibited. Hand watering or drip irrigation of trees and foundations may be done on days and at times as established by the City Council.
    - The use of treated or raw city water to fill, refill or maintain the level of any fountain or swimming pool is prohibited.

- Washing of automobiles, trucks, trailers, boats, or other types of vehicles or mobile equipment is prohibited except, if the health, safety, and welfare of the public is contingent upon vehicle cleaning, as determined by the Director of City Health Services, then the washing of such vehicles shall be allowed.

- A multiplier shall be assessed to the volumetric water fees as set forth in section A8.002(a)(7) of this code.

Initiation and Termination Procedure

The Water Utilities Director shall notify the City Manager and City Council upon entering the threshold of a drought stage. The Council shall implement each stage by resolution. Such resolution shall be published one time in the local newspaper. The criteria for each stage and the water management measures which shall be enforced are listed in the Water Supply Stages section.

The Water Utilities Director for the City will act as the administrator of the water conservation and drought contingency plan. The administrator will oversee the execution and implementation of all elements of the program. The administrator will be responsible for supervising the promulgation and retention of adequate records for program verification.

The Water Conservation Plan will be maintained for the duration of the City's financial obligation to the Texas Water Development Board.

Targets and Goals

The San Angelo Drought Contingency Ordinance is designed to reduce water demand through the imposition of specific water use restrictions and the use of bill surcharges for customers depending upon the level of the reservoir system storage. At each successive condition, the water use reduction goals increase. More restrictive measures are mandated as reservoir storage decreases, the demand reduction measures are summarized in Drought Water Reduction Targets below.

Drought Water Reduction Targets

Level	Reservoir Storage Level	Target Demand Reduction
Level 1	24 months' supply	10%
Level 2	18 months' supply	15%
Level 3	12 months' supply	25%

Variance Procedures and Exceptions

Section 11.05.004 of the City code lays out the procedures for requesting and receiving a variance to the enforceable provision of Water Conservation and Drought Contingency Ordinance.

A person desiring an exemption from any provision of the restrictions must file a petition for a variance with the City Manager. All petitions for variances must be reviewed and acted upon by the City Council. The petition is required to contain certain specific information detailed by ordinance including alternative conservation measures implemented by the petitioner as a condition of receiving the variance. The City Council may also impose other requirements as a condition of granting the variance.

Enforcement and Wholesale Provisions

Section 11.05.002 of the ordinance provides for the Water Utilities Director of the City as the manager of the Water Conservation Plan.

Wholesale customers of the City are required to adopt applicable provisions of the City's Water Conservation and Drought Contingency Plan. Contracts for the sale of water already in effect will be revised to reflect the applicable provisions of the City's most current Water Conservation and Drought Contingency Plan when the contracts are renewed. Violations of the ordinance are misdemeanors under City code, and specific penalties are described in Section 11.05.006 of the code.

Informing and Educating the Public

The Water Utilities Director will provide reports to the news media with information regarding current water supply conditions, projected water supply, and demand conditions if the current drought conditions continue, and consumer information on water conservation measures and practices. Information describing each water supply stage trigger point and drought level restrictions on water use shall be prepared and published on the City's website.

LIST OF ATTACHMENTS

CITY OF SAN ANGELO APPLICATION FOR AUTHORIZATION TO CONVEY, DIVERT, AND REUSE NEW DISCHARGES INTO A WATERCOURSE

1 Resolution 2020-071; Resolution of the City of San Angelo, Texas Authorizing Daniel Valenzuela to Sign All Applications Related to Water Rights Permitting With the TCEQ

2 February 10, 2005 Special Warranty Deed

3 City of San Angelo Water Supply Facilities and Services Contract

ATTACHMENT 1

Resolution 2020-071
Resolution of the City of San Angelo, Texas Authorizing Daniel Valenzuela to Sign All Applications Related to Water Rights Permitting With the TCEQ

RESOLUTION 2020-071

RESOLUTION OF THE CITY OF SAN ANGELO, TEXAS AUTHORIZING DANIEL VALENZUELA TO SIGN ALL APPLICATIONS RELATED TO WATER RIGHTS PERMITTING WITH THE TCEQ

WHEREAS, as part of the City of San Angelo's continuing efforts to utilize and maximize the beneficial use and reuse of its existing water resources, and to develop additional water supplies, the City finds it necessary from time to time to seek regulatory approvals through water rights permitting and other water use permitting and permitting amendments from the Texas Commission on Environmental Quality and other political subdivisions of the State of Texas having jurisdiction; and

WHEREAS, title 30, Section 294.14(5) of the Texas Administrative Code requires that applications to the Texas Commission on Environmental Quality involving certain water rights permitting and other water use permitting and permitting amendments be signed by a duly authorized official of the City of San Angelo; and

WHEREAS, in certain instances the City of San Angelo is required to provide written evidence of that authorization of signature; and

WHEREAS, the City Council of the City of San Angelo intends to grant Daniel Valenzuela, as the City Manager of the City of San Angelo, full authority to sign all documents and take all such other necessary action related to water rights permitting and other water use permitting and permitting amendments, as well as all other regulatory matters involving the City of San Angelo's water resources.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SAN ANGELO, TEXAS:

That Daniel Valenzuela, as the City Manager for the City of San Angelo, is delegated full authority to sign all documents and take all such other necessary action related to water rights permitting and other water use permitting and permitting amendments, as well as all other regulatory matters involving the City of San Angelo's water resources, as required by title 30, Section 295.14(5) of the Texas Administrative Code.

ADOPTED this the 4th day of August, 2020.

THE CITY OF SAN ANGELO, TEXAS:

DocuSigned by:

Mayor Gunter

Brenda Gunter, Mayor

ATTEST:

DocuSigned by:

Julia Antilley, City Clerk

APPROVED AS TO FORM:

DocuSigned by:

Theresa James

Theresa James, City Attorney

ATTACHMENT 2

February 10, 2005 Special Warranty Deed

(310.12 AC) · GERMAN EMMIGRATION SUR. 351-353
W. NICHOLAS SUR. 352 ½

1177/493 OPR

585468

NOTICE OF CONFIDENTIALITY RIGHTS: IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OF THE FOLLOWING INFORMATION FROM THIS INSTRUMENT BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

SPECIAL WARRANTY DEED

Date: February 10, 2005

Grantor: JUANITA WILLIAMS HALE, Trustee of the Shelter Trust under the Will of J. ELDON WILLIAMS, dated March 11, 1994

Grantor's Mailing Address: 1722 Parkview Drive, San Angelo, Texas 76904

Grantee: CITY OF SAN ANGELO

Grantee's Mailing Address: P.O. Box 1751, San Angelo, Texas 76902

Consideration: Cash and other valuable consideration

Property (including any improvements): Being 310.12 acres of land out of German Emigration Co. Survey 351, Abstract 314; Section 352, Abstract 315; Section 353, Abstract 303; and W. Nicholas Survey 352 ½, Abstract 7949 all in Tom Green County, Texas, described more particularly in Exhibit "A" attached hereto, together with:

