

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## NOTICE OF AN APPLICATION FOR A WATER USE PERMIT

APPLICATION NO. 13741

The City of San Angelo seeks authorization to use the bed and banks of the Concho River to convey 13,443 acre-feet of discharged treated municipal wastewater per year, authorized under Texas Pollutant Discharge Elimination System Permit No. WQ0010641003, for subsequent diversion and use for municipal purposes in the City's service area in Tom Green County. More information on the application and how to participate in the permitting process is given below.

**APPLICATION.** City of San Angelo, The City, 72 W. College Avenue, San Angelo, Texas 76903, has applied to the Texas Commission on Environmental Quality (TCEQ) for a Water Use Permit pursuant to Texas Water Code (TWC) § 11.042, and TCEQ Rules Title 30 Texas Administrative Code (TAC) § 295.1, et seq. Mailed notice to the downstream water right holders of record in the Colorado River Basin is required pursuant to 30 TAC § 295.161(a). Notice to the Texas Parks and Wildlife Department and the Public Interest Council is required pursuant to § 295.161(c).

The City of San Angelo seeks authorization to use the bed and banks of the Concho River, Colorado River Basin, to convey 13,443 acre-feet of discharged treated municipal wastewater per year for subsequent diversion from a point on the Concho River for municipal purposes within the City's service area in Tom Green County.

The City owns and operates the City of San Angelo Wastewater Treatment Facility, authorized under Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0010641003, which authorizes an annual average discharge of 13,443 acre-feet of treated municipal wastewater per year.

The City's discharged treated municipal wastewater return flows originate from its stored surface water and groundwater sources legally available to the City, and the relative mix of its surface water and groundwater sources at any given time will vary based on water supply conditions and source availabilities.

The City has only applied its treated municipal wastewater to agricultural irrigation and has not discharged to a watercourse.

The treated municipal wastewater return flows will be discharged at a point on the Concho River, located at Latitude 31.484744° N, Longitude 100.319989° W in Tom Green County, ZIP Code 76905, at a maximum discharge rate of 27.85 cfs (12,500 gpm).

The discharged treated municipal wastewater return flows will be diverted from a point on the Concho River, located at Latitude 31.533732° N, Longitude 100.244074° W in Tom Green County, ZIP Code 76861, at a maximum diversion rate of 27.85 cfs (12,500 gpm).

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. Additional information was received on June 8, 2023, July 5, July 25, September 24, and October 16, 2024.

The Executive Director has completed the technical review of the application and prepared a draft permit. The draft permit, if granted, would include special conditions including, but not

limited to, maintenance of an accounting plan and streamflow restrictions. The application, technical memoranda, and Executive Director's draft permit are available for viewing on the TCEQ web page at: [https://www.tceq.texas.gov/permitting/water\\_rights/wr-permitting/view-wr-pend-apps](https://www.tceq.texas.gov/permitting/water_rights/wr-permitting/view-wr-pend-apps). Alternatively, you may request a copy of the documents by contacting the TCEQ Office of the Chief Clerk by phone at (512) 239-3300 or by mail at TCEQ OCC, Notice Team (MC-105), P.O. Box 13087, Austin, Texas 78711.

**PUBLIC COMMENT / PUBLIC MEETING.** Written public comments and requests for a public meeting should be submitted to the Office of the Chief Clerk, at the address provided in the information section below by September 9, 2025. A public meeting is intended for the taking of public comment and is not a contested case hearing. A public meeting will be held if the Executive Director determines that there is a significant degree of public interest in the application.

**CONTESTED CASE HEARING.** The TCEQ may grant a contested case hearing on this application if a written hearing request is filed by September 9, 2025. The Executive Director can consider an approval of the application unless a written request for a contested case hearing is filed by September 9, 2025.

To request a contested case hearing, you must submit the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "[I/we] request a contested case hearing;" (4) a brief and specific description of how you would be affected by the application in a way not common to the general public; and (5) the location and distance of your property relative to the proposed activity. You may also submit proposed conditions to the requested permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing to the Office of the Chief Clerk at the address provided in the information section below.

If a hearing request is filed, the Executive Director will not issue the permit and will forward the application and hearing request to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

**INFORMATION.** Written hearing requests, public comments, or requests for a public meeting should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 or electronically at <https://www14.tceq.texas.gov/epic/eComment/> by entering WRPERM 13741 in the search field. For information concerning the hearing process, please contact the Public Interest Counsel, MC 103, at the same address. For additional information, individual members of the general public may contact the Public Education Program at 1-800-687-4040. General information regarding the TCEQ can be found at our web site at [www.tceq.texas.gov](http://www.tceq.texas.gov). Si desea información en Español, puede llamar al 1-800-687-4040 o por el internet al <http://www.tceq.texas.gov>.

Issued: August 07, 2025



# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## WATER USE PERMIT

PERMIT NO.	13741	TYPE §	11.042
Permittee:	City of San Angelo	Address:	72 W. College Avenue San Angelo, TX 76903
Filed:	December 30, 2020	Granted:	
Purpose:	Municipal	County:	Tom Green
Watercourse:	Concho River	Watershed:	Colorado River Basin

WHEREAS, the City of San Angelo (City/Permittee) seeks authorization to use the bed and banks of the Concho River, Colorado River Basin, to convey 13,443 acre-feet of discharged treated municipal wastewater per year for subsequent diversion from a point on the Concho River for municipal purposes within the City's service area in Tom Green County; and

WHEREAS, the City owns and operates the City of San Angelo Wastewater Treatment Facility, authorized under Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0010641003, which authorizes an annual average discharge of 13,443 acre-feet of treated municipal wastewater per year; and

WHEREAS, the City's discharged treated municipal wastewater return flows originate from its stored surface water and groundwater sources legally available to the City, and the relative mix of its surface water and groundwater sources at any given time will vary based on water supply conditions and source availabilities; and

WHEREAS, the City has only applied its treated municipal wastewater to agricultural irrigation and has not discharged to a watercourse; and

WHEREAS, the treated municipal wastewater return flows will be discharged at a point on the Concho River, located at Latitude 31.484744° N, Longitude 100.319989° W in Tom Green County, at a maximum discharge rate of 27.85 cfs (12,500 gpm); and

WHEREAS, the discharged treated municipal wastewater return flows will be diverted from a point on the Concho River, located at Latitude 31.533732° N, Longitude 100.244074° W in Tom Green County, at a maximum diversion rate of 27.85 cfs (12,500 gpm); and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, this permit, if granted, is subject to requirements and orders of the Concho Watermaster; and

WHEREAS, the City has provided, and the Executive Director has approved, an accounting plan (*Reuse Accounting Plan for Conveyance and Diversion of San Angelo's Treated Wastewater Effluent on the Concho River*); and

WHEREAS, the Executive Director recommends that special conditions be included in the permit; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality in issuing this permit;

NOW, THEREFORE, this permit, designated as Water Use Permit No. 13741, is issued to the City of San Angelo, subject to the following terms and conditions:

1. USE

Permittee is authorized to use the bed and banks of the Concho River to convey 13,443 acre-feet of its discharged treated municipal wastewater return flows per year for subsequent diversion and use for municipal purposes within the City's service area in Tom Green County.

2. DISCHARGE

The treated municipal wastewater return flows will be discharged, pursuant to TPDES Permit No. WQ0010641003, at a point on the Concho River, located at Latitude 31.484744° N, Longitude 100.319989° W, in Tom Green County.

3. DIVERSION

A. Permittee is authorized to divert its discharged treated municipal wastewater return flows from a point on the Concho River, located at Latitude 31.533732° N, Longitude 100.244074° W, in Tom Green County.

B. The maximum diversion rate is 27.85 cfs (12,500 gpm).

4. PRIORITY DATE

The discharged treated municipal wastewater return flows authorized to be conveyed via the bed and banks of the Concho River under this permit are not subject to priority calls from water right holders.

5. CONSERVATION

Permittee shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every water supply contract entered into on or after the effective date of this permit, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures.

6. SPECIAL CONDITIONS

- A. Permittee shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement. Such measures shall include, but shall not be limited to, the installation of screens on any new diversion structure(s).
- B. Permittee shall not divert the authorized return flows unless streamflow at USGS Gage No. 08136500 – Concho River at Paint Rock, TX exceeds 1 cfs.
- C. Diversions authorized under this permit are dependent upon Permittee's potentially interruptible treated municipal wastewater return flows or discharges and are conditioned on the availability of those discharges. The right to divert the discharged return flows is subject to revocation if discharges become permanently unavailable for diversion and may be subject to reduction if the discharges are not available in quantities and qualities sufficient to fully satisfy the permit. Should the discharges become permanently unavailable for diversion, Permittee shall immediately cease diversion of return flows under this permit and either apply to amend the permit, or voluntarily forfeit the permit. If Permittee does not amend the permit or forfeit the permit, the Commission may begin proceedings to cancel this permit.
- D. Permittee shall only divert treated municipal wastewater return flows that are actually discharged, less losses.
- E. Permittee shall only divert and use its treated municipal wastewater return flows pursuant to Paragraph 1. USE and Paragraph 3. DIVERSION in accordance with the most recently approved accounting plan (*Reuse Accounting Plan for Conveyance and Diversion of San Angelo's Treated Wastewater Effluent on the Concho River*). Any modifications to the accounting plan shall be approved by the Executive Director. Any modifications to the accounting plan that change the permit terms must be in the form of an amendment to the permit. Should Permittee fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Permittee shall immediately cease diversion of discharged return flows under this permit, and either apply to amend the permit, or voluntarily forfeit the permit. If Permittee fails to amend the accounting plan or forfeit the permit, the Commission may begin proceedings to cancel the permit. Permittee shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.
- F. Prior to diversion of any return flows in excess of the amount currently authorized by TPDES Permit No. WQ0010641003, Permittee shall apply for and be granted the right to reuse those return flows.
- G. Permittee shall install and maintain a measuring device which accounts for, within 5% accuracy, the quantity of water diverted from the point(s) authorized above in Paragraph 3. DIVERSION.
- H. Permittee shall allow representatives of the Concho Watermaster reasonable access to the property to inspect the measuring device.
- I. Permittee shall contact the Concho Watermaster prior to diversion of water authorized by this permit.

This permit is issued subject to superior water rights in the Colorado River Basin.

Permittee agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this permit.

All other matters requested in the application which are not specifically granted by this permit are denied.

This permit is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of state water resources exercised by the Commission.

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For the Commission

Date Issued:

## Sarah Henderson

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**From:** Jason Hill [REDACTED] >  
**Sent:** Friday, August 1, 2025 10:03 AM  
**To:** Sarah Henderson  
**Subject:** Re: City of San Angelo Water Use Permit Application No. 13741

Morning, Sarah. We're ready for the notice to issue whenever y'all are. No need for us to review the draft again if each of our proposed changes are acceptable. Thanks for your work on this.

## Jason Hill

ATTORNEY



3800 North Lamar Blvd., Suite 200  
Austin, Texas 78756  
[REDACTED] | (512) 806-1060

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**From:** Sarah Henderson <sarah.henderson@tceq.texas.gov>  
**Date:** Wednesday, July 30, 2025 at 5:56 PM  
**To:** Jason Hill [REDACTED]  
**Subject:** RE: City of San Angelo Water Use Permit Application No. 13741

Mr. Hill,  
Staff has agreed to make the Applicants requested revisions to the draft public notice and draft water use permit.

Would you like to review the revised drafts again before I proceed with issuing notice?

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

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**From:** Jason Hill <[REDACTED]>  
**Sent:** Thursday, July 24, 2025 5:44 PM  
**To:** Kathy Alexander <Kathy.Alexander@tceq.texas.gov>

**Cc:** Sarah Henderson <Sarah.Henderson@tceq.texas.gov>

**Subject:** City of San Angelo Water Use Permit Application No. 13741

Kathy,

I've attached some proposed edits to the draft permit (with corresponding edits to the draft notice) for staff's consideration. I have included some modifications to reflect a greater emphasis on the sources of the discharges that could be diverted under the WUP. I have also made some proposed changes for consistency. None of these revisions are substantive. All of them are reflected in redline.

Thank you for giving the City the chance to review and provide input on these documents. Please let me know if you need anything else from me or from the City.

Many thanks.

**Jason Hill**

ATTORNEY



3800 North Lamar Blvd., Suite 200  
Austin, Texas 78756

██████████ | (512) 806-1060



## Sarah Henderson

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**From:** Jason Hill <[REDACTED]>  
**Sent:** Thursday, July 24, 2025 5:44 PM  
**To:** Kathy Alexander  
**Cc:** Sarah Henderson  
**Subject:** City of San Angelo Water Use Permit Application No. 13741  
**Attachments:** 20250724 City of San Angelo 13741 Draft Permit--RL.docx; 20250724 City of San Angelo 13741 Draft Notice--RL.docx

Kathy,

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Many thanks.

**Jason Hill**

ATTORNEY



3800 North Lamar Blvd., Suite 200  
Austin, Texas 78756

[REDACTED] | (512) 806-1060

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## WATER USE PERMIT

PERMIT NO. 13741 TYPE § 11.042

Permittee: City of San Angelo Address: 72 W. College Avenue  
San Angelo, TX 76903

Filed: December 30, 2020 Granted:

Purpose: Municipal County: Tom Green

Watercourse: Concho River Watershed: Colorado River Basin

WHEREAS, the City of San Angelo (City/Permittee) seeks authorization to use the bed and banks of the Concho River, Colorado River Basin, to convey 13,443 acre-feet of ~~return flows~~discharged treated municipal wastewater per year for subsequent diversion from a point on the Concho River for municipal purposes within the City's service area in Tom Green County; and

WHEREAS, the City owns and operates the City of San Angelo Wastewater Treatment Facility, authorized under Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0010641003, ~~which authorizes an annual average with a total~~ discharge of 13,443 acre-feet of treated municipal wastewater per year; and

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# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



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To request a contested case hearing, you must submit the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "[I/we] request a contested case hearing;" (4) a brief and specific description of how you would be affected by the application in a way not common to the general public; and (5) the location and distance of your property relative to the proposed activity. You may also submit proposed conditions to the requested permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing to the Office of the Chief Clerk at the address provided in the information section below.

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Issued:

## Sarah Henderson

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**From:** Sarah Henderson  
**Sent:** Friday, July 11, 2025 5:41 PM  
**To:** [REDACTED]  
**Cc:** Kathy Alexander; Chris Kozlowski; Humberto Galvan; Jason Hill  
**Subject:** City of San Angelo Water Use Permit Application No. 13741  
**Attachments:** City of San Angelo\_13741\_Drafts\_11Jul2025.pdf

Mr. Kelton,  
Please find the attached draft notice, draft permit, and related technical memoranda for your review.  
Comments are requested by July 25, 2025.  
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

Brooke T. Paup, *Chairwoman*  
Bobby Janecka, *Commissioner*  
Catarina R. Gonzales, *Commissioner*  
Kelly Keel, *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

July 11, 2025

Mr. Shane Kelton  
Executive Director of Public Works  
City of San Angelo  
301 W. Beauregard Avenue  
San Angelo, TX 76903

VIA E-MAIL

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

Dear Mr. Kelton:

Drafts, subject to revision, of the public notice, proposed Water Use Permit No. 13741, and the related technical memoranda are attached.

Staff is recommending that the referenced application be granted in accordance with the attached drafts. Please review the drafts and contact me no later than July 25, 2025 with any comments or questions as the notice will be forwarded to the Office of the Chief Clerk for mailing after that date.

Please note this application requires a 30-day comment period and once the comment period has closed, the proposed Water Use Permit No. 13741 may be issued as drafted given no hearing requests are received.

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

Sincerely,

A handwritten signature in black ink that reads "Sarah Henderson".

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

Attachments

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## NOTICE OF AN APPLICATION FOR A WATER USE PERMIT

APPLICATION NO. 13741

The City of San Angelo seeks authorization to use the bed and banks of the Concho River to convey 13,443 acre-feet of return flows, authorized under Texas Pollutant Discharge Elimination System Permit No. WQ0010641003, for subsequent diversion and use for municipal purposes in the City's service area in Tom Green County. More information on the application and how to participate in the permitting process is given below.

**APPLICATION.** City of San Angelo, The City, 72 W. College Avenue, San Angelo, Texas 76903, has applied to the Texas Commission on Environmental Quality (TCEQ) for a Water Use Permit pursuant to Texas Water Code (TWC) § 11.042, and TCEQ Rules Title 30 Texas Administrative Code (TAC) § 295.1, et seq. Mailed notice to the downstream water right holders of record in the Colorado River Basin is required pursuant to 30 TAC § 295.161(a). Notice to the Texas Parks and Wildlife Department and the Public Interest Council is required pursuant to § 295.161(c).

The City of San Angelo seeks authorization to use the bed and banks of the Concho River, Colorado River Basin, to convey 13,443 acre-feet of return flows per year for subsequent diversion from a point on the Concho River for municipal purposes within the City's service area in Tom Green County.

The City owns and operates the City of San Angelo Wastewater Treatment Facility, authorized under Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0010641003, with a total discharge of 13,443 acre-feet of water per year.

The City's return flows originate from surface water and groundwater sources legally available to the City and the relative mix of surface water and groundwater sources at any given time will vary based on water supply conditions and source availabilities.

The return flows were previously applied to agricultural irrigation and have not been discharged to a watercourse.

The return flows will be discharged at a point on the Concho River, located at Latitude 31.484744° N, Longitude 100.319989° W in Tom Green County, ZIP Code 76905, at a maximum discharge rate of 27.85 cfs (12,500 gpm).

The discharged return flows will be diverted from a point on the Concho River, located at Latitude 31.533732° N, Longitude 100.244074° W in Tom Green County, ZIP Code 76861, at a maximum diversion rate of 27.85 cfs (12,500 gpm).

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. Additional information was received on June 8, 2023, July 5, July 25, September 24, and October 16, 2024.

The Executive Director has completed the technical review of the application and prepared a draft permit. The draft permit, if granted, would include special conditions including, but not limited to, maintenance of an accounting plan and streamflow restrictions. The application, technical memoranda, and Executive Director's draft permit are available for viewing on the TCEQ web page at: [https://www.tceq.texas.gov/permitting/water\\_rights/wr-permitting/view-wr-pend-apps](https://www.tceq.texas.gov/permitting/water_rights/wr-permitting/view-wr-pend-apps). Alternatively, you may request a copy of the documents by contacting the TCEQ Office of the Chief Clerk by phone at (512) 239-3300 or by mail at TCEQ OCC, Notice Team (MC-105), P.O. Box 13087, Austin, Texas 78711.

**PUBLIC COMMENT / PUBLIC MEETING.** Written public comments and requests for a public meeting should be submitted to the Office of the Chief Clerk, at the address provided in the information section below by \_\_\_\_\_. A public meeting is intended for the taking of public comment and is not a contested case hearing. A public meeting will be held if the Executive Director determines that there is a significant degree of public interest in the application.

**CONTESTED CASE HEARING.** The TCEQ may grant a contested case hearing on this application if a written hearing request is filed by \_\_\_\_\_. The Executive Director can consider an approval of the application unless a written request for a contested case hearing is filed by \_\_\_\_\_.

To request a contested case hearing, you must submit the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "[I/we] request a contested case hearing;" (4) a brief and specific description of how you would be affected by the application in a way not common to the general public; and (5) the location and distance of your property relative to the proposed activity. You may also submit proposed conditions to the requested permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing to the Office of the Chief Clerk at the address provided in the information section below.

If a hearing request is filed, the Executive Director will not issue the permit and will forward the application and hearing request to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

**INFORMATION.** Written hearing requests, public comments, or requests for a public meeting should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 or electronically at <https://www14.tceq.texas.gov/epic/eComment/> by entering WRPERM 13741 in the search field. For information concerning the hearing process, please contact the Public Interest Counsel, MC 103, at the same address. For additional information, individual members of the general public may contact the Public Education Program at 1-800-687-4040. General information regarding the TCEQ can be found at our web site at [www.tceq.texas.gov](http://www.tceq.texas.gov). Si desea información en Español, puede llamar al 1-800-687-4040 o por el internet al <http://www.tceq.texas.gov>.

Issued:



# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## WATER USE PERMIT

PERMIT NO.	13741	TYPE §	11.042
Permittee:	City of San Angelo	Address:	72 W. College Avenue San Angelo, TX 76903
Filed:	December 30, 2020	Granted:	
Purpose:	Municipal	County:	Tom Green
Watercourse:	Concho River	Watershed:	Colorado River Basin

WHEREAS, the City of San Angelo (City/Permittee) seeks authorization to use the bed and banks of the Concho River, Colorado River Basin, to convey 13,443 acre-feet of return flows per year for subsequent diversion from a point on the Concho River for municipal purposes within the City's service area in Tom Green County; and

WHEREAS, the City owns and operates the City of San Angelo Wastewater Treatment Facility, authorized under Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0010641003, with a total discharge of 13,443 acre-feet of water per year; and

WHEREAS, the City's return flows originate from surface water and groundwater sources legally available to the City and the relative mix of surface water and groundwater sources at any given time will vary based on water supply conditions and source availabilities; and

WHEREAS, the return flows were previously applied to agricultural irrigation and have not been discharged to a watercourse; and

WHEREAS, the return flows will be discharged at a point on the Concho River, located at Latitude 31.484744° N, Longitude 100.319989° W in Tom Green County, at a maximum discharge rate of 27.85 cfs (12,500 gpm); and

WHEREAS, the discharged return flows will be diverted from a point on the Concho River, located at Latitude 31.533732° N, Longitude 100.244074° W in Tom Green County, at a maximum diversion rate of 27.85 cfs (12,500 gpm); and

WHEREAS, the Texas Commission on Environmental Quality finds that jurisdiction over the application is established; and

WHEREAS, this permit, if granted, is subject to requirements and orders of the Concho Watermaster; and



WHEREAS, the City has provided, and the Executive Director has approved, an accounting plan (*Reuse Accounting Plan for Conveyance and Diversion of San Angelo's Treated Wastewater Effluent on the Concho River*); and

WHEREAS, the Executive Director recommends that special conditions be included in the permit; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality in issuing this permit;

NOW, THEREFORE, this permit, designated as Water Use Permit No. 13741, is issued to the City of San Angelo, subject to the following terms and conditions:

1. USE

Permittee is authorized to use the bed and banks of the Concho River to convey 13,443 acre-feet of return flows per year for subsequent diversion and use for municipal purposes within the City's service area in Tom Green County.

2. DISCHARGE

The return flows will be discharged, pursuant to TPDES Permit No. WQ0010641003, at a point on the Concho River, located at Latitude 31.484744° N, Longitude 100.319989° W, in Tom Green County.

3. DIVERSION

A. Permittee is authorized to divert its return flows from a point on the Concho River, located at Latitude 31.533732° N, Longitude 100.244074° W, in Tom Green County.

B. The maximum diversion rate is 27.85 cfs (12,500 gpm).

4. PRIORITY DATE

The return flows authorized to be conveyed via the bed and banks of the Concho River under this permit are not subject to priority calls from downstream water right holders.

5. CONSERVATION

Permittee shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every water supply contract entered into on or after the effective date of this permit, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures.

6. SPECIAL CONDITIONS

A. Permittee shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement. Such measures shall include, but shall not be limited to, the installation of screens on any new diversion structure(s).

- B. Permittee shall not divert the authorized return flows unless streamflow at USGS Gage No. 08136500 – Concho River at Paint Rock, TX exceeds 1 cfs.
- C. Diversions authorized under this permit are dependent upon potentially interruptible return flows or discharges and are conditioned on the availability of those discharges. The right to divert the discharged return flows is subject to revocation if discharges become permanently unavailable for diversion and may be subject to reduction if the return flows are not available in quantities and qualities sufficient to fully satisfy the permit. Should the discharges become permanently unavailable for diversion, Permittee shall immediately cease diversion of return flows under this permit and either apply to amend the permit, or voluntarily forfeit the permit. If Permittee does not amend the permit or forfeit the permit, the Commission may begin proceedings to cancel this permit.
- D. Permittee shall only divert return flows that are actually discharged, less losses.
- E. Permittee shall only divert and use return flows pursuant to Paragraph 1. USE and Paragraph 3. DIVERSION in accordance with the most recently approved accounting plan (*Reuse Accounting Plan for Conveyance and Diversion of San Angelo's Treated Wastewater Effluent on the Concho River*). Any modifications to the accounting plan shall be approved by the Executive Director. Any modifications to the accounting plan that change the permit terms must be in the form of an amendment to the permit. Should Permittee fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Permittee shall immediately cease diversion of discharged return flows under this permit, and either apply to amend the permit, or voluntarily forfeit the permit. If Permittee fails to amend the accounting plan or forfeit the permit, the Commission may begin proceedings to cancel the permit. Permittee shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.
- F. Prior to diversion of any return flows in excess of the amount currently authorized by TPDES Permit No. WQ0010641003, Permittee shall apply for and be granted the right to reuse those return flows.
- G. Permittee shall install and maintain a measuring device which accounts for, within 5% accuracy, the quantity of water diverted from the point(s) authorized above in Paragraph 3. DIVERSION.
- H. Permittee shall allow representatives of the Concho Watermaster reasonable access to the property to inspect the measuring device.
- I. Permittee shall contact the Concho Watermaster prior to diversion of water authorized by this permit.

This permit is issued subject to superior water rights in the Colorado River Basin.

Permittee agrees to be bound by the terms, conditions, and provisions contained herein and such agreement is a condition precedent to the granting of this permit.

All other matters requested in the application which are not specifically granted by this permit are denied.

This permit is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of state water resources exercised by the Commission.

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For the Commission

Date Issued:

DRAFT

# Texas Commission on Environmental Quality

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## INTEROFFICE MEMORANDUM

**To:** Sarah Henderson, Project Manager  
Water Rights Permitting Team

**Date:** June 25, 2025

**From:** Leslie Patterson, Team Leader   
Resource Protection Team

**Subject:** City of San Angelo  
WRPERM 13741  
CN600251615  
Concho River, Colorado River Basin  
Tom Green County

### APPLICATION SUMMARY

The City of San Angelo (City) requests authorization to use the bed and banks of the Concho River, Colorado River Basin, to convey 13,443 acre-feet of groundwater and surface water-based return flows for subsequent diversion and use for municipal purposes within the City's service area in Tom Green County. The return flows will be discharged from the City of San Angelo Wastewater Treatment Facility, authorized under Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0010641003, and diverted from a point on the Concho River at a maximum diversion rate of 27.85 cfs (12,500 gpm).

### WATER CONSERVATION REVIEW

Pursuant to Title 30 Texas Administrative Code (TAC) §295.9(1), the additional use of state water requires a water conservation review.

While this review is specifically triggered by the portion of this application that pertains to the additional use of surface water-based return flows, the review evaluates the City's entire water system.

The purpose of this review is to:

- (1) determine whether reasonable water conservation goals have been set;
- (2) determine whether the proposed strategies can achieve the stated goals;
- (3) determine whether there is a substantiated need for the water and whether the amount to be appropriated is reasonable for the proposed use; and
- (4) determine whether the water conservation plan addresses a water supply need in a manner that is consistent with the state water plan and the relevant approved regional water plan.

If these criteria are met, then staff considers this sufficient evidence to conclude that the City will avoid waste and achieve water conservation. This review forms a

basis for permit conditions and limitations as provided by Texas Water Code (TWC) §11.134 and 30 TAC §288.7.

### **Water Conservation Goals and Strategies**

Resource Protection staff reviewed the City's water conservation and drought contingency plans for municipal use and found that the plans meet the requirements in 30 TAC Chapter 288.

The City's 2024 Water Conservation Plan states that its conservation program utilizes Supply Management and Demand Management Methods to work towards optimizing use of water resources.

Supply Management Program Elements include:

- Coordinated use of water supplies to ensure that water withdraws from reservoirs are conducted in a manner that ensures optimum dependable yield and efficiency of operation
- Watershed management to ensure diversion channels, creeks, and natural waterways are clean and obstruction-free to increase captured water flow while minimizing flooding potential and reducing siltation
- Metering of all service connections to ensure maximum return for delivered water while minimizing water loss
- Leak detection and repair to minimize water loss
- Treated wastewater reuse and recycling for irrigation uses to lessen the demand for raw water

Demand Management Program Elements include:

- Inclining rate structure to encouraging water customers to conserve during times of high demand
- Regulations for conserving water by implementation and adoption of the City's Water Conservation and Drought Contingency Plans
- Adoption of the maximum standard plumbing fixture capacities by the City
- Continuing education programs to increase public awareness on the benefits and need for water conservation as well as practical cost-effective methods and technologies to conserve water
- Restrictions on certain potable water use activities by all customers

The Water Conservation Plan also includes the following goals:

The 5-year and 10-year goals for total per capita water use by the City's users is to maintain the water use at or below 123 gallons per capita per day (GPCD) by the end of 2029 and 122 GPCD by the end of 2034. The 5-year and 10-year goals for residential per capita water use is to maintain the use at or below 69 GPCD by the end of 2029 and 68 GPCD by the end of 2034. The 5-year and 10-year goals for per capita water loss is to maintain the water loss at less than 20 GPCD by the end of 2029 and 18 GPCD by the end of 2034.

Resource Protection staff has deemed these measures and goals to be reasonable.

**Requirements for a Water Right Application under 30 TAC §288.7**

Under 30 TAC §288.7, a water conservation plan submitted with a water right application for a new or additional appropriation of water must include data and information which:

- (1) supports the applicant's proposed use of water with consideration of the water conservation goals of the water conservation plan;
- (2) evaluates conservation as an alternative to the proposed appropriation; and
- (3) evaluates any other feasible alternative to new water development including, but not limited to, waste prevention, recycling and reuse, water transfer and marketing, regionalization, and optimum water management practices and procedures.

The City submitted a 2024 Water Conservation Plan which provided data and information addressing the requirements.

***Consideration of Water Conservation Goals***

According to the City, the Concho River Water Project supports its proposed water use with consideration of the Water Conservation Plan's goals and objectives by stretching its current and future water supplies through reuse. The use of the diverted flows will be a continuation of the City's beneficial use and consumption of its existing supplies. The plan to apply this water to the currently authorized beneficial use is the product of reasonable diligence on the City's part, and it reflects the City's commitment to conserve and maximize the beneficial use of its water supplies without waste. The project will complement the City's efforts to reach its 5-year and 10-year goals as discussed above, by extending the City's current water supplies and adding a reliable source to help meet future water needs.

***Conservation as an Alternative to the Proposed Appropriation***

The Concho River Water Project works in conjunction with the City's existing water conservation efforts. As noted in the 2021 Region F Water Plan, the City is proactive in its efforts to reduce water demand through public education, an inclining rate structure, a water waste ordinance, a landscape ordinance, and outdoor watering limits. These water conservation strategies have led to low GPCD water use average for the City's customers.

The City recognized that an anticipated two percent demand reduction from water conservation will not offset the water demand increases over the regional water planning horizon. Water conservation through consumption-reduction measures alone is not a feasible alternative to meet the City's projected demands. The Concho River Water Project, which is considered a water conservation project, once implemented, will increase the recycling and reuse of water as well as improve efficient use of the City's existing water supplies.



### **Feasible Alternatives to New Water Development**

The City studied twenty-four possible water supply alternatives, including six groundwater strategies, three purchased water strategies, eight water reuse strategies, and seven miscellaneous strategies. The study concluded that the Concho River Water Project would be a reliable and cost-effective water source. In addition, the Region F Water Planning Group recognized the feasibility of the project and included it as a recommended strategy in the approved 2021 Region F Water Plan and in the Initially Prepared 2026 Region F Plan.

In the 2021 Region F Water Plan and the Initially Prepared 2026 Plan, the Recommended Water Management Strategies for the City include:

- Municipal conservation
- Subordination
- Brush control
- Concho River Water Project (indirect reuse)
- Hickory aquifer expansion (listed as implemented in the 2026 plan)
- West Texas Water Partnership

In addition, both water plans identify alternative management strategies for the City such as Edwards-Trinity Plateau aquifer supplies from Schleicher County and desalination of brackish groundwater supplies. These are alternatives that the regional water planning group determined could be developed in the future to compliment the City's recommended strategies outlined above or serve as an alternative in the event one or more recommended strategies becomes infeasible.

### **Water Needs**

According to the 2021 Region F Water Plan, the estimated population served by the City is projected to be 116,437 by 2030 and increase to 148,090 by 2070. In addition, the City is projected to have a water shortage of 7,682 acre-feet per year by 2030, increasing to 13,097 acre-feet per year by 2070. In the Initial Prepared 2026 Region F Water Plan, the Concho River Water Project is discussed as a recommended water management strategy to meet the City's projected water demands from 2024 to 2080.

The request for authorization to divert and reuse surface water-based return flows can facilitate meeting the projected needs of the City and Region F.

### **Consistency with State and Regional Water Plans**

The City of San Angelo is located within the Region F Water Planning Group. As stated in the approved 2021 regional water plan, the requested bed-and-banks authorization (Concho River Water Project) is a critical strategy in the City's water planning to meet its projected long-term water supply deficits. Among the recommended and alternative strategies considered, the Concho River Water Project for indirect reuse was found to be one of the most cost-effective and reliable water supply sources analyzed by the Region F Planning Group.

The 2021 Region F Water Plan and the Initially Prepared 2026 Region F Water Plan both specifically include the Concho River Water Project as a recommended water management strategy for the City of San Angelo. As such, the application is consistent with the 2021 Region F Water Plan, the Initial Prepared 2026 Region F Water Plan, and the 2022 State Water Plan.

### **RECOMMENDATIONS**

Resource Protection staff has evaluated the application and determined that it meets the review requirements.

The following water conservation language should be included in the proposed permit, if granted:

Permittee shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every water supply contract entered into on or after the effective date of this permit, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water shall have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures.


# Texas Commission on Environmental Quality

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## INTEROFFICE MEMORANDUM

To: Sarah Henderson, Project Manager  
Water Rights Permitting Team

Date: June 25, 2025

Through: Leslie Patterson, Team Leader   
Resource Protection Team

From: Kenneth Coonrod, Aquatic Scientist  
Resource Protection Team

Subject: City of San Angelo  
WRPERM 13741  
CN600251615  
Concho River, Colorado River Basin  
Tom Green County

Environmental reviews of water right applications are conducted in accordance with applicable provisions of the Texas Water Code (TWC) and the administrative rules of the Texas Commission on Environmental Quality (TCEQ). The provisions applicable to environmental reviews can vary according to the type and the location of the authorization requested.

### APPLICATION SUMMARY

The City of San Angelo (City) requests authorization to use the bed and banks of the Concho River, Colorado River Basin, to convey 13,443 acre-feet of groundwater and surface water-based return flows for subsequent diversion and use for municipal purposes within the City's service area in Tom Green County. The return flows will be discharged from the City of San Angelo Wastewater Treatment Facility, authorized under Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0010641003, and diverted from a point on the Concho River at a maximum diversion rate of 27.85 cfs (12,500 gpm).

### ENVIRONMENTAL ANALYSIS

**Aquatic and Riparian Habitats:** The City's proposed bed and banks and diversion are located on the Concho River, a perennial stream, situated in the Red Prairie ecoregion (Griffith et al. 2004).