135 acre feet per annum of Concho River water as described in (a) Certificate of Adjudication No. 14-1348, entered in Cause No. 44,900-A of the 51st District Court of Tom Green County, Texas recorded in Volume 2, Page 47, of the Water Permit Records of Tom Green County, Texas, which is to be used to irrigate a maximum of 106 acres of land out of the following described property: Being a total of 309.04 acres of land in Tom Green County described as: 330.7 acres of land, more or less, out of the German Emigration Co. Survey, Section 351, Abstract 314; Section 352, Abstract 315; Section 353, Abstract 303; and Section 352 ½, Abstract 7949, W.N. Nichols Survey, being more particularly described in Volume 224, Page 620 of the Deed Records of Tom Green County, Texas; SAVE AND EXCEPT 21.66 acres, more or less, being more particularly described in Volume 613, Page 149 of the Deed Records of Tom Green County, Texas.

Exceptions:

1. Discrepancies, conflicts, or shortages in area or boundary lines, or any encroachments or protrusions, or any overlapping of improvements.

2. Standby fees, taxes and assessments by any taxing authority for the year 2005, and subsequent years, and subsequent taxes and assessments by any taxing authority for prior years due to change in land usage or ownership, but not those taxes or assessments for prior years because of an exemption granted to a previous owner of the property under Section 11.13, *Texas Tax Code*, or because of improvements not assessed for a previous tax year.

3. Appropriation Affidavit and Map executed by W. T. Campbell as agent and tenant for Joseph Moulin, dated June 27, 1914, and recorded in Volume 75, Page 62 of the Deed Records of Tom Green County, Texas.

4. Water Permit issued by the Board of Water Engineers to San Angelo Water Supply Corporation, dated February 3, 1960, and recorded in Volume 1, Page 73 of the Water Control Records of Tom Green County, Texas.

5. Terms and conditions in Certificate of Adjudication by the Texas Water Commission in favor of J. Eldon Williams, dated March 12, 1980, and recorded in Volume 2, Page 47 of the Water Permit Records of Tom Green County, Texas.

6. Easement for Right of Way executed by J. Eldon Williams to the Colorado Municipal Water District, dated March 11, 1992, granting a 60 foot easement for a water transportation pipeline, recorded in Volume 369, Page 529 of the Official Public Records of Real Property of Tom Green County, Texas.

7. 160 foot wide easement for electric transmission lines and telecommunications lines executed by Juanita Williams Hale as Trustee of the Lois Bradford Williams Shelter Trust in favor of the Lower Colorado River Authority, dated March 10, 2001, and recorded in Volume 876, Page 297 of the Official Public Records of Real Property of Tom Green County, Texas.

8. 160 foot wide easement for electric transmission lines and telecommunications lines executed by Juanita Williams Hale as Trustee of the Lois Bradford Williams Shelter Trust in favor of LCRA Transmission Services Corporation, dated February 20, 2002, and recorded in Volume 899, Page 896 of the Official Public Records of Real Property of Tom Green County, Texas.

9. Absence of water within the Concho River.

Grantor, for the Consideration and subject to the Exceptions, grants, sells, and conveys to Grantee the Property, together with all and singular the rights and appurtenances thereto in any way belonging, to have and to hold it to Grantee and Grantee's successors and assigns forever. Grantor binds Grantor and Grantor's successors to warrant and forever defend all and singular the Property to Grantee and Grantee's successors and assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof, except as to the Exceptions, when the claim is made by, through, or under Grantor, but not otherwise.

In this deed,"including" means "including, without limitation."

Juanita Williams Hale

JUANITA WILLIAMS HALE, Trustee of the Shelter Trust under the Will of J. ELDON WILLIAMS, dated March 11, 1994

THE STATE OF TEXAS
COUNTY OF TOM GREEN

This instrument was acknowledged before me on February 11, 2005, by JUANITA WILLIAMS HALE, as Trustee of the Shelter Trust under the Will of J. ELDON WILLIAMS, dated March 11, 1994.

(Notary stamp)

J. NATHAN CLARK
Notary Public
STATE OF TEXAS
My Commission
Expires 11/09/2006

Nathan Clark

Notary Public, State of Texas

F:\WP\CLIENTS\7715.sfj\Special Warranty Deed.wpd 2-8-2005 SFJ:pc

EXHIBIT A

WILSON LAND SURVEYING, INC.

LICENSED STATE & REGISTERED PROFESSIONAL LAND SURVEYORS
PHONE 325/653-3916 * FAX 325/655-1895
P.O. BOX 3326-ZIP 76902
1514 W. BEAUREGARD AVE.

WM. C. WILSON, JR.
R.P.L.S., L.S.L.S.

SAN ANGELO, TEXAS 76901

THOMAS J. HOUSTON
R.P.L.S., L.S.L.S.,
B.S.S

Williams
to
City of San Angelo

Description
310.12 Acres

Being 310.12 acres of land out of German Emigration Survey 351, Abstract 314; Survey 352, Abstract 315; Survey 353, Abstract 303; and W. Nicholas Survey 352 1/2, Abstract 7949 all in Tom Green County, Texas and also being part of that "330.7 Ac." tract described in Deed from Mrs. Carrie Williams, et al to J. Eldon Williams dated January 3, 1944 and recorded in Volume 224 at page 620 of the Deed Records of Tom Green County, Texas. Said 310.12 acres being described by metes and bounds as follows:

Beginning at a point in or near the centerline of Douglas Loop for the N.E. corner of said "330.7 Ac." tract and the N.E. corner of this tract from which a 5/8" iron rod with plastic cap marked "RPLS 4261" set on the North side of a corner post bears S.0°37'48"E. 20.88 feet.

Thence with the East line of said "330.7 Ac." tract and along or near a fence on the West side of Chandler Road, S.0°37'48"E. 1201.09 feet to a 1" iron pipe found on the N.W. side of a corner post for a S.E. corner of said "330.7 Ac." tract and the N.E. corner of Lot 31, Concho East Estates Subdivision as recorded in Cabinet B at Slide 115 of the Plat Records of Tom Green County, Texas.

Thence with a South line of said "330.7 Ac." tract, a North line of said Concho East Estates Subdivision and along or near a fence, N.88°39'09"W. 1258.37 feet to a 5/8" iron rod with plastic cap marked "RPLS 4261" set in the position of a bent 1" iron pipe found for the N.W. corner of said subdivision and an ell corner of said "330.7 Ac." tract.