The checklist for the Colorado River Basin identified 39 species of ichthyofauna occurring within the Concho hydrologic unit (United States Geologic Survey [USGS])

code 12090105) (Hendrickson and Cohen 2022). The Texas fatmucket (*Lampsilis bracteata*), and the Texas pimpleback (*Cyclonaias petrina*), federally-listed endangered species, and the Guadalupe bass (*Micropterus treculii*), the Brazos water snake (*Nerodia harteri*), the Concho water snake (*Nerodia paucimaculata*), and the Texas fawnsfoot (*Truncilla macrodon*), high-interest aquatic and aquatic-dependent species, are known to occur in Tom Green County (TPWD 2024). This permit, if granted, is not expected to have an effect on any federally-listed endangered or high-interest aquatic or aquatic-dependent species, because no additional state water is being requested by the City.

The City has agreed to install screens on any new diversion structures in order to minimize entrainment and impingement of aquatic organisms. The City's request is not expected to adversely impact aquatic and riparian habitats in the area.

The TCEQ regulates bed and banks authorizations to convey groundwater and surface water-based treated effluent under the authority of TWC §11.042. That provision allows the commission to place special conditions in the authorization to "maintain instream uses and freshwater inflows to bays and estuaries." On August 8, 2012, the TCEQ adopted environmental flow standards for the Colorado and Lavaca Rivers, and Matagorda and Lavaca Bays (Title 30 Texas Administrative Code (TAC) Chapter 298 Subchapter D). These environmental flow standards are considered adequate to support a sound ecological environment (Title 30 TAC § 298.310). This review is conducted in accordance with §11.042 of the TWC, and although this is not a new appropriation of water, it will utilize TCEQ administrative rules which include Title 30 TAC Chapter 298 Subchapter D to provide consistency in water rights administration. Resource Protection staff recommend a streamflow restriction that is intended to protect the stream from dewatering. Resource Protection staff utilized the subsistence environmental flow standards (Title 30 TAC § 298.330(e)(5)) established at USGS Gage No. 08136500 – Concho River at Paint Rock, TX for the streamflow restriction as shown in Table 1.

**Table 1. Environmental Flow Values at USGS Gage No. 08136500 – Concho River at Paint Rock, TX**

Season	Subsistence
Winter	1 cfs
Spring	1 cfs
Summer	1 cfs
Fall	1 cfs

cfs = cubic feet per second

Seasons are defined in Title 30 TAC § 298.305 as follows: Winter (November through February), Spring (March through June), Summer (July through August), and Fall (September through October). Staff recommend that diversion of water under this proposed permit should be limited to comply with the applicable subsistence flow value of 1 cfs.

**Recreational Uses:** The Concho River (Segment 1421) has a designated primary contact recreation 1 use (TCEQ 2022). The City's request should not adversely impact recreational uses.

**Water Quality:** The Concho River (Segment 1421) has a designated high aquatic life and public water supply use (TCEQ 2022). Segment 1421, from the confluence of an unnamed tributary near Chandler Road upstream to the confluence of Red Creek, was identified in the *Texas Integrated Report*, with a concern for screening levels for depressed dissolved oxygen in water, and from the confluence of Red Creek upstream to the dam near Vines Road, with a concern for screening levels for depressed dissolved oxygen and nitrate in water (TCEQ 2024). The City's request should not adversely impact water quality.

**Freshwater Inflows:** Freshwater inflows are critical for maintaining the historical productivity of bays and estuaries along the Gulf Coast. The proposed project is located more than 200 river miles from the Gulf. The application does not request a new appropriation of water; therefore, the City's request should not have any impact to Matagorda Bay.

## RECOMMENDATIONS

Resource Protection staff recommend the following Special Conditions be included in the proposed permit, if granted:

1. Permittee shall implement reasonable measures in order to reduce impacts to aquatic resources due to entrainment or impingement. Such measures shall include, but shall not be limited to, the installation of screens on any diversion structure(s).
2. Permittee shall not divert water unless streamflow at USGS Gage No. 08136500 – Concho River at Paint Rock, TX exceeds 1 cfs.

## LITERATURE CITED

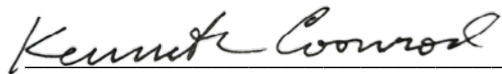
Griffith, G.E., S.A. Bryce, J.M. Omernik, J.A. Comstock, A.C. Rogers, B. Harrison, S.L. Hatch, and D. Bezanson. 2004. Ecoregions of Texas. (2-sided color poster with map, descriptive text, and photographs). U.S. Geological Survey, Reston, VA. Scale 1:2,500,000.

Hendrickson, DA, Cohen, AE. 2022. Fishes of Texas Project Database (version 3.00) [Internet]. University of Texas at Austin: Texas Advanced Computing Center. [cited 2025 May 5]. Available from <http://doi.org/10.17603/C3WC70>.

TCEQ. 2022. Texas Surface Water Quality Standards §§307.1-307.10. Austin (TX): Texas Commission on Environmental Quality.

TCEQ. 2024. Texas Integrated Report of Surface Water Quality. Austin (TX): Texas Commission on Environmental Quality.

TPWD. 2024. TPWD County Lists of Protected Species and Species of Greatest Conservation Need [Internet]. Austin (TX): Tom Green County, revised January 15, 2025. [cited 2025 May 5]. Available from <http://tpwd.texas.gov/gis/rtest/>.

A handwritten signature in cursive script, reading "Kenneth Coonrod", is positioned above a horizontal line.

Kenneth Coonrod, Aquatic Scientist



**Texas Commission on Environmental Quality**

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INTEROFFICE MEMORANDUM

To: Sarah Henderson, Project Manager  
Water Rights Permitting Team

Date: June 30, 2025

Through: *KA* Kathy Alexander, Ph.D., Policy and Technical Analyst  
Water Availability Division

*TG* Trent Gay, Team Leader  
Surface Water Availability Team

From: Andrew Garcia, Hydrologist  
Surface Water Availability Team

Subject: City of San Angelo  
WRPERM 13741  
CN600251615  
Concho River, Colorado River Basin  
Tom Green County

**HYDROLOGY REVIEW**

**Application Summary**

The City of San Angelo (City) requests authorization to use the bed and banks of the Concho River, Colorado River Basin, to convey 13,443 acre-feet of groundwater and surface water-based return flows for subsequent diversion and use for municipal purposes within the City's service area in Tom Green County. The return flows will be discharged from the City of San Angelo Wastewater Treatment Facility, authorized under Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0010641003, and diverted from a point on the Concho River at a maximum diversion rate of 27.85 cfs (12,500 gpm).

The City submitted an accounting plan on June 8, 2023. The accounting plan was subsequently revised on September 19, 2024, and a final version was submitted on October 16, 2024.

The application was declared administratively complete on December 30, 2020.

**Hydrology Review**

Resource Protection staff recommended instream flow requirements for this application. See the Resource Protection memo dated June 25, 2025.

Regarding the request to use the bed and banks of the Concho River to convey groundwater and surface water-based return flows, the application included the information required in 30 Texas Administrative Code (TAC) §295.112 and §295.113.

At the time of this technical review, the City had not discharged the return flows requested in the application. Therefore, no water rights can be affected because no water rights have relied on those return flows and no water rights have been granted based on those return flows.

The City submitted an accounting plan (*Reuse Accounting Plan for Conveyance and Diversion of San Angelo's Treated Wastewater Effluent on the Concho River*) that tracks the amount of discharged return flows, conveyance losses (0.4%), instream flow requirements, and the amount of return flows diverted. Staff reviewed the accounting plan and found it to be acceptable. Staff's opinion is that maintenance of the accounting plan will ensure that only discharged return flows are diverted so senior water rights are protected.

In addition, this application is subject to the requirements and orders of the Concho River Watermaster. The Watermaster actively manages water rights on a daily basis and protects senior water rights in times of shortage. Therefore, there should be no effect on other basin water rights as a result of this application.

## **Conclusion**

TWC 11.042(b) specifically allows for the use of a state watercourse for the conveyance of groundwater-based return flows. The City's groundwater-based return flows would not be considered to be part of the natural flow of the Concho River. TWC 11.042(c) specifically allows for the use of a state watercourse for the conveyance of surface water-based return flows.

Staff can support granting the application and recommends that the following special conditions be included in the permit:

1. Diversions authorized under this permit are dependent upon potentially interruptible return flows or discharges and are conditioned on the availability of those discharges. The right to divert the discharged return flows is subject to revocation if discharges become permanently unavailable for diversion and may be subject to reduction if the return flows are not available in quantities and qualities sufficient to fully satisfy the permit. Should the discharges become permanently unavailable for diversion, Permittee shall immediately cease diversions of return flows under this permit and either apply to amend the permit, or voluntarily forfeit the permit. If Permittee does not amend the permit or forfeit the permit, the Commission may begin proceedings

- to cancel this permit.
2. Permittee shall only divert daily return flows that are actually discharged, less losses.
  3. Permittee shall only divert and use return flows pursuant to Paragraph 1. USE and Paragraph 3. DIVERSION in accordance with the most recently approved accounting plan (*Reuse Accounting Plan for Conveyance and Diversion of San Angelo's Treated Wastewater Effluent on the Concho River*). Any modifications to the accounting plan shall be approved by the Executive Director. Any modification to the accounting plan that changes the permit terms must be in the form of an amendment to the permit. Should Permittee fail to maintain the accounting plan or notify the Executive Director of any modifications to the plan, Permittee shall immediately cease diversion of discharged return flows under this permit, and either apply to amend the permit, or voluntarily forfeit the permit. If Permittee fails to amend the accounting plan or forfeit the permit, the Commission may begin proceedings to cancel the permit. Permittee shall immediately notify the Executive Director upon modification of the accounting plan and provide copies of the appropriate documents effectuating such changes.
  4. Prior to diversion of any return flows in excess of the amount currently authorized by TPDES Permit No. WQ0010641003, Permittee shall apply for and be granted the right to reuse those return flows.

Note that the application is subject to the requirements and orders of the Concho River Watermaster.



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Andrew Garcia, Hydrologist

**Sarah Henderson**

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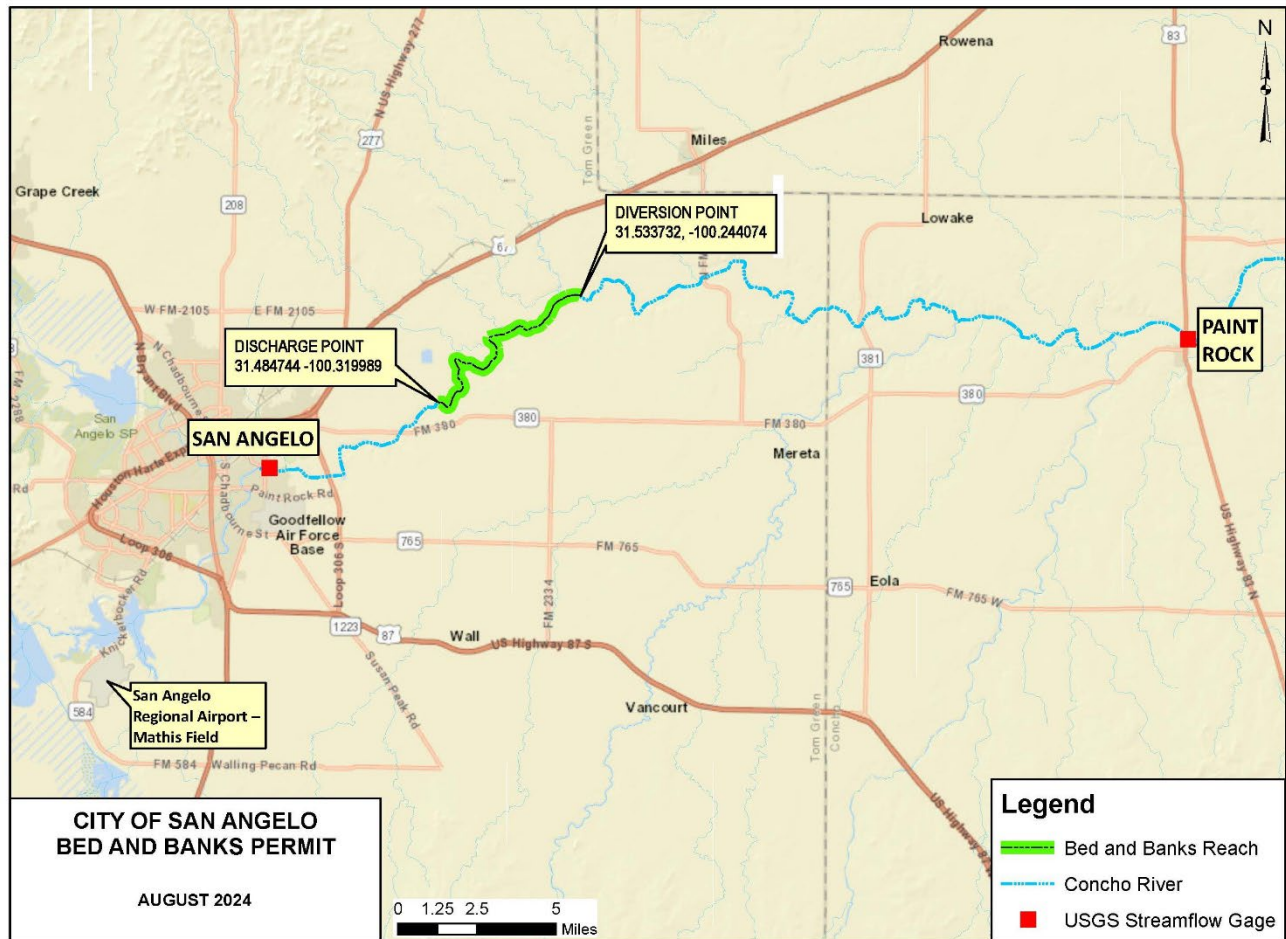
**From:** Bob Brandes <[REDACTED]>  
**Sent:** Wednesday, October 16, 2024 5:42:09 PM  
**To:** Kathy Alexander <kathy.alexander@tceq.texas.gov>  
**Subject:** Revisions to San Angelo Permit 13741 Accounting Plan

Kathy, I think I have revised the accounting plan as per our discussions today with Trent. I don't have Trent's email, so please forward to him, and he can contact me if issues still remain. As before, the Excel program contains both the Narrative and the Accounting Plan calculations. I have also included a redline Word version of the Narrative showing the changes I made. Thanks for reviewing this.

*Bob Brandes*  
*Robert J. Brandes Consulting*  
[REDACTED]  
*Phone: 512 / 461-1477*

## OVERVIEW

The City of San Angelo (“City”) plans to reuse the treated effluent from its municipal wastewater reclamation facility for potable water purposes to help meet the future water needs of its customers. As part of this project, the treated effluent is to be discharged from the wastewater treatment plans 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**

The discharge point at the upper end of the 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. The diversion point located downstream on the Concho River is immediately upstream of an existing dam authorized under Certificate of Adjudication No. 14-1348, which also is owned by the City.

Permit No. 13741 authorizes the City to convey its treated wastewater effluent along the designated segment of the Concho River and to divert the effluent from the river provided that no more water is withdrawn from the river than was discharged into the river, after accounting for carriage losses. Carriage losses along this reach of the Concho River have been investigated and determined to be 0.4 percent of the amount of water flowing past the discharge point down to the diversion point.

Special conditions in Permit No. 13741 require the City to maintain an accounting plan to document the daily effluent discharges into the Concho River, the associated conveyance losses along the conveyance reach, and the daily diversions of the effluent from the Concho River. This accounting plan is programmed in the accompanying Excel worksheet and includes the necessary calculations and checks to ensure compliance with the provisions of Permit No. 13741, including the requirement for a minimum bypass flow of 1.0 cfs at the Paint Rock gage downstream on the Concho River. Elements of this worksheet are described in the following section.

## **ACCOUNTING PLAN WORKSHEET**

The accounting plan worksheet is structured for a single calendar year of daily accounting. Days of the year are listed in rows down the page, with the last day of the previous year in the first row. Individual parameter values for each day are listed across the page in 21 columns. The worksheet requires daily entry of only three basic quantities: the previous 24-hour quantity of effluent discharged, the previous 24-hour quantity of effluent diverted, and the measured flow in the Concho River at the Paint Rock gage. All other quantities are calculated within the worksheet.

Each day, the allowable amount of effluent that can be diverted over the next 24-hour period is calculated based on the amount of effluent discharged the previous 24-hour period, after adjustments for conveyance losses and for any over diversions the previous 24 hours relative to the previous allowable diversion amount. The one-day time lag is considered reasonable given the relatively steady nature of wastewater discharges from day to day, the length of the conveyance reach, and the normal travel time through the reach. A daily check is also made of the flow in the Concho River at the Paint Rock gage to ensure that effluent diversions do not cause the flow at the gage to fall below 1.0 cfs, which is the required environmental bypass flow stipulated in Permit No. 13741 and is equal to the Subsistence e-flow value at the Paint Rock gage. Allowable effluent diversions are reduced by the amount the gage flow is below this e-flow value. In applying the accounting plan, data are entered into the worksheet daily at approximately the same time each day.

Following is a description of parameters and calculations for each of the columns in the worksheet labeled Reuse Acct Plan.

Column 1: DATE – The date identified for daily calculations, month/day/year.

Column 2: PREVIOUS 24-HOUR DISCHARGE, M Gallons – The quantity of effluent discharged the previous 24 hours, in units of million gallons.

Column 3: PREVIOUS 24-HOUR DISCHARGE, Acre-Feet –Column 2 converted to units of acre-feet.



- Column 4: PREVIOUS 24-HOUR CONVEYANCE LOSS, M Gallons – The calculated conveyance loss of the effluent discharged the previous 24 hours based on a loss factor of 0.4%, in units of million gallons.
- Column 5: PREVIOUS 24-HOUR CONVEYANCE LOSS, Acre-Feet – Column 4 converted to units of acre-feet.
- Column 6: AVAILABLE DIVERSION NEXT 24 HOURS AFTER LOSS ADJUSTMENT, M Gallons – The quantity of effluent available for diversion the next 24 hours equal to the quantity of effluent discharged the previous 24 hours reduced by the conveyance loss in Column 4, in units of million gallons.
- Column 7 - AVAILABLE DIVERSION NEXT 24 HOURS AFTER LOSS ADJUSTMENT, Acre-Feet – Column 6 converted to units of acre-feet.
- Column 8: PREVIOUS 24-HOUR DIVERSION, M Gallons – The quantity of effluent diverted the previous 24 hours, in units of million gallons.
- Column 9: PREVIOUS 24-HOUR DIVERSION, Acre-Feet – Column 8 converted to units of acre-feet.
- Column 10: PREVIOUS 24-HOUR OVER DIVERSION, M Gallons – The amount of over diversion the previous 24 hours calculated by subtracting the ALLOWABLE DIVERSION for the previous 24 hours from the PREVIOUS 24-HOUR DIVERSION with only positive values retained, in units of million gallons.
- Column 11: PREVIOUS 24-HOUR OVER DIVERSION, Acre-Feet – Column 10 converted to units of acre-feet.
- Column 12: AVAILABLE DIVERSION NEXT 24 HOURS AFTER OVER-DIV ADJUSTMENT, M Gallons – The quantity of effluent available for diversion the next 24 hours equal to the AVAILABLE DIVERSION NEXT 24 HOURS AFTER LOSS ADJUSTMENT in Column 6 reduced by the PREVIOUS 24-HOUR OVER DIVERSION in Column 10, in units of million gallons.
- Column 13: AVAILABLE DIVERSION NEXT 24 HOURS AFTER OVER-DIV ADJUSTMENT, Acre-Feet – Column 12 converted to units of acre-feet.
- Column 14: PAINT ROCK GAGE FLOW, cfs – Measured flow in the Concho River at the Paint Rock gage at time of daily data entry.
- Column 15: E-FLOW BYPASS EQUALED/EXCEEDED, Yes or No – Notation as to whether or not the flow in the Concho River at the Paint Rock gage exceeds the environmental bypass flow requirement of 1.0 cfs.
- Column 16: FINAL ALLOWABLE DIVERSION NEXT 24 HOURS, M Gallons – The allowable diversion for the next 24-hour period equal to the AVAILABLE DIVERSION NEXT 24 HOURS AFTER OVER-DIV ADJUSTMENT in Column 12, except when the Paint Rock gage flow is less than 1.0 cfs (the required environmental bypass flow)-~~and, then~~ the allowable diversion is set equal to the AVAILABLE DIVERSION NEXT 24 HOURS AFTER OVER-DIV ADJUSTMENT in Column 12 minus the amount the flow at the Paint Rock gage is less than 1.0 cfs, in units of million gallons.

- Column 17: FINAL ALLOWABLE DIVERSION NEXT 24 HOURS, Acre-Feet – Column 16 converted to units of acre-feet.
- Column 18: YEAR-TO-DATE DISCHARGE VOLUME, M Gallons – The cumulative amount of effluent discharged during the current year as of the beginning of the current day, in units of million gallons. The current value of this quantity is reported in Cell (F,10).
- Column 19: YEAR-TO-DATE DISCHARGE VOLUME, Acre-Feet – Column 18 converted to units of acre-feet. The current value of this quantity is reported in Cell (M,10).
- Column 20: YEAR-TO-DATE DIVERSION VOLUME, M Gallons – The cumulative amount of effluent diverted during the current year as of the beginning of the current day, in units of million gallons. The current value of this quantity is reported in Cell (F,12).
- Column 21: YEAR-TO-DATE DIVERSION VOLUME, Acre-Feet – Column 20 converted to units of acre-feet. The current value of this quantity is reported in Cell (M,12).

**City of San Angelo**

**WRPERM No. 13741**

October 16, 2024

*Reuse Accounting Plan for Conveyance and Diversion of San Angelo's Treated  
Wastewater Effluent on the Concho River*

Contact

Mr. Chris Kozlowski

(512) 239-1801

**Sarah Henderson**

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**Subject:** RE: Water Use Permit Application No. 13741 - City of San Angelo

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**From:** Jason Hill [REDACTED] >  
**Sent:** Tuesday, September 24, 2024 4:51 PM  
**To:** Kathy Alexander <[kathy.alexander@tceq.texas.gov](mailto:kathy.alexander@tceq.texas.gov)>  
**Cc:** Bob Brandes [REDACTED]  
**Subject:** Water Use Permit Application No. 13741 - City of San Angelo

Kathy, the City revised its WCP/DCP again earlier this month. I've attached the official record of adoption of ordinance No. 2024-079 that codifies the revised plans.

Also, I've attached revised portions of certain appendices that reflect corrected discharge point coordinates. The revised coordinates are also reflected in the attached reuse accounting plan and workbook.

The revised accounting plan/workbook also includes modified calculations to reflect a one-day lag time for the 24-hour allowable diversion from the Concho River based on the previous 24-hour discharge volume, which is a more appropriate calculation. The requirement for a minimum environmental bypass flow as a condition for making diversions of effluent has also been incorporated into the reuse accounting plan worksheet and workbook for allowable diversions. The 1.0 cfs subsistence flow, measured at the Paint Rock gage, has been used for this purpose. A new column has been added to the worksheet for entering the measured daily flow at the Paint Rock gage. A second column has been added to determine whether the measured gage flow is less than the required bypass flow (= Yes or No). If the answer is "Yes", then the allowable effluent diversion is reduced by the amount that the gage flow is below the 1.0 cfs e-flow value. This should address issues that we've previously discussed.

Let me know if you need any more info from the City on any of this.

Many thanks.

**Jason Hill**  
ATTORNEY



3800 North Lamar Blvd., Suite 200  
Austin, Texas 78756  
[REDACTED] | (512) 806-1060

Official Minute Record  
September 17, 2024

Volume 2024  
Page 374

**ORDINANCE 2024-079**

**AN ORDINANCE AMENDING CHAPTER 11 "UTILITIES", ARTICLE 11.05 "WATER CONSERVATION AND DROUGHT CONTINGENCY PLAN" OF THE CODE OF ORDINANCES OF THE CITY OF SAN ANGELO TEXAS; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE**

**NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF SAN ANGELO, TEXAS THAT:**

Section 1: CHAPTER 11, ARTICLE 11.05 of the Code of Ordinances is hereby amended to read as depicted on Exhibit A.

Section 2: The ordinance was adopted after two readings of the San Angelo City Council with public hearing.

Section 3: The following severability clause is hereby adopted with this amendment:

SEVERABILITY:

That the terms and provisions of this Ordinance shall be deemed to be severable in that if any portion of this Ordinance shall be declared to be invalid, the same shall not affect the validity of the other provisions of this Ordinance.

Section 4: This Ordinance shall be effective upon passage.

**INTRODUCED on the 3rd day of September 2024, and finally ADOPTED on this 17th day of September 2024.**

**CITY OF SAN ANGELO**

**ATTEST:**

DocuSigned by:

  
Heather Starn, City Clerk

Signed by:

  
Brenda Gunter, Mayor

**APPROVED AS TO FORM:**

DocuSigned by:

  
Theresa James, City Attorney

**EXHIBIT A**  
**CODE OF ORDINANCES**  
**CHAPTER 11 UTILITIES**

**ARTICLE 11.05 WATER CONSERVATION AND DROUGHT CONTINGENCY PLANS**

**Sec. 11.05.001 Purpose**

This Article establishes the city's water conservation plan and drought contingency plan, as defined in title 30, section 288.1, of the Texas Administrative Code, as amended. The combined purpose of the plans is to encourage water conservation at all times and to establish strategies and procedures for identifying, classifying, and handling temporary and recurring water supply shortages and water demand emergencies 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 and Drought Contingency Plan," as adopted by Council by resolution, on file in the office of the city clerk, and available for public inspection, is adopted and incorporated herein (the "Plan").
  - a. *Implementation.* The director of water utilities will act as the administrator of the 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) In addition to the requirements in Section XIV of the City of San Angelo Water Conservation Plan and Drought Contingency Plan regarding wholesale water contract requirements, 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 curtail water deliveries to or diversions by wholesale water customers on a pro rata basis in accordance with Texas Water Code section 11.039, as it may be amended, 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 water customer informing them of their monthly water usage allocations and shall notify the news media and the executive director of the Texas 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 Texas 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 Texas Commission on Environmental Quality and shall notify the news media.
- 17) Public information. The water utilities director will provide continuing public education and information about the Plan, including 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 city will

affirmatively provide opportunity for public input to the drought contingency plan at regularly scheduled City Council meetings. Prior notice of the scheduled City Council meetings are posted on the city's website. The purpose of this effort shall be to seek user input in the preparation of the drought contingency plan, for informing wholesale customers about the plan, and keep the citizenry informed about the water conservation plan and drought contingency plans and their importance to the city's water supply.

**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. During each water supply level stage established in this section, the water utilities director may also use other alternative water sources with the prior approval of the Texas Commission on Environmental Quality executive director as appropriate and when required (e.g., interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.).
- 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.
    - i. 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.

- ii. Golf courses greens may be watered daily except during the "prohibited watering hours" as stated in section 11.05.002.
- iii. 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:
  - i. 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.
  - ii. Golf course greens may be watered daily except during the "prohibited watering hours" as stated in section 11.05.002.
  - iii. 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:
  - i. 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.

- ii. The use of treated or raw city water to fill, refill or maintain the level of any fountain or swimming pool is prohibited.
  - iii. 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.

**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:
    - i. Name and address of the petitioner(s).
    - ii. Purpose and estimated amount of water use.
    - iii. Specific provision(s) of this article from which the petitioner is requesting an exemption.
    - iv. 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.
    - v. Description of the relief requested.
    - vi. Period of time for which the variance is sought.
    - vii. 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.
    - viii. Other pertinent information.
    - ix. 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:
  - i. Cannot be technically accomplished during the expected duration of the water supply shortage or other condition for which this article is in effect;
  - ii. Will cause undue hardship on a program or service offered by a public entity; or
  - iii. 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.

#### **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 Plan. The administrator will oversee the execution and implementation of all elements of the water conservation and drought contingency programs. 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. Every wholesale water contract entered into or renewed after this Article becomes effective, including contract extensions, must include a provision stating that, in case of a shortage of water resulting from drought, the water to be distributed shall be divided pro rata in accordance with Texas Water Code section 11.039, as it may be amended.

##### *c) Service restrictions.* The 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.

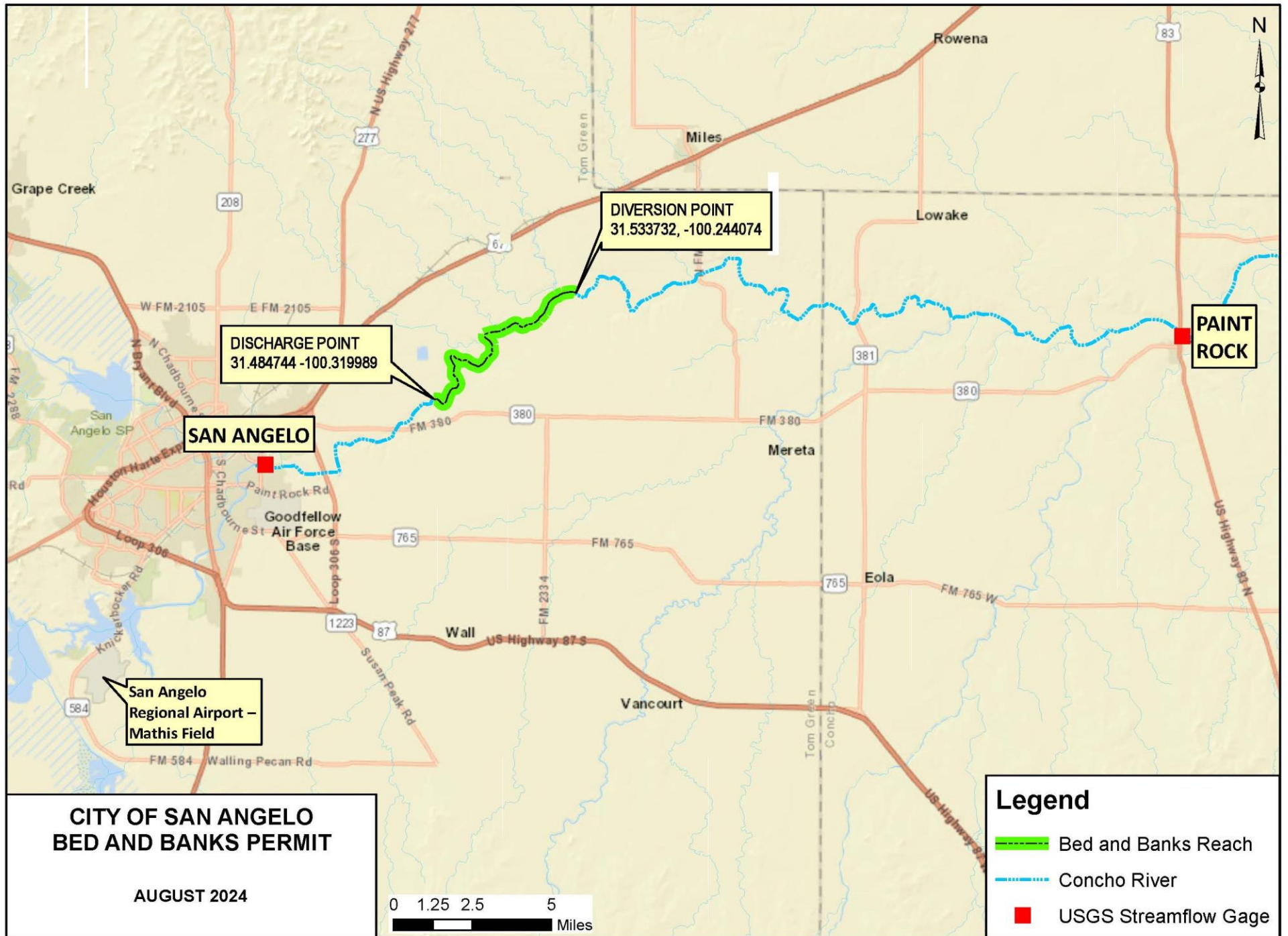
- 4) The building inspection department will not certify new construction which fails to meet the plan requirements.

**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.*
    - i. 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.
    - ii. 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.
    - iii. 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.