Thence with an East line of said "330.7 Ac." tract, the West line of said subdivision and along or near a fence, S.0°20'25"W., at 1474.75 feet a found 1" iron pipe, at 3184.80 feet a found 1" iron pipe, in all 4563.49 feet to a point on the North bank of the Concho River for the S.E. corner of said "330.7 Ac." tract and the S.E. corner of this tract.

Thence with said North bank of the Concho River and its meanders, S.39°48'37"W. 50.86 feet; S.34°42'13"W. 260.30 feet; S.36°09'03"W. 171.38 feet; S.27°09'31"W. 264.86 feet; S.28°48'30"W. 228.23 feet; S.12°39'12"W. 113.32 feet;

N.87°46'14"E. 12.00 feet; S.1°07'51"W. 33.83 feet;
S.12°12'35"E. 166.47 feet; S.26°18'10"W. 91.97 feet;
S.73°39'51"W. 277.24 feet; N.65°27'58"W. 142.08 feet;
N.66°03'50"W. 315.05 feet; N.68°48'30"W. 255.04 feet;
N.63°01'50"W. 311.34 feet; N.77°56'11"W. 148.64 feet;
S.87°57'34"W. 157.78 feet; N.39°36'48"W. 153.81 feet;
N.4°53'39"W. 154.09 feet; N.73°10'18"E. 66.70 feet;
N.4°56'22"E. 88.35 feet; N.37°03'33"W. 68.72 feet;
N.62°48'59"W. 118.63 feet; N.73°02'22"W. 233.89 feet;
N.78°09'51"W. 213.01 feet; and S.84°13'25"W. 317.82 feet to a point for the S.W. corner of said "330.7 Ac." tract, the S.W. corner of this tract and a S.E. corner of that "260.8 Ac." tract described in Deed from John Carl McGlothin to Wilma Faye Crownover dated July 1, 1987 and recorded in Volume 34 at page 290 of the Official Public Records of Real Property of Tom Green County, Texas.

Thence with a common line between said "330.7 Ac." and "260.8 Ac." tracts, N.0°30'56"E. 87.04 feet to a point for corner from which a 3/8" spike set at a corner post bears N.58°30'46"W. 9.05 feet and continuing N.80°30'56"E. 124.45 feet to a point for corner.

Thence continuing with said common line between said "330.7 Ac." and "260.8 Ac." tracts, N.55°59'56"E., at 38.24 feet a 3/8" spike set at corner post and continuing along or near a fence, a total distance of 1054.17 feet to a fence angle post.

Thence continuing with said common line between said "330.7 Ac." and "260.8 Ac." tracts and along or near a fence, N.87°19'33"E. 203.45 feet and N.0°19'35"E. 571.73 feet to a found 4" iron pipe corner post.

Thence continuing with said common line between said "330.7 Ac." and "260.8 Ac." tracts and along or near a fence, N.73°37'03"W. 113.82 feet to a 4" iron pipe corner post, N.0°09'57"W. 2403.72 feet to a 4" iron pipe corner post, S.75°21'41"W 309.75 feet to a 3" iron pipe corner post and N.0°42'07"W. 1113.89 feet to a point for a N.W. corner of said "330.7 Ac." tract and a N.E. corner of said "260.8 Ac." tract from which a 5/8" iron rod with plastic cap marked "RPLS 4261" set on the North side of a fence corner post on the South side of Douglas Loop bears N.0°42'07"W. 14.01 feet.

Thence with a North line of said "330.7 Ac." tract, S.89°42'07"E. 210.23 feet to a point for corner.

Thence along or near the South line of Douglas Loop, S.85°53'36"E. 448.67 feet to a 5/8" iron rod with plastic cap marked "RPLS 4261" set on the South side of a corner post.

Thence along or near a fence on the East side of Douglas Loop, N.3°09'45"E. 186.55 feet to a 3" iron pipe corner post found in the South line of that "21.66 Ac." tract described in Deed from J. Eldon Williams, et ux to A & B Farm dated April 12, 1974 and recorded in Volume 613 at page 149 of said Deed Records from which

a point for the S.W. corner of said "21.66 Ac." tract bears N.89°18'13"W. 18.99 feet.

Thence with the South line of said "21.66 Ac." tract and along or near a fence, S.89°18'13"E. 627.12 feet to a 3" iron pipe corner post found for the fenced S.E. corner of said "21.66 Ac." tract.

Thence with the fenced East line of said "21.66 Ac." tract, N.11°46'07"E. 582.61 feet to a 3" iron pipe corner post, N.59°39'11"E. 306.47 feet to a 3" iron pipe corner post and N.8°18'23"E., at 397.90 feet a 5/8" rebar found at a corner post on the South side of Douglas Loop, at total distance of 420.12 feet to a point in Douglas Loop in the North line of said "330.7 Ac." tract for the N.E. corner of said "21.66 Ac." tract and a N.W. corner of this tract.

Thence with the North line of said "330.7 Ac." tract and near the center of Douglas Loop, S.89°18'19"E. 1726.93 feet to the place of beginning and containing 310.12 acres of land including 0.87 acre in Douglas Loop.

NOTE: Courses and distances recited herein are of the Texas Coordinate System of 1927 - Central Zone.

Surveyed on the ground January 11 thru 21, 2005.

Thomas J. Houston
Registered Professional Land Surveyor No. 4261

ALSO SEE ACCOMPANYING DESCRIPTIONS AND PLAT (850/31)

D:\WP51\WORK\WMSCA.DOC

Exhibit A

FILED FOR RECORD
2005 FEB 14 PM 1:04
ELIZABETH MCGILL
COUNTY CLERK
COUNTY OF TOM GREEN, TEXAS

STATE OF TEXAS }
COUNTY OF TOM GREEN }
I hereby certify that this instrument was FILED in File Number Sequence on the date and at the time stamped hereon by me, and was duly RECORDED in the Official Public Records of Real Property of Tom Green County, Texas on
FEB 16 2005

ELIZABETH MCGILL COUNTY CLERK
TOM GREEN COUNTY, TEXAS

ATTACHMENT 3

City of San Angelo Water Supply Facilities and Services Contract

CITY OF SAN ANGELO
WATER SUPPLY FACILITIES AND SERVICES CONTRACT

THE STATE OF TEXAS :

COLORADO RIVER MUNICIPAL WATER DISTRICT :

THIS CONTRACT (hereinafter called "Contract") made an entered into as of the 1st day of SEPTEMBER, 1985, between t COLORADO RIVER MUNICIPAL WATER DISTRICT (hereinafter calle "District") a political subdivision of the State of Texas, being a conservation and reclamation district created and functioning pursuant to Chapter 340, Acts of the Regular Session of the 51st Legislature, 1949, as amended (the "Dis trict Act"), pursuant to Article XVI, Section 59, of the Constitution of the State of Texas and the CITY OF SAN ANGEL TEXAS (hereinafter called "City") a political subdivision o the State of Texas in Tom Green County, Texas, operating und its Home Rule Charter and the Constitution and laws of the State of Texas.