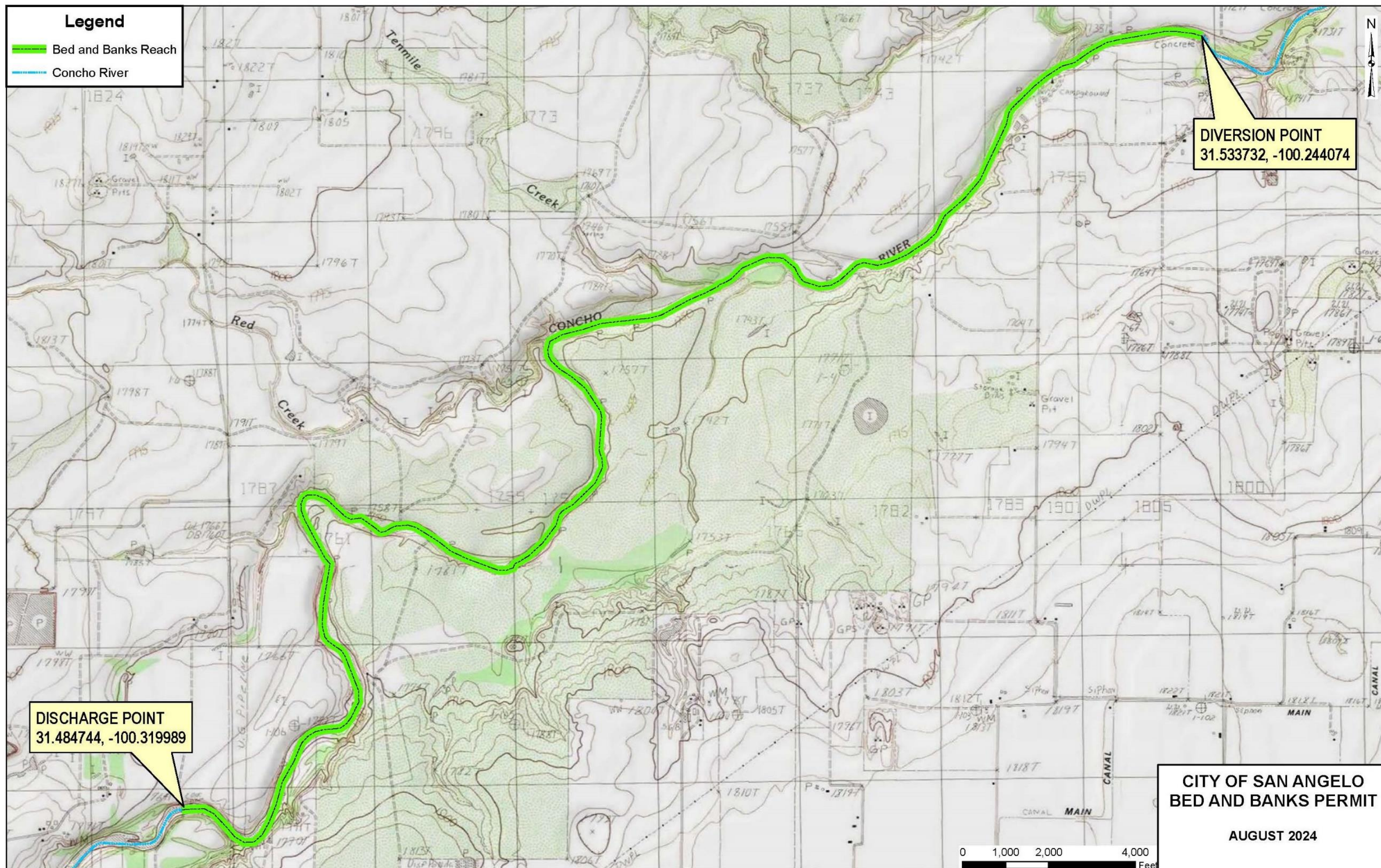
## **APPENDIX C**

### Maps



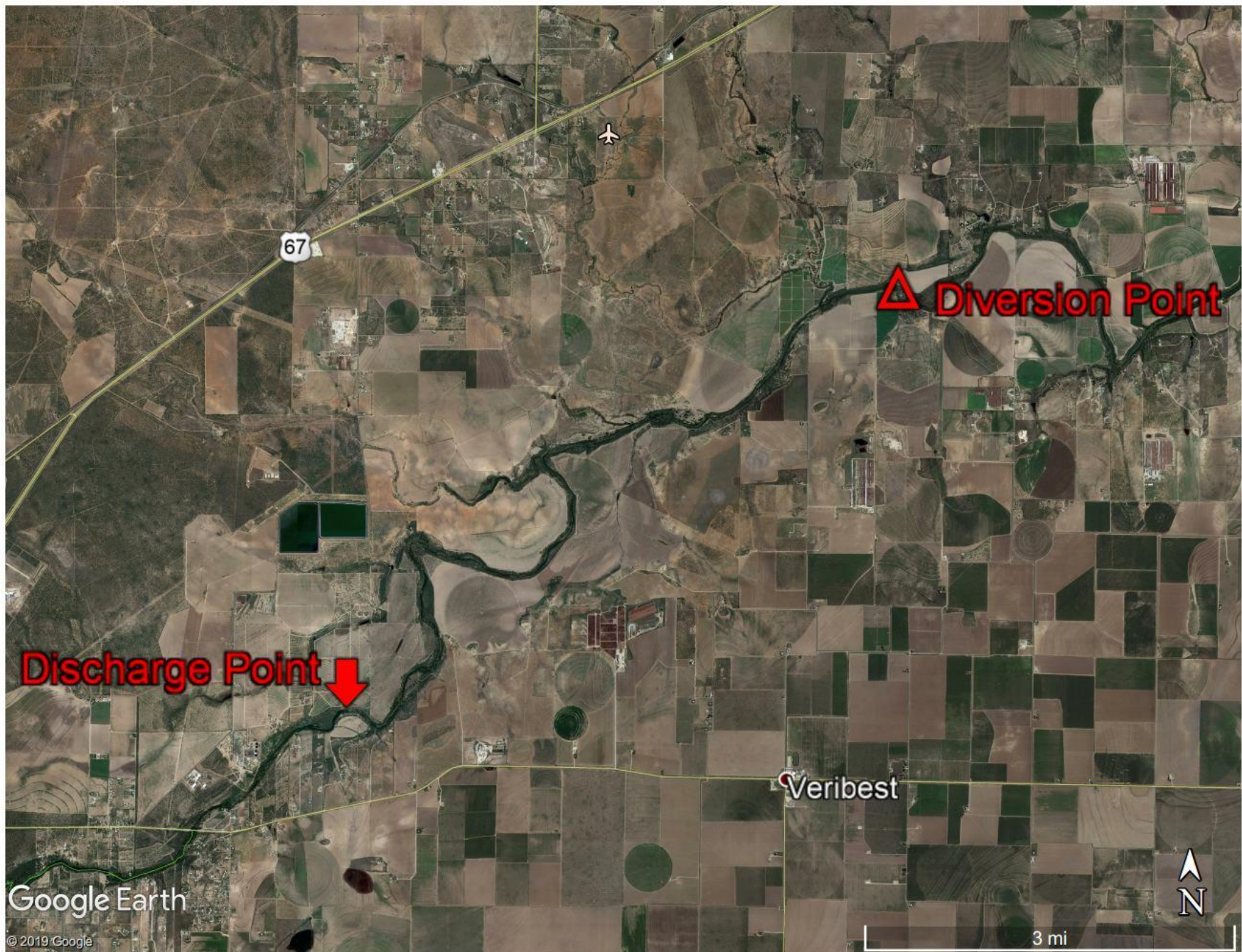
**Map 1 – General Location Map Showing Bed and Banks Conveyance Reach of Concho River**





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





**Map 3 – Aerial View of Bed and Banks Conveyance Reach**





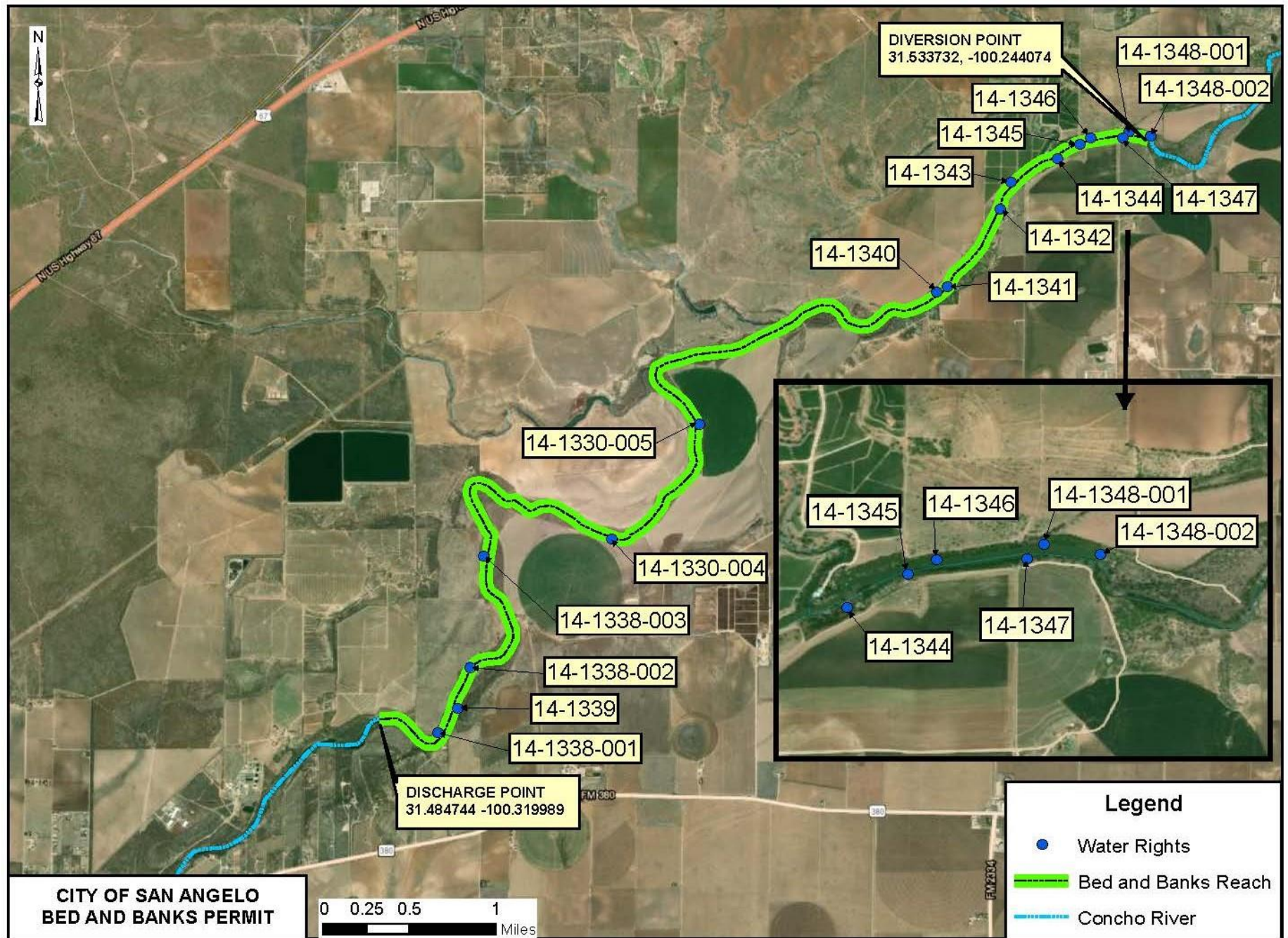
**Map 4 – Discharge Point at Upstream End of Bed and Banks Conveyance Reach**





**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

September 20, 2024

## 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.

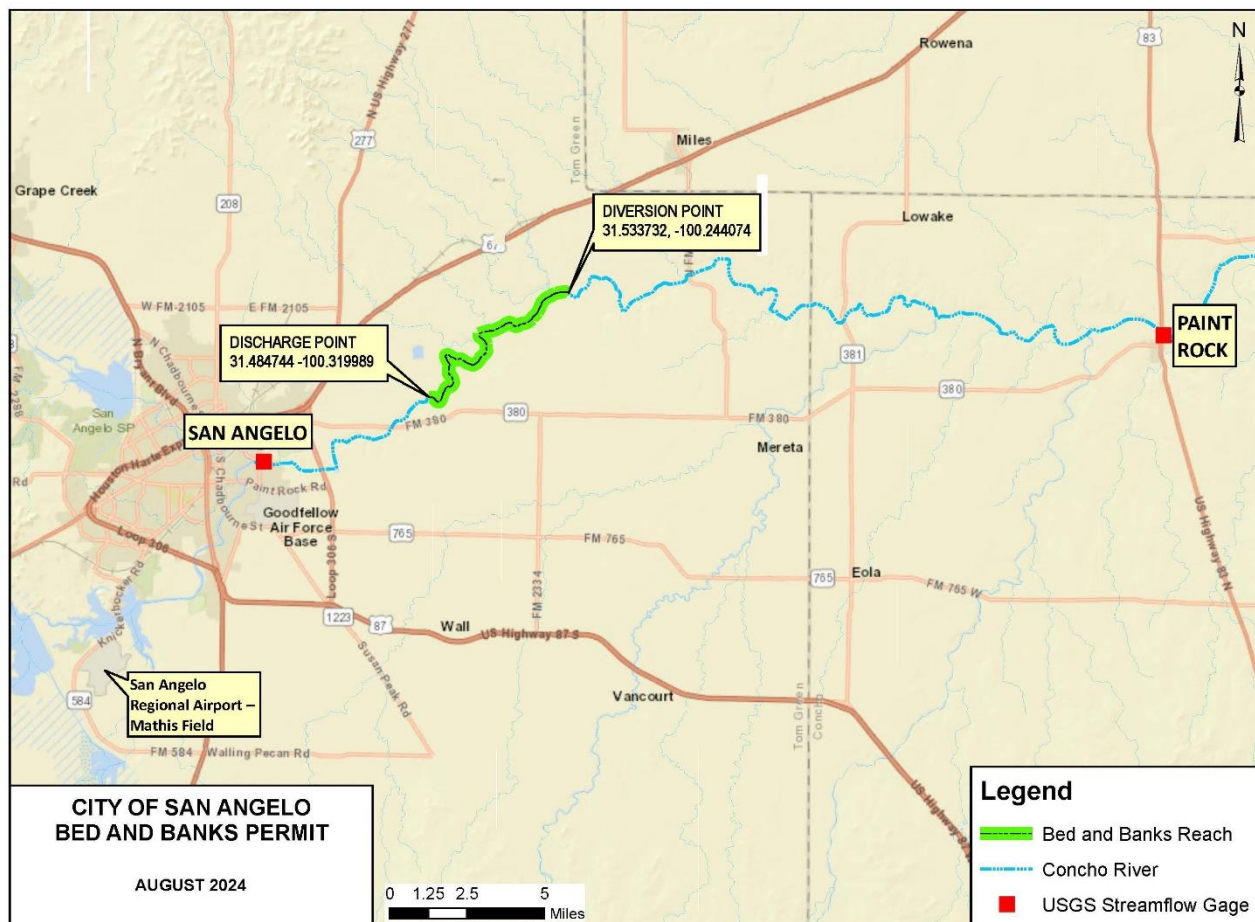


Figure 1 General Location Map for City of San Angelo Reuse Project

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**

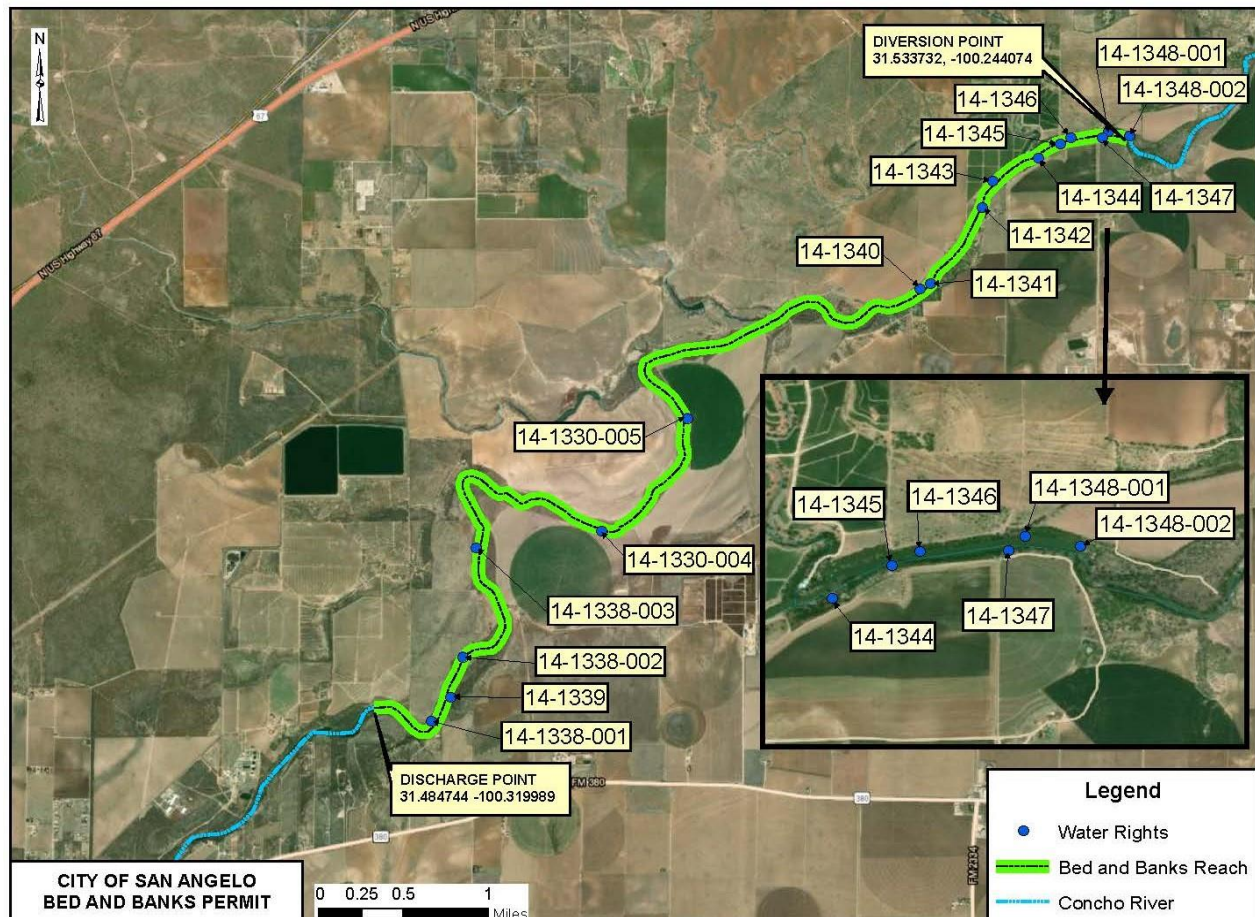
The discharge point at the upper end of the proposed conveyance reach of the Concho River is located approximately 5.4 river miles downstream from Loop 306 on the east side of San Angelo. It is immediately below an existing dam authorized under Certificate of Adjudication No. 14-1337 that is owned by 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<sup>1</sup>. 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:

$$\text{GAIN/LOSS} = \text{PAINT ROCK FLOW} + \text{TOTAL DIVERSIONS} - \text{SAN ANGELO FLOW}$$

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

---

<sup>1</sup> 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**

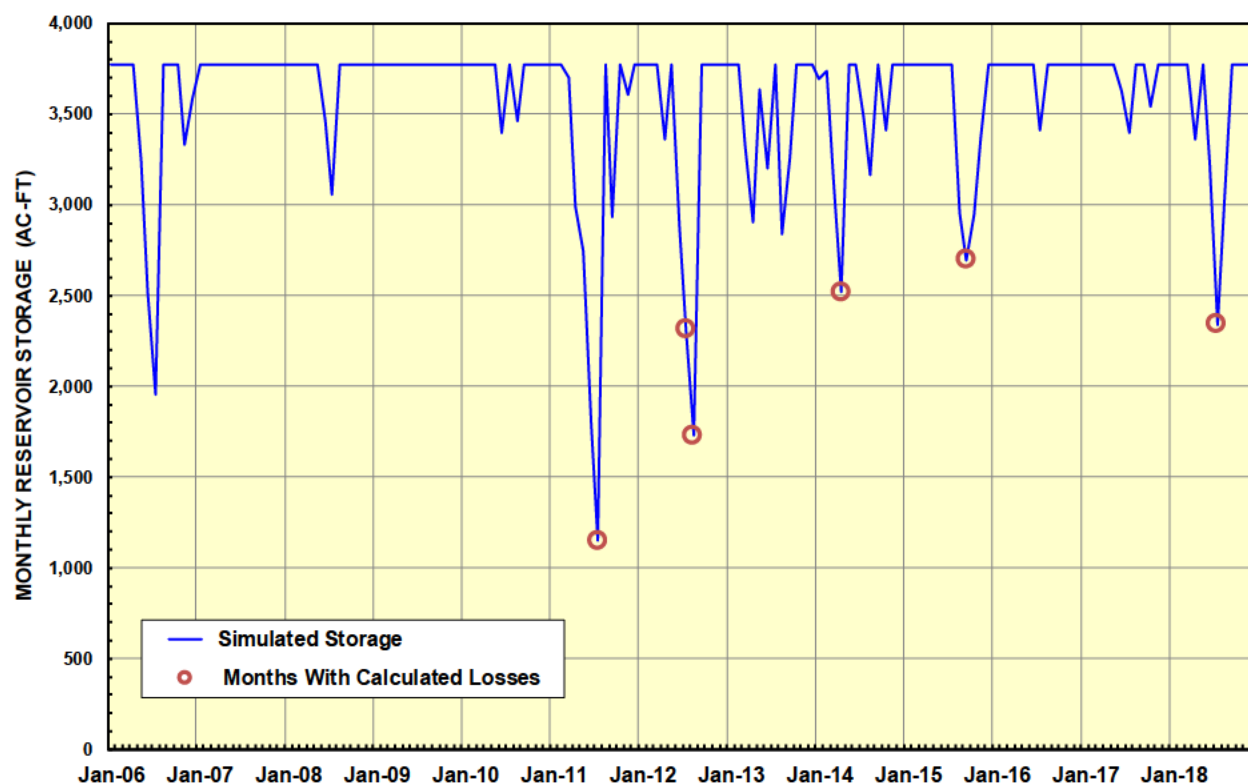
	PARAMETERS	RUN ID							
		1	2	3	4	5	6	7	8
(1)	<b>RAINFALL CRITERIA (Inches)</b>								
(2)	Previous Month's Rainfall < or = to:	0.40	0.50	0.50	1.30	1.30	1.30	1.30	1.30
(3)	Current Month's Rainfall < or = to:	0.10	0.10	0.50	0.50	0.60	0.70	0.90	1.00
(4)	<b>RESULTS</b>								
(5)	Total Number of Qualifying 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.

**City of San Angelo**

**WRPERM No. 13741**

September 24, 2024

*Reuse Accounting Plan for Conveyance and Diversion of San Angelo's Treated  
Wastewater Effluent on the Concho River*

Contact

Mr. Chris Kozlowski

(512) 239-1801

## Sarah Henderson

---

From: Bob Brandes [REDACTED] >

Sent: Thursday, July 25, 2024 13:50

To: Kathy Alexander <kathy.alexander@tceq.texas.gov>; 'Jason Hill' [REDACTED]; Trent Gay

<Trent.Gay@tceq.texas.gov>; Andrew Garcia <Andrew.Garcia@Tceq.Texas.Gov>

Subject: RE: Accounting Plan Discussion

A revised version that may address TCEQ concerns.

*Bob Brandes*

*Robert J. Brandes Consulting*

*Phone: 512 / 461-1477*

**City of San Angelo**

**WRPERM No. 13741**

July 25, 2024

*Reuse Accounting Plan for Conveyance and Diversion of San Angelo's Treated  
Wastewater Effluent on the Concho River*

Contact

Mr. Chris Kozlowski

(512) 239-1801

## Sarah Henderson

---

**From:** Jason Hill [REDACTED] >  
**Sent:** Friday, July 5, 2024 6:19 PM  
**To:** Sarah Henderson  
**Cc:** Daniel Valenzuela; Kelton, Shane; Theresa James  
**Subject:** City of San Angelo Application No. 13741 for a Water Use Permit  
**Attachments:** 20240705 WCP-DCP update transmittal copy.pdf

Ms. Henderson,

The City of San Angelo recently updated its Water Conservation Plan and Drought Contingency Plan. I have included a copy of the plans, as well as a transmittal letter, as an attachment to this email. Let me know if you have any questions or require any follow up from me on this.

Many thanks.

**Jason Hill**

ATTORNEY



3800 North Lamar Blvd., Suite 200  
Austin, Texas 78756

[REDACTED] | (512) 806-1060

July 5, 2024

Sarah Henderson, Project Manager  
Water Rights Permitting Team  
Water Rights Permitting and Availability Section  
Texas Commission on Environmental Quality

sent via email to [sarah.henderson@tceq.texas.gov](mailto:sarah.henderson@tceq.texas.gov)

RE: City of San Angelo Application No. 13741 for a Water Use Permit  
authorizing delivery of water down bed and banks; City of San Angelo  
2024 Water Conservation Plan and Drought Contingency Plan.

Dear Ms. Henderson:

On October 15, 2020, the City of San Angelo submitted the application identified above for a water use permit. Agency staff declared the application to be administratively complete on December 30, 2020. The City has since considered and adopted its updated Water Conservation Plan and Drought Contingency Plan, a copy of which I have included with this correspondence.

The prior version of the plans was included in Section F of the City's application. Please update the information in Section F by including in it the City of San Angelo 2024 Water Conservation Plan and Drought Contingency Plan.

If there is any additional information the City can provide to facilitate technical review of the application, please let me know at your first convenience.

Sincerely,



Jason Hill

Sarah Henderson

July 5, 2024

Page 2

encl.

cc: Daniel Valenzuela, City Manager  
Shane Kelton, Executive Director of Public Works  
Theresa James, City Attorney

# WATER CONSERVATION PLAN AND DROUGHT CONTINGENCY PLAN

---

CITY OF SAN ANGELO

PWSID 2260001

JUNE 2024

**Prepared for:**  
**CITY OF SAN ANGELO**  
**301 W. BEAUREGARD**  
**SAN ANGELO, TEXAS 76903**



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# **CITY OF SAN ANGELO, TEXAS WATER CONSERVATION PLAN**

## **Section I. Declaration of Policy, Purpose and Intent**

The City of San Angelo (City) recognizes the importance of its water resources and seeks to protect and maximize those supplies. The City recognizes the importance of efficient use of our existing supplies to make them last as long as possible. The City has embraced water conservation and reuse as a way to maximize the longevity and sustainability of its water resources and to protect the water supplies of its citizens. The City pursues water conservation through the enactment and implementation of this Water Conservation Plan.

The purpose of the Water Conservation Plan (Plan) is to: promote the wise and responsible use of water by implementing structural programs that result in quantifiable water conservation results; develop, maintain, and enforce water conservation policies and ordinances; and support public education programs that inform customers about water and wastewater facilities operations, and water conservation.

In accordance with 30 Texas Administrative Code (TAC) Chapter 288, the City of San Angelo practices and promotes conservation of water through the implementation of practices described in the Texas Water Development Board's (TWDB's) *Best Management Practices (BMP) Guide for Municipal and Wholesale Users*. The City has implemented a number of those municipal BMPs identified by the TWDB in order to maximize its water conservation efforts.

## **Section II. Definitions**

The following words and terms, when used in this Plan, shall have the following meanings, unless the context clearly indicates otherwise (Source: 30 TAC §288.1).

### **A. Agricultural or Agriculture: Any of the following activities:**

1. cultivating the soil to produce crops for human food, animal feed, or planting seed or for the production of fibers;
2. the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or non-soil media by a nursery grower;
3. raising, feeding, or keeping animals for breeding purposes or for the production of food or fiber, leather, pelts, or other tangible products having a commercial value;
4. raising or keeping equine animals;
5. wildlife management; and

6. planting cover crops, including cover crops cultivated for transplantation, or leaving land idle for the purpose of participating in any governmental program or normal crop or livestock rotation procedure.
- B.** Agricultural use: Any use or activity involving agriculture, including irrigation.
- C.** Best management practices: Voluntary efficiency measures that save a quantifiable amount of water, either directly or indirectly, and that can be implemented within a specific time frame.
- D.** Conservation: Those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses.
- E.** Commercial use: The use of water by a place of business, such as a hotel, restaurant, or office building. This does not include multi-family residences or agricultural, industrial, or institutional users.
- F.** Drought contingency plan: A strategy or combination of strategies for temporary supply and demand management responses to temporary and potentially recurring water supply shortages and other water supply emergencies. A drought contingency plan may be a separate document identified as such or may be contained within another water management document(s).
- G.** Industrial use: The use of water in processes designed to convert materials of a lower order of value into forms having greater usability and commercial value, and the development of power by means other than hydroelectric, but does not include agricultural use.
- H.** Institutional use: The use of water by an establishment dedicated to public service, such as a school, university, church, hospital, nursing home, prison or government facility. All facilities dedicated to public service are considered institutional regardless of ownership.
- I.** Irrigation: The agricultural use of water for the irrigation of crops, trees, and pastureland, including, but not limited to, golf courses and parks which do not receive water from a public water supplier.
- J.** Irrigation water use efficiency: The percentage of that amount of irrigation water which is beneficially used by agriculture crops or other vegetation relative to the amount of water diverted from the source(s) of supply. Beneficial uses of water for irrigation purposes include, but are not limited to, evapotranspiration needs for vegetative maintenance and growth, salinity management, and leaching requirements associated with irrigation.

- K.** Mining use: The use of water for mining processes including hydraulic use, drilling, washing sand and gravel, and oil field re-pressuring.
- L.** Municipal use: The use of potable water provided by a public water supplier as well as the use of sewage effluent for residential, commercial, industrial, agricultural, institutional, and wholesale uses.
- M.** Nursery grower: A person engaged in the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or nonsoil media, who grows more than 50% of the products that the person either sells or leases, regardless of the variety sold, leased, or grown. For the purpose of this definition, grow means the actual cultivation or propagation of the product beyond the mere holding or maintaining of the item prior to sale or lease, and typically includes activities associated with the production or multiplying of stock such as the development of new plants from cuttings, grafts, plugs, or seedlings.
- N.** Pollution: The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property, or to the public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.
- O.** Public water supplier: An individual or entity that supplies water to the public for human consumption.
- P.** Residential use: The use of water that is billed to single and multi-family residences, which applies to indoor and outdoor uses.
- Q.** Residential gallons per capita per day: The total gallons sold for residential use by a public water supplier divided by the residential population served and then divided by the number of days in the year.
- R.** Regional water planning group: A group established by the Texas Water Development Board to prepare a regional water plan under Texas Water Code §16.053.
- S.** Retail public water supplier: An individual or entity that for compensation supplies water to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants when that water is not resold to or used by others.
- T.** Reuse: The authorized use for one or more beneficial purposes of use of water that remains unconsumed after the water is used for the original purpose of use and before that water is either disposed of or discharged or otherwise allowed to flow into a watercourse, lake, or other body of state-owned water.

- U.** Total use: The volume of raw or potable water provided by a public water supplier to billed customer sectors or nonrevenue uses and the volume lost during conveyance, treatment, or transmission of that water.
- V.** Total gallons per capita per day (GPCD): The total amount of water diverted and/or pumped for potable use divided by the total permanent population divided by the days of the year. Diversion volumes of reuse as defined in 30 TAC Section 288.1 shall be credited against total diversion volumes for the purposes of calculating GPCD for targets and goals.
- W.** Water conservation plan: A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water. A water conservation plan may be a separate document identified as such or may be contained within another water management document(s).
- X.** Wholesale public water supplier: An individual or entity that for compensation supplies water to another for resale to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants as an incident of that employee service or tenancy when that water is not resold to or used by others, or an individual or entity that conveys water to another individual or entity but does not own the right to the water which is conveyed, whether or not for a delivery fee.
- Y.** Wholesale use: Water sold from one entity or public water supplier to other retail water purveyors for resale to individual customers.

### **Section III. Utility Profile Summary**

The City supplies treated potable water to municipal, industrial, agricultural and wholesale users. The City holds Certificate of Convenience and Necessity (CCN) Number 10242. City municipal and industrial and agricultural use customers are located within City CCN area encompassing approximately 58 square miles as depicted in the service area map in Appendix A. The Upper Colorado River Authority (UCRA) is a wholesale water provider in Tom Green County and has an agreement with the City of San Angelo for San Angelo to treat up to 1,000 acre-feet per year of water from any of City sources in return for water from O.C. Fisher. The City of Miles and local rural water supply corporations in Tom Green and Concho Counties contract with UCRA to provide treated water which is transmitted through either City or the retail customer's systems. A more detailed utility profile is included in Appendix B. The utility profile is summarized as follows.

#### **A. Population**

City population in the year 2023 as estimated using information supplied by the Texas Water Development Board (TWDB) for the 2021 Regional Water Plan is estimated to be 106,677 persons in 2024 and is projected to reach 116,437 by 2030.

Table 1 provides population figures for the City of San Angelo for the previous five years.

**Table 1: Population for City of San Angelo for Preceding Five Years**

Year	San Angelo Population
2019	99,224
2020	99,893
2021	101,547
2022	103,229
2023	104,939
Source: US Census Data and 2021 Regional Water Plan	

Table 2 depicts projected population figures for San Angelo through the year 2070.

**Table 2: Projected Population for City of San Angelo**

Year	San Angelo Population
2030	116,437
2040	123,653
2050	131,315
2060	139,451
2070	148,090
Source: 2021 Regional Water Plan	

## **B. Customer Data and Water Use Data**

On average, the City diverts approximately 15,365 acre-feet per year of raw water from its water sources to satisfy the demands of water users.

City water customers consist of a mixture of residential, commercial, industrial, wholesale, institutional and irrigation users. The City serves approximately 41,917 residential connections, 2,906 commercial connections, 473 institutional connections, and 61 industrial connections.

Treated wastewater discharged from the City's wastewater treatment plant is utilized by agricultural customers for agricultural and irrigation use.

Table 3 summarizes the expected water use figures for San Angelo municipal wholesale users over the next decade.



**Table 3: Projected Water Demand for the Coming Decade**

Year	San Angelo Population	San Angelo Demand (gal/yr)
2025	108,444	5,628,934,707
2026	110,240	5,784,198,387
2027	112,065	5,939,462,067
2028	113,921	6,094,725,747
2029	115,808	6,249,989,427
2030	116,437	6,405,253,107
2031	117,159	6,432,526,836
2032	117,885	6,459,800,564
2033	118,615	6,487,074,293
2034	119,350	6,514,348,022
Source: 2021 Regional Water Plan		

**C. Water Supply System**

**1. Water Sources**

The City holds numerous surface water rights in the Concho River Basin and has also contracted for surface water from other sources. Currently, the City can obtain surface water from six sources: Twin Buttes Reservoir, Lake Nasworthy, O.C. Fisher Lake, O.H. Ivie Reservoir, E.V. Spence Reservoir, and direct diversions from the South Concho River and the Concho River main stem.

The City holds water rights for up to approximately 124,688 ac-ft/yr of surface water for municipal uses. However, these water supplies are not fully reliable; during drought-of-record conditions, there will be little water available from many of these supplies. It is projected by the Region F Water planning Group that in 2030 surface water supplies available to the City will provide a safe yield of approximately 5,706 acre-feet per year.

In addition to surface water, the City also own groundwater rights in the Hickory Aquifer. The City's Hickory wellfield consists of 15 wells located in McCulloch County and transmission facilities to transport the water 62 miles to the City's Groundwater Treatment Facility (GWTF) and are capable of providing an additional 12,000 acre-feet/year of treated groundwater.

As part of an agreement with the Upper Colorado River Authority (UCRA), San Angelo treats up to 1,000 acre-feet per year water for customers of UCRA. The water delivered from the City of San Angelo treatment works are provided under UCRA water rights.

## 2. Water Treatment

Historically, San Angelo has relied upon its surface water sources to produce potable water. Surface water is treated at the City's conventional treatment plant located along the South Concho River, east of Metcalfe Street between East Avenue K and East Avenue H. The City's surface water treatment plant is aging, with many of the treatment process units dating back to the 1950's. With the development of the Hickory Aquifer, San Angelo constructed a groundwater treatment facility, co-located with the Surface Water Treatment Plant (SWTP), that was brought online in 2015.

Currently, the City is expanding its production of groundwater from the Hickory Aquifer which includes a corresponding expansion of the GWTF treatment capabilities.

A majority of the drinking water for the San Angelo service area originates from surface water treated at the SWTP. The SWTP utilizes a conventional treatment process that consists of coagulation, flocculation, sedimentation, and filtration followed by disinfection prior to entering the City's water distribution system. The existing SWTP is rated for approximately 42 MGD and covers nearly 20 acres.

Initially, raw surface water is pumped to the SWTP and dosed with a blended coagulant (aluminum sulfate and polymer) in any one of three rapid mix basins. Following coagulant addition, the water can be transferred to as many as five flocculation trains, each with a separate downstream sedimentation clarifier to settle the flocculated particles. The sludge from the clarifiers flows to a sludge lagoon, and the clarified water advances to filtration. The filtration equipment consists of 15 dual-media, gravity filters. Effluent from the filters flows into two intermediate clearwell storage tanks before being combined into a single large clearwell (Clearwell No. 3). Just before being combined in Clearwell No. 3, the filtered water is disinfected with chlorine followed by liquid ammonium sulfate (LAS) for continued disinfection via chloramination.

The GWTF is located adjacent to the SWTP on the south side of the property and currently treats water from 15 wells in the Hickory Aquifer. The wellfield is located approximately 62 miles southeast of the GWTF in McCulloch County (approximately 10 miles south of Melvin, TX). Water from the wellfield is pumped to the GWTF through a 30-inch transmission water line. Once at the plant, iron is first removed from the raw water via oxidative precipitation and subsequent filtration. Thereafter, the water is treated using ion exchange media to remove radionuclides such as Radium 226/228 and Gross Alpha/Beta. The water is subsequently disinfected using chlorine followed by the addition of LAS to promote further disinfection via chloramination. Finally, treated water from the GWTF is blended with

water from the SWTP

before entering the City's distribution system. Treated groundwater from the GWTF is also blended with the treated surface water in Clearwell No. 3. Finally, the combined waters are pumped into the distribution system using two high service pump stations.