W I T N E S S E T H:

WHEREAS, the District on October 11, 1977, filed with t Texas Department of Water Resources, an application for a permit to construct a dam and reservoir on the Colorado Rive and impound water behind said dam in Coleman, Concho, and Runnels Counties, Texas, said reservoir being commonly referr to as the Stacy Reservoir; and

WHEREAS, the dam is proposed to be built across the Colorado River downstream from the confluence of the Concho River with the Colorado River; and

WHEREAS, the Texas Water Commission did issue to the District a permit on June 26, 1979, authorizing the construc tion of said dam and Stacy Reservoir; and

and brought about the necessity of the District filing an application for a new permit with the Texas Department of Water Resources in March of 1985; and

WHEREAS, the Texas Water Commission on April 23, 1985, did reconsider the action it had previously taken in 1979; and

WHEREAS, the Texas Water Commission issued a permit to the District on May 14, 1985, which permit has not been contested and now constitutes a valid authority to proceed with the construction of the Stacy Reservoir; and

WHEREAS, City has evidenced its strong desire to obtain water from Stacy Reservoir in quantities hereinafter set forth; and

WHEREAS, District is willing to make available to City water up to 15,001.78 acre-feet annually out of Stacy Reservoir, subject to the terms, conditions, and limitations hereafter contained; and

WHEREAS, the District requested and has received approval of this Contract from the Texas Department of Water Resources; and

WHEREAS, it is recognized by the parties hereto that District will use this Contract as a basis for obtaining credit and as a means for the payment and security of bonds sold for the purpose of paying for the costs and expenses directly related to Stacy Reservoir; and

WHEREAS, the District and the City are authorized to enter into this Contract pursuant to the District Act, Vernon's Ann. Tex. Civ. St. Art. 4413(32c), and other applicable laws.

NOW, THEREFORE, in consideration of the mutual covenants and agreements contained here, District agrees to provide to the City certain water supply facilities and services of Stacy Reservoir, and City agrees to make payments to the District in consideration therefor, upon the terms and conditions herein set forth to-wit:

Section 1. QUANTITY.

Subject only to Sections 8, 9, 11, and 12, and all other applicable provisions hereof, District agrees that the City shall have the right to take and withdraw from Stacy Reservoir, at the point of delivery herein specified, a certain quantity of water which is hereby defined and designated as the "Contract Quantity" as follows:

(a) The Contract Quantity, beginning on the effective date of this Contract and extending throughout the useful life of the Stacy Reservoir, shall be 4,888,345,000 gallons (15,001.78 acre-feet) per year except as it may be modified as hereinafter described, and provided that the Contract Quantity in any year shall never exceed in any year 16.54% of the "safe yield" of the Stacy Reservoir as defined below. The Contract Quantity of 4,888,345,000 gallons per year is 16.54% of the "safe yield" of the Stacy Reservoir (90,700 acre-feet), and has been calculated by the District's consulting engineers in accordance with the following definition of the term "safe yield":

> The "safe yield" of a reservoir is defined as being the quantity of water that can be withdrawn from a reservoir on an annual basis, during a repeat of the drought of record, assuming that the reservoir is at maximum conservation level at the beginning of year one and diverting monthly a designated quantity of water from the reservoir for a period of time equal to the number of months in the drought of record, at which point in time, the reservoir would contain a one-year supply and at the same point in time, the reservoir would commence refilling.

(b) Water up to the Contract Quantity, except as otherwise provided herein, may be withdrawn from Stacy Reservoir by City at any rate of withdrawal City may desire, subject to the availability of water and the maximum capacity of City's facilities for diverting and transporting water from Stacy Reservoir; however, if at such times as City has taken its Contract Quantity for any calendar year and desires additional water within the same calendar year, District may, at its option, specify any quantity of water City may divert during the remaining days of the calendar year, subject to Section 8(e) below.

(c) The consideration to be paid by City to District for the Contract Quantity and any water in excess thereof withdrawn from the Stacy Reservoir by City pursuant to this Section 1, shall be determined in accordance with Section 8 of this Contract.

Section 2. QUALITY.

District shall not be obligated to treat in any manner any water made available by District and received by City hereunder. City has satisfied itself that such water will be suited for all of City's municipal and domestic needs. Specifically, it is understood that the water delivered hereunder will require treatment in a water treatment plant or plants owned and operated by City. District does not guarantee quality of water made available hereunder. Water impounded in the Stacy Reservoir shall be surface runoff water of the drainage area of the Colorado River and its tributaries.

Section 3. POINT OF DELIVERY.

Water will be made available to City at a point in the Stacy Reservoir adjacent to a point on the shoreline of said reservoir, said shoreline point being N. 80° 50' W., 4,920' from the N.E. corner of the M. Sander Survey No. 200, Abstract A-749, and being in Concho County, Texas, or at any other point in Stacy Reservoir that will be mutually acceptable to both parties to this Contract. City may construct, or cause to be constructed, whatever facilities it may deem necessary at the point of delivery and/or cause to be constructed any supply line facilities over and across land owned by District in order to convey and transport City's water from the point of delivery to the City's treatment plant or plants; however, District is not required to acquire land solely for such purpose.

Section 4. PUMP STATION SITES AND PIPELINE RIGHTS-OF-WAY. In consideration of City's payments to be made hereafter District hereby further grants to City the right to use and occupy lands owned by the District, if any, immediately

adjacent to the Stacy Reservoir, for the purpose of constructing a pump station and laying pipelines for transporting water from Stacy Reservoir. Also, City will be granted and conveyed the right to all reasonable and necessary easements and rights-of-way across District land for the purpose of constructing, installing, maintaining, repairing, and operating thereon a pump station and related pipelines, equipment, and facilities necessary for withdrawing the City's water from Stacy Reservoir. District further agrees to grant and convey to City or to any private or public agency designated by City (provided that such agency is acceptable to District) all reasonable and necessary easements and rights-of-way across District land for the purpose of constructing, installing, maintaining, repairing, replacing, and operating a pipeline for the transporting of City's water withdrawn by City from the Stacy Reservoir. The location of such pipeline easements and rights-of-way shall be determined by agreement of the parties.

Section 5. RESERVOIR WATER LEVEL.

The water level of the Stacy Reservoir will fluctuate from time to time depending upon the inflow of water into said reservoir, any releases that may be required by federal or state agencies, the amount of water diverted by pumping, the amount diverted through evaporation, and the implementation of the release schedule as contained in the "Settlement Agreement" between the District and the Lower Colorado River Authority, a copy of which is attached hereto and identified as Exhibit "A". The conservation level of the Stacy Reservoir is 1551.50 feet above mean sea level and at that elevation, there shall be impounded in the reservoir 554,340 acre-feet. The elevation of the emergency spillway is 1563.00 feet above msl. The District will prohibit construction of permanent facilities by the public below elevation 1567.00 and it is recommended that City not contemplate constructing anything below elevation 1567 that may suffer damage in the event the reservoir level rises to

that elevation. The reservoir can be expected to attain elevation 1577.60 in the event the reservoir is full and at which time, the probable maximum flood occurs. The City should maintain this uppermost in its mind when constructing facilities to divert and transport water from the Stacy Reservoir and satisfy itself that facilities constructed by it below the elevation 1577.60 will not suffer material damage in the event of flooding. District does not guarantee that the Contract Quantity, as set forth in Section 1 above, will be available at any point in time nor that water will be at any particular elevation at any given time.

Section 6. MEASURING EQUIPMENT.

District shall furnish, install, operate, and maintain at its own expense at the point of delivery, the necessary equipment and devices of standard type for measuring properly the quantity of water delivered under this Contract. Such meter or meters shall be installed on the discharge side of City pumps installed at the point of delivery. Such meter or meters and other equipment so installed shall remain the property of District. City shall have access to such metering equipment at all reasonable times, but the calibrating and adjustments thereof shall be done only by employees or agents of District. For the purpose of this Contract the original record or reading of the meter or meters shall be the journal or other record book of the District in its office in which the records of the employees or agents of District who take the readings are or may be transcribed. Upon request of City, District will give City a copy of such journal or record book, or permit City to have access to same in the office of District during reasonable business hours.

Not more than three times a year District shall calibrate its meters, the expense of such calibration to be borne by the District, if requested in writing by City to do so, in the presence of a representative of City, and the parties jointly

shall observe any adjustments which are made to the meters in case any adjustments shall be necessary. If City in writing shall request District to calibrate its meters, District shall give City notice of the time when any such calibration is to be made. If a representative of City is not present at the time set, District may proceed with calibration and adjustment in the absence of any representative of City.

If City requests the meters be calibrated more often than the three times in any year, as hereinabove permitted, District shall comply, but should the calibration prove the meter or meters are functioning correctly and are within the accuracy as set out below, City shall reimburse District for its expenses incurred in performing the calibration. If the calibration proves the meter or meters to be inaccurate in excess of the two percent (2%) hereinbelow set out, the expense of such calibration shall be borne by District.

If upon any test, the percentage of inaccuracy of any metering equipment is found to be in excess of two percent (2%), the 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 (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 cannot be ascertainable 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 parties hereto 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, (1) by correcting the error if the percentage of

the error is ascertainable by calibration test or mathematical calculation, or (2) estimating the quantify of delivery or deliveries during the preceding period under similar conditions when the meter or meters were registering accurately.

City may, at its own expense, install and operate a check meter, which shall remain the property of the City, to check each meter installed by District, but the measurement of water for the purpose of this Contract 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 City, 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 have been furnished or installed by District.

Section 7. UNIT MEASUREMENT.

The unit of measurement for water delivered hereunder shall be 1,000 gallons of water, U. S. Standard Liquid Measure.

Section 8. PRICE AND TERMS.

(a) It is anticipated that the District will finance the cost of the Stacy Reservoir Project with money derived from the sale of revenue bonds, and the District will use its best efforts to issue and sell such bonds, to be issued in one or more series or installments as determined by the District. The term "bonds" as used in this Contract shall mean all bonds hereafter issued, sold, and delivered, and the interest and any redemption premium thereon, by the District to acquire, construct, complete, or improve the Stacy Reservoir Project, and any bonds issued to refund any of such bonds or to refund any such refunding bonds. Bonds will be issued by the District in

amounts sufficient to pay all costs of the Stacy Reservoir Project. The bonds will in all probability be retired over a 30-year period. The principal amount of the bonds as well as the interest rates to be paid thereon is not known at this time. The District shall be the sole judge as to the principal amount of the bonds, the time for issuing the bonds, the interest rates to be paid thereon, the terms and conditions thereof, and the period of time in which the bonds will be retired. It is recognized by the parties hereto that the construction of the Stacy Reservoir Project is contingent upon the ability of the District to issue and sell bonds in amounts sufficient for such purpose. The cost of the Stacy Reservoir Project, shall include, but not be limited to, the cost of pre-construction expenses as set out more fully in (g) of this Section 8, the cost of all construction work, including the dam and spillway structures, all engineering and legal expenses, the lands and rights-of-way required for the dam and reservoir basin, lands and rights-of-way required for public use, the cost of adjusting conflicts (such as highways, roads, pipelines, electric and telephone lines, cemeteries, archaeological investigations, and mitigation for any damages the reservoir may cause to the environment), and the costs and expenses of issuing the bonds. The bonds also will be issued in sufficient amounts to fund a debt service reserve fund for the bonds. In consideration of the District's undertaking to construct the Stacy Reservoir and making available to the City the Contract Quantity as set forth in Section 1 hereof, the City agrees to pay to the District semiannually, on or before the 20th day of June and on or before the 20th day of December of each year, a sum equal to 16.54% of the amount of the interest accruing and being payable on the bonds on each July 1 and January 1; and, further, City agrees to pay on or before the 20th day of December annually, a sum equal to 16.54% of the principal amount of the bonds maturing and coming due on each January 1

during the life of the bonds. In the event the principal and interest payment due dates differ from January 1 and July 1 annually, the City will pay the appropriate amount on or before the 10th day preceding the dates principal and interest payments are due.

Immediately following each sale of any bonds to finance the Stacy Reservoir Project, the District will submit to the City a debt service schedule for such bonds which will include the annual principal and interest payments and the dates upon which they are due.

Notwithstanding the foregoing, if any surplus proceeds from the sale of the bonds should remain on hand in the Construction Fund established for the Stacy Reservoir Project (i) after the completion of the Stacy Reservoir Project, or (ii) if, for any reason (although none presently is expected), it becomes impracticable for the District to continue or complete the Stacy Reservoir Project, and it is abandoned, then in either case the District shall apply such surplus bond proceeds as soon as practicable to the payment of interest on and/or principal of the bonds, and the amounts so applied shall, for the purposes of this Contract, be deemed to reduce the amount of interest payable on the bonds to the extent applied to interest, and to reduce the amount of principal maturing to the extent applied to principal.

It is further agreed that each semiannual amount which the City is required by this Contract to pay to the District for interest accruing and being payable on the bonds shall be credited and reduced by an amount equal to 16.54% of the estimated investment earnings (for the six-month period ending on the last day of the month during which the payment was due) attributable to that part of the District's debt service reserve fund which was funded from proceeds from the sale of Stacy Reservoir Project bonds. The District shall estimate such investment earnings for the applicable six-month period

and advise the City of the amount thereof on or before the 10th day of the month during which the payment is due, and any difference between such estimate and the actual earnings shall be adjusted as soon as practicable.