### 3. Water Distribution

The City's water distribution system provides facilities that are capable of furnishing sufficient water at suitable pressures to San Angelo water customers. The system consists of underground water mains, pumping stations, ground storage tanks, elevated storage tanks, valves, fire hydrants, and approximately 45,000 customer water meters.

After the water is processed at the treatment plants, it is stored in ground and elevated storage tanks with a combined volume of 17.60 million gallons. The distribution network is laid out in a continuous looped system to circulate water and maintain constant system pressure. Pumping stations are located strategically throughout the system to pump water, maintain uniform pressure and maintain storage tank levels.

## D. Wastewater System

### 1. Wastewater Collection

City wastewater collection system consists of a network of sewer mains, lift stations, and manholes serving San Angelo sewer customers. Sewage flows by gravity, aided when necessary, by lift stations, through the collection system to the City's Wastewater Reclamation Facility (WRF) which is operated under a permit issued by the TCEQ.

### 2. Wastewater Treatment

Raw wastewater from the City's collection system enters the WRF at the raw wastewater lift station which pumps wastewater to the headworks structure. The headworks structure contains multiple treatment processes including coarse bar screens, fine screens, and a grit removal system. Wastewater then enters one of the four primary clarifiers before flowing into the aeration basins for further treatment. The WRF has two aeration basins, each containing more than 3,000 ceramic fine bubble diffusers. After secondary treatment in the aeration basins, the wastewater is then sent to one of the four final clarifiers, which allows activated sludge from the aeration basins to be removed. After final clarification, the final effluent passes through a chlorine contact basin, though no chlorine is added since the effluent is all land applied. Following the chlorine contact basin, the final effluent pump station transfers all effluent to the effluent storage reservoirs.

north of the WRF. From the storage reservoirs, the reclaimed water is either pumped to the Tom Green County Water Control and Improvement District #1 or is land applied at the City Farm adjacent to the WRF.

Sludge produced from the different treatment units is collected and sent through thickening, stabilization, and dewatering processes. Dewatered cake from the belt filter presses is sent to disposal.

Wastewater quality is protected against industrial pollution through City Industrial Pre-Treatment Program. Industrial users are required to treat wastewater to specific standards before it is released into the municipal sanitary sewer system.

## **Section IV. Water Conservation Goals**

### **A. Municipal Use Goals**

The 5- and 10-year goals (also referred to as targets) for total per capita water use by City users is to maintain per capita water use at or below 123 gallons per capita per day (gpcd) by the end of 2029, and at or below 122 gpcd by the end of 2034. The 5- and 10-year goal for residential per capita water use by City users is to maintain residential per capita water use at or below 69 gpcd by the end of 2029 and 68 gpcd by the end of 2034. The 5- and 10-year per capita water loss goal is to maintain per capita water loss at less than 20 gpcd by the end of 2029 and 18 gpcd by the end of 2034. These goals are set in accordance with the 2021 Regional Water Plan and City records. See Appendix C.

### **B. Wholesale Use Goals**

As part of an agreement with the UCRA, the City of San Angelo treats up to 1,000 acre-feet per year water for customers of UCRA. The water delivered from the City of San Angelo treatment works are provided under UCRA water rights. As such, the goal for wholesale water use customers served by the City of San Angelo is to maintain wholesale water use at up to 1,000 acre-feet per year and maintain water loss to the wholesale customers at 15% or less.

## **Section V. Metering Devices**

It is City policy to purchase meters that meet at least the minimum standards developed by the American Water Works Association. All metering devices used to meter water diverted from the source of supply are accurate to within plus or minus 5% to measure and account for water diverted from the source of supply. All service connections in the distribution system are metered. Meters are systematically tested and replaced, if necessary, to assure reliability of meter performance. The City has established the following meter maintenance and replacement programs:

<b><u>Meter Type</u></b>	<b><u>Calibration Period and Replacement</u></b>
Master Meters	Annually and replaced, as needed
1-1/2 inch and larger	Replaced as needed <sup>1, 2</sup>
1-1/2 inch and smaller	Replaced as needed <sup>1, 2</sup>

Notes <sup>1</sup> Representative meter samples are tested annually to verify meter accuracy.  
<sup>2</sup> Meters are replaced as necessary.

The wholesale water purchasers are responsible for metering device installation, maintenance and calibration for meters located within their service areas.

## **Section VI. Universal Metering**

It is City policy to individually meter all water usage, except for fire protection and flushing to maintain a safe potable water distribution system, including all new construction within the City's CCN coverage area. Combined with an aggressive leak detection and repair program, electronic data collection devices, and a computerized billing system, City universal metering program has resulted in a water delivery accuracy rate within industry operating standards and comports with industry accepted practices.

## **Section VII. Measures to Determine and Control Unaccounted-For Uses of Water and Water Loss**

The City utilizes a record management system which records water pumped, water delivered, water sales and water losses to track water transmission, distribution, and delivery to customers. This information is used to evaluate the integrity of the water delivery system from source to end user to control and minimize unaccounted-for uses of water and water loss from the system. The record management system utilized by the City segregates water sales and users into user classes of single-family residential, multi-family residential, commercial, public/institutional, agricultural and industrial. It is City policy to investigate customer complaints of low pressure and possible leaks. The City visually inspects suspected leaks and makes quick and timely repairs to those leaks when detected. The City utilizes an Automated Meter Reading (AMR) record management system which automatically monitors and records water delivered to customers to better enable real time customer water leak detection. The City's Water Conservation Program described in Section VIII below incorporates additional elements designed to determine and control unaccounted-for uses of water and water loss from the system.

## **Section VIII. Water Conservation Program**

The City's Water Conservation Program utilizes Supply Management Methods and Demand Management Methods to work towards optimizing use of City water resources.

### **A. Supply Management Program Elements consist of:**

1. Coordinated use of water supplies to ensure the City withdraws water from its water supply reservoirs in a manner that ensures optimum dependable yield and efficiency of operation.

2. Watershed management to ensure diversion channels, creeks, natural drainage ways, etc. discharging to local reservoirs are clean, relatively straight, and obstruction-free to increase captured water flow while minimizing flooding potential in populated areas and reducing siltation entering local reservoirs.
3. Metering all service connections to ensure maximum return for delivered water while minimizing unaccounted-for water loss.
4. Leak detection and repair to minimize unaccounted-for water loss.
5. Treated wastewater reuse and recycling to lessen the demand for raw water used to produce water for irrigation uses.

**B. Demand Management Program Elements consist of:**

1. Water pricing as a mechanism for encouraging water customers to conserve.
2. Regulations for conserving water via the Water Conservation Plan and the Drought Contingency Plan ordinance adopted by the City.
3. Plumbing Code for the City requires maximum standard plumbing fixture capacities not be exceeded.
4. Continuing education programs to increase public awareness of supply, treatment and conveyance systems in the City, to increase public awareness of the benefits and need for conservation, and to make information about practical cost-effective methods and technologies to achieve conservation available.
5. The City utilizes water conservation measures to restrict certain potable water use activities by all customers of the Water Utility System. Pursuant to this measure all potable water irrigation by commercial, industrial and residential customers utilizing individual sprinklers, or sprinkler systems, on lawns, gardens, landscaped areas, trees, shrubs or other plants may water only on designated day(s) and then only during designated hours as outlined in the City's Drought Contingency Plan ordinance.

**Section IX. Public Education**

Public education is an ongoing and integral part of City water conservation programs. A public information and education program developed and implemented by the City is an important component in the City's water conservation strategy. Water Utilities education programs have these principal objectives including:

- Increase public awareness of supply, treatment, and conveyance systems in the City, and
- Increase public awareness of the needs for and benefits of conservation.

A variety of communication techniques either have or are being utilized including: electronic information materials via City internet website; newspaper supplements; presentations at neighborhood, civic, social, and professional organizations; public service announcements; and public school and university programs.

## **Section X. Water Rate Structure**

The City has adopted a non-promotional, inverted rate structure. Under this rate structure the billing rate increases as individual water consumption increases. This rate structure promotes conservation and shifts the cost of supplying water to those consumers using it most. A copy of the City's current water rates is provided in Appendix F.

## **Section XI. Reservoir Operations Plan**

The City owns water rights permits that authorize the operation and maintenance of six reservoirs—Twin Buttes on the Middle Concho River, South Concho River, and Spring Creek, Nasworthy on the South Concho River, Metcalfe on the South Concho River, Ben Ficklin on the South Concho River, Lone Wolf on the South Concho River, and Bell Street on the Concho River. In addition, the City maintains contracts for certain volumes of water stored in O.C. Fisher Reservoir on the North Concho River, E.V. Spence Reservoir on the Colorado River, and O.H. Ivie Reservoir on the Colorado River. To make the most efficient use of these and the other City water supplies, the City has developed a comprehensive water rights accounting plan. The accounting plan allows the City's various water supply sources to be more fully and effectively utilized and it facilitates the operation and management of these water rights, including reservoirs, in coordination with the Concho Watermaster.

## **Section XII. Additional Assessments for Water Use Permitting**

Applications to appropriate or to use water for any purpose or use require water conservation plans to include additional information about those practices, techniques, and technologies that will be used to reduce the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, or prevent the pollution of water.

Long-term regional water supply planning efforts indicate that San Angelo will experience a water supply deficit beginning in 2030 that is projected to grow through 2070. As part of its commitment to ensure adequate water supplies for future generations, the City of San Angelo commissioned a broad-based evaluation of feasible water supply options for potential incorporation into the City's existing water supply portfolio. This significant effort led to the creation of the City of San Angelo Water Supply Engineering Feasibility Study. The study was completed in October 2018.

The Water Supply Engineering Feasibility Study identified the leading option for the City's next water supply—the Concho River Project. The Concho River Project involves the beneficial reuse of flows discharged at the City's proposed new outfall on the Concho River from what will be an upgraded wastewater treatment plant. After being treated and discharged, the water will be transported using the bed and banks of the Concho River to a downstream diversion point. From there, the water will be piped to the City's water treatment plant, where it will be treated to drinking water standards. This indirect reuse plan will rely on flows that will have never been discharged into the Concho River prior to this effort.

The Concho River Project was developed as part of the City of San Angelo's overall efforts to conserve and reuse its water resources.

#### **A. Consistency With Water Conservation Plan Goals and Objectives**

The Concho River Project supports the City's proposed use of water with consideration of the goals and objectives of the Water Conservation Plan by stretching its current and future water supplies through reuse. The use of the diverted flows will be a continuation of the City's beneficial use and consumption of its existing supplies. The plan to apply this water to the currently authorized beneficial use is the product of reasonable diligence on the City's part, and it is an additional reflection of the City's commitment to conserve and maximize the beneficial use of its water supplies without waste.

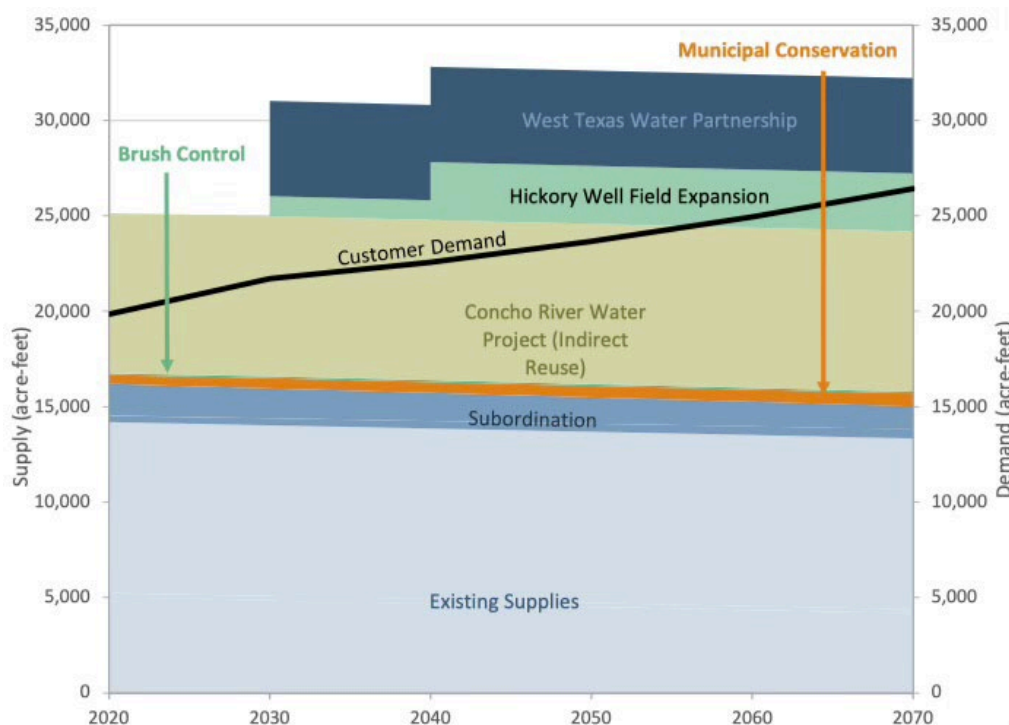
The Concho River Project is an effort to extend San Angelo's current surface water and groundwater supplies. It will do so by adding a reliable source that will help meet water needs for decades to come. The Concho River Project will complement the City's efforts to reach the five-year and 10-year goals of the Water Conservation Plan.

#### **B. Conservation Alternatives**

The Concho River Project works in conjunction with the City's existing robust water conservation efforts outlined in the Water Conservation Plan. As noted in the approved 2021 Region F Water Plan, the City of San Angelo's water conservation strategy is a proactive effort to reduce water demands "through public education and outreach, inclining rate structure to discourage high water use, a water waste ordinance, a landscape ordinance for new construction, and time of day outdoor watering limits." These conservation efforts have led to a low gallons-per-capita-per-day water use average for City water customers. Municipal conservation as a demand-reduction tool has been, and continues to be, a recommended and implemented water management strategy for San Angelo.

Even when including the City's comprehensive five-year and 10-year water conservation goals and strategies, however, the City is still projected to experience a water supply deficit by 2030. The graphic below illustrates the significant need for the Concho River Project even when considering water conservation. (2021 Region F Water Plan 5D-25)



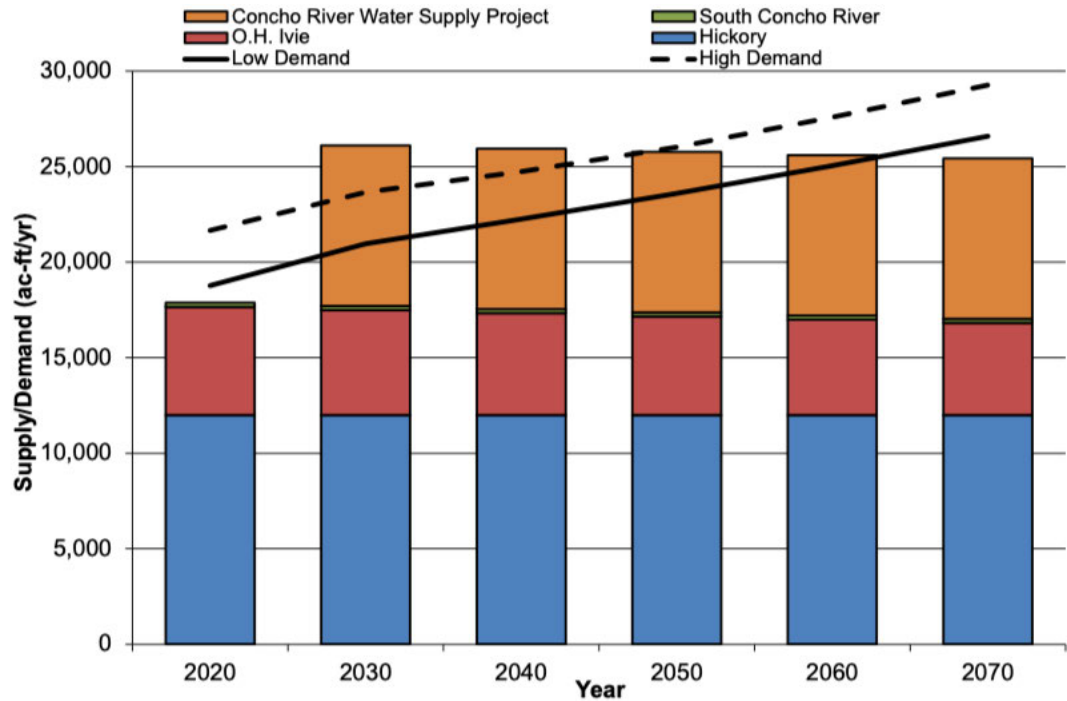


While an important component of the City's water supply portfolio, the anticipated two-percent demand reduction from water conservation will not offset the significant water demand increases over the regional water planning horizon. Conservation—in the context of consumption-reduction measures—is not a feasible alternative on its own to the Concho River Project.

However, the Concho River Project will improve the efficiency in the use of the City's water supplies and will by its nature increase the recycling and reuse of water so that the City's existing water supplies will be made available for future uses. The Concho River Project is by definition a water conservation project.

### C. Other Feasible Alternatives

Before recommending the Concho River Project, engineers and City staff studied 24 possible water supply alternatives. Those included six groundwater strategies, three purchased water strategies, eight water reuse strategies, and seven miscellaneous strategies. The analysis team concluded that the Concho River Project would be a reliable and cost-effective source that will produce water at an affordable cost with a relatively quick delivery potential and low environmental impact. The project will produce about 7.5 million gallons per day when completed. By comparison, the Hickory Aquifer is currently capable of producing eight million gallons per day, although that is being expanded to 12 MGD.



The Region F Regional Water Planning Group recognized the feasibility of the Concho River Project and included it as a recommended strategy in the approved 2021 Region F Water Plan. The recommendation followed the planning group's comprehensive analysis of existing and proposed water supply strategies for the City of San Angelo, including multiple supply alternatives, as shown in the tables below. (2021 Region F Water Plan 5D-24)

#### Recommended Water Management Strategies for the City of San Angelo

-Values are in Acre-Feet per Year-

	2020	2030	2040	2050	2060	2070
Surplus (Shortage) before Recommend Strategies	(3,202)	(5,207)	(6,280)	(7,575)	(9,100)	(10,739)
<b>Recommended Strategies</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<i>Subordination - Ivie Contract</i>	329	359	391	421	453	483
<i>Subordination - San Angelo System</i>	1,670	1,575	1,480	1,385	1,290	1,195
<i>Municipal Conservation</i>	467	541	567	602	639	679
Brush Control	90	90	90	90	90	90
Concho River Project (Indirect Reuse)	8,400	8,400	8,400	8,400	8,400	8,400
Hickory Well Field Expansion	0	1,040	3,040	3,040	3,040	3,040
West Texas Water Partnership	0	5,000	5,000	5,000	5,000	5,000
<b>Total Supply from Recommended Strategies</b>	<b>8,490</b>	<b>14,530</b>	<b>16,530</b>	<b>16,530</b>	<b>16,530</b>	<b>16,530</b>
	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<b>Surplus (Shortage) after Recommended Strategies</b>	<b>5,288</b>	<b>9,323</b>	<b>10,250</b>	<b>8,955</b>	<b>7,430</b>	<b>5,791</b>
<b>Management Supply Factor</b>	<b>1.3</b>	<b>1.4</b>	<b>1.5</b>	<b>1.4</b>	<b>1.3</b>	<b>1.2</b>

Strategies in grey italics were included in the previous calculation of surplus (shortages). They are included in this table for completeness but are not included in the total to avoid double counting.

**Costs for the Recommended Strategies for the City of San Angelo**

Strategy	Capital Cost (Million \$)	Unit Cost (\$/1,000 gal)	
		With Debt Service	After Debt Service
Municipal Conservation	---	NA	NA
Subordination	---	NA	NA
Brush Control	---	NA	\$1.50
Concho River Water Project	\$117	\$3.84	\$0.83
Hickory Well Field Expansion	\$66	\$7.12	\$3.18
West Texas Water Partnership	\$549.1	\$5.47	\$1.24

The approved 2021 Region F Water Plan Recommended Water Management Strategies for San Angelo include:

- Municipal conservation
- Subordination
- Brush control
- *Concho River Water Project*
- Hickory wellfield expansion
- Pecos County groundwater supply

In addition, the approved 2021 Region F Water Plan identifies several alternative management strategies for San Angelo. These are alternatives that the planning group determined could be developed in the future to further compliment the City's recommended strategies, or that can serve as alternatives in the event one or more recommended strategies becomes infeasible. These include Edwards-Trinity aquifer supply development in Schleicher County, Pecos Valley and Edwards-Trinity aquifer supplies in Southwest Pecos County, desalination of Additional Groundwater Supplies, and West Texas Water Partnership/Pecos County wellfield (alternative delivery option).

### **Section XIII. Means of Implementation and Enforcement**

A copy of the resolution adopting this Water Conservation Plan (Plan) is included in Appendix D. The City Manager works with the Director of Water Utilities in the implementation and enforcement of the Plan, and in the City's submission of its annual water conservation implementation report. This report is used by the City to review the effectiveness of its water conservation program.

The Director of Water Utilities designates a member of the Water Utilities Department staff as a Conservation Coordinator. The Conservation Coordinator is responsible for implementation and coordination of water conservation programs.

To support the Plan and water conservation efforts, the City maintains a Drought Contingency Plan Ordinance (see City of San Angelo Municipal Code Chapter 11, Article 11.05). This ordinance provides water conservation measures during times of water shortage or other emergency water supply conditions. The ordinance provides for enforcement of ordinance violations.

**A. Enforcement Within City CCN Area**

The Plan is enforced within the City's CCN coverage area by providing service taps only to customers complying with adopted ordinances, maintaining a non-declining rate structure, discontinuing service to those customers who do not pay their water bills until payment is made, and verifying new construction conforms to adopted ordinances and plumbing codes.

**B. Enforcement for City Wholesale Purchasers**

Wholesale customers receive written notification of Plan adoption and any subsequent Amendments. Adoption of this Plan by the City per 30 Texas Administrative Code (TAC) §288.5 obligates wholesale customers as defined in 30 TAC §288.1 to implement water conservation measures. A copy of the notification letter to wholesale users has been included in Appendix E. The City makes best efforts to ensure implementation and enforcement of the Plan by wholesale users via these contractual requirements and outreach efforts.

**Section XIV. Additional Wholesale Water Contract Requirements**

It is City policy to include in every wholesale water supply contract entered into or renewed after official adoption of the Plan, including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using applicable elements in 30 TAC Chapter 288. If the wholesale customer intends to resell the water, then the contract between the City and the wholesale customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with 30 TAC Chapter 288.

**Section XV. Coordination with Regional Water Planning Group**

All of the customers served by the City are located within the Region F Water Planning Area. The City has provided a copy of this Plan to the Regional Water Planning Group. A copy of the transmittal letter to Region F Regional Water Planning Group is provided in Appendix G.

**Section XVI. Revisions to the Water Conservation Plan**

The City will review and update this water conservation plan, as appropriate, based on new or updated information. As a minimum the Plan will be updated every five (5) years.

**Section XVII. Severability**

It is City intention that the sections, paragraphs, sentences, clauses, and phrases of this Plan are severable. If, any phrase, clause, sentence, paragraph or section shall be declared unconstitutional by a valid judgment or decree of any court of competent jurisdiction, such unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs or sections of this Plan, since the same would not have been enacted by the

City without the incorporation into this Plan of any such unconstitutional phrase, clause, sentence, paragraph or section.

**CODE OF ORDINANCES  
CHAPTER 11 UTILITIES**

**ARTICLE 11.05 WATER CONSERVATION AND DROUGHT CONTINGENCY PLAN**

**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; Ord. No. 2019-056 , § 1, 5-7-19)

### **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.
  - i. 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.
  - ii. Golf courses greens may be watered daily except during the "prohibited watering hours" as stated in section 11.05.002.
  - iii. 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:
  - i. 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.
  - ii. Golf course greens may be watered daily except during the "prohibited watering hours" as stated in section 11.05.002.
  - iii. 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:
  - i. 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.
  - ii. The use of treated or raw city water to fill, refill or maintain the level of any fountain or swimming pool is prohibited.
  - iii. 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:
  - i. Name and address of the petitioner(s).
  - ii. Purpose and estimated amount of water use.
  - iii. Specific provision(s) of this article from which the petitioner is requesting an exemption.
  - iv. 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.
  - v. Description of the relief requested.
  - vi. Period of time for which the variance is sought.
  - vii. 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.
  - viii. Other pertinent information.
  - ix. 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:
  - i. Cannot be technically accomplished during the expected duration of the water supply shortage or other condition for which this article is in effect;
  - ii. Will cause undue hardship on a program or service offered by a public entity; or
  - iii. 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:

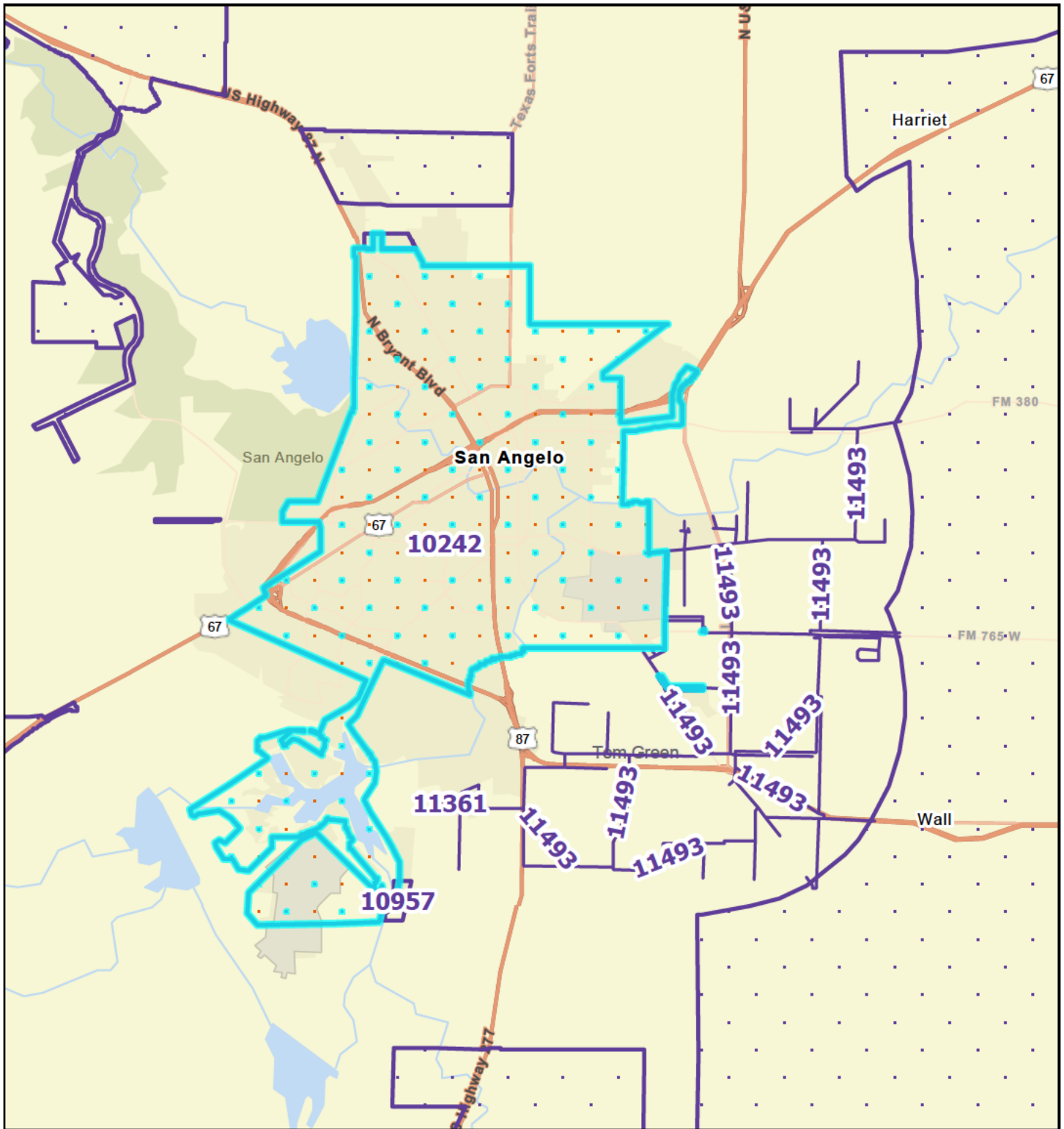
- 1) *First violation.* Any person or entity as defined under this chapter may be given a verbal or written warning.
  - 2) *Second and subsequent violations.*
    - i. Violation of any provision of the water conservation and drought contingency plan constitutes a class C misdemeanor offense for which a citation may be issued.
    - ii. 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.
    - iii. 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 A**

### **Service Area Map**

# City of San Angelo Water Service Area (CCN 10242)



5/13/2024, 3:42:45 PM

- Water CCN Facility Lines
- Water CCN Service Areas
- Sewer CCN Service Areas



1:178,659

0 1.25 2.5 5 mi

0 2 4 8 km

Texas Parks & Wildlife, CONANP, Esri, TomTom, Garmin, SafeGraph, METV/  
NASA, USGS, EPA, NPS, USDA, USFWS



## **Appendix B**

### **Utility Profile for Retail Water Supplier**

## 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:	Shane	Last Name:
	Title:	Water Utilities Director	
Address:	301 W. Beauregard	City:	San Angelo
		State:	TX
Zip Code:	76903	Zip+4:	
		Email:	
Telephone Number:	3256574209	Date:	5/13/2024
Is this person the designated Conservation Coordinator?	<input type="radio"/> Yes <input checked="" type="radio"/> No		

Coordinator:	First Name:	Maria	Last Name:	Padilla
	Title:	Water Conservation Coordinator		
Address:	301 W. Beauregard	City:	San Angelo	Zip Code:
				76903
Email:		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

## UTILITY PROFILE FOR RETAIL WATER SUPPLIER

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
2023	107,252	1,922	94,918
2022	101,004	1,906	93,720
2021	101,400	1,890	92,537
2020	101,004	1,874	91,370
2019	100,215	1,871	88,690

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
2030	116,437	2,032	115,272
2040	123,653	2,032	122,416
2050	131,315	2,032	130,001
2060	139,451	2,032	138,056
2070	148,090	2,032	146,609

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

Population figures for the City of San Angelo are taken from the 2021 Regional Water Plan. Population figures for the wholesale water users include City of Miles and Red Creek MUD. Goodfellow Air Force Base users are categorized as institutional water users and are not included in wholesale use figures.

## 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
2023	5,348,861,616	0	285,537,500	5,063,324,116	129
2022	5,218,392,929	0	287,408,333	4,930,984,596	134
2021	4,641,770,707	0	275,755,208	4,366,015,499	118
2020	4,788,416,162	0	277,836,458	4,510,579,704	122
2019	4,524,656,566	0	216,843,299	4,307,813,267	118
Historic Average	4,904,419,596	0	268,676,160	4,635,743,436	124

### 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

## 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)
2025	108,444	5,628,934,707
2026	110,240	5,784,198,387
2027	112,065	5,939,462,067
2028	113,921	6,094,725,747
2029	115,808	6,249,989,427
2030	116,437	6,405,253,107
2031	117,159	6,432,526,836
2032	117,885	6,459,800,564
2033	118,615	6,487,074,293
2034	119,350	6,514,348,022

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

Population and projected water demand figures for the City of San Angelo are taken from the 2021 Regional Water Plan.

## 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	122,324,000	Treated
Robinson Premium Beef	Industrial	50,000,000	Treated
Shannon Medical Center	Institutional	50,000,000	Treated
Angelo State University	Institutional	40,000,000	Treated
Tom Green County Jail	Institutional	20,000,000	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	129,581,000	Treated
Ethicon, Inc.	Industrial	40,349,000	Treated
Red Creek MUD	Municipal	21,543,400	Treated
Valley Proteins	Industrial	1,324,000	Treated
The Water Barrel	Commercial	668,000	Treated

### F. Utility Data Comment Section

Additional comments about utility data.

--

## 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	32,134	72.67 %
Residential - Multi-Family	8,440	19.09 %
Industrial	117	0.26 %
Commercial	2,992	6.77 %
Institutional	535	1.21 %
Agricultural	4	0.01 %
<b>Total</b>	<b>44,222</b>	<b>100.00 %</b>

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
<b>2023</b>	179	137	9	0	0	0	325
<b>2022</b>	412	0	2	11	0	0	425
<b>2021</b>	1,227	250	0	8	4	0	1,489
<b>2020</b>	4,167	7,435	57	75	1	0	11,735
<b>2019</b>	396	5	6	12	0	0	419

## 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
2023	2,320,181,000	420,389,000	13,723,000	489,910,000	895,267,000	362,000	4,139,832,000
2022	2,468,308,000	435,697,000	136,581,000	480,369,000	651,605,000	703,000	4,173,263,000
2021	2,163,073,000	431,415,000	130,543,000	454,604,000	487,974,000	2,339,000	3,669,948,000
2020	2,307,841,000	417,089,000	138,015,000	439,870,000	393,853,000	446,000	3,697,114,000
2019	2,081,581,000	417,787,000	129,907,000	520,914,000	405,343,000	11,217,000	3,566,749,000

### C. Residential Water Use

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

Year	Total Residential GPCD
2023	70
2022	79
2021	70
2020	74
2019	68
Historic Average	72



## 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				
	2023	2022	2021	2020	2019
January	428,108,486	269,361,338	251,034,197	244,867,283	240,204,705
February	241,684,329	251,585,404	272,067,515	228,251,286	224,374,830
March	291,009,486	299,518,820	270,163,741	240,030,225	260,640,677
April	314,641,822	338,211,451	310,871,148	278,489,710	278,660,364
May	331,757,636	402,165,595	314,940,139	322,993,089	265,852,169
June	392,627,604	434,023,980	363,704,070	375,776,957	300,657,661
July	397,662,588	489,868,200	347,862,176	408,306,921	366,793,864
August	473,369,658	449,661,050	355,098,697	423,310,013	430,928,487
September	377,199,156	357,913,236	351,631,558	323,047,266	360,374,172
October	342,750,392	337,353,651	290,734,279	321,253,380	313,785,586
November	276,328,271	272,612,517	275,010,940	270,651,345	270,645,763
December	272,692,572	270,987,758	266,829,540	260,136,525	253,830,722
<b>Total</b>	<b>4,139,832,000</b>	<b>4,173,263,000</b>	<b>3,669,948,000</b>	<b>3,697,114,000</b>	<b>3,566,749,000</b>

## 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				
	2023	2022	2021	2020	2019
January	236,000	678,000	537,000	2,785,000	1,326,000
February	198,000	602,000	347,000	1,789,000	1,522,000
March	144,000	267,000	410,000	1,770,000	3,334,000
April	870,000	854,000	3,386,000	5,643,000	4,150,000
May	1,392,000	1,615,000	1,340,000	6,008,000	3,527,000
June	1,672,000	2,407,000	2,031,000	8,766,000	2,917,000
July	1,994,000	2,916,000	1,676,000	13,347,000	6,922,000
August	2,745,000	2,989,000	1,926,000	12,084,000	6,672,000
September	3,021,000	2,679,000	1,907,000	6,634,000	8,237,000
October	2,202,000	1,745,000	1,510,000	7,186,000	9,081,000
November	1,521,000	1,573,000	2,663,000	1,746,000	6,137,000
December	466,000	571,000	916,000	1,159,000	2,460,000
<b>Total</b>	16,461,000	18,896,000	18,649,000	68,917,000	56,285,000

3. Summary of seasonal and annual water use.

	Summer RETAIL (Treated + Raw)	Total RETAIL (Treated + Raw)
<b>2023</b>	1,270,070,850	4,156,293,000
<b>2022</b>	1,381,865,230	4,192,159,000
<b>2021</b>	1,072,297,943	3,688,597,000
<b>2020</b>	1,241,590,891	3,766,031,000
<b>2019</b>	1,114,891,012	3,623,034,000
<b>Average in Gallons</b>	1,216,143,185.20	3,885,222,800.00

## 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
2023	912,565,390	23	33.29 %
2022	432,021,267	11	8.29 %
2021	479,681,651	13	10.33 %
2020	591,415,458	16	12.35 %
2019	546,619,057	15	12.08 %
Average	592,460,565	16	15.27 %

### 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)
2023	11,387,104	13805117	1.2123
2022	11,485,367	15020274	1.3078
2021	10,105,745	11655412	1.1533
2020	10,317,893	13495553	1.3080
2019	9,926,120	12118380	1.2209

### G. Summary of Historic Water Use

Water Use Category	Historic Average	Percent of Connections	Percent of Water Use
Residential - Single Family	2,268,196,800	72.67 %	58.92 %
Residential - Multi-Family	424,475,400	19.09 %	11.03 %
Industrial	109,753,800	0.26 %	2.85 %
Commercial	477,133,400	6.77 %	12.40 %
Institutional	566,808,400	1.21 %	14.72 %
Agricultural	3,013,400	0.01 %	0.08 %

## 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	36,661	0	36,661	92.98 %
Industrial	54	0	54	0.14 %
Commercial	2,424	0	2,424	6.15 %
Institutional	291	0	291	0.74 %
Agricultural	0	0	0	0.00 %
<b>Total</b>	<b>39,430</b>	<b>0</b>	<b>39,430</b>	<b>100.00 %</b>

3. Percentage of water serviced by the wastewater system: 99.00 %

## 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				
	2023	2022	2021	2020	2019
January	211,491,000	211,812,000	200,457,000	196,994,000	209,190,000
February	210,060,000	206,062,000	208,253,000	202,795,000	210,788,000
March	214,077,000	218,323,000	213,072,000	209,574,000	208,921,000
April	218,940,000	228,703,000	227,528,000	202,235,000	209,402,000
May	210,465,000	222,001,000	222,111,000	203,977,000	210,563,000
June	216,738,000	225,767,000	220,280,000	207,415,000	216,351,000
July	216,904,000	227,243,000	229,865,000	213,842,000	210,943,000
August	216,126,000	223,442,000	214,220,000	214,913,000	218,444,000
September	222,433,000	224,707,000	216,951,000	211,219,000	210,562,000
October	209,625,000	219,584,000	217,365,000	207,660,000	214,572,000
November	207,871,000	210,030,000	210,289,000	203,253,000	209,127,000
December	223,407,000	209,663,000	211,480,000	195,981,000	199,095,000
<b>Total</b>	<b>2,578,137,000</b>	<b>2,627,337,000</b>	<b>2,591,871,000</b>	<b>2,469,858,000</b>	<b>2,527,958,000</b>

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)	0
Agricultural	
Discharge to surface water	0
Evaporation Pond	0
Other	
<b>Total</b>	<b>0</b>

## UTILITY PROFILE FOR RETAIL WATER SUPPLIER

### C. Wastewater System Data Comment

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

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## **Appendix C**

### **Water Conservation Plan 5 and 10 Yr Goals for Water Savings**



## WATER CONSERVATION GOALS 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:	Shane	Last Name: Kelton
	Title:	Water Utilities Director	
Address:	301 W. Beauregard	City:	San Angelo State: TX
Zip Code:	76903	Zip+4:	Email:
Telephone Number:	3256574209	Date:	6/5/2024

Is this person the designated Conservation Coordinator? ☐ Yes ☒ No

Coordinator:	First Name:	Charlotte	Last Name:	Anderson
	Title:	Water Conservation Coordinator		
Address:		City:	San Angelo	Zip Code: 76901
Email:		Telephone Number:	325-486-3771	

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

## WATER CONSERVATION GOALS FOR RETAIL WATER SUPPLIER

	<b>Historic 5 Year Average</b>	<b>Baseline</b>	<b>5-Year Goal for Year 2029</b>	<b>10-Year Goal for Year 2034</b>
<b>Water Loss (GPCD)</b>	124	124	123	122
<b>Residential GPCD</b>	72	70	69	68
<b>Water Loss (GPCD)</b>	16	23	20	18
<b>Water Loss Percentage</b>	13.00%	19.00%	16.00%	15.00%

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

Attached file(s):

<b>File Name</b>	<b>File Description</b>
San Angelo WCP-DCP with Appendix.pdf	

## **Appendix D**

### **Resolution Adopting the Water Conservation and Drought Contingency Plan**

Official Minute Record  
June 18, 2024

Volume 2024  
Page 173

**RESOLUTION 2024-042**

**RESOLUTION OF THE CITY OF SAN ANGELO, TEXAS ADOPTING THE CITY OF SAN ANGELO 2024 WATER CONSERVATION PLAN**

**WHEREAS**, the City of San Angelo reviews and updates the Water Conservation Plan (SCP) every five years in order to adjust goals and targets, and take into account new technology and new best management practices; and

**WHEREAS**, the last plan was adopted in May 2019, updated in September 2019, and a supplement was adopted June 2023; and

**WHEREAS**, THE City of San Angelo 2024 Water Conservation Plan has been prepared and is ready for adoption.

**NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF SAN ANGELO, TEXAS:**

Section 1: That the City of San Angelo 2024 Water Conservation Plan is hereby adopted by the City of San Angelo.

**ADOPTED this 18<sup>th</sup> day of June 2024.**

**THE CITY OF SAN ANGELO, TEXAS:**

**ATTEST:**

DocuSigned by:  
  
Heather Mastny, City Clerk

DocuSigned by:  
  
Brenda Gunter, Mayor

**APPROVED AS TO FORM:**

DocuSigned by:  
  
Theresa James, City Attorney

## **Appendix E**

### **Notification to Wholesale Purchasers**

(Date)

(Wholesale Customer)

(Address)

Dear (Wholesale Customer);

As you are aware, per requirements found in 30 Texas Administrative Code (TAC) Chapter 288 the City of San Angelo is required by the State of Texas to develop, implement, and maintain a Water Conservation Plan ("Plan"). We take this opportunity to remind you of the requirements pertaining to water conservation for your system.

As a wholesale water customer of the City of San Angelo your system is obligated to develop a Water Conservation Plan of your own. The requirement for your system to develop a Water Conservation Plan is found in 30 TAC Subchapter A, §288.5. We request that at the time you submit your system's plan to the State, you furnish us a copy as well. Providing us a copy of your system's plan will ensure a higher degree of accuracy as we update our Plan on a regular and prescribed basis.

Sincerely,

Shane Kelton  
Executive Director of Public Works  
Conservation Coordinator  
City of San Angelo

## **Appendix F**

### **City of San Angelo Water Rate Structure**





# Utility Rates

Effective October 1, 2023



## Water Rates – Fixed Charge

Meter Size	Amount
5/8"	\$ 31.92
1"	\$ 38.64
1 1/2"	\$ 45.40
2"	\$ 59.86
3"	\$174.80
4"	\$218.24
6"	\$317.71
8"	\$430.66

# Water Rates – Volumetric Water Fees

Rate blocks / 1,000 gallons	Residential Amount
0 – 2	\$3.95
3 - 5	\$5.76
6 - 15	\$6.73
16 - 39	\$7.20
> 39	\$13.19

Rate blocks / 1,000 gallons	Non-Residential Amount
All usage	\$7.20

# Water Rates – Volumetric Water Fees

Rate blocks / 1,000 gallons	Landscape & Untreated Amount
Winter	October – April
0 – 89	\$6.95
> 89	\$154.54
Summer	May – September
0 – 89	\$7.26
> 89	\$16.24



## Wastewater Rates – Fixed Charge

Meter Size	Amount
5/8"	\$ 30.17
1"	\$ 34.93
1 1/2"	\$ 39.72
2"	\$ 49.94
3"	\$131.22
4"	\$161.95
6"	\$232.28
8"	\$312.18

# Wastewater Rates – Volumetric Wastewater Fees

Rate blocks / 1,000 gallons	Residential and Schools Amount
4 – 15 (max)	\$3.81

Rate blocks / 1,000 gallons	Non-Residential Amount
4 & above	\$3.81



## **Appendix G**

### **Transmittal to Regional Water Planning Group**





The City of

# San Angelo, Texas

72 W. College Ave • Zip 76903

June 27th, 2024

Cole Walker  
Chairman, Region F Water Planning Group  
Colorado River Municipal Water District  
P.O. Box 869  
Big Spring, Texas 79721-0869

Re: Updated Water Conservation and Drought Contingency Plans for the City of San Angelo (PWS 2260001)

Dear Mr. Walker:

Enclosed for your use, please find copies of the recently updated Water Conservation and Drought Contingency Plans for the City of San Angelo. The plans contain the required elements as described in Title 30, Chapter 288 of the Texas Administrative Code, and other applicable rules. The City will also submit these plans to the Texas Water Development Board and the Texas Commission on Environmental Quality. If you have any questions, you may reach me at (325) 657-4206 or [Shane.Kelton@cosatx.us](mailto:Shane.Kelton@cosatx.us).

Sincerely,

Shane Kelton  
Executive Director of Public Works  
Conservation Coordinator  
City of San Angelo

## Sarah Henderson

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**From:** Jason Hill [REDACTED] >  
**Sent:** Thursday, June 8, 2023 9:07 PM  
**To:** Sarah Henderson  
**Cc:** Kelton, Shane; James, Theresa; Daniel Valenzuela; Kathy Alexander  
**Subject:** Water Use Permit Application No. 13741 - City of San Angelo  
**Attachments:** 20230608 COSA Response to Tech RFI 13741.pdf; Response Exh. 2 - Acct Plan.xlsx

Sarah, I've attached the City's response to the staff's requests for information. Once you've had a chance to review it, please let me know if you have any questions about any of the information provided.

I've also included a link that should allow you to download the document in the event you're not able to access the attachment because of the file size. [Click here](#) to access the document online.

Thank you in advance for your attention to this.

**Jason Hill**  
ATTORNEY



3800 North Lamar Blvd., Suite 200  
Austin, Texas 78756  
[REDACTED] | (512) 806-1060



The City of

# San Angelo, Texas

72 W. College Ave • Zip 76903

June 9, 2023

Sarah Henderson, Project Manager  
Water Rights Permitting Team  
Water Rights Permitting and Availability Section  
Texas Commission on Environmental Quality

sent via email to [sarah.henderson@tceq.texas.gov](mailto:sarah.henderson@tceq.texas.gov)

RE: April 28, 2023 request for additional information;  
City of San Angelo Application No. 13741 for a Water Use Permit authorizing delivery  
of water down bed and banks.

Dear Ms. Henderson:

The City has received and reviewed your April 28, 2023 requests for information. A copy of your correspondence is attached to these responses for convenient reference as **Response Exhibit 1**. As the City has previously indicated, it has developed an indirect reuse project known as the Concho River Water Project. The project will rely on the beneficial use of treated effluent that has never been discharged into the Concho River prior to this effort. By beneficially reusing flows discharged from an upgraded wastewater treatment plant, the City will add much needed reliability to its already diverse water supply portfolio while at the same time protecting water quality, the environment, human health and safety, and water rights.

The Concho River Water Project involves new TPDES permitting to authorize discharges into the Concho River, and a Water Use Permit to convey, divert, and reuse the discharged flows. As you recognize in your requests, the City has secured the necessary TPDES permitting authorization to discharge into the Concho River. Application No. 13741 is a request for the necessary bed-and-banks authorization to convey, divert, and reuse the discharged flows, all of which will be new to the Concho River. Because these flows would not otherwise exist in the river but for the City's water development efforts, the diversions requested in Application No. 13741 should be authorized without being subject to priority calls.

The additional information in this correspondence is provided in response to your requests and is offered as a supplement to the comprehensive information already submitted with Application No. 13741.

*1. Submit a revised City of San Angelo Water Rights Accounting Plan that incorporates this application, or a new stand-alone accounting plan for this application, that would demonstrate how the City would ensure compliance with the terms and conditions of any permit granted for this application. The accounting plan must account for, at minimum, discharged return flows, channel losses, travel time (if applicable) and the amount of return flows available for diversion at the requested diversion point.*

The City has developed a stand-alone water accounting plan specifically designed to manage flows discharged pursuant to TPDES Permit No. WQ0010641003 as well as the diversions made based on the availability of those flows. The plan accounts for the various factors referenced in your request to ensure that water rights holders and the environment will not be negatively impacted by the diversions requested in Application No. 13741. The accounting plan developed for the Concho River Water Project works in conjunction with the existing City of San Angelo Water Rights Accounting Plan. The two plans will work together to comprehensively provide for the coordinated operation of City-owned reservoirs and its other water rights to optimize available water supplies while protecting water rights holders in the Colorado River basin. A copy of the accounting plan responsive to your request is included with these responses as **Response Exhibit 2**.

*2. Confirm the latitude and longitude of the requested diversion point in decimal degrees, to at least six decimal places. Staff notes that the latitude and longitude coordinates provided in the application are not consistent with the map.*

The diversion point coordinates have been reviewed as requested, and no inconsistency has been found. However, there are inconsistencies in the coordinates for the discharge point stated in Worksheet 4.1 of the application and those shown on the maps. The correct coordinates for the discharge point are those shown on the maps, and a revised copy of Worksheet 4.1 is attached to these responses as **Response Exhibit 3**. The correct coordinates for the discharge point are as follows:

Latitude: 31.484460 N  
Longitude: 100.319820 W

*3. Provide a copy of Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0010641003.*

The City is authorized to treat wastewater at two locations: the Mathis Field Wastewater Treatment Facility (TLAP Permit No. WQ0010641002) and the City of San Angelo Wastewater Treatment Facility (TPDES Permit No. WQ0010641003). TLAP Permit No. WQ0010641002 authorizes the City to dispose of 0.013 MGD of domestic wastewater effluent in the interim phase, and 0.094 MGD in the final phase, via surface irrigation of 52 acres of non-public access pastureland. TLAP Permit No. WQ0010641002 was renewed on July 20, 2020, for an additional 10-year term.



TLAP Permit No. WQ0010641003 authorized the City to treat and dispose of domestic wastewater effluent at a daily average flow not to exceed 11.3 MGD via evaporation and surface irrigation on 560 irrigable acres of pasture grass, and 1,680 irrigable acres of sorghum, corn, haygrazer, cotton, alfalfa, soybeans, wheat, oats and rye over the irrigated area in the Interim phase. For the final phase, the permit authorized treatment and disposal at a daily average flow not to exceed 16.3 MGD via evaporation and irrigation on 697 irrigable acres of pasture grass and 2,090 irrigable acres of sorghum, corn, haygrazer, cotton, alfalfa, soybeans, wheat, oats and rye over the irrigated area.

The TCEQ issued TPDES Permit No. WQ0010641003 on February 21, 2021. TPDES Permit No. WQ0010641003 supersedes and replaces TLAP Permit No. WQ0010641003. TPDES Permit No. WQ0010641003 maintains the City's authorization to land apply certain volumes of treated effluent. In addition, the permit authorizes the City to discharge domestic wastewater effluent at an average flow not to exceed 12.0 MGD directly to the Concho River. The flows that would be diverted pursuant to the authorization requested in Application No. 13741 would be tied to the availability of these discharges. A true and correct copy of TPDES Permit No. WQ0010641003 is attached to these responses as **Response Exhibit 4**.

*4. Provide additional information concerning the submitted water conservation and drought contingency plans.*

*a. Documentation of coordination with the regional water planning group for the applicant's service area in order to ensure consistency with the appropriate approved regional water plan(s).*

The City of San Angelo is situated within the Region F Regional Water Planning Group. It closely coordinates planning activities with the group both in its role as a municipal water supplier and through its participation as the voting member-representative for Municipalities over 50,000 population.

As stated in the approved 2021 Region F Water Plan, "[t]hrough the standard procedure and discussions with the City of San Angelo, potentially feasible water management strategies were developed for further discussion." A true and correct excerpt from the approved 2021 Region F Water Plan is attached to these responses as **Response Exhibit 5**. In addition, correspondence from the consultant for the Region F Water Planning Group indicating the planning group's review and consideration of the City's water conservation plan is attached as **Response Exhibit 6**.

As shown in the approved plan, the requested bed-and-banks authorization is a critical strategy in the City's plan to meet its projected long-term water supply deficits. Among the several recommended and alternative strategies considered, the Concho River indirect reuse project offers one of the most cost-effective, reliable water supply sources that were analyzed by the Region F planning group.

*b. Data and information to comply with Title 30 Texas Administrative Code (TAC) § 288.7 that:*

- i. supports the applicant's proposed use of water with consideration of the water conservation goals of the water conservation plan,*
- ii. evaluates conservation as an alternative to the proposed appropriation; and*
- iii. evaluates any other feasible alternative to new water development.*

The City is not requesting any new appropriation of water, nor is it requesting the right to divert any water that downstream water rights owners are lawfully entitled to. Application No. 13741 is strictly limited to a request for authorization to convey, divert, and reuse flows the City creates from discharges it makes into the Concho River from the City of San Angelo Wastewater Treatment Facility, less carriage losses. Nevertheless, the City's Water Conservation Plan addresses the applicable components of Title 30, section 288.7 of the Texas Administrative Code. A copy of the Concho River Water Project supplement to the City of San Angelo Water Conservation Plan is included with, and is incorporated into, these responses as **Response Exhibit 7**.

The requests contained in Application No. 13741 support the City's proposed use of water with consideration of the goals and objectives of the Water Conservation Plan. The use of the diverted flows will be a continuation of the City's beneficial use and consumption of its existing supplies. The Concho River Water Project works in conjunction with the City's existing robust water conservation efforts outlined in the Water Conservation Plan.

Even when including the City's comprehensive five-year and 10-year water conservation goals and strategies, however, the City is still projected to experience a water supply deficit by 2030. The demand reduction from the City's water conservation program will not offset the significant water demand increases over the water planning horizon. Conservation in the context of consumption-reduction measures is not a feasible alternative on its own to the Concho River Water Project. However, the Concho River Water Project will improve the efficiency in the use of the City's water supplies and will by its nature increase the recycling and reuse of water so that the City's existing water supplies will be made available for future uses. Stated another way, the Concho River Water Project is a water conservation project.

Before recommending the Concho River Water Project, engineers and City staff studied several possible water supply alternatives. In addition, the Region F Regional Water Planning Group recognized the feasibility of the Concho River Water Project and included it as a recommended strategy in the approved 2021 Region F Water Plan. The recommendation followed the planning group's comprehensive analysis of existing and proposed water supply strategies for the City of San Angelo, including multiple supply alternatives. After a thorough evaluation of feasible alternative supply strategies, the City's analysis team concluded that the Concho River Water Project would be a reliable and cost-effective source that will yield water at an affordable cost with a relatively quick delivery potential and low environmental impact.

This concludes the City's responses to your requests for information. As you can see, Application No. 13741 is a critical component to the City's Concho River Water Project. Thank you for your timely consideration of the City's request. Please let me know if there is any additional information the City can provide.

Sincerely,



Shane Kelton

cc: Daniel Valenzuela, City Manager  
Theresa James, City Attorney  
Jason Hill, counsel

Attached Response Exhibits

1. April 28, 2023 correspondence from Sarah Henderson to Shane Kelton
2. Concho River Water Project accounting plan
3. Revised Worksheet 4.1
4. TPDES Permit No. WQ0010641003
5. Approved 2021 Region F Water Plan excerpt
6. June 2, 2023 correspondence from Lissa Gregg regarding 2019 Water Conservation Plan
7. City of San Angelo Water Conservation Plan / Concho River Water Project supplement



## Response Exhibit 1

Jon Niermann, *Chairman*  
Emily Lindley, *Commissioner*  
Bobby Janecka, *Commissioner*  
Erin E. Chancellor, *Interim Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

April 28, 2023

Mr. Shane Kelton  
Executive Director of Public Works  
City of San Angelo  
301 W. Beauregard Avenue  
San Angelo, Texas 76903

**VIA E-MAIL**

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 Limited Mailed Notice  
Concho River, Colorado River Basin  
Tom Green County

Dear Mr. Kelton:

Additional information is required to complete technical review.

1. Submit a revised *City of San Angelo Water Rights Accounting Plan* that incorporates this application, or a new stand-alone accounting plan for this application, that would demonstrate how the City would ensure compliance with the terms and conditions of any permit granted for this application. The accounting plan must account for, at minimum, discharged return flows, channel losses, travel time (if applicable) and the amount of return flows available for diversion at the requested diversion point.
2. Confirm the latitude and longitude of the requested diversion point in decimal degrees, to at least six decimal places. Staff notes that the latitude and longitude coordinates provided in the application are not consistent with the map.
3. Provide a copy of Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0010641003.
4. Provide additional information concerning the submitted water conservation and drought contingency plans.
  - a. Documentation of coordination with the regional water planning group for the applicant's service area in order to ensure consistency with the appropriate approved regional water plan(s).

- b. Data and information to comply with Title 30 Texas Administrative Code (TAC) § 288.7 that:
  - i. supports the applicant's proposed use of water with consideration of the water conservation goals of the water conservation plan,
  - ii. evaluates conservation as an alternative to the proposed appropriation; and
  - iii. evaluates any other feasible alternative to new water development.

The information requested is considered essential by the Executive Director to make recommendations to the Commission on whether the application can be granted. Please provide the requested information by May 29, 2023 or the application may be returned pursuant to Title 30 TAC § 281.19. Alternatively, you may have the question of the necessity of the requested data (or the sufficiency of the information already submitted) referred to the Commission for a decision. To be considered, a request for a referral must be provided by May 29, 2023.

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

Sincerely,

*Sarah Henderson*

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

Jon Niermann, *Chairman*  
Emily Lindley, *Commissioner*  
Bobby Janecka, *Commissioner*  
Erin E. Chancellor, *Interim Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

May 26, 2023

Mr. Jason Hill  
J.T. Hill PLLC  
3800 North Lamar Blvd., Suite 200  
Austin, Texas 78756

VIA E-MAIL

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 Limited Mailed Notice  
Concho River, Colorado River Basin  
Tom Green County

Dear Mr. Hill:

This acknowledges the request, on May 25, 2023, for an extension of time to respond to the Texas Commission on Environmental Quality request for additional information letter dated April 28, 2023.

An extension is granted until June 9, 2023, and after that date the application may be returned pursuant to Title 30 Texas Administrative Code § 281.19. No further extensions will be granted associated with this request for information.

If you have any questions concerning this matter, please contact Ms. Sarah Henderson at [sarah.henderson@tceq.texas.gov](mailto:sarah.henderson@tceq.texas.gov) or by telephone at (512) 239-2535.

Sincerely,

A handwritten signature in black ink, appearing to read "B Galvan".

Bert Galvan, Manager  
Water Rights Permitting and Availability Section  
Water Availability Division

BG/sh

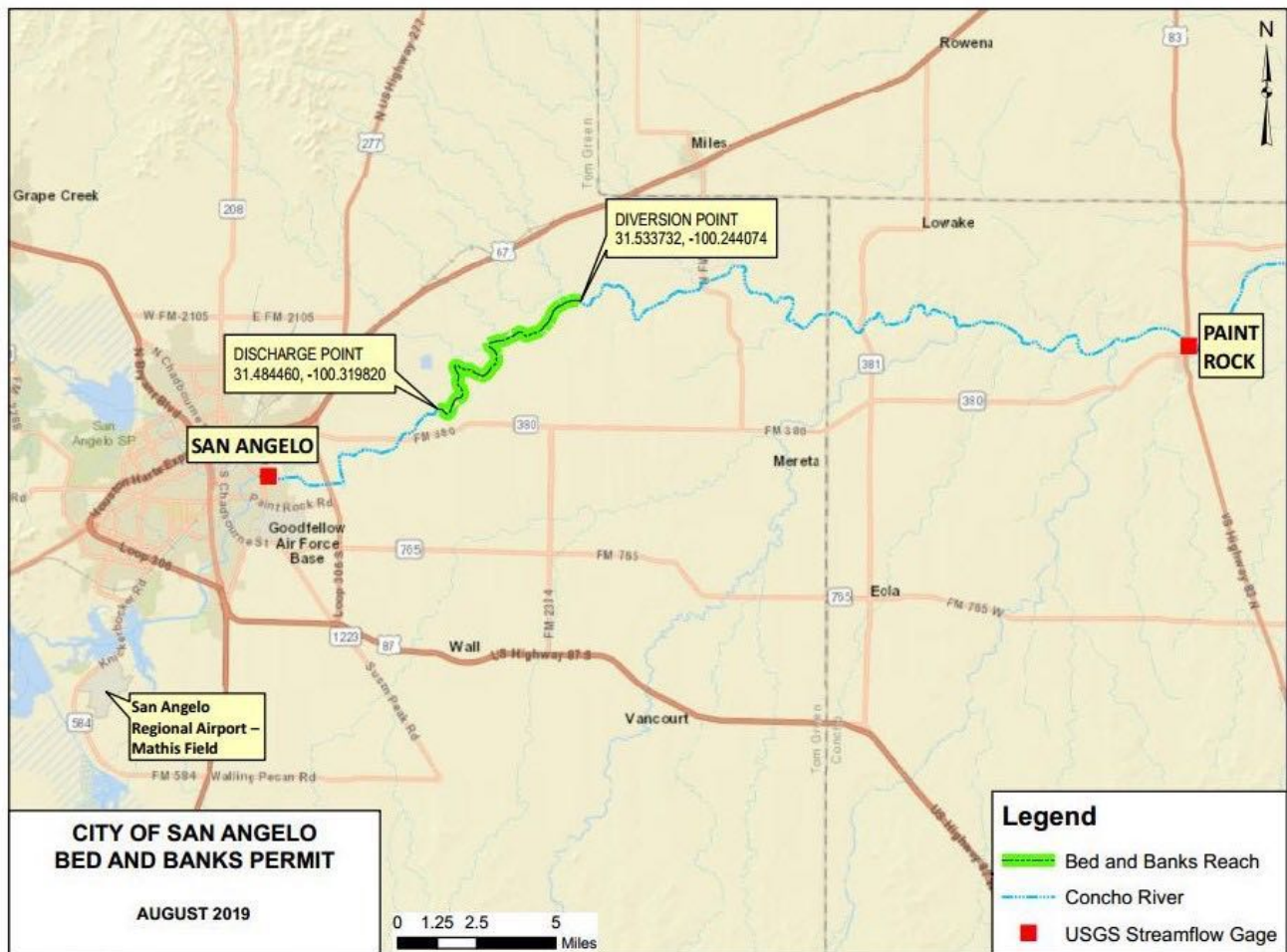
cc: Mr. Shane Kelton, City of San Angelo

## Response Exhibit 2

**DESCRIPTION OF REUSE ACCOUNTING PLAN  
FOR CONVEYANCE AND DIVERSION OF SAN ANGELO'S  
TREATED WASTEWATER EFFLUENT ON THE CONCHO RIVER  
Version 1.0, May 25, 2023**

**OVERVIEW**

The City of San Angelo ("City") plans to reuse the treated effluent from its municipal wastewater reclamation facility for potable water purposes to help meet the future water needs of its customers. As part of this project, the treated effluent is to be discharged from the wastewater treatment plans 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**

The discharge point at the upper end of the 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. The diversion point located downstream on the Concho River is immediately upstream of an existing dam authorized under Certificate of Adjudication No. 14-1348, which also is owned by the City.

Permit No. \_\_\_\_\_ authorizes the City to convey its treated wastewater effluent along the designated segment of the Concho River and to divert the effluent from the river provided that no more water is withdrawn from the river than was discharged into the river, after accounting for carriage losses. Carriage losses along this reach of the Concho River have been investigated and determined to be 0.4 percent of the amount of water flowing past the discharge point down to the diversion point.

Special conditions in Permit No. \_\_\_\_\_ require the City to maintain an accounting plan to document the daily effluent discharges into the Concho River, the associated conveyance losses along the conveyance reach, and the daily diversions of the effluent from the Concho River. This accounting plan is programmed in the accompanying Excel worksheet and includes the necessary calculations and checks to ensure compliance with the provisions of Permit No. \_\_\_\_\_. Elements of this worksheet are described in the following section.

## **ACCOUNTING PLAN WORKSHEET**

The accounting plan worksheet is structured for a single calendar year of daily accounting. Days of the year are listed in rows down the page, with the last day of the previous year in the first row, and individual parameter values for each day are listed across the page. The worksheet requires daily entry of only two basic quantities; the previous 24-hour quantity of effluent discharged and the previous 24-hour quantity of effluent diverted. All other quantities are calculated by the worksheet.

The calculation of the allowable diversion of effluent on a given day is based on the amount of the previous 24-hour effluent discharge and diversion. This one-day lag is considered reasonable given the relatively steady nature of wastewater discharges from day to day and the length of the conveyance reach and normal travel time through the reach. In applying the accounting plan, it is assumed that data will be entered into the worksheet daily at approximately the same time each day. Column headings in the worksheet refer to “PREVIOUS 24-HOUR” for purposes of entering data and performing the calculations. The quantity “ALLOWABLE DIVERSION” is the amount of effluent that can be diverted in the next 24 hours, taking into consideration the amount of effluent discharged and diverted during the previous 24 hours and any over diversions or under diversions relative to the previous 24-hour allowable diversion.

Following is a description of parameters and calculations for each of the columns in the worksheet.

Column 1: DATE – The date identified for daily calculations, month/day/year.



- Column 2: ALLOWABLE DIVERSION, M Gallons – The allowable diversion for the upcoming 24 hours based on the quantity of effluent discharged the previous 24 hours, adjusted for any over or under diversions relative to the allowable diversion for the previous 24 hours, in units of million gallons.
- Column 3: ALLOWABLE DIVERSION, Acre-Feet – Same as Column 2 converted to units of acre-feet.
- Column 4: PREVIOUS 24-HOUR DISCHARGE, M Gallons – The quantity of effluent discharged the previous 24 hours, in units of million gallons.
- Column 5: PREVIOUS 24-HOUR DISCHARGE, Acre-Feet – Same as Column 4 converted to units of acre-feet.
- Column 6: PREVIOUS 24-HOUR CONVEYANCE LOSS, M Gallons – The calculated conveyance loss of the effluent discharged the previous 24 hours based on a loss factor of 0.4%, in units of million gallons.
- Column 7: PREVIOUS 24-HOUR CONVEYANCE LOSS, Acre-Feet – Same as Column 6 converted to units of acre-feet.
- Column 8: PREVIOUS 24-HOUR DIVERSION, M Gallons – The quantity of effluent diverted the previous 24 hours, in units of million gallons.
- Column 9: PREVIOUS 24-HOUR DIVERSION, Acre-Feet – Same as Column 8 converted to units of acre-feet.
- Column 10: OVER (+) OR UNDER (-) DIVERSION, M Gallons – The amount of over or under diversion the previous 24 hours calculated by subtracting from the PREVIOUS 24-HOUR DIVERSION the ALLOWABLE DIVERSION for the previous 24 hours, in units of million gallons.
- Column 11: OVER (+) OR UNDER (-) DIVERSION, Acre-Feet – Same as Column 10 converted to units of acre-feet.
- Column 12: YEAR-TO-DATE DISCHARGE, M Gallons – The cumulative amount of effluent discharged during the current year, in units of million gallons. The current value of this quantity is reported in Cell (F,8).
- Column 13: YEAR-TO-DATE DISCHARGE, Acre-Feet – Same as Column 12 converted to units of acre-feet. The current value of this quantity is reported in Cell (N,8).
- Column 14: YEAR-TO-DATE DIVERSION, M Gallons – The cumulative amount of effluent diverted during the current year, in units of million gallons. The current value of this quantity is reported in Cell (F,10).
- Column 15: YEAR-TO-DATE DIVERSION, Acre-Feet – Same as Column 14 converted to units of acre-feet. The current value of this quantity is reported in Cell (N,10).

Response Exh. 2 - Acct Plan.xlsx  
included with email submission

## Response Exhibit 3

## 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  
~~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.**

## Response Exhibit 4



TPDES PERMIT NO.  
WQ0010641003  
[For TCEQ office use only - EPA I.D.  
No. TX0141534]

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
P.O. Box 13087  
Austin, Texas 78711-3087

This major amendment supersedes  
and replaces TLAP Permit No.  
WQ0010641003 issued on February  
21, 2021.

**PERMIT TO DISCHARGE WASTES**  
under provisions of  
Section 402 of the Clean Water Act  
and Chapter 26 of the Texas Water Code

City of San Angelo

72 West College Avenue

San Angelo, Texas 76903

is authorized to treat and discharge wastes from the City of San Angelo Wastewater Treatment Facility, SIC  
Code 4952

located at 1898 City Farm Road, San Angelo in Tom Green County, Texas 76905

**Interim Phase:** The City of San Angelo Wastewater Treatment Facility consists of an activated sludge process plant using the conventional mode. Treatment units include a lift station with manual bar screen and emergency overflow basin, two bar screens, one de-gritting unit, two fine screens, four primary clarifiers, two aeration basins, four final clarifiers, one chlorine contact basin, two primary sludge thickeners, a sludge blend tank, three anaerobic digesters, one sludge holding tank, three gravity belt thickeners, and three belt filter presses. Prior to irrigation, the effluent is stored in two effluent holding ponds having a total capacity of 3,200 acre-feet. The permittee is authorized to dispose of treated domestic wastewater effluent at a daily average flow not to exceed 11.3 million gallons per day (MGD) or an annual average flow of 10.7 MGD via evaporation and surface irrigation via land application on 560 irrigable acres of pasture grass and 1,680 irrigable acres of sorghum, corn, haygrazer, cotton, alfalfa, soybeans, wheat, oats and rye over the irrigated area. Application rates to the irrigated land shall not exceed 3.5-6.4 acre-feet per year per acre irrigated. The wastewater treatment facility and disposal site are located in the drainage basin of the Concho River in Segment No. 1421 of the Colorado River Basin. No discharge of pollutants into water in the state is authorized by the Interim Phase of this permit.

**Final Phase:** The permittee is authorized to discharge treated domestic wastewater effluent at an annual average flow not to exceed 12.0 MGD via Outfall 001 directly to the Concho River in Segment No. 1421 of the Colorado River Basin; and dispose of treated domestic wastewater effluent via evaporation and surface irrigation via land application at a daily average flow not to exceed 11.3 million gallons per day (MGD) or an annual average flow of 10.7 MGD on 560 irrigable acres of pasture grass and 1,680 irrigable acres of sorghum, corn, haygrazer, cotton, alfalfa, soybeans, wheat, oats and rye over the irrigated area. Application rates to the irrigated land shall not exceed 3.5-6.4 acre-feet per year per acre irrigated. The combined annual average flow of discharge and disposal via evaporation and surface irrigation via land application shall not exceed 12.0 MGD. The wastewater treatment facility and disposal site are located in the drainage basin of the Concho River in Segment No. 1421 of the Colorado River Basin

only according to effluent limitations, monitoring requirements, and other conditions set forth in this permit, as well as the rules of the Texas Commission on Environmental Quality (TCEQ), the laws of the State of Texas, and other orders of the TCEQ. The issuance of this permit does not grant to the permittee the right to use private or public property for conveyance of wastewater along the discharge route described in this permit. This includes, but is not limited to, property belonging to any individual, partnership, corporation, or other entity. Neither does this permit authorize any invasion of personal rights nor any violation of federal, state, or local laws or regulations. It is the responsibility of the permittee to acquire property rights as may be necessary to use the discharge route.