It is further agreed that none of the principal and interest on the bonds which is paid at their maturity or redemption from the part of the District's debt service reserve fund which was funded from proceeds from the sale of Stacy Reservoir Project bonds shall be deemed to be principal or interest accruing or maturing on the bonds for the purpose of calculating the City's payments under this Section.

(b) In addition to payments by the City to the District as set forth in Subsection (a) of this Section 8, City shall pay its pro rata share (16.54%) of the District's annual cost of the administrative and maintenance expenses related to the Stacy Reservoir. District will, on or before November 1 each year, prepare an Annual Budget covering the District's anticipated expenses for the ensuing calendar year. Immediately following the adoption of the Budget by the District's Board of Directors, a copy of the Budget will be furnished the City. On or before February 1 of each year, City will pay to District fifty percent (50%) of City's share of the amount budgeted for the administrative and maintenance expenses of Stacy Reservoir. On or before February 1 of the following year, after having determined the actual cost of the administrative and maintenance expenses of the Stacy Reservoir for the preceding year as reflected in the December 31 Financial Statement prepared by the District, District will bill City for the balance of its pro rata share of such expenses. The pro rata cost of administrative expenses for the Stacy Reservoir shall be calculated based on the operation and maintenance expenses of the Stacy Reservoir (excluding all Stacy recreational expenses) as such bears to the total operation, maintenance, and recreation expenses of the District's entire system (including

recreational expenses at Stacy Reservoir), but excluding all pump station and well field electric power expenses. The percentage factor as computed above will then be applied to the District's annual administrative expenses to determine the amount of administrative expenses that will be chargeable to the Stacy Reservoir. The cost of operating and maintaining recreation facilities at Stacy Reservoir will not be included in the operation and maintenance expenses billed to City.

(c) Capital improvements and non-recurring maintenance expenses required to maintain the Stacy Reservoir and/or to enhance the quality of the water impounded in the Stacy Reservoir, if such is deemed desirable by the District, may be financed and paid for by the District by the issuance of additional bonds as hereinbefore defined, or may be financed from money the District otherwise has available. City shall pay to the District City's pro rata share (16.54%) of the principal amount of such bonds and the interest the District is required to pay on any such bonds when due. In the event District pays for such capital expenditures, non-recurring maintenance expenses, and/or water quality enhancement expenses from money accumulated by District in its designated accounts, City shall pay District its share (16.54%) of said expenditures and expenses, plus interest equal to the interest being paid on 364-day U. S. Treasury Bills as of January 1 preceding the time that such expenditures or expenses have been incurred. City will pay District for its share of such expenditures and expenses contained in this Subsection (c) beginning immediately after such expenditures or expenses have been incurred, and for a term of years to be agreed upon by District and City. Such term shall not be of such duration as to work an undue hardship on the City.

(d) Once all bonds that the District sold to finance the cost of the Stacy Reservoir Project, and any refunding bonds relating thereto, have been retired, the only payments City

shall make to the District in return for its continued right to divert water from the Stacy Reservoir will be the expenses as are set forth in (b) and (c) of this Section 8 and payment shall be made in the same manner as is set forth there.

(e) In the event City requests the right to divert water in excess of its Contract Quantity in any calendar year, District will consider such request and if, in the opinion of the District, water surplus to the District's needs is available in the Stacy Reservoir, District may elect to make water available to City up to the quality of surplus water the District has available in the Stacy Reservoir. City agrees that during any year it will not purchase any water from any other party which has the right to divert water from Stacy Reservoir unless and until such time as City has first requested to purchase surplus water from District and District elects not to grant such request.

In the event City requests the right from the District and/or a third party to divert water surplus to the needs of District and/or third party, and City is granted such request, City shall maintain accurate records as to the quantity of surplus water City diverts from the District and/or third party, in order that the total amount of surplus water City diverts when added to the amount the District and/or third party diverts during the same calendar year, shall not exceed the total quantity of water District and/or third party are entitled to annually. District will have the right to examine any and all records City will maintain to determine the quantity of water diverted by City from the Stacy Reservoir.

In the event City requests the District to make available to City water surplus to the needs of the District and District honors such request, City shall pay District, for all of District's surplus water diverted by City, on or before the 15th day of the month following such diversion, a sum equal to the cost per thousand gallons calculated by the District to be

the District's cost per thousand gallons for all water impounded in the Stacy Reservoir which the District has the right to divert during the year such sale by District to City takes place. In arriving at the District's cost per thousand gallons, the District shall take into account its share of the debt service requirements it will pay that calendar year on any outstanding Stacy Reservoir bonds, plus its share of the administrative and operation and maintenance expenses of Stacy Reservoir, plus its share of the cost of any capital expenditures, non-recurring maintenance expenses and/or any water quality enhancement expenses of Stacy Reservoir, but excluding the percentage of such requirements and expenses paid by other parties which have the right to divert water from Stacy Reservoir.

(f) All payments by City to District as set forth hereinabove, except those payments due in accordance with Subsection (e) of this Section 8, shall be payable on the designated date regardless of whether or not City diverts in any calendar year any or all of its Contract Quantity.

(g) Prior to the sale of bonds to finance the construction of the Stacy Reservoir Project, the District will have expended funds to cover the cost of various and sundry expenses relative to the Stacy Reservoir Project. Such expenses included, but were not limited to, the cost of obtaining the permit from the Texas Department of Water Resources, the cost of a model and an engineering report covering the service spillway, engineering and legal expenses, the cost of a surface archaeological survey of the reservoir basin, certain geotechnical investigation expenses, as well as administrative expenses, including travel, and the loss of income the District would have derived from the expended funds had the funds been invested. These pre-construction expenses, including the loss of interest on money that has been directed toward the building of the Stacy Reservoir Project as of August 1, 1985,

amounted to $2,653,947.81. City agrees that within 30 days following the execution of this Contract, it will pay to District a sum equal to 16.54% of the amount stated immediately above. City further agrees that it will pay its 16.54% share of any money the District spends monthly toward the construction of the Stacy Reservoir Project between August 1, 1985, and the date that money is available from the sale of bonds to finance the cost of the Stacy Reservoir Project. District will bill City monthly for City's share and City will remit within 10 days following receipt of statement from District.

District will make available upon City's request its ledgers and other financial records during normal business hours, in order that City may satisfy itself that charges made to City are real and just.