This permit shall expire at midnight, **five years from the date of issuance.**

ISSUED DATE: October 19, 2022

For the Commission

City of San Angelo

TPDES Permit No. WQ0010641003

INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTSLand Application**Conditions of Land Application: No discharge of pollutants into water in the state is authorized.****A. Effluent Limitations**Character: Treated Domestic Sewage EffluentVolume: Daily Average Flow – 11.3 MGD from the treatment system. Annual Average flow for any twelve-month period shall not exceed 10.7 MGD.Quality: The following effluent limitations are required in the Interim phase:

<u>Parameter</u>	<u>Effluent Concentrations</u>	
	(Not to Exceed)	
	<u>Daily</u>	<u>Single</u>
	<u>Average</u>	<u>Grab</u>
	mg/l	mg/l
Biochemical Oxygen Demand (5-day)	N/A	65

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.

**B. Monitoring Requirements:**

<u>Parameter</u>	<u>Monitoring Frequency</u>	<u>Sample Type</u>
Flow	Continuous	Totalizing meter
Biochemical Oxygen Demand (5-day)	One/week	Composite
pH	One/week	Grab

The monitoring shall be done after the final treatment unit and prior to storage of the treated effluent. If the effluent is land applied directly from the treatment system, monitoring shall be done after the final treatment unit and prior to land application. These records shall be maintained on a monthly basis and be available at the plant site for inspection by authorized representatives of the Commission for at least three years.

City of San Angelo

TPDES Permit No. WQ0010641003

FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTSOutfall Number 001

1. During the period beginning upon the completion of expansion to the 12.0 million gallons per day (MGD) facility and lasting through the date of expiration, the permittee is authorized to discharge subject to the following effluent limitations:

The annual average flow of effluent shall not exceed 12.0 MGD, nor shall the average discharge during any two-hour period (2-hour peak) exceed 33,333 gallons per minute. The combined annual average flow of discharge and disposal via evaporation and surface irrigation via land application shall not exceed 12.0 MGD.

Effluent Characteristic	Discharge Limitations				Min. Self-Monitoring Requirements	
	Daily Avg mg/l (lbs/day) Report	7-day Avg mg/l N/A	Daily Max mg/l Report	Single Grab mg/l N/A	Report Daily Avg. & Daily Max. Measurement Frequency Continuous	Sample Type Totalizing Meter
Flow, MGD	Report	N/A	Report	N/A	Continuous	Totalizing Meter
Carbonaceous Biochemical Oxygen Demand (5-day)						
April - September	5 (501)	10	20	30	One/day	Composite
October - March	10 (1,001)	15	25	35	One/day	Composite
Total Suspended Solids						
April - September	12 (1,202)	20	40	60	One/day	Composite
October - March	15 (1,502)	25	40	60	One/day	Composite
Ammonia Nitrogen						
April - September	3 (300)	6	10	15	One/day	Composite
October - March	4 (401)	7	10	15	One/day	Composite
Total Phosphorus	0.5 (50)	1	2	3	One/day	Composite
<i>E. coli</i> , CFU or MPN per 100 ml	126	N/A	399	N/A	Five/week	Grab

\*CFU or MPN - colony-forming units or most probable number

2. The effluent shall contain a total chlorine residual of at least 1.0 mg/l after a detention time of at least 20 minutes (based on peak flow) and shall be monitored daily by grab sample. The permittee shall dechlorinate the chlorinated effluent to less than 0.1 mg/l total chlorine residual and shall monitor total chlorine residual daily by grab sample after the dechlorination process. An equivalent method of disinfection may be substituted only with prior approval of the Executive Director.
3. The pH shall not be less than 6.5 standard units nor greater than 9.0 standard units and shall be monitored once per day by grab sample.
4. There shall be no discharge of floating solids or visible foam in other than trace amounts and no discharge of visible oil.
5. Effluent monitoring samples shall be taken at the following location(s): Following the final treatment unit.
6. The effluent shall contain a minimum dissolved oxygen of 6.0 mg/l shall be monitored twice per week by grab sample.
7. The annual average flow and maximum 2-hour peak flow shall be reported monthly.



City of San Angelo

TPDES Permit No. WQ0010641003

FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTSLand Application**Conditions of Land Application: No discharge of pollutants into water in the state is authorized.****A. Effluent Limitations**Character: Treated Domestic Sewage EffluentVolume: Daily Average Flow – 11.3 MGD from the treatment system. Annual Average flow for any twelve-month period shall not exceed 10.7 MGD. The combined annual average flow of discharge and disposal via evaporation and surface irrigation via land application shall not exceed 12.0 MGD.Quality: The following effluent limitations are required in the Final phases

<u>Parameter</u>	<u>Effluent Concentrations</u>	
	(Not to Exceed)	
	<u>Daily</u> <u>Average</u> mg/l	<u>Single</u> <u>Grab</u> mg/l
Biochemical Oxygen Demand (5-day)	N/A	65

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.

**B. Monitoring Requirements:**

<u>Parameter</u>	<u>Monitoring Frequency</u>	<u>Sample Type</u>
Flow	Continuous	Totalizing meter
Biochemical Oxygen Demand (5-day)	One/week	Composite
pH	One/week	Grab

The monitoring shall be done after the final treatment unit and prior to storage of the treated effluent. If the effluent is land applied directly from the treatment system, monitoring shall be done after the final treatment unit and prior to land application. These records shall be maintained on a monthly basis and be available at the plant site for inspection by authorized representatives of the Commission for at least three years.

**DEFINITIONS AND STANDARD PERMIT CONDITIONS**

As required by Title 30 Texas Administrative Code (TAC) Chapter 305, certain regulations appear as standard conditions in waste discharge permits. 30 TAC § 305.121 - 305.129 (relating to Permit Characteristics and Conditions) as promulgated under the Texas Water Code (TWC) §§ 5.103 and 5.105, and the Texas Health and Safety Code (THSC) §§ 361.017 and 361.024(a), establish the characteristics and standards for waste discharge permits, including sewage sludge, and those sections of 40 Code of Federal Regulations (CFR) Part 122 adopted by reference by the Commission. The following text includes these conditions and incorporates them into this permit. All definitions in TWC § 26.001 and 30 TAC Chapter 305 shall apply to this permit and are incorporated by reference. Some specific definitions of words or phrases used in this permit are as follows:

**1. Flow Measurements**

- a. Annual average flow - the arithmetic average of all daily flow determinations taken within the preceding 12 consecutive calendar months. The annual average flow determination shall consist of daily flow volume determinations made by a totalizing meter, charted on a chart recorder and limited to major domestic wastewater discharge facilities with one million gallons per day or greater permitted flow.
- b. Daily average flow - the arithmetic average of all determinations of the daily flow within a period of one calendar month. The daily average flow determination shall consist of determinations made on at least four separate days. If instantaneous measurements are used to determine the daily flow, the determination shall be the arithmetic average of all instantaneous measurements taken during that month. Daily average flow determination for intermittent discharges shall consist of a minimum of three flow determinations on days of discharge.
- c. Daily maximum flow - the highest total flow for any 24-hour period in a calendar month.
- d. Instantaneous flow - the measured flow during the minimum time required to interpret the flow measuring device.
- e. 2-hour peak flow (domestic wastewater treatment plants) - the maximum flow sustained for a two-hour period during the period of daily discharge. The average of multiple measurements of instantaneous maximum flow within a two-hour period may be used to calculate the 2-hour peak flow.
- f. Maximum 2-hour peak flow (domestic wastewater treatment plants) - the highest 2-hour peak flow for any 24-hour period in a calendar month.

**2. Concentration Measurements**

- a. Daily average concentration - the arithmetic average of all effluent samples, composite or grab as required by this permit, within a period of one calendar month, consisting of at least four separate representative measurements.
  - i. For domestic wastewater treatment plants - When four samples are not available in a calendar month, the arithmetic average (weighted by flow) of all values in the previous four consecutive month period consisting of at least four measurements shall be utilized as the daily average concentration.

- ii. For all other wastewater treatment plants - When four samples are not available in a calendar month, the arithmetic average (weighted by flow) of all values taken during the month shall be utilized as the daily average concentration.
- b. 7-day average concentration - the arithmetic average of all effluent samples, composite or grab as required by this permit, within a period of one calendar week, Sunday through Saturday.
- c. Daily maximum concentration - the maximum concentration measured on a single day, by the sample type specified in the permit, within a period of one calendar month.
- d. Daily discharge - the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in terms of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the sampling day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the sampling day.

The daily discharge determination of concentration made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the daily discharge determination of concentration shall be the arithmetic average (weighted by flow value) of all samples collected during that day.

- e. Bacteria concentration (*E. coli* or Enterococci) - Colony Forming Units (CFU) or Most Probable Number (MPN) of bacteria per 100 milliliters effluent. The daily average bacteria concentration is a geometric mean of the values for the effluent samples collected in a calendar month. The geometric mean shall be determined by calculating the  $n$ th root of the product of all measurements made in a calendar month, where  $n$  equals the number of measurements made; or, computed as the antilogarithm of the arithmetic mean of the logarithms of all measurements made in a calendar month. For any measurement of bacteria equaling zero, a substituted value of one shall be made for input into either computation method. If specified, the 7-day average for bacteria is the geometric mean of the values for all effluent samples collected during a calendar week.
  - f. Daily average loading (lbs/day) - the arithmetic average of all daily discharge loading calculations during a period of one calendar month. These calculations must be made for each day of the month that a parameter is analyzed. The daily discharge, in terms of mass (lbs/day), is calculated as (Flow, MGD x Concentration, mg/l x 8.34).
  - g. Daily maximum loading (lbs/day) - the highest daily discharge, in terms of mass (lbs/day), within a period of one calendar month.
3. Sample Type
- a. Composite sample - For domestic wastewater, a composite sample is a sample made up of a minimum of three effluent portions collected in a continuous 24-hour period or during the period of daily discharge if less than 24 hours, and combined in volumes proportional to flow, and collected at the intervals required by 30 TAC § 319.9 (a). For industrial wastewater, a composite sample is a sample made up of a minimum of three effluent portions collected in a continuous 24-hour period or during the period of daily discharge if less than 24 hours, and combined in volumes proportional to flow, and collected at the intervals required by 30 TAC § 319.9 (b).

- b. Grab sample - an individual sample collected in less than 15 minutes.
- 4. Treatment Facility (facility) - wastewater facilities used in the conveyance, storage, treatment, recycling, reclamation and/or disposal of domestic sewage, industrial wastes, agricultural wastes, recreational wastes, or other wastes including sludge handling or disposal facilities under the jurisdiction of the Commission.
- 5. The term "sewage sludge" is defined as solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in 30 TAC Chapter 312. This includes the solids that have not been classified as hazardous waste separated from wastewater by unit processes.
- 6. The term "biosolids" is defined as sewage sludge that has been tested or processed to meet Class A, Class AB, or Class B pathogen standards in 30 TAC Chapter 312 for beneficial use.
- 7. Bypass - the intentional diversion of a waste stream from any portion of a treatment facility.

## **MONITORING AND REPORTING REQUIREMENTS**

### **1. Self-Reporting**

Monitoring results shall be provided at the intervals specified in the permit. Unless otherwise specified in this permit or otherwise ordered by the Commission, the permittee shall conduct effluent sampling and reporting in accordance with 30 TAC §§ 319.4 - 319.12. Unless otherwise specified, effluent monitoring data shall be submitted each month, to the Compliance Monitoring Team of the Enforcement Division (MC 224), by the 20th day of the following month for each discharge which is described by this permit whether or not a discharge is made for that month. Monitoring results must be submitted online using the NetDMR reporting system available through the TCEQ website unless the permittee requests and obtains an electronic reporting waiver. Monitoring results must be signed and certified as required by Monitoring and Reporting Requirements No. 10.

As provided by state law, the permittee is subject to administrative, civil and criminal penalties, as applicable, for negligently or knowingly violating the Clean Water Act (CWA); TWC §§ 26, 27, and 28; and THSC § 361, including but not limited to knowingly making any false statement, representation, or certification on any report, record, or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, or falsifying, tampering with or knowingly rendering inaccurate any monitoring device or method required by this permit or violating any other requirement imposed by state or federal regulations.

### **2. Test Procedures**

- a. Unless otherwise specified in this permit, test procedures for the analysis of pollutants shall comply with procedures specified in 30 TAC §§ 319.11 - 319.12. Measurements, tests, and calculations shall be accurately accomplished in a representative manner.
- b. All laboratory tests submitted to demonstrate compliance with this permit must meet the requirements of 30 TAC § 25, Environmental Testing Laboratory Accreditation and Certification.

### **3. Records of Results**

- a. Monitoring samples and measurements shall be taken at times and in a manner so as to be representative of the monitored activity.

- b. Except for records of monitoring information required by this permit related to the permittee's sewage sludge or biosolids use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), monitoring and reporting records, including strip charts and records of calibration and maintenance, copies of all records required by this permit, records of all data used to complete the application for this permit, and the certification required by 40 CFR § 264.73(b)(9) shall be retained at the facility site, or shall be readily available for review by a TCEQ representative for a period of three years from the date of the record or sample, measurement, report, application or certification. This period shall be extended at the request of the Executive Director.
- c. Records of monitoring activities shall include the following:
  - i. date, time and place of sample or measurement;
  - ii. identity of individual who collected the sample or made the measurement.
  - iii. date and time of analysis;
  - iv. identity of the individual and laboratory who performed the analysis;
  - v. the technique or method of analysis; and
  - vi. the results of the analysis or measurement and quality assurance/quality control records.

The period during which records are required to be kept shall be automatically extended to the date of the final disposition of any administrative or judicial enforcement action that may be instituted against the permittee.

#### 4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit using approved analytical methods as specified above, all results of such monitoring shall be included in the calculation and reporting of the values submitted on the approved self-report form. Increased frequency of sampling shall be indicated on the self-report form.

#### 5. Calibration of Instruments

All automatic flow measuring or recording devices and all totalizing meters for measuring flows shall be accurately calibrated by a trained person at plant start-up and as often thereafter as necessary to ensure accuracy, but not less often than annually unless authorized by the Executive Director for a longer period. Such person shall verify in writing that the device is operating properly and giving accurate results. Copies of the verification shall be retained at the facility site and/or shall be readily available for review by a TCEQ representative for a period of three years.

#### 6. Compliance Schedule Reports

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of the permit shall be submitted no later than 14 days following each schedule date to the Regional Office and the Compliance Monitoring Team of the Enforcement Division (MC 224).

## 7. Noncompliance Notification

- a. In accordance with 30 TAC § 305.125(9) any noncompliance which may endanger human health or safety, or the environment shall be reported by the permittee to the TCEQ. Except as allowed by 30 TAC § 305.132, report of such information shall be provided orally or by facsimile transmission (FAX) to the Regional Office within 24 hours of becoming aware of the noncompliance. A written submission of such information shall also be provided by the permittee to the Regional Office and the Compliance Monitoring Team of the Enforcement Division (MC 224) within five working days of becoming aware of the noncompliance. For Publicly Owned Treatment Works (POTWs), the permittee must submit the written report for unauthorized discharges and unanticipated bypasses that exceed any effluent limit in the permit using the online electronic reporting system available through the TCEQ website unless the permittee requests and obtains an electronic reporting waiver. The written submission shall contain a description of the noncompliance and its cause; the potential danger to human health or safety, or the environment; the period of noncompliance, including exact dates and times; if the noncompliance has not been corrected, the time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, and to mitigate its adverse effects.
  - b. The following violations shall be reported under Monitoring and Reporting Requirement 7.a.:
    - i. Unauthorized discharges as defined in Permit Condition 2(g).
    - ii. Any unanticipated bypass that exceeds any effluent limitation in the permit.
    - iii. Violation of a permitted maximum daily discharge limitation for pollutants listed specifically in the Other Requirements section of an Industrial TPDES permit.
  - c. In addition to the above, any effluent violation which deviates from the permitted effluent limitation by more than 40% shall be reported by the permittee in writing to the Regional Office and the Compliance Monitoring Team of the Enforcement Division (MC 224) within 5 working days of becoming aware of the noncompliance.
  - d. Any noncompliance other than that specified in this section, or any required information not submitted or submitted incorrectly, shall be reported to the Compliance Monitoring Team of the Enforcement Division (MC 224) as promptly as possible. For effluent limitation violations, noncompliances shall be reported on the approved self-report form.
8. In accordance with the procedures described in 30 TAC §§ 35.301 - 35.303 (relating to Water Quality Emergency and Temporary Orders) if the permittee knows in advance of the need for a bypass, it shall submit prior notice by applying for such authorization.
9. Changes in Discharges of Toxic Substances

All existing manufacturing, commercial, mining, and silvicultural permittees shall notify the Regional Office, orally or by facsimile transmission within 24 hours, and both the Regional Office and the Compliance Monitoring Team of the Enforcement Division (MC 224) in writing within five (5) working days, after becoming aware of or having reason to believe:

- a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant listed at 40 CFR Part 122, Appendix D, Tables II and III (excluding Total Phenols) which is not limited in the permit, if that discharge will exceed the highest of the following “notification levels”:
  - i. One hundred micrograms per liter (100 µg/L);
  - ii. Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
  - iii. Five (5) times the maximum concentration value reported for that pollutant in the permit application; or
  - iv. The level established by the TCEQ.
- b. That any activity has occurred or will occur which would result in any discharge, on a nonroutine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following “notification levels”:
  - i. Five hundred micrograms per liter (500 µg/L);
  - ii. One milligram per liter (1 mg/L) for antimony;
  - iii. Ten (10) times the maximum concentration value reported for that pollutant in the permit application; or
  - iv. The level established by the TCEQ.

#### 10. Signatories to Reports

All reports and other information requested by the Executive Director shall be signed by the person and in the manner required by 30 TAC § 305.128 (relating to Signatories to Reports).

#### 11. All POTWs must provide adequate notice to the Executive Director of the following:

- a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to CWA § 301 or § 306 if it were directly discharging those pollutants;
- b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit; and
- c. For the purpose of this paragraph, adequate notice shall include information on:
  - i. The quality and quantity of effluent introduced into the POTW; and
  - ii. Any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

**PERMIT CONDITIONS****1. General**

- a. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in an application or in any report to the Executive Director, it shall promptly submit such facts or information.
- b. This permit is granted on the basis of the information supplied and representations made by the permittee during action on an application, and relying upon the accuracy and completeness of that information and those representations. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked, in whole or in part, in accordance with 30 TAC Chapter 305, Subchapter D, during its term for good cause including, but not limited to, the following:
  - i. Violation of any terms or conditions of this permit;
  - ii. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or
  - iii. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.
- c. The permittee shall furnish to the Executive Director, upon request and within a reasonable time, any information to determine whether cause exists for amending, revoking, suspending or terminating the permit. The permittee shall also furnish to the Executive Director, upon request, copies of records required to be kept by the permit.

**2. Compliance**

- a. Acceptance of the permit by the person to whom it is issued constitutes acknowledgment and agreement that such person will comply with all the terms and conditions embodied in the permit, and the rules and other orders of the Commission.
- b. The permittee has a duty to comply with all conditions of the permit. Failure to comply with any permit condition constitutes a violation of the permit and the Texas Water Code or the Texas Health and Safety Code, and is grounds for enforcement action, for permit amendment, revocation, or suspension, or for denial of a permit renewal application or an application for a permit for another facility.
- c. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit.
- d. The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal or other permit violation that has a reasonable likelihood of adversely affecting human health or the environment.
- e. Authorization from the Commission is required before beginning any change in the permitted facility or activity that may result in noncompliance with any permit requirements.



- f. A permit may be amended, suspended and reissued, or revoked for cause in accordance with 30 TAC §§ 305.62 and 305.66 and TWC§ 7.302. The filing of a request by the permittee for a permit amendment, suspension and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
- g. There shall be no unauthorized discharge of wastewater or any other waste. For the purpose of this permit, an unauthorized discharge is considered to be any discharge of wastewater into or adjacent to water in the state at any location not permitted as an outfall or otherwise defined in the Other Requirements section of this permit.
- h. In accordance with 30 TAC § 305.535(a), the permittee may allow any bypass to occur from a TPDES permitted facility which does not cause permitted effluent limitations to be exceeded or an unauthorized discharge to occur, but only if the bypass is also for essential maintenance to assure efficient operation.
- i. The permittee is subject to administrative, civil, and criminal penalties, as applicable, under TWC §§ 7.051 - 7.075 (relating to Administrative Penalties), 7.101 - 7.111 (relating to Civil Penalties), and 7.141 - 7.202 (relating to Criminal Offenses and Penalties) for violations including, but not limited to, negligently or knowingly violating the federal CWA §§ 301, 302, 306, 307, 308, 318, or 405, or any condition or limitation implementing any sections in a permit issued under the CWA § 402, or any requirement imposed in a pretreatment program approved under the CWA §§ 402 (a)(3) or 402 (b)(8).

### 3. Inspections and Entry

- a. Inspection and entry shall be allowed as prescribed in the TWC Chapters 26, 27, and 28, and THSC § 361.
- b. The members of the Commission and employees and agents of the Commission are entitled to enter any public or private property at any reasonable time for the purpose of inspecting and investigating conditions relating to the quality of water in the state or the compliance with any rule, regulation, permit or other order of the Commission. Members, employees, or agents of the Commission and Commission contractors are entitled to enter public or private property at any reasonable time to investigate or monitor or, if the responsible party is not responsive or there is an immediate danger to public health or the environment, to remove or remediate a condition related to the quality of water in the state. Members, employees, Commission contractors, or agents acting under this authority who enter private property shall observe the establishment's rules and regulations concerning safety, internal security, and fire protection, and if the property has management in residence, shall notify management or the person then in charge of his presence and shall exhibit proper credentials. If any member, employee, Commission contractor, or agent is refused the right to enter in or on public or private property under this authority, the Executive Director may invoke the remedies authorized in TWC § 7.002. The statement above, that Commission entry shall occur in accordance with an establishment's rules and regulations concerning safety, internal security, and fire protection, is not grounds for denial or restriction of entry to any part of the facility, but merely describes the Commission's duty to observe appropriate rules and regulations during an inspection.

#### 4. Permit Amendment and/or Renewal

- a. The permittee shall give notice to the Executive Director as soon as possible of any planned physical alterations or additions to the permitted facility if such alterations or additions would require a permit amendment or result in a violation of permit requirements. Notice shall also be required under this paragraph when:
  - i. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in accordance with 30 TAC § 305.534 (relating to New Sources and New Dischargers); or
  - ii. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in the permit, nor to notification requirements in Monitoring and Reporting Requirements No. 9; or
  - iii. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
- b. Prior to any facility modifications, additions, or expansions that will increase the plant capacity beyond the permitted flow, the permittee must apply for and obtain proper authorization from the Commission before commencing construction.
- c. The permittee must apply for an amendment or renewal at least 180 days prior to expiration of the existing permit in order to continue a permitted activity after the expiration date of the permit. If an application is submitted prior to the expiration date of the permit, the existing permit shall remain in effect until the application is approved, denied, or returned. If the application is returned or denied, authorization to continue such activity shall terminate upon the effective date of the action. If an application is not submitted prior to the expiration date of the permit, the permit shall expire and authorization to continue such activity shall terminate.
- d. Prior to accepting or generating wastes which are not described in the permit application or which would result in a significant change in the quantity or quality of the existing discharge, the permittee must report the proposed changes to the Commission. The permittee must apply for a permit amendment reflecting any necessary changes in permit conditions, including effluent limitations for pollutants not identified and limited by this permit.
- e. In accordance with the TWC § 26.029(b), after a public hearing, notice of which shall be given to the permittee, the Commission may require the permittee, from time to time, for good cause, in accordance with applicable laws, to conform to new or additional conditions.
- f. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under CWA § 307(a) for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this permit, this permit shall be modified or revoked and reissued to conform to the toxic effluent standard or

prohibition. The permittee shall comply with effluent standards or prohibitions established under CWA § 307(a) for toxic pollutants within the time provided in the regulations that established those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

#### 5. Permit Transfer

- a. Prior to any transfer of this permit, Commission approval must be obtained. The Commission shall be notified in writing of any change in control or ownership of facilities authorized by this permit. Such notification should be sent to the Applications Review and Processing Team (MC 148) of the Water Quality Division.
- b. A permit may be transferred only according to the provisions of 30 TAC § 305.64 (relating to Transfer of Permits) and 30 TAC § 50.133 (relating to Executive Director Action on Application or WQMP update).

#### 6. Relationship to Hazardous Waste Activities

This permit does not authorize any activity of hazardous waste storage, processing, or disposal that requires a permit or other authorization pursuant to the Texas Health and Safety Code.

#### 7. Relationship to Water Rights

Disposal of treated effluent by any means other than discharge directly to water in the state must be specifically authorized in this permit and may require a permit pursuant to TWC Chapter 11.

#### 8. Property Rights

A permit does not convey any property rights of any sort, or any exclusive privilege.

#### 9. Permit Enforceability

The conditions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstances, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

#### 10. Relationship to Permit Application

The application pursuant to which the permit has been issued is incorporated herein; provided, however, that in the event of a conflict between the provisions of this permit and the application, the provisions of the permit shall control.

#### 11. Notice of Bankruptcy

- a. Each permittee shall notify the Executive Director, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any chapter of Title 11 (Bankruptcy) of the United States Code (11 USC) by or against:
  - i. the permittee;
  - ii. an entity (as that term is defined in 11 USC, § 101(14)) controlling the permittee or listing the permit or permittee as property of the estate; or

- iii. an affiliate (as that term is defined in 11 USC, § 101(2)) of the permittee.
- b. This notification must indicate:
  - i. the name of the permittee;
  - ii. the permit number(s);
  - iii. the bankruptcy court in which the petition for bankruptcy was filed; and
  - iv. the date of filing of the petition.

## **OPERATIONAL REQUIREMENTS**

1. The permittee shall at all times ensure that the facility and all of its systems of collection, treatment, and disposal are properly operated and maintained. This includes, but is not limited to, the regular, periodic examination of wastewater solids within the treatment plant by the operator in order to maintain an appropriate quantity and quality of solids inventory as described in the various operator training manuals and according to accepted industry standards for process control. Process control, maintenance, and operations records shall be retained at the facility site, or shall be readily available for review by a TCEQ representative, for a period of three years.
2. Upon request by the Executive Director, the permittee shall take appropriate samples and provide proper analysis in order to demonstrate compliance with Commission rules. Unless otherwise specified in this permit or otherwise ordered by the Commission, the permittee shall comply with all applicable provisions of 30 TAC Chapter 312 concerning sewage sludge or biosolids use and disposal and 30 TAC §§ 319.21 - 319.29 concerning the discharge of certain hazardous metals.
3. Domestic wastewater treatment facilities shall comply with the following provisions:
  - a. The permittee shall notify the Municipal Permits Team, Wastewater Permitting Section (MC 148) of the Water Quality Division, in writing, of any facility expansion at least 90 days prior to conducting such activity.
  - b. The permittee shall submit a closure plan for review and approval to the Municipal Permits Team, Wastewater Permitting Section (MC 148) of the Water Quality Division, for any closure activity at least 90 days prior to conducting such activity. Closure is the act of permanently taking a waste management unit or treatment facility out of service and includes the permanent removal from service of any pit, tank, pond, lagoon, surface impoundment and/or other treatment unit regulated by this permit.
4. The permittee is responsible for installing prior to plant start-up, and subsequently maintaining, adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failures by means of alternate power sources, standby generators, and/or retention of inadequately treated wastewater.
5. Unless otherwise specified, the permittee shall provide a readily accessible sampling point and, where applicable, an effluent flow measuring device or other acceptable means by which effluent flow may be determined.

6. The permittee shall remit an annual water quality fee to the Commission as required by 30 TAC Chapter 21. Failure to pay the fee may result in revocation of this permit under TWC § 7.302(b)(6).

7. Documentation

For all written notifications to the Commission required of the permittee by this permit, the permittee shall keep and make available a copy of each such notification under the same conditions as self-monitoring data are required to be kept and made available. Except for information required for TPDES permit applications, effluent data, including effluent data in permits, draft permits and permit applications, and other information specified as not confidential in 30 TAC §§ 1.5(d), any information submitted pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted in the manner prescribed in the application form or by stamping the words confidential business information on each page containing such information. If no claim is made at the time of submission, information may be made available to the public without further notice. If the Commission or Executive Director agrees with the designation of confidentiality, the TCEQ will not provide the information for public inspection unless required by the Texas Attorney General or a court pursuant to an open records request. If the Executive Director does not agree with the designation of confidentiality, the person submitting the information will be notified.

8. Facilities that generate domestic wastewater shall comply with the following provisions; domestic wastewater treatment facilities at permitted industrial sites are excluded.
  - a. Whenever flow measurements for any domestic sewage treatment facility reach 75% of the permitted daily average or annual average flow for three consecutive months, the permittee must initiate engineering and financial planning for expansion and/or upgrading of the domestic wastewater treatment and/or collection facilities. Whenever the flow reaches 90% of the permitted daily average or annual average flow for three consecutive months, the permittee shall obtain necessary authorization from the Commission to commence construction of the necessary additional treatment and/or collection facilities. In the case of a domestic wastewater treatment facility which reaches 75% of the permitted daily average or annual average flow for three consecutive months, and the planned population to be served or the quantity of waste produced is not expected to exceed the design limitations of the treatment facility, the permittee shall submit an engineering report supporting this claim to the Executive Director of the Commission.

If in the judgment of the Executive Director the population to be served will not cause permit noncompliance, then the requirement of this section may be waived. To be effective, any waiver must be in writing and signed by the Director of the Enforcement Division (MC 219) of the Commission, and such waiver of these requirements will be reviewed upon expiration of the existing permit; however, any such waiver shall not be interpreted as condoning or excusing any violation of any permit parameter.

- b. The plans and specifications for domestic sewage collection and treatment works associated with any domestic permit must be approved by the Commission and failure to secure approval before commencing construction of such works or making a discharge is a violation of this permit and each day is an additional violation until approval has been secured.

- c. Permits for domestic wastewater treatment plants are granted subject to the policy of the Commission to encourage the development of area-wide waste collection, treatment, and disposal systems. The Commission reserves the right to amend any domestic wastewater permit in accordance with applicable procedural requirements to require the system covered by this permit to be integrated into an area-wide system, should such be developed; to require the delivery of the wastes authorized to be collected in, treated by or discharged from said system, to such area-wide system; or to amend this permit in any other particular to effectuate the Commission's policy. Such amendments may be made when the changes required are advisable for water quality control purposes and are feasible on the basis of waste treatment technology, engineering, financial, and related considerations existing at the time the changes are required, exclusive of the loss of investment in or revenues from any then existing or proposed waste collection, treatment or disposal system.
9. Domestic wastewater treatment plants shall be operated and maintained by sewage plant operators holding a valid certificate of competency at the required level as defined in 30 TAC Chapter 30.
10. For Publicly Owned Treatment Works (POTWs), the 30-day average (or monthly average) percent removal for BOD and TSS shall not be less than 85%, unless otherwise authorized by this permit.
11. Facilities that generate industrial solid waste as defined in 30 TAC § 335.1 shall comply with these provisions:
  - a. Any solid waste, as defined in 30 TAC § 335.1 (including but not limited to such wastes as garbage, refuse, sludge from a waste treatment, water supply treatment plant or air pollution control facility, discarded materials, discarded materials to be recycled, whether the waste is solid, liquid, or semisolid), generated by the permittee during the management and treatment of wastewater, must be managed in accordance with all applicable provisions of 30 TAC Chapter 335, relating to Industrial Solid Waste Management.
  - b. Industrial wastewater that is being collected, accumulated, stored, or processed before discharge through any final discharge outfall, specified by this permit, is considered to be industrial solid waste until the wastewater passes through the actual point source discharge and must be managed in accordance with all applicable provisions of 30 TAC Chapter 335.
  - c. The permittee shall provide written notification, pursuant to the requirements of 30 TAC § 335.8(b)(1), to the Corrective Action Section (MC 127) of the Remediation Division informing the Commission of any closure activity involving an Industrial Solid Waste Management Unit, at least 90 days prior to conducting such an activity.
  - d. Construction of any industrial solid waste management unit requires the prior written notification of the proposed activity to the Registration and Reporting Section (MC 129) of the Permitting and Registration Support Division. No person shall dispose of industrial solid waste, including sludge or other solids from wastewater treatment processes, prior to fulfilling the deed recordation requirements of 30 TAC § 335.5.
  - e. The term "industrial solid waste management unit" means a landfill, surface impoundment, waste-pile, industrial furnace, incinerator, cement kiln, injection well,

container, drum, salt dome waste containment cavern, or any other structure vessel, appurtenance, or other improvement on land used to manage industrial solid waste.

- f. The permittee shall keep management records for all sludge (or other waste) removed from any wastewater treatment process. These records shall fulfill all applicable requirements of 30 TAC § 335 and must include the following, as it pertains to wastewater treatment and discharge:
- i. Volume of waste and date(s) generated from treatment process;
  - ii. Volume of waste disposed of on-site or shipped off-site;
  - iii. Date(s) of disposal;
  - iv. Identity of hauler or transporter;
  - v. Location of disposal site; and
  - vi. Method of final disposal.

The above records shall be maintained on a monthly basis. The records shall be retained at the facility site, or shall be readily available for review by authorized representatives of the TCEQ for at least five years.

12. For industrial facilities to which the requirements of 30 TAC § 335 do not apply, sludge and solid wastes, including tank cleaning and contaminated solids for disposal, shall be disposed of in accordance with THSC § 361.

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## SLUDGE PROVISIONS

The permittee is authorized to dispose of sludge only at a Texas Commission on Environmental Quality (TCEQ) authorized land application site, co-disposal landfill, wastewater treatment facility, or facility that further processes sludge. **The disposal of sludge or biosolids by land application on property owned, leased or under the direct control of the permittee is a violation of the permit unless the site is authorized with the TCEQ. This provision does not authorize Distribution and Marketing of Class A or Class AB Biosolids. This provision does not authorize the permittee to land apply biosolids on property owned, leased or under the direct control of the permittee.**

### SECTION I. REQUIREMENTS APPLYING TO ALL SEWAGE SLUDGE OR BIOSOLIDS LAND APPLICATION

#### A. General Requirements

1. The permittee shall handle and dispose of sewage sludge or biosolids in accordance with 30 TAC § 312 and all other applicable state and federal regulations in a manner that protects public health and the environment from any reasonably anticipated adverse effects due to any toxic pollutants that may be present in the sludge or biosolids.
2. In all cases, if the person (permit holder) who prepares the sewage sludge supplies the sewage sludge to another person for land application use or to the owner or lease holder of the land, the permit holder shall provide necessary information to the parties who receive the sludge to assure compliance with these regulations.
3. The land application of processed or unprocessed chemical toilet waste, grease trap waste, grit trap waste, milk solids, or similar non-hazardous municipal or industrial solid wastes, or any of the wastes listed in this provision combined with biosolids, WTP residuals or domestic septage is prohibited unless the grease trap waste is added at a fats, oil and grease (FOG) receiving facility as part of an anaerobic digestion process.

#### B. Testing Requirements

1. Sewage sludge or biosolids shall be tested annually in accordance with the method specified in both 40 CFR Part 261, Appendix II and 40 CFR Part 268, Appendix I [Toxicity Characteristic Leaching Procedure (TCLP)] or other method that receives the prior approval of the TCEQ for the contaminants listed in 40 CFR Part 261.24, Table 1. Sewage sludge or biosolids failing this test shall be managed according to RCRA standards for generators of hazardous waste, and the waste's disposition must be in accordance with all applicable requirements for hazardous waste processing, storage, or disposal. Following failure of any TCLP test, the management or disposal of sewage sludge or biosolids at a facility other than an authorized hazardous waste processing, storage, or disposal facility shall be prohibited until such time as the permittee can demonstrate the sewage sludge or biosolids no longer exhibits the hazardous waste toxicity characteristics (as demonstrated by the results of the TCLP tests). A written report shall be provided to both the TCEQ Registration and Reporting Section (MC 129) of the Permitting and Registration Support Division and the Regional Director (MC Region 8) within seven (7) days after failing the TCLP Test.



The report shall contain test results, certification that unauthorized waste management has stopped, and a summary of alternative disposal plans that comply with RCRA standards for the management of hazardous waste. The report shall be addressed to: Director, Permitting and Registration Support Division (MC 129), Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087. In addition, the permittee shall prepare an annual report on the results of all sludge toxicity testing. This annual report shall be submitted to the TCEQ Regional Office (MC Region 8) and the Compliance Monitoring Team (MC 224) of the Enforcement Division by September 30<sup>th</sup> of each year. The permittee must submit this annual report using the online electronic reporting system available through the TCEQ website unless the permittee requests and obtains an electronic reporting waiver.

2. Biosolids shall not be applied to the land if the concentration of the pollutants exceeds the pollutant concentration criteria in Table 1. The frequency of testing for pollutants in Table 1 is found in Section I.C. of this permit.

TABLE 1

<u>Pollutant</u>	<u>Ceiling Concentration</u> <u>(Milligrams per kilogram)*</u>
Arsenic	75
Cadmium	85
Chromium	3000
Copper	4300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
PCBs	49
Selenium	100
Zinc	7500

\* Dry weight basis

3. Pathogen Control

All sewage sludge that is applied to agricultural land, forest, a public contact site, or a reclamation site must be treated by one of the following methods to ensure that the sludge meets either the Class A, Class AB or Class B biosolids pathogen requirements.

- a. For sewage sludge to be classified as Class A biosolids with respect to pathogens, the density of fecal coliform in the sewage sludge must be less than 1,000 most probable number (MPN) per gram of total solids (dry weight basis), or the density of *Salmonella* sp. bacteria in the sewage sludge must be less than three MPN per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed. In addition, one of the alternatives listed below must be met:

Alternative 1 - The temperature of the sewage sludge that is used or disposed shall be maintained at or above a specific value for a period of time. See 30 TAC § 312.82(a)(2)(A) for specific information;

Alternative 5 (PFRP) - Sewage sludge that is used or disposed of must be treated in one of the Processes to Further Reduce Pathogens (PFRP) described in 40 CFR Part 503, Appendix B. PFRP include composting, heat drying, heat treatment, and thermophilic aerobic digestion; or

Alternative 6 (PFRP Equivalent) - Sewage sludge that is used or disposed of must be treated in a process that has been approved by the U. S. Environmental Protection Agency as being equivalent to those in Alternative 5.

- b. For sewage sludge to be classified as Class AB biosolids with respect to pathogens, the density of fecal coliform in the sewage sludge must be less than 1,000 MPN per gram of total solids (dry weight basis), or the density of *Salmonella* sp. bacteria in the sewage sludge be less than three MPN per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed. In addition, one of the alternatives listed below must be met:

Alternative 2 - The pH of the sewage sludge that is used or disposed shall be raised to above 12 std. units and shall remain above 12 std. units for 72 hours.

The temperature of the sewage sludge shall be above 52° Celsius for 12 hours or longer during the period that the pH of the sewage sludge is above 12 std. units.

At the end of the 72-hour period during which the pH of the sewage sludge is above 12 std. units, the sewage sludge shall be air dried to achieve a percent solids in the sewage sludge greater than 50%; or

Alternative 3 - The sewage sludge shall be analyzed for enteric viruses prior to pathogen treatment. The limit for enteric viruses is less than one Plaque-forming Unit per four grams of total solids (dry weight basis) either before or following pathogen treatment. See 30 TAC § 312.82(a)(2)(C)(i-iii) for specific information. The sewage sludge shall be analyzed for viable helminth ova prior to pathogen treatment. The limit for viable helminth ova is less than one per four grams of total solids (dry weight basis) either before or following pathogen treatment. See 30 TAC § 312.82(a)(2)(C)(iv-vi) for specific information; or

Alternative 4 - The density of enteric viruses in the sewage sludge shall be less than one Plaque-forming Unit per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed. The density of viable helminth ova in the sewage sludge shall be less than one per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed.

- c. Sewage sludge that meets the requirements of Class AB biosolids may be classified a Class A biosolids if a variance request is submitted in writing that is supported by substantial documentation demonstrating equivalent methods for reducing odors and written approval is granted by the executive director. The executive director may deny the variance request or revoke that approved variance if it is determined that the variance may potentially endanger human health or the environment, or create nuisance odor conditions.
- d. Three alternatives are available to demonstrate compliance with Class B biosolids criteria.

Alternative 1

- i. A minimum of seven random samples of the sewage sludge shall be collected within 48 hours of the time the sewage sludge is used or disposed of during each monitoring episode for the sewage sludge.
- ii. The geometric mean of the density of fecal coliform in the samples collected shall be less than either 2,000,000 MPN per gram of total solids (dry weight basis) or 2,000,000 Colony Forming Units per gram of total solids (dry weight basis).

Alternative 2 - Sewage sludge that is used or disposed of shall be treated in one of the Processes to Significantly Reduce Pathogens (PSRP) described in 40 CFR Part 503, Appendix B, so long as all of the following requirements are met by the generator of the sewage sludge.

- i. Prior to use or disposal, all the sewage sludge must have been generated from a single location, except as provided in paragraph v. below;
- ii. An independent Texas Licensed Professional Engineer must make a certification to the generator of a sewage sludge that the wastewater treatment facility generating the sewage sludge is designed to achieve one of the PSRP at the permitted design loading of the facility. The certification need only be repeated if the design loading of the facility is increased. The certification shall include a statement indicating the design meets all the applicable standards specified in Appendix B of 40 CFR Part 503;
- iii. Prior to any off-site transportation or on-site use or disposal of any sewage sludge generated at a wastewater treatment facility, the chief certified operator of the wastewater treatment facility or other responsible official who manages the processes to significantly reduce pathogens at the wastewater treatment facility for the permittee, shall certify that the sewage sludge underwent at least the minimum operational requirements necessary in order to meet one of the PSRP. The acceptable processes and the minimum operational and record keeping requirements shall be in accordance with established U.S. Environmental Protection Agency final guidance;
- iv. All certification records and operational records describing how the requirements of this paragraph were met shall be kept by the generator for a minimum of three years and be available for inspection by commission staff for review; and
- v. If the sewage sludge is generated from a mixture of sources, resulting from a person who prepares sewage sludge from more than one wastewater treatment facility, the resulting derived product shall meet one of the PSRP, and shall meet the certification, operation, and record keeping requirements of this paragraph.

Alternative 3 - Sewage sludge shall be treated in an equivalent process that has been approved by the U.S. Environmental Protection Agency, so long as all of the following requirements are met by the generator of the sewage sludge.

- i. Prior to use or disposal, all the sewage sludge must have been generated from a single location, except as provided in paragraph v. below;

- ii. Prior to any off-site transportation or on-site use or disposal of any sewage sludge generated at a wastewater treatment facility, the chief certified operator of the wastewater treatment facility or other responsible official who manages the processes to significantly reduce pathogens at the wastewater treatment facility for the permittee, shall certify that the sewage sludge underwent at least the minimum operational requirements necessary in order to meet one of the PSRP. The acceptable processes and the minimum operational and record keeping requirements shall be in accordance with established U.S. Environmental Protection Agency final guidance;
- iii. All certification records and operational records describing how the requirements of this paragraph were met shall be kept by the generator for a minimum of three years and be available for inspection by commission staff for review;
- iv. The Executive Director will accept from the U.S. Environmental Protection Agency a finding of equivalency to the defined PSRP; and
- v. If the sewage sludge is generated from a mixture of sources resulting from a person who prepares sewage sludge from more than one wastewater treatment facility, the resulting derived product shall meet one of the Processes to Significantly Reduce Pathogens, and shall meet the certification, operation, and record keeping requirements of this paragraph.

In addition to the Alternatives 1 – 3, the following site restrictions must be met if Class B biosolids are land applied:

- i. Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application of biosolids.
- ii. Food crops with harvested parts below the surface of the land shall not be harvested for 20 months after application of biosolids when the biosolids remain on the land surface for 4 months or longer prior to incorporation into the soil.
- iii. Food crops with harvested parts below the surface of the land shall not be harvested for 38 months after application of biosolids when the biosolids remain on the land surface for less than 4 months prior to incorporation into the soil.
- iv. Food crops, feed crops, and fiber crops shall not be harvested for 30 days after application of biosolids.
- v. Domestic livestock shall not be allowed to graze on the land for 30 days after application of biosolids.
- vi. Turf grown on land where biosolids are applied shall not be harvested for 1 year after application of the biosolids when the harvested turf is placed on either land with a high potential for public exposure or a lawn.
- vii. Public access to land with a high potential for public exposure shall be restricted for 1 year after application of biosolids.

- viii. Public access to land with a low potential for public exposure shall be restricted for 30 days after application of biosolids.
  - ix. Land application of biosolids shall be in accordance with the buffer zone requirements found in 30 TAC § 312.44.
4. Vector Attraction Reduction Requirements

All bulk sewage sludge that is applied to agricultural land, forest, a public contact site, or a reclamation site shall be treated by one of the following Alternatives 1 through 10 for vector attraction reduction.

- Alternative 1 - The mass of volatile solids in the sewage sludge shall be reduced by a minimum of 38%.
- Alternative 2 - If Alternative 1 cannot be met for an anaerobically digested sludge, demonstration can be made by digesting a portion of the previously digested sludge anaerobically in the laboratory in a bench-scale unit for 40 additional days at a temperature between 30° and 37° Celsius. Volatile solids must be reduced by less than 17% to demonstrate compliance.
- Alternative 3 - If Alternative 1 cannot be met for an aerobically digested sludge, demonstration can be made by digesting a portion of the previously digested sludge with percent solids of two percent or less aerobically in the laboratory in a bench-scale unit for 30 additional days at 20° Celsius. Volatile solids must be reduced by less than 15% to demonstrate compliance.
- Alternative 4 - The specific oxygen uptake rate (SOUR) for sewage sludge treated in an aerobic process shall be equal to or less than 1.5 milligrams of oxygen per hour per gram of total solids (dry weight basis) at a temperature of 20° Celsius.
- Alternative 5 - Sewage sludge shall be treated in an aerobic process for 14 days or longer. During that time, the temperature of the sewage sludge shall be higher than 40° Celsius and the average temperature of the sewage sludge shall be higher than 45° Celsius.
- Alternative 6 - The pH of sewage sludge shall be raised to 12 or higher by alkali addition and, without the addition of more alkali shall remain at 12 or higher for two hours and then remain at a pH of 11.5 or higher for an additional 22 hours at the time the sewage sludge is prepared for sale or given away in a bag or other container.
- Alternative 7 - The percent solids of sewage sludge that does not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75% based on the moisture content and total solids prior to mixing with other materials. Unstabilized solids are defined as organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

Alternative 8 - The percent solids of sewage sludge that contains unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 90% based on the moisture content and total solids prior to mixing with other materials at the time the sludge is used. Unstabilized solids are defined as organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

Alternative 9 -

- i. Biosolids shall be injected below the surface of the land.
- ii. No significant amount of the biosolids shall be present on the land surface within one hour after the biosolids are injected.
- iii. When sewage sludge that is injected below the surface of the land is Class A or Class AB with respect to pathogens, the biosolids shall be injected below the land surface within eight hours after being discharged from the pathogen treatment process.

Alternative 10 -

- i. Biosolids applied to the land surface or placed on a surface disposal site shall be incorporated into the soil within six hours after application to or placement on the land.
- ii. When biosolids that are incorporated into the soil is Class A or Class AB with respect to pathogens, the biosolids shall be applied to or placed on the land within eight hours after being discharged from the pathogen treatment process.

### C. Monitoring Requirements

Toxicity Characteristic Leaching Procedure (TCLP) Test	- annually
PCBs	- annually

All metal constituents and fecal coliform or *Salmonella* sp. bacteria shall be monitored at the appropriate frequency shown below, pursuant to 30 TAC § 312.46(a)(1):

<u>Amount of biosolids (*) metric tons per 365-day period</u>	<u>Monitoring Frequency</u>
0 to less than 290	Once/Year
290 to less than 1,500	Once/Quarter
1,500 to less than 15,000	Once/Two Months
15,000 or greater	Once/Month

(\*) *The amount of bulk biosolids applied to the land (dry wt. basis).*

Representative samples of sewage sludge shall be collected and analyzed in accordance with the methods referenced in 30 TAC § 312.7

Identify each of the analytic methods used by the facility to analyze enteric viruses, fecal coliforms, helminth ova, *Salmonella* sp., and other regulated parameters.

Identify in the following categories (as applicable) the sewage sludge or biosolids treatment process or processes at the facility: preliminary operations (e.g., sludge or biosolids grinding and degritting), thickening (concentration), stabilization, anaerobic digestion, aerobic digestion, composting, conditioning, disinfection (e.g., beta ray irradiation, gamma ray irradiation, pasteurization), dewatering (e.g., centrifugation, sludge drying beds, sludge lagoons), heat drying, thermal reduction, and methane or biogas capture and recovery.

Identify the nature of material generated by the facility (such as a biosolid for beneficial use or land-farming, or sewage sludge or biosolids for disposal at a landfill) and whether the material is ultimately conveyed off-site in bulk or in bags.

**SECTION II. REQUIREMENTS SPECIFIC TO BULK SEWAGE SLUDGE OR BIOSOLIDS FOR APPLICATION TO THE LAND MEETING CLASS A, CLASS AB or B PATHOGEN REDUCTION AND THE CUMULATIVE LOADING RATES IN TABLE 2, OR CLASS B PATHOGEN REDUCTION AND THE POLLUTANT CONCENTRATIONS IN TABLE 3**

For those permittees meeting Class A, Class AB or B pathogen reduction requirements and that meet the cumulative loading rates in Table 2 below, or the Class B pathogen reduction requirements and contain concentrations of pollutants below listed in Table 3, the following conditions apply:

**A. Pollutant Limits**

Table 2

<u>Pollutant</u>	Cumulative Pollutant Loading Rate (pounds per acre)*
Arsenic	36
Cadmium	35
Chromium	2677
Copper	1339
Lead	268
Mercury	15
Molybdenum	Report Only
Nickel	375
Selenium	89
Zinc	2500

Table 3

<u>Pollutant</u>	Monthly Average Concentration (milligrams per kilogram)*
Arsenic	41
Cadmium	39
Chromium	1200
Copper	1500
Lead	300
Mercury	17
Molybdenum	Report Only
Nickel	420
Selenium	36
Zinc	2800

\*Dry weight basis

**B. Pathogen Control**

All bulk sewage sludge that is applied to agricultural land, forest, a public contact site, a reclamation site, shall be treated by either Class A, Class AB or Class B biosolids pathogen reduction requirements as defined above in Section I.B.3.



**C. Management Practices**

1. Bulk biosolids shall not be applied to agricultural land, forest, a public contact site, or a reclamation site that is flooded, frozen, or snow-covered so that the bulk sewage sludge enters a wetland or other waters in the State.
2. Bulk biosolids not meeting Class A requirements shall be land applied in a manner which complies with Applicability in accordance with 30 TAC §312.41 and the Management Requirements in accordance with 30 TAC § 312.44.
3. Bulk biosolids shall be applied at or below the agronomic rate of the cover crop.
4. An information sheet shall be provided to the person who receives bulk Class A or AB biosolids sold or given away. The information sheet shall contain the following information:
  - a. The name and address of the person who prepared the Class A or AB biosolids that are sold or given away in a bag or other container for application to the land.
  - b. A statement that application of the biosolids to the land is prohibited except in accordance with the instruction on the label or information sheet.
  - c. The annual whole sludge application rate for the biosolids application rate for the biosolids that does not cause any of the cumulative pollutant loading rates in Table 2 above to be exceeded, unless the pollutant concentrations in Table 3 found in Section II above are met.

**D. Notification Requirements**

1. If bulk is applied to land in a State other than Texas, written notice shall be provided prior to the initial land application to the permitting authority for the State in which the bulk biosolids are proposed to be applied. The notice shall include:
  - a. The location, by street address, and specific latitude and longitude, of each land application site.
  - b. The approximate time period bulk biosolids will be applied to the site.
  - c. The name, address, telephone number, and National Pollutant Discharge Elimination System permit number (if appropriate) for the person who will apply the bulk biosolids.
2. The permittee shall give 180 days prior notice to the Executive Director in care of the Wastewater Permitting Section (MC 148) of the Water Quality Division of any change planned in the biosolids disposal practice.

**E. Record Keeping Requirements**

The documents will be retained at the facility site and/or shall be readily available for review by a TCEQ representative. The person who prepares bulk sewage sludge or a biosolids material shall develop the following information and shall retain the information at the facility site and/or shall be readily available for review by a TCEQ representative for a

period of five years. If the permittee supplies the sludge to another person who land applies the sludge, the permittee shall notify the land applier of the requirements for record keeping found in 30 TAC § 312.47 for persons who land apply.

1. The concentration (mg/kg) in the sludge of each pollutant listed in Table 3 above and the applicable pollutant concentration criteria (mg/kg), or the applicable cumulative pollutant loading rate and the applicable cumulative pollutant loading rate limit (lbs/ac) listed in Table 2 above.
2. A description of how the pathogen reduction requirements are met (including site restrictions for Class AB and Class B biosolids, if applicable).
3. A description of how the vector attraction reduction requirements are met.
4. A description of how the management practices listed above in Section II.C are being met.
5. The following certification statement:

“I certify, under penalty of law, that the applicable pathogen requirements in 30 TAC § 312.82(a) or (b) and the vector attraction reduction requirements in 30 TAC § 312.83(b) have been met for each site on which bulk biosolids are applied. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practices have been met. I am aware that there are significant penalties for false certification including fine and imprisonment.”

6. The recommended agronomic loading rate from the references listed in Section II.C.3. above, as well as the actual agronomic loading rate shall be retained. The person who applies bulk biosolids shall develop the following information and shall retain the information at the facility site and/or shall be readily available for review by a TCEQ representative indefinitely. If the permittee supplies the sludge to another person who land applies the sludge, the permittee shall notify the land applier of the requirements for record keeping found in 30 TAC § 312.47 for persons who land apply:
  - a. A certification statement that all applicable requirements (specifically listed) have been met, and that the permittee understands that there are significant penalties for false certification including fine and imprisonment. See 30 TAC § 312.47(a)(4)(A)(ii) or 30 TAC § 312.47(a)(5)(A)(ii), as applicable, and to the permittee’s specific sludge treatment activities.
  - b. The location, by street address, and specific latitude and longitude, of each site on which biosolids are applied.
  - c. The number of acres in each site on which bulk biosolids are applied.
  - d. The date and time biosolids are applied to each site.
  - e. The cumulative amount of each pollutant in pounds/acre listed in Table 2 applied to each site.
  - f. The total amount of biosolids applied to each site in dry tons.

The above records shall be maintained on-site on a monthly basis and shall be made available to the Texas Commission on Environmental Quality upon request.

## **F. Reporting Requirements**

The permittee shall report annually to the TCEQ Regional Office (MC Region 8) and Compliance Monitoring Team (MC 224) of the Enforcement Division, by September 30<sup>th</sup> of each year the following information. The permittee must submit this annual report using the online electronic reporting system available through the TCEQ website unless the permittee requests and obtains an electronic reporting waiver.

1. Identify in the following categories (as applicable) the sewage sludge or biosolids treatment process or processes at the facility: preliminary operations (e.g., sludge or biosolids grinding and degritting), thickening (concentration), stabilization, anaerobic digestion, aerobic digestion, composting, conditioning, disinfection (e.g., beta ray irradiation, gamma ray irradiation, pasteurization), dewatering (e.g., centrifugation, sludge drying beds, sludge lagoons), heat drying, thermal reduction, and methane or biogas capture and recovery.
2. Identify the nature of material generated by the facility (such as a biosolid for beneficial use or land-farming, or sewage sludge for disposal at a monofill) and whether the material is ultimately conveyed off-site in bulk or in bags.
3. Results of tests performed for pollutants found in either Table 2 or 3 as appropriate for the permittee's land application practices.
4. The frequency of monitoring listed in Section I.C. that applies to the permittee.
5. Toxicity Characteristic Leaching Procedure (TCLP) results.
6. PCB concentration in sludge or biosolids in mg/kg.
7. Identity of hauler(s) and TCEQ transporter number.
8. Date(s) of transport.
9. Texas Commission on Environmental Quality registration number, if applicable.
10. Amount of sludge or biosolids disposal dry weight (lbs/acre) at each disposal site.
11. The concentration (mg/kg) in the sludge of each pollutant listed in Table 1 (defined as a monthly average) as well as the applicable pollutant concentration criteria (mg/kg) listed in Table 3 above, or the applicable pollutant loading rate limit (lbs/acre) listed in Table 2 above if it exceeds 90% of the limit.
12. Level of pathogen reduction achieved (Class A, Class AB or Class B).
13. Alternative used as listed in Section I.B.3.(a. or b.). Alternatives describe how the pathogen reduction requirements are met. If Class B biosolids, include information on how site restrictions were met.
14. Identify each of the analytic methods used by the facility to analyze enteric viruses, fecal coliforms, helminth ova, *Salmonella* sp., and other regulated parameters.
15. Vector attraction reduction alternative used as listed in Section I.B.4.

16. Amount of sludge or biosolids transported in dry tons/year.
17. The certification statement listed in either 30 TAC § 312.47(a)(4)(A)(ii) or 30 TAC § 312.47(a)(5)(A)(ii) as applicable to the permittee's sludge or biosolids treatment activities, shall be attached to the annual reporting form.
18. When the amount of any pollutant applied to the land exceeds 90% of the cumulative pollutant loading rate for that pollutant, as described in Table 2, the permittee shall report the following information as an attachment to the annual reporting form.
  - a. The location, by street address, and specific latitude and longitude.
  - b. The number of acres in each site on which bulk biosolids are applied.
  - c. The date and time bulk biosolids are applied to each site.
  - d. The cumulative amount of each pollutant (i.e., pounds/acre) listed in Table 2 in the bulk biosolids applied to each site.
  - e. The amount of biosolids (i.e., dry tons) applied to each site.

The above records shall be maintained on a monthly basis and shall be made available to the Texas Commission on Environmental Quality upon request.

**SECTION III. REQUIREMENTS APPLYING TO ALL SEWAGE SLUDGE OR BIOSOLIDS DISPOSED IN A MUNICIPAL SOLID WASTE LANDFILL**

- A. The permittee shall handle and dispose of sewage sludge or biosolids in accordance with 30 TAC § 330 and all other applicable state and federal regulations to protect public health and the environment from any reasonably anticipated adverse effects due to any toxic pollutants that may be present. The permittee shall ensure that the sewage sludge meets the requirements in 30 TAC § 330 concerning the quality of the sludge or biosolids disposed in a municipal solid waste landfill.
- B. If the permittee generates sewage sludge and supplies that sewage sludge or biosolids to the owner or operator of a municipal solid waste landfill (MSWLF) for disposal, the permittee shall provide to the owner or operator of the MSWLF appropriate information needed to be in compliance with the provisions of this permit.
- C. The permittee shall give 180 days prior notice to the Executive Director in care of the Wastewater Permitting Section (MC 148) of the Water Quality Division of any change planned in the sewage sludge or biosolids disposal practice.
- D. Sewage sludge or biosolids shall be tested annually in accordance with the method specified in both 40 CFR Part 261, Appendix II and 40 CFR Part 268, Appendix I (Toxicity Characteristic Leaching Procedure) or other method, which receives the prior approval of the TCEQ for contaminants listed in Table 1 of 40 CFR § 261.24. Sewage sludge or biosolids failing this test shall be managed according to RCRA standards for generators of hazardous waste, and the waste's disposition must be in accordance with all applicable requirements for hazardous waste processing, storage, or disposal.

Following failure of any TCLP test, the management or disposal of sewage sludge or biosolids at a facility other than an authorized hazardous waste processing, storage, or disposal facility shall be prohibited until such time as the permittee can demonstrate the sewage sludge or biosolids no longer exhibits the hazardous waste toxicity characteristics (as demonstrated by the results of the TCLP tests). A written report shall be provided to both the TCEQ Registration and Reporting Section (MC 129) of the Permitting and Registration Support Division and the Regional Director (MC Region 8) of the appropriate TCEQ field office within 7 days after failing the TCLP Test.

The report shall contain test results, certification that unauthorized waste management has stopped, and a summary of alternative disposal plans that comply with RCRA standards for the management of hazardous waste. The report shall be addressed to: Director, Permitting and Registration Support Division (MC 129), Texas Commission on Environmental Quality, P. O. Box 13087, Austin, Texas 78711-3087. In addition, the permittee shall prepare an annual report on the results of all sludge toxicity testing. This annual report shall be submitted to the TCEQ Regional Office (MC Region 8) and the Compliance Monitoring Team (MC 224) of the Enforcement Division by September 30 of each year.

- E. Sewage sludge or biosolids shall be tested as needed, in accordance with the requirements of 30 TAC Chapter 330.
- F. Record Keeping Requirements

The permittee shall develop the following information and shall retain the information for five years.

1. The description (including procedures followed and the results) of all liquid Paint Filter Tests performed.
2. The description (including procedures followed and results) of all TCLP tests performed.

The above records shall be maintained on-site on a monthly basis and shall be made available to the Texas Commission on Environmental Quality upon request.

#### G. Reporting Requirements

The permittee shall report annually to the TCEQ Regional Office (MC Region 8) and Compliance Monitoring Team (MC 224) of the Enforcement Division by September 30<sup>th</sup> of each year the following information. The permittee must submit this annual report using the online electronic reporting system available through the TCEQ website unless the permittee requests and obtains an electronic reporting waiver.

1. Identify in the following categories (as applicable) the sewage sludge or biosolids treatment process or processes at the facility: preliminary operations (e.g., sludge or biosolids grinding and degritting), thickening (concentration), stabilization, anaerobic digestion, aerobic digestion, composting, conditioning, disinfection (e.g., beta ray irradiation, gamma ray irradiation, pasteurization), dewatering (e.g., centrifugation, sludge drying beds, sludge lagoons), heat drying, thermal reduction, and methane or biogas capture and recovery.
2. Toxicity Characteristic Leaching Procedure (TCLP) results.
3. Annual sludge or biosolids production in dry tons/year.
4. Amount of sludge or biosolids disposed in a municipal solid waste landfill in dry tons/year.
5. Amount of sludge or biosolids transported interstate in dry tons/year.
6. A certification that the sewage sludge or biosolids meets the requirements of 30 TAC § 330 concerning the quality of the sludge disposed in a municipal solid waste landfill.
7. Identity of hauler(s) and transporter registration number.
8. Owner of disposal site(s).
9. Location of disposal site(s).
10. Date(s) of disposal.

The above records shall be maintained on-site on a monthly basis and shall be made available to the Texas Commission on Environmental Quality upon request.

#### **SECTION IV. REQUIREMENTS APPLYING TO SLUDGE OR BIOSOLIDS TRANSPORTED TO ANOTHER FACILITY FOR FURTHER PROCESSING**

These provisions apply to sludge or biosolids that is transported to another wastewater treatment facility or facility that further processes sludge or biosolids. These provisions are intended to allow transport of sludge or biosolids to facilities that have been authorized to accept sludge or biosolids. These provisions do not limit the ability of the receiving facility to determine whether to accept the sludge or biosolids, nor do they limit the ability of the receiving facility to request additional testing or documentation.

##### **A. General Requirements**

1. The permittee shall handle and dispose of sewage sludge or biosolids in accordance with 30 TAC Chapter 312 and all other applicable state and federal regulations in a manner that protects public health and the environment from any reasonably anticipated adverse effects due to any toxic pollutants that may be present in the sludge.
2. Sludge or biosolids may only be transported using a registered transporter or using an approved pipeline.

##### **B. Record Keeping Requirements**

1. For sludge transported by an approved pipeline, the permittee must maintain records of the following:
  - a. the amount of sludge or biosolids transported;
  - b. the date of transport;
  - c. the name and TCEQ permit number of the receiving facility or facilities;
  - d. the location of the receiving facility or facilities;
  - e. the name and TCEQ permit number of the facility that generated the waste; and
  - f. copy of the written agreement between the permittee and the receiving facility to accept sludge or biosolids.
2. For sludge or biosolids transported by a registered transporter, the permittee must maintain records of the completed trip tickets in accordance with 30 TAC § 312.145(a)(1)-(7) and amount of sludge or biosolids transported.
3. The above records shall be maintained on-site on a monthly basis and shall be made available to the TCEQ upon request. These records shall be retained for at least five years.

**C. Reporting Requirements**

The permittee shall report the following information annually to the TCEQ Regional Office (MC Region 8) and Compliance Monitoring Team (MC 224) of the Enforcement Division, by September 30<sup>th</sup> of each year. The permittee must submit this annual report using the online electronic reporting system available through the TCEQ website unless the permittee requests and obtains an electronic reporting waiver.

1. Identify in the following categories (as applicable) the sewage sludge or biosolids treatment process or processes at the facility: preliminary operations (e.g., sludge or biosolids grinding and degritting), thickening (concentration), stabilization, anaerobic digestion, aerobic digestion, composting, conditioning, disinfection (e.g., beta ray irradiation, gamma ray irradiation, pasteurization), dewatering (e.g., centrifugation, sludge drying beds, sludge lagoons), heat drying, thermal reduction, and methane or biogas capture and recovery.
2. the annual sludge or biosolids production;
3. the amount of sludge or biosolids transported;
4. the owner of each receiving facility;
5. the location of each receiving facility; and
6. the date(s) of disposal at each receiving facility.

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**OTHER REQUIREMENTS - Outfall 001:**

1. The permittee shall employ or contract with one or more licensed wastewater treatment facility operators or wastewater system operations companies holding a valid license or registration according to the requirements of 30 TAC Chapter 30, Occupational Licenses and Registrations, and in particular 30 TAC Chapter 30, Subchapter J, Wastewater Operators and Operations Companies.

This Category A facility must be operated by a chief operator or an operator holding a Class A license or higher. The facility must be operated a minimum of five days per week by the licensed chief operator or an operator holding the required level of license or higher. The licensed chief operator or operator holding the required level of license or higher must be available by telephone or pager seven days per week. Where shift operation of the wastewater treatment facility is necessary, each shift that does not have the on-site supervision of the licensed chief operator must be supervised by an operator in charge who is licensed not less than one level below the category for the facility.

2. The facility is not located in the Coastal Management Program boundary.
3. Chronic toxic criteria apply at the edge of the chronic aquatic life mixing zone. The mixing zone is defined as 300 feet downstream and 100 feet upstream from the point of discharge.
4. The permittee shall comply with the requirements of 30 TAC 309.13(a) through (d) through design, construction and continuous operation of this facility. The permittee shall also comply with the requirements of 30 TAC 309.13(e).
  - a. The existing emergency overflow basin shall be operated on an as-needed basis, storing excess influent wastewater for no more than 48 hours prior to being returned to the headworks for treatment. Provisions for draining of the emergency overflow pond shall be provided. As it will be operated under these conditions, the emergency overflow basin will be subject to the buffer zone requirement of being located no closer than 150 feet to the nearest property line.
  - b. The flow equalization basin, when constructed, shall be operated on an as-needed basis to dampen hydraulic peak flow surges through the facility. The flow equalization basin shall be aerated and/or mixed to prevent anaerobic conditions when in use. As it will be operated under this condition, the flow equalization basin will be subject to the buffer zone requirement of being located no closer than 150 feet to the nearest property line.
  - c. The biological nutrient removal (BNR) selector basins, when constructed, shall be operated on a continuous basis with a hydraulic detention time less than 48 hours. The BNR selector basins shall utilize oxidation-reduction potential (ORP) process controls to maintain a specific ORP range in the selector basins to support enhanced nutrient reduction while preventing the formation of nuisance odors. The BNR basins shall also include submersible mixing that will prevent stratification of influent wastewater in the basins during treatment operations. As they will be operated under these conditions, the biological nutrient removal selector basins will be subject to the buffer zone requirement of being located no closer than 150 feet to the nearest property line.

- d. Prior to construction of the Final phase, the permittee must submit to the Executive Director a request for, and obtain the approval of, a nuisance odor control prevention plan in accordance with 30 TAC 309.13(e)(2).
5. The permittee shall provide facilities for the protection of its wastewater treatment facility from a 100-year flood.
6. In accordance with 30 TAC § 319.9, a permittee that has at least twelve months of uninterrupted compliance with its bacteria limit may notify the commission in writing of its compliance and request a less frequent measurement schedule. To request a less frequent schedule, the permittee shall submit a written request to the TCEQ Wastewater Permitting Section (MC 148) for each phase that includes a different monitoring frequency. The request must contain all of the reported bacteria values (Daily Avg. and Daily Max/Single Grab) for the twelve consecutive months immediately prior to the request. If the Executive Director finds that a less frequent measurement schedule is protective of human health and the environment, the permittee may be given a less frequent measurement schedule. For this permit, 5/week may be reduced to 3/week at Outfall 001 in the Final phase. **A violation of any bacteria limit by a facility that has been granted a less frequent measurement schedule will require the permittee to return to the standard frequency schedule and submit written notice to the TCEQ Wastewater Permitting Section (MC 148).** The permittee may not apply for another reduction in measurement frequency for at least 24 months from the date of the last violation. The Executive Director may establish a more frequent measurement schedule if necessary to protect human health or the environment.
7. Prior to construction of the Final phase treatment facilities, the permittee shall submit to the TCEQ Wastewater Permitting Section (MC 148) a summary transmittal letter in accordance with the requirements in 30 TAC § 217.6(d). If requested by the Wastewater Permitting Section, the permittee shall submit plans, specifications, and a final engineering design report which comply with 30 TAC Chapter 217, Design Criteria for Domestic Wastewater Systems. The permittee shall clearly show how the treatment system will meet the effluent limitations required on Page 2a of this permit. A copy of the summary transmittal letter shall be available at the plant site for inspection by authorized representatives of the TCEQ.
8. Within 120 days from the commencement of discharges made via Outfall 001, the permittee shall complete Attachment B with the analytical results from discharges made via this outfall. The completed tables with the results of these analysis and laboratory reports shall be submitted to the Municipal Permits Team, Wastewater Permitting Section MC 148, TCEQ Water Quality Division. Based on a technical review of the submitted analytical results, an amendment may be initiated by TCEQ staff to include additional effluent limitations and/or monitoring requirements. Test methods utilized to complete the tables shall be according to the test procedures specified in the Definitions and Standard Permit Conditions section of this permit and sensitive enough to detect the parameters listed in Attachment B at the minimum analytical level (MAL).
9. Reporting requirements according to 30 TAC §§ 319.1-319.11 and any additional effluent reporting requirements contained in this permit for discharges made via Outfall 001 are suspended from the effective date of the permit until plant startup resulting in a discharge from the facility described by this permit via Outfall 001. The permittee shall provide written notice to the TCEQ Regional Office (MC Region 8) and the Applications Review and Processing Team (MC 148) of the Water Quality Division in writing at least forty-five days

prior to anticipated discharge via Outfall 001 on Notification of Completion Form 20007.