(h) In the event City fails to make any payment required to be made to District under this Contract, within the time specified herein, interest on the total amount due shall accrue at the rate of interest that was being paid on 90-day U. S. Treasury Bills as of January 1 immediately past, until paid in full with interest as above specified, provided that such rate shall never be usurious or exceed the maximum rate permitted by law. In the event any such payment is not made within sixty (60) days from the date such payment became due, District may, at its option, and unless prohibited by law, discontinue the availability of the facilities and services of the Stacy Reservoir to the City, and terminate the right of the City to divert water therefrom until the amount then due District is paid in full with interest as above specified.

Section 9. FACTORS THAT MAY INFLUENCE THE CONTRACT QUANTITY.

When the District's consulting engineers computed the safe yield of the Stacy Reservoir, among the factors taken into consideration were the monthly inflow, the average monthly

evaporation, the quantity of water diverted monthly, the rate of siltation, and a period of time equal to the drought of record. With these considerations taken into account, the engineers determined that the safe yield of the Stacy Reservoir would be 90,700 acre-feet annually.

If one or all of the following conditions materialized, City's Contract Quantity would be reduced by a factor that would be determined when and if such conditions occurred: (1) releases through the dam that may be required by any federal or state agency, except those releases of the magnitude of 8 cfs and 2.5 cfs (3,806 acre-feet annually) as is set forth in Section 6(a)4(c) of Permit No. 3676 issued to the District by the Texas Water Commission on May 14, 1985; (2) any reduction of the calculated safe yield by reason of the accumulation of silt within the reservoir basin over a period of time in excess of the amount of siltation initially considered by the District's consulting engineers; (3) factors that may develop within the drainage area of the Stacy Reservoir that would reduce the dependable quantity of runoff per square mile of drainage area; (4) the experiencing of a drought having a longer duration than the drought of record; and/or (5) critical shortage of water in Stacy Reservoir.

If District is required to release water through the dam by any federal or state agency for any reason, except those releases of the magnitude of 8 cfs and 2.5 cfs (3,806 acre-feet annually) as is set forth in Section 6(a)4(c) of Permit No. 3676 issued to the District by the Texas Water Commission on May 14, 1985, the quantity of water released during any calendar year would be measured and the Contract Quantity available to the City and any other party having the right to divert specified quantities of water from the Stacy Reservoir, would be reduced the ensuing calendar year by a proportionate share of the waters released. Such proportionate share shall

be calculated by using each of said parties' percentage of the "safe yield".

In the event that a siltation survey of the reservoir is made at some point in time, and found to be in excess of the anticipated siltation that should exist at said point in time, the safe yield of the reservoir will be recalculated by the District's consulting engineers. The newly calculated safe yield would then be compared to the original safe yield to determine the percentage of reduction in the safe yield. This percentage would be applied to the City's Contract Quantity to determine what City's Contract Quantity would be in subsequent years.

Should some condition develop within the drainage area of the Stacy Reservoir that would cause a reduction in the quantity of water that would run into the Stacy Reservoir, such reduction would be taken into consideration and a new safe yield quantity would then be calculated. The newly calculated safe yield would then be compared to the original safe yield and a percentage factor would be determined that would then be applied to the City's Contract Quantity to arrive at a Contract Quantity that would exist by reason of changed conditions within the drainage area.

In the event Stacy Reservoir should experience a drought that exceeds in time the drought of record, the District's consulting engineers would recalculate the safe yield of the Stacy Reservoir and the newly calculated safe yield brought on by the establishment of a new drought of record, would be compared with the original safe yield calculation and the percentage of reduction in the safe yield would be applied to reduce City's Contract Quantity.

One or all of the above conditions could possibly occur which would determine what quantity of water City would be entitled to receive from the Stacy Reservoir. City, as well as all other parties, including the District, who have a right to

a specified quantity of water in the Stacy Reservoir, would experience a reduction in their contract quantity computed in the same manner as the reduction in the Contract Quantity to the City; however, no reduction in the Contract Quantity to the City brought about by any one or all of the above conditions, will reduce the payments by City to District when such are due as set out in Section 8 above.

In the event the District's consulting engineers are requested by the District to re-evaluate the "safe yield" of the Stacy Reservoir and their study indicates that the safe yield is a quantity larger than the initial quantity (90,700 acre-feet), City immediately thereafter will be notified that its Contract Quantity has increased in direct proportion as the newly determined safe yield bears to the original safe yield of 90,700 acre-feet.

During any period of time when, in the judgment of District, there is a critical shortage of water impounded in Stacy Reservoir, which makes it impractical or inadvisable for District to deliver to City its Contract Quantity in any calendar year, the water deemed available by District from the Stacy Reservoir shall be rationed to City during each calendar month of such period of time as follows:

(1) There shall be calculated for each entity that has a right to take water from the Stacy Reservoir, the total amount of water from all sources actually consumed by each entity and the customers of each entity's water system during the immediate preceding calendar month; and

(2) From each of such total amounts of water thus calculated for each entity, there shall be deducted the amount of such water which was obtained during City's immediate preceding calendar month from sources owned and operated by each entity and not under the control of District; and

(3) The available water in Stacy Reservoir shall be prorated ratably between City and the other entities having the right to divert water from Stacy Reservoir in proportion to the aforesaid resulting amounts for each entity; providing however, in determining the share of such prorated water to which City shall be entitled, for the purpose of prorating only, it shall be assumed that City had withdrawn a minimum of 407,362,000 gallons (1,250.148 acre-feet, one-twelfth of City's Contract Quantity) of water from said reservoir during the immediate preceding calendar month.

(4) In the event a potential water shortage occurs in the Stacy Reservoir and if City has an adequate supply in its own sources of supply facilities to meet its full requirements, City may offer its share of its Contract Quantity then available in the Stacy Reservoir to District for District's use. The amount of City's water diverted by District from the Stacy Reservoir will be paid for by District at a rate per thousand gallons as calculated in the same manner as the sale of surplus water by District to City as set forth in Section 8(e) above.

Section 10. LITIGATION.

In the event the District is involved in litigation by reason of any question arising regarding the operation and maintenance of the Stacy Reservoir, City and all other parties having the right to divert water from the Stacy Reservoir shall pay their pro rata share of the cost of legal services, any monetary award required of the District to be made, and other expenses involved in litigating the legal matter. The City's share shall be 16.54% of such cost.

Section 11. SPECIAL CONDITIONS.

(a) City agrees that all water diverted by it under this Contract shall be used for domestic and municipal purposes only and that this Contract shall not be assigned in whole or in part.

(b) District agrees that it will not sell water to any customer now being served by City or reasonably capable of being served by City's water distribution system, except with the expressed written consent of City.

(c) District shall, subject to Sections 9 and 12, and other applicable provisions of this Contract, make water available to City to the extent of the Contract Quantity.

(d) Title to all water made available hereunder shall remain in District to the point of delivery and upon passing through District's meter or meters installed at the specified point of delivery such title to the water shall pass to City. Each of the parties hereto shall be responsible for and agrees to save and hold the other party harmless from all claims,

demands, and causes of action which may be asserted by anyone on account of the transportation, delivery and disposal of said water while title remains in such party.

(e) Water diverted from the Stacy Reservoir by City and not used or consumed by City or its customers shall be discharged into the wastewater treatment plant or plants of City.

(f) District shall never have the right to demand payment by City of any obligation assumed or imposed on it under and by virtue of this Contract from funds raised or to be raised by taxation. City's obligation under this Contract shall never be construed to be a debt of City of such kind as to require it under the laws of this State to levy and collect a tax to discharge such obligation, it being expressly understood by the parties hereto that all payments due by City hereunder are to be made from the revenues received by City from its combined water and sewer system and/or derived from other lawfully available funds.

(g) To the extent City does not make its payments under this Contract from other lawfully available funds, all payments to be made hereunder by it shall constitute reasonable and necessary "operating expenses" of City's combined water and sewer system, as defined in Vernon's Ann. Tex. Civ. St. Article 1113, and that such payments will be made from the revenues of its combined water and sewer system. The City represents and has determined that the facilities and services to be provided under this Contract are absolutely necessary and essential to the present and future operation of its combined water and sewer system, and that the construction and operation of the Stacy Reservoir Project constitute the reasonable and necessary method for obtaining a new source or water supply, and, accordingly, all payments required by this Contract to be made by the City shall constitute reasonable and necessary operating expenses of its combined water and sewer system as described above, with the effect that the obligation to make such

payments from revenues of such combined water and sewer system shall have priority over any obligation to make payments from such revenues of principal, interest, or otherwise, with respect to all bonds or other obligations heretofore or hereafter issued by the City.

(h) The City agrees throughout the term of this Contract to continuously operate and maintain its combined water and sewer system and to fix and collect such rates and charges for water and sewer services and/or water services to be supplied by its combined water and sewer system as aforesaid as will produce revenues in an amount equal to at least (i) all of the expenses of operation and maintenance of such system, including specifically its payments under this Contract, and (ii) all other amounts as required by law and the provisions of the ordinances or resolutions authorizing its revenue bonds or other obligations now or hereafter outstanding, including the amounts required to pay all principal of and interest on such bonds and other obligations.

Section 12. 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 the City to make the payments required under this Contract, then if such party shall give notice and full particulars of such force majeure in writing to the other party 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, restrain 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 13. UNCONDITIONAL OBLIGATION TO MAKE PAYMENTS.

Recognizing the fact that the City urgently requires an additional source of water supply, 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 the payments received from City hereunder to pay and secure its bonds, it is hereby agreed that City shall be unconditionally obligated to pay, without offset or counterclaim, all of its payments to the District as provided and determined by this Contract, regardless of whether or not the District actually acquires, constructs, or completes the Stacy Reservoir Project or is actually operating or providing the facilities or services of the Stacy Reservoir Project, or whether or not the City actually uses water from the Stacy Reservoir Project, whether due to Force Majeure or any other reason whatsoever, and regardless of any other provisions of this or any other contract or agreement between the parties hereto. This covenant by the City shall be for the benefit of and enforceable by the owners of the bonds and/or the District. It is acknowledged and recognized by the City that risks are involved to the District in the construction and completion of, and filling and maintaining water in the Stacy Reservoir Project, just as there would be if City directly were to undertake to construct a reservoir for its own use, and the City is willing to accept and share in such risks in the knowledge that the bondholders are not responsible for such risks and would not purchase the

District's bonds if they were required to assume the risks involved in constructing, completing, and maintaining water in a reservoir, in order to be repaid for financing the Stacy Reservoir Project. Thus the City hereby agrees that it will make its payments hereunder as herein provided in consideration for the District's agreement to undertake the construction and maintenance of the Stacy Reservoir Project as herein provided, and the District agrees that it will use its best efforts to finance, construct, operate and maintain the Stacy Reservoir Project as herein provided.

Section 14. TERM OF CONTRACT; MODIFICATION; NOTICES; STATE OR FEDERAL LAWS, RULES, ORDERS, OR REGULATIONS.

(a) This Contract shall be effective as of the date of execution hereof, and this Contract shall continue in force and effect until the principal of and interest on all District bonds relating to the Stacy Reservoir Project shall have been paid, and thereafter shall continue in force and effect during the entire useful life of the Stacy Reservoir Project.

(b) Modification. No change, amendment, or modification of this Contract shall be made or be effective which will affect adversely the prompt payment when due of all moneys required to be paid by the City under the terms of this Contract, and no such change, amendment, or modification shall be made or be effective which would cause a violation of any provisions of any resolution authorizing the issuance of District's bonds.

(c) Addresses and Notice. 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:

Colorado River Municipal Water District
P. O. Box 3370
Big Spring, Texas 79721-3370

If to the City, as follows:

City of San Angelo
P. O. Box 1751
San Angelo, Texas 76902

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.

(d) State or Federal Laws, Rules, Orders, or Regulations. 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 15. 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 16. 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 the services of the Stacy Reservoir Project 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 the City 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 the City's obligations hereunder could not be adequately compensated in money damages alone, the City 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. Notwithstanding anything to the contrary contained in this Contract, any right or remedy or any default hereunder, except the right of the District to receive the payments required to be made by City hereunder, which shall never be determined to be waived, shall be deemed to be conclusively waived unless asserted by a proper proceeding at law or in equity within two (2) years plus one (1) day after the occurrence of such default. 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 a waiver of subsequent breaches or defaults of any kind, character, or description, under any circumstances.

Section 17. 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 Howard 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 Howard County, Texas, is the 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 Howard 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.

COLORADO RIVER MUNICIPAL WATER DISTRICT

BY _____
President, Board of Directors

ATTEST:

Secretary, Board of Directors

(DISTRICT SEAL)

APPROVED AS TO FORM AND LEGALITY

Robert H. Moore III
ATTORNEYS FOR THE DISTRICT

CITY OF SAN ANGELO, TEXAS

By Burt Terrill
Burt Terrill, Mayor

By Bill Thompson
Bill Thompson, S.M.D. #1

By Don Butts
Don Butts, S.M.D. #2

By Daniel Cardenas #3
Daniel Cardenas, S.M.D. #3

By Carline Tucker
Carline Tucker, S.M.D. #4

By Richard Crisp
Richard Crisp, S.M.D. #5

By Tim Edwards
Tim Edwards, S.M.D. #6

ATTEST:

Peggy J. Gilmore
Peggy J. Gilmore, City Secretary

(CITY SEAL)

APPROVED AS TO FORM AND LEGALITY

Mindy W. Ward
Mindy Ward, City Attorney