10. In order to determine possible impacts to the receiving stream from this permitted discharge, the permittee shall conduct an instream monitoring study of algal abundance in the Concho River. Within 180 days of permit issuance, the permittee shall submit a monitoring work plan to the TCEQ Standards Implementation Team (MC 150) and submit a copy of the report to the Compliance Monitoring Team (MC-224) for TCEQ review and approval prior to any sampling.

The TCEQ may disapprove or modify the work plan within 60 days of receipt. The monitoring plan shall include written records of visual assessments and photographs of algal abundance and aerial coverage. Monitoring shall begin within 180 days of the activation of the permit's final phase and initiation of discharge to the Concho River. Monitoring shall occur at 1) a minimum of one sampling station on the Concho River located at least 500 feet upstream of the discharge point (i.e., outside of the mixing zone) in an area unimpacted by other wastewater discharges; and 2) a minimum of one sampling station at least 500 feet downstream of the discharge point. Monitoring shall be done at a minimum frequency of once per month and continue for at least two years. Monitoring should be performed during baseflow conditions, and monitoring should be suspended for at least two weeks following a significant rain event accompanied by benthic scouring of stormwater flow.

The intent of this study is to monitor the effects of this discharge on algal growth in the receiving stream. Data should reflect this to the greatest extent possible. Data collection should occur at five fixed transects in each sample reach and visually assess the following at each transect: percent aerial coverage of algae, dominant algae type (filamentous algae, diatoms, or other), percent aerial coverage of macrophytes, and dominant macrophyte type (submerged, emergent, or floating macrophytes). Prior to the expiration of the issued permit, a final report shall be submitted to the TCEQ Standards Implementation Team (MC 150) and a submitted copy to the Compliance Monitoring Team (MC-224).

#### **SPECIAL PROVISIONS -Land Application:**

1. This permit is granted subject to the policy of the Commission to encourage the development of area-wide waste collection, treatment, and disposal systems. The Commission reserves the right to amend this permit in accordance with applicable procedural requirements to require the system covered by this permit to be integrated into an area-wide system, if an area-wide system is developed; to require the delivery of the wastes authorized to be collected in, treated by, or discharged from the system, to an area-wide system; or to amend this permit in any other particular to effectuate the Commission's policy. Such amendments may be made when the changes required are advisable for water quality control purposes and are feasible on the basis of waste treatment technology, engineering, financial, and related considerations existing at the time the changes are required, exclusive of the loss of investment in or revenues from any then existing or proposed waste collection, treatment, or disposal system.
2. The permittee shall employ or contract with one or more licensed wastewater treatment facility operators or wastewater system operations companies holding a valid license or registration according to the requirements of 30 TAC Chapter 30, Occupational Licenses and Registrations, and in particular 30 TAC Chapter 30, Subchapter J, Wastewater Operators and Operations Companies.

This Category A facility must be operated by a chief operator or an operator holding a Category A license or higher. The facility must be operated a minimum of five days per week by the licensed chief operator or an operator holding the required level of license or higher. The licensed chief operator or operator holding the required level of license or higher must be available by telephone or pager seven days per week. Where shift operation of the wastewater treatment facility is necessary, each shift that does not have the on-site supervision of the licensed chief operator must be supervised by an operator in charge who is licensed not less than one level below the category for the facility.

3. The permittee shall maintain and operate the treatment facility in order to achieve optimum efficiency of treatment capability. This shall include required monitoring of effluent flow and quality as well as appropriate grounds and building maintenance.
4. Irrigation practices shall be designed and managed so as to prevent ponding of effluent or contamination of ground and surface waters and to prevent the occurrence of nuisance conditions in the area. Tailwater control facilities shall be provided as necessary to prevent the discharge of any effluent from the irrigated land.
5. Effluent shall not be applied for irrigation during rainfall events or when the ground is frozen or saturated.
6. Holding or storage ponds shall conform to the design criteria for stabilization ponds with regard to construction and levee design and shall maintain a minimum freeboard of two feet according to 30 TAC Chapter 217, Design Criteria for Domestic Wastewater Systems.
7. The permittee shall provide facilities for the protection of its wastewater treatment facilities from a 100-year flood.
8. Application rates for the irrigated lands as shown on Attachment "A" are as follows:
  - a. Tract A (627 acres) - the application rate for the irrigated land shall not exceed 3.5 acre-feet per year per acre irrigated.
  - b. Tract B (237 acres) - the application rate for the irrigated land shall not exceed 4.2 acre-feet per year per acre irrigated
  - c. Tract C (1,150 acres) – the application rate for the irrigated land shall not exceed 6.4 acre-feet per year per acre irrigated (6.69 acre-feet/acre/year for pasture and 6.14 acre-feet/acre/year for sorghum, corn, haygrazer, cotton, alfalfa, soybeans, wheat, oats and rye).
  - d. Tract D (226 acres) – the application rate for the irrigated land shall not exceed 6.4 acre-feet per year per acre irrigated (6.69 acre-feet/acre/year for pasture and 6.14 acre-feet/acre/year for sorghum, corn, haygrazer, cotton, alfalfa, soybeans, wheat, oats and rye).

The permittee is responsible for providing equipment to determine application rates and maintaining accurate records of the volume of effluent applied. These records shall be made available for review by the TCEQ and shall be maintained for at least three years.

9. The permittee shall obtain representative soil samples from the root zones of the land application area receiving wastewater. Composite sampling techniques shall be used. Each composite sample shall represent no more than 80 acres, with no less than 10 to 15

subsamples representing each composite sample. Subsamples shall be composited by like sampling depth and soil type for analysis and reporting. Soil types are soils that have like topsoil or plow layer textures. These soils shall be sampled individually from 0 to 6 inches, 6 inches to 18 inches, and 18 inches to 30 inches below ground level. The permittee shall sample soils in December to May of each year. Soil samples shall be analyzed within 30 days of sample collection.

The permittee shall provide annual soil analyses of the land application area according to the following table:

Parameter	Method	Minimum Analytical Level (MAL)	Reporting units
pH	2:1 (v/v) water to soil mixture		Standard Units (SU). Reported to 0.1 SU after calibration of pH meter
Electrical Conductivity	2:1 (v/v) water to soil mixture	0.01	dS/m (same as mmho/cm)
Nitrate-nitrogen	From a 1 <u>N</u> KCl soil extract	1	mg/kg (dry weight basis)
Total Kjeldahl Nitrogen (TKN)	For determination of Organic plus Ammonium Nitrogen. Procedures that use Mercury (Hg) are not acceptable.	20	mg/kg (dry weight basis)
Total Nitrogen	= TKN + nitrate-nitrogen (same as, organic-nitrogen + ammonium-nitrogen + nitrate-nitrogen)		mg/kg (dry weight basis)
Plant-available: Phosphorus (P)	Mehlich III with inductively coupled plasma	1 (P)	mg/kg (dry weight basis)
Plant-available: Potassium (K)	May be determined in the same Mehlich III extract with inductively coupled plasma	5 (K)	mg/kg (dry weight basis)
Amendment Addition, e.g., gypsum			Report in short tons/acre in the year effected

The permittee shall provide a copy of this plan to the analytical laboratory prior to sample analysis. The permittee shall submit the results of the annual soil sample analyses with copies of the laboratory reports and a map depicting the areas that have received wastewater within the permanent land application fields to the Water Quality Assessment Team (MC 150), TCEQ Regional Office (MC Region 8) and the Enforcement Division (MC 224) no later than end of September following the sampling date of each year. If wastewater is not applied in a particular year, the permittee shall notify the same TCEQ offices and indicate that wastewater has not been applied on the approved land disposal sites during that year.

10. The permittee shall erect adequate signs stating that the irrigation water is from a non-potable water supply for any area where treated effluent is stored or where there exist hose bibs or faucets. Signs shall consist of a red slash superimposed over the international symbol for drinking water accompanied by the message "DO NOT DRINK THE WATER" in both English and Spanish. All piping transporting the effluent shall be clearly marked with these same signs.
11. Spray fixtures for the irrigation system shall be of such design that they cannot be operated by unauthorized personnel.
12. Irrigation with effluent shall be accomplished only when the area specified is not in use.
13. Permanent transmission lines shall be installed from the holding pond to each tract of land to be irrigated utilizing effluent from that pond.
14. Facilities for the retention of treated or untreated wastewater shall be adequately lined to control seepage. The following methods of pond lining are acceptable.
  - a. In-situ clay soils or placed and compacted clay soils meeting the following requirements:
    - 1) More than 30% passing a No. 200 mesh sieve
    - 2) Liquid limit greater than 30%
    - 3) Plasticity index greater than 15
    - 4) A minimum thickness of 2 feet
    - 5) Permeability equal to or less than  $1 \times 10^{-7}$  cm/sec (\*)
    - 6) Soil compaction will be 95% standard proctor at optimum moisture content (\*)

(\*) For new and/or modified ponds only.
  - b. Membrane lining with a minimum thickness of 20 mils, and an underdrain leak detection system.
  - c. An alternate method of pond lining may be utilized with prior approval from the Executive Director.

The permittee shall furnish certification by a Texas Licensed Professional Engineer that the completed pond lining meets the appropriate criteria above upon request. The certification shall be sent to the TCEQ Regional Office (MC Region 8) and Water Quality Compliance Monitoring Team (MC 224) of the Enforcement Division.

15. The permittee shall comply with the requirements of 30 TAC Section 309.13 (a) through (d). In addition, by ownership of the required buffer zone area, the permittee shall comply with the requirements of 30 TAC Section 309.13(e).
16. The permittee will not irrigate within 200 feet of any definable bank of a river or water course. The City will also comply with any buffer zone requirements for irrigation found in the Commissioner's regulations and in state laws. All buffer zone set backs are as shown on the Attachment "A".
17. The permittee's farm manager shall submit a copy of the City's Farm Management Program Plan (Plan) to the Executive Director of the TCEQ in care of Water Quality Assessment Team

(MC 150), the Compliance Monitoring Team (MC 224) of the Enforcement Division and the Regional office (MC Region 8 - San Angelo) by December 15 of each year. The Plan shall address the application of treatment plant effluent regulated by this permit. The plan shall specify which crops will be grown on each specific tract of land and their corresponding irrigation rates (acre-feet/acre/year) for each crop and crop combination during the following calendar year and the proposed schedule for harvesting each crop. Any subsequent amendments to the Plan will be filed within 20 days with the Executive Director's Water Quality Assessment Team (MC 150) and the San Angelo Regional office.

18. The permittee shall maintain permanent crops consisting of sorghum, corn, haygrazer, cotton, alfalfa, soybeans, wheat, oats and rye over the irrigated area. Harvesting (cut and remove from the field) shall be conducted at least once a year. Mowing and harvesting dates shall be recorded in a log book kept on site to be made available to TCEQ personnel upon request.
19. The permittee shall install monitoring wells to monitor for leakage from the new evaporation/irrigation ponds. Down gradient of the ponds, the wells shall be spaced 500 feet apart along the proposed ponds. Up gradient of the ponds, the wells shall be spaced every 1,000 feet apart all along the proposed ponds. Monitoring wells for Tract A, as shown on Attachment A, will be spaced 1,500 feet apart along the Concho River.
20. Disposal of wastewater on Tract C, which is divided by Red Creek (as shown on Attachment A), shall be by sprinkler irrigation only. No flood irrigation on this land will be used or authorized.

The sprinklers to be used for the sprinkler irrigation shall be either pivot or side row sprinklers. Sprinklers referred to as gun sprinklers will be of the small radius type (not to exceed 150 gallons per minute) and used only in the perimeters of the irrigation fields where pivot or side row sprinklers are not effective.

21. a. The permittee will maintain (and as needed construct any additional) tailwater control berms along both banks of the creek, which flows through Tract A (as shown on Attachment A) and along those parts of Tract A that adjoin the Concho River. The berms must prevent wastewater runoff from flowing into the creek or the Concho River.
- b. The permittee will maintain (and as needed construct any additional) tailwater control berms adjacent to Red Creek (which flows through Tract C) and the areas adjacent to the Concho River (which borders Tract C to the south) on the proposed irrigation lands, as shown on Attachment A. The berms must prevent wastewater runoff from flowing into the Red Creek or the Concho River.
22. The permittee shall comply with the requirements of 30 TAC 309.13(a) through (d) through design, construction and continuous operation of this facility. The permittee shall also comply with the requirements of 30 TAC 309.13(e).
  - a. The existing emergency overflow basin shall be operated on an as-needed basis, storing excess influent wastewater for no more than 48 hours prior to being returned to the headworks for treatment. Provisions for draining of the emergency overflow pond shall be provided. When operated under these conditions, the emergency overflow basin will be subject to the buffer zone requirement of being located no closer than 150 feet to the nearest property line.

- b. The flow equalization basin, when constructed, shall be operated on an as-needed basis to dampen hydraulic peak flow surges through the facility. The flow equalization basin shall be aerated and/or mixed to prevent anaerobic conditions when in use. When operated under this condition, the flow equalization basin will be subject to the buffer zone requirement of being located no closer than 150 feet to the nearest property line.
- c. The biological nutrient removal (BNR) selector basins, when constructed, shall be operated on a continuous basis with a hydraulic detention time less than 48 hours. The BNR selector basins shall utilize oxidation-reduction potential (ORP) process controls to maintain a specific ORP range in the selector basins to support enhanced nutrient reduction while preventing the formation of nuisance odors. The BNR basins shall also include submersible mixing that will prevent stratification of influent wastewater in the basins during treatment operations. When operated under these conditions, the biological nutrient removal selector basins will be subject to the buffer zone requirement of being located no closer than 150 feet to the nearest property line.
- d. Prior to construction of the Final phase, the permittee must submit to the Executive Director a request for, and obtain the approval of, a nuisance odor control prevention plan in accordance with 30 TAC 309.13(e)(2).



**CONTRIBUTING INDUSTRIES AND PRETREATMENT REQUIREMENTS**

1. The following pollutants may not be introduced into the treatment facility:
  - a. Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW), including, but not limited to, waste streams with a closed-cup flash point of less than 140° Fahrenheit (60° Celsius) using the test methods specified in 40 CFR § 261.21;
  - b. Pollutants which will cause corrosive structural damage to the POTW, but in no case shall there be discharges with a pH lower than 5.0 standard units, unless the works are specifically designed to accommodate such discharges;
  - c. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW, resulting in Interference;
  - d. Any pollutant, including oxygen-demanding pollutants (e.g., biochemical oxygen demand), released in a discharge at a flow rate and/or pollutant concentration which will cause Interference with the POTW;
  - e. Heat in amounts which will inhibit biological activity in the POTW, resulting in Interference, but in no case shall there be heat in such quantities that the temperature at the POTW treatment plant exceeds 104° Fahrenheit (40° Celsius) unless the Executive Director, upon request of the POTW, approves alternate temperature limits;
  - f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause Interference or Pass Through;
  - g. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems; and
  - h. Any trucked or hauled pollutants except at discharge points designated by the POTW.
2. The permittee shall require any indirect discharger to the treatment works to comply with the reporting requirements of Sections 204(b), 307, and 308 of the Clean Water Act, including any requirements established under 40 CFR Part 403 [*rev. Federal Register/ Vol. 70/ No. 198/ Friday, October 14, 2005/ Rules and Regulations, pages 60134-60798*].
3. The permittee shall provide adequate notification to the Executive Director, care of the Wastewater Permitting Section (MC 148) of the Water Quality Division, within 30 days subsequent to the permittee's knowledge of either of the following:
  - a. Any new introduction of pollutants into the treatment works from an indirect discharger which would be subject to Sections 301 and 306 of the Clean Water Act if it were directly discharging those pollutants; and
  - b. Any substantial change in the volume or character of pollutants being introduced into the treatment works by a source introducing pollutants into the treatment works at the time of issuance of the permit.

Any notice shall include information on the quality and quantity of effluent to be introduced into the treatment works and any anticipated impact of the change on the quality or quantity of effluent to be discharged from the POTW.

Revised July 2007

## BIOMONITORING REQUIREMENTS

### CHRONIC BIOMONITORING REQUIREMENTS: FRESHWATER

The provisions of this section apply to Outfall 001 for whole effluent toxicity (WET) testing.

#### 1. Scope, Frequency, and Methodology

- a. The permittee shall test the effluent for toxicity in accordance with the provisions below. Such testing will determine if an appropriately dilute effluent sample adversely affects the survival, reproduction, or growth of the test organisms.
- b. Within 90 days of discharge from the 12.0 MGD facility, the permittee shall conduct the following toxicity tests using the test organisms, procedures and quality assurance requirements specified in this part of this permit and in accordance with "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms," fourth edition (EPA-821-R-02-013) or its most recent update:
  - 1) Chronic static renewal survival and reproduction test using the water flea (*Ceriodaphnia dubia*) (Method 1002.0). This test should be terminated when 60% of the surviving adults in the control produce three broods or at the end of eight days, whichever occurs first. This test shall be conducted once per quarter.
  - 2) Chronic static renewal 7-day larval survival and growth test using the fathead minnow (*Pimephales promelas*) (Method 1000.0). A minimum of five replicates with eight organisms per replicate shall be used in the control and in each dilution. This test shall be conducted once per quarter.

The permittee must perform and report a valid test for each test species during the prescribed reporting period. An invalid test must be repeated during the same reporting period. An invalid test is defined as any test failing to satisfy the test acceptability criteria, procedures, and quality assurance requirements specified in the test methods and permit.

- c. The permittee shall use five effluent dilution concentrations and a control in each toxicity test. These effluent dilution concentrations are 32%, 42%, 56%, 75%, and 100% effluent. The critical dilution, defined as 94% effluent, is the effluent concentration representative of the proportion of effluent in the receiving water during critical low flow or critical mixing conditions.
- d. This permit may be amended to require a WET limit, a chemical-specific effluent limit, a best management practice, or other appropriate actions to address toxicity. The permittee may be required to conduct a toxicity reduction evaluation (TRE) after multiple toxic events.
- e. Testing Frequency Reduction

- 1) If none of the first four consecutive quarterly tests demonstrates significant toxicity, the permittee may submit this information in writing and, upon approval, reduce the testing frequency to once per six months for the invertebrate test species and once per year for the vertebrate test species.
- 2) If one or more of the first four consecutive quarterly tests demonstrates significant toxicity, the permittee shall continue quarterly testing for that species until this permit is reissued. If a testing frequency reduction had been previously granted and a subsequent test demonstrates significant toxicity, the permittee shall resume a quarterly testing frequency for that species until this permit is reissued.

2. Required Toxicity Testing Conditions

- a. Test Acceptance - The permittee shall repeat any toxicity test, including the control and all effluent dilutions, which fail to meet the following criteria:
  - 1) a control mean survival of 80% or greater;
  - 2) a control mean number of water flea neonates per surviving adult of 15 or greater;
  - 3) a control mean dry weight of surviving fathead minnow larvae of 0.25 mg or greater;
  - 4) a control coefficient of variation percent (CV%) of 40 or less in between replicates for the young of surviving females in the water flea test; and the growth and survival endpoints in the fathead minnow test;
  - 5) a critical dilution CV% of 40 or less for young of surviving females in the water flea test; and the growth and survival endpoints for the fathead minnow test, unless statistically significant toxicity is demonstrated at the critical dilution, in which case the test shall be considered valid;
  - 6) a percent minimum significant difference of 47 or less for water flea reproduction; and
  - 7) a PMSD of 30 or less for fathead minnow growth.
- b. Statistical Interpretation
  - 1) For the water flea survival and reproduction test, the statistical analyses used to determine the inhibition concentration of effluent that would cause a 25% reduction (IC25) in survival or mean young per female shall be as described in the methods manual referenced in Part 1.b.
  - 2) For the fathead minnow larval survival and growth tests, the statistical analyses used to determine the IC25 in survival or growth shall be as described in the methods manual referenced in Part 1.b.

- 3) The permittee is responsible for reviewing test concentration-response relationships to ensure that calculated test-results are interpreted and reported correctly. The document entitled "Method Guidance and Recommendation for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)" (EPA 821-B-00-004) provides guidance on determining the validity of test results.
- 4) Most point estimates are derived from a mathematical model that assumes a continuous dose-response relationship. For any test result that demonstrates a non-continuous (threshold) response, or a non-monotonic dose-response relationship, the IC<sub>25</sub> should be determined based on the method guidance manual referenced in Item 3.
- 5) Pursuant to the responsibility assigned to the permittee in Part 2.b.3), test results that demonstrate a non-monotonic dose-response relationship may be submitted, prior to the due date, for technical review of test validity and acceptability. The method guidance manual referenced in Item 3 will be used as the basis, along with best professional judgement, for making a determination of test validity and acceptability.

c. Dilution Water

- 1) Dilution water used in the toxicity tests shall be the receiving water collected at a point upstream of the discharge as close as possible to the discharge point but unaffected by the discharge. Where the toxicity tests are conducted on effluent discharges to receiving waters that are classified as intermittent streams, or where the toxicity tests are conducted on effluent discharges where no receiving water is available due to zero flow conditions, the permittee shall:
  - a) substitute a synthetic dilution water that has a pH, hardness, and alkalinity similar to that of the closest downstream perennial water unaffected by the discharge; or
  - b) use the closest downstream perennial water unaffected by the discharge.
- 2) Where the receiving water proves unsatisfactory as a result of pre-existing instream toxicity (i.e. fails to fulfill the test acceptance criteria of Part 2.a.), the permittee may substitute synthetic dilution water for the receiving water in all subsequent tests provided the unacceptable receiving water test met the following stipulations:
  - a) a synthetic lab water control was performed (in addition to the receiving water control) which fulfilled the test acceptance requirements of Part 2.a;
  - b) the test indicating receiving water toxicity was carried out to completion (i.e., 7 days);

- c) the permittee submitted all test results indicating receiving water toxicity with the reports and information required in Part 3.
- 3) The synthetic dilution water shall consist of standard, moderately hard, reconstituted water. Upon approval, the permittee may substitute other appropriate dilution water with chemical and physical characteristics similar to that of the receiving water.
- d. Samples and Composites
  - 1) The permittee shall collect a minimum of three composite samples from Outfall 001. The second and third composite samples will be used for the renewal of the dilution concentrations for each toxicity test.
  - 2) The permittee shall collect the composite samples such that the samples are representative of any periodic episode of chlorination, biocide usage, or other potentially toxic substance being discharged on an intermittent basis.
  - 3) The permittee shall initiate the toxicity tests within 36 hours after collection of the last portion of the first composite sample. The holding time for any subsequent composite sample shall not exceed 72 hours. Samples shall be maintained at a temperature of 0-6 degrees Centigrade during collection, shipping, and storage.
  - 4) If Outfall 001 ceases discharging during the collection of effluent samples, the requirements for the minimum number of effluent samples, the minimum number of effluent portions, and the sample holding time are waived during that sampling period. However, the permittee must have collected an effluent composite sample volume sufficient to complete the required toxicity tests with renewal of the effluent. When possible, the effluent samples used for the toxicity tests shall be collected on separate days if the discharge occurs over multiple days. The sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report.
  - 5) The effluent samples shall not be dechlorinated after sample collection.

### 3. Reporting

All reports, tables, plans, summaries, and related correspondence required in this section shall be submitted to the attention of the Standards Implementation Team (MC 150) of the Water Quality Division.

- a. The permittee shall prepare a full report of the results of all tests conducted in accordance with the manual referenced in Part 1.b. for every valid and invalid toxicity test initiated whether carried to completion or not.
- b. The permittee shall routinely report the results of each biomonitoring test on the Table 1 forms provided with this permit.

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- 1) Annual biomonitoring test results are due on or before January 20th for biomonitoring conducted during the previous 12-month period.
  - 2) Semiannual biomonitoring test results are due on or before July 20th and January 20th for biomonitoring conducted during the previous 6-month period.
  - 3) Quarterly biomonitoring test results are due on or before April 20th, July 20th, October 20th, and January 20th for biomonitoring conducted during the previous calendar quarter.
  - 4) Monthly biomonitoring test results are due on or before the 20th day of the month following sampling.
- c. Enter the following codes for the appropriate parameters for valid tests only:
- 1) For the water flea, Parameter T4P3B, enter a "1" if the IC25 for survival is less than the critical dilution; otherwise, enter a "0."
  - 2) For the water flea, Parameter T6P3B, report the IC25 for survival.
  - 3) For the water flea, Parameter T5P3B, enter a "1" if the IC25 for reproduction is less than the critical dilution; otherwise, enter a "0."
  - 4) For the water flea, Parameter T7P3B, report the IC25 for reproduction.
  - 5) For the fathead minnow, Parameter T4P6C, enter a "1" if the IC25 for survival is less than the critical dilution; otherwise, enter a "0."
  - 6) For the fathead minnow, Parameter T6P6C, report the IC25 for survival.
  - 7) For the fathead minnow, Parameter T5P6C, enter a "1" if the IC25 for growth is less than the critical dilution; otherwise, enter a "0."
  - 8) For the fathead minnow, Parameter T7P6C, report the IC25 for growth.
- d. Enter the following codes for retests only:
- 1) For retest number 1, Parameter 22415, enter a "1" if the IC25 for survival is less than the critical dilution; otherwise, enter a "0."
  - 2) For retest number 2, Parameter 22416, enter a "1" if the IC25 for survival is less than the critical dilution; otherwise, enter a "0."

#### 4. Persistent Toxicity

The requirements of this Part apply only when a test demonstrates a significant effect at the critical dilution. A significant effect is defined as an IC25 of a specified endpoint (survival, growth, or reproduction) less than the critical dilution. Significant lethality is defined as a survival IC25 less than the critical dilution. Similarly, significant sublethality is defined as a growth or reproduction IC25 less than the critical dilution.

- a. The permittee shall conduct a total of 2 additional tests (retests) for any species that demonstrates a significant effect (lethal or sublethal) at the critical dilution. The two retests shall be conducted monthly during the next two consecutive months. The permittee shall not substitute either of the two retests in lieu of routine toxicity testing. All reports shall be submitted within 20 days of test completion. Test completion is defined as the last day of the test.
- b. If the retests are performed due to a demonstration of significant lethality, and one or both of the two retests specified in Part 4.a. demonstrates significant lethality, the permittee shall initiate the TRE requirements as specified in Part 5. The provisions of Part 4.a. are suspended upon completion of the two retests and submittal of the TRE action plan and schedule defined in Part 5.

If neither test demonstrates significant lethality and the permittee is testing under the reduced testing frequency provision of Part 1.e., the permittee shall return to a quarterly testing frequency for that species.

- c. If the two retests are performed due to a demonstration of significant sublethality, and one or both of the two retests specified in Part 4.a. demonstrates significant lethality, the permittee shall again perform two retests as stipulated in Part 4.a.
- d. If the two retests are performed due to a demonstration of significant sublethality, and neither test demonstrates significant lethality, the permittee shall continue testing at the quarterly frequency.
- e. Regardless of whether retesting for lethal or sublethal effects, or a combination of the two, no more than one retest per month is required for a species.

##### 5. Toxicity Reduction Evaluation

- a. Within 45 days of the retest that demonstrates significant lethality, or within 45 days of being so instructed due to multiple toxic events, the permittee shall submit a general outline for initiating a TRE. The outline shall include, but not be limited to, a description of project personnel, a schedule for obtaining consultants (if needed), a discussion of influent and effluent data available for review, a sampling and analytical schedule, and a proposed TRE initiation date.
- b. Within 90 days of the retest that demonstrates significant lethality, or within 90 days of being so instructed due to multiple toxic events, the permittee shall submit a TRE action plan and schedule for conducting a TRE. The plan shall specify the approach and methodology to be used in performing the TRE. A TRE is a step-wise investigation combining toxicity testing with physical and chemical analyses to determine actions necessary to eliminate or reduce effluent toxicity to a level not effecting significant lethality at the critical dilution. The TRE action plan shall describe an approach for the reduction or elimination of lethality for both test species defined in Part 1.b. At a minimum, the TRE action plan shall include the following:

- 1) Specific Activities - The TRE action plan shall specify the approach the permittee intends to utilize in conducting the TRE, including toxicity characterizations, identifications, confirmations, source evaluations, treatability studies, and alternative approaches. When conducting characterization analyses, the permittee shall perform multiple characterizations and follow the procedures specified in the document entitled "Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I" (EPA/600/6-91/005F) or alternate procedures. The permittee shall perform multiple identifications and follow the methods specified in the documents entitled "Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R-92/080) and "Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R-92/081). All characterization, identification, and confirmation tests shall be conducted in an orderly and logical progression;
  - 2) Sampling Plan - The TRE action plan should describe sampling locations, methods, holding times, chain of custody, and preservation techniques. The effluent sample volume collected for all tests shall be adequate to perform the toxicity characterization/identification/confirmation procedures and chemical-specific analyses when the toxicity tests show significant lethality. Where the permittee has identified or suspects a specific pollutant and source of effluent toxicity, the permittee shall conduct, concurrent with toxicity testing, chemical-specific analyses for the identified and suspected pollutant and source of effluent toxicity;
  - 3) Quality Assurance Plan - The TRE action plan should address record keeping and data evaluation, calibration and standardization, baseline tests, system blanks, controls, duplicates, spikes, toxicity persistence in the samples, randomization, reference toxicant control charts, and mechanisms to detect artifactual toxicity; and
  - 4) Project Organization - The TRE action plan should describe the project staff, project manager, consulting engineering services (where applicable), consulting analytical and toxicological services, etc.
- c. Within 30 days of submittal of the TRE action plan and schedule, the permittee shall implement the TRE.
- d. The permittee shall submit quarterly TRE activities reports concerning the progress of the TRE. The quarterly reports are due on or before April 20th, July 20th, October 20th, and January 20th. The report shall detail information regarding the TRE activities including:
- 1) results and interpretation of any chemical-specific analyses for the identified and suspected pollutant performed during the quarter;
  - 2) results and interpretation of any characterization, identification, and confirmation tests performed during the quarter;



- 3) any data and substantiating documentation which identifies the pollutant(s) and source of effluent toxicity;
  - 4) results of any studies/evaluations concerning the treatability of the facility's effluent toxicity;
  - 5) any data that identifies effluent toxicity control mechanisms that will reduce effluent toxicity to the level necessary to meet no significant lethality at the critical dilution; and
  - 6) any changes to the initial TRE plan and schedule that are believed necessary as a result of the TRE findings.
- e. During the TRE, the permittee shall perform, at a minimum, quarterly testing using the more sensitive species. Testing for the less sensitive species shall continue at the frequency specified in Part 1.b.
- f. If the effluent ceases to effect significant lethality, i.e., there is a cessation of lethality, the permittee may end the TRE. A cessation of lethality is defined as no significant lethality for a period of 12 consecutive months with at least monthly testing. At the end of the 12 months, the permittee shall submit a statement of intent to cease the TRE and may then resume the testing frequency specified in Part 1.b.

This provision accommodates situations where operational errors and upsets, spills, or sampling errors triggered the TRE, in contrast to a situation where a single toxicant or group of toxicants cause lethality. This provision does not apply as a result of corrective actions taken by the permittee. Corrective actions are defined as proactive efforts that eliminate or reduce effluent toxicity. These include, but are not limited to, source reduction or elimination, improved housekeeping, changes in chemical usage, and modifications of influent streams and effluent treatment.

The permittee may only apply this cessation of lethality provision once. If the effluent again demonstrates significant lethality to the same species, the permit will be amended to add a WET limit with a compliance period, if appropriate. However, prior to the effective date of the WET limit, the permittee may apply for a permit amendment removing and replacing the WET limit with an alternate toxicity control measure by identifying and confirming the toxicant and an appropriate control measure.

- g. The permittee shall complete the TRE and submit a final report on the TRE activities no later than 28 months from the last test day of the retest that confirmed significant lethal effects at the critical dilution. The permittee may petition the Executive Director (in writing) for an extension of the 28-month limit. However, to warrant an extension the permittee must have demonstrated due diligence in its pursuit of the toxicity identification evaluation/TRE and must prove that circumstances beyond its control stalled the toxicity identification evaluation/TRE. The report shall provide information pertaining to the specific control mechanism selected that will, when implemented, result in the reduction

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of effluent toxicity to no significant lethality at the critical dilution. The report shall also provide a specific corrective action schedule for implementing the selected control mechanism.

- h. Based on the results of the TRE and proposed corrective actions, this permit may be amended to modify the biomonitoring requirements, where necessary, require a compliance schedule for implementation of corrective actions, specify a WET limit, specify a best management practice, and specify a chemical-specific limit.
- i. Copies of any and all required TRE plans and reports shall also be submitted to the U.S. EPA Region 6 office, 6WQ-PO.

## CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION

Dilution water used: \_\_\_\_\_ Receiving water \_\_\_\_\_ Synthetic Dilution water \_\_\_\_\_

## NUMBER OF YOUNG PRODUCED PER ADULT AT END OF TEST

REP	Percent effluent					
	0%	32%	42%	56%	75%	100%
A						
B						
C						
D						
E						
F						
G						
H						
I						
J						
Survival Mean						
Total Mean						
CV%*						

Designate males (M), and dead females (D), along with number of neonates (x) released prior to death.

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TABLE 1 (SHEET 2 OF 4)

## CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

## PERCENT SURVIVAL

	Percent effluent					
Time of Reading	0%	32%	42%	56%	75%	100%
24h						
48h						
End of Test						

1. Is the IC<sub>25</sub> for reproduction less than the critical dilution (94%)? \_\_\_\_\_ YES  
\_\_\_\_\_ NO
2. Is the IC<sub>25</sub> for survival less than the critical dilution (94%)? \_\_\_\_\_ YES \_\_\_\_\_ NO
3. Enter percent effluent corresponding to each IC<sub>25</sub> below:  
IC<sub>25</sub> survival = \_\_\_\_\_ %  
IC<sub>25</sub> reproduction = \_\_\_\_\_ %

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TABLE 1 (SHEET 3 OF 4)

## BIOMONITORING REPORTING

## FATHEAD MINNOW LARVAE GROWTH AND SURVIVAL

Dates and Times  
Composites  
Collected

No. 1 FROM: \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_ TO: \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

No. 2 FROM: \_\_\_\_\_ TO: \_\_\_\_\_

No. 3 FROM: \_\_\_\_\_ TO: \_\_\_\_\_

Test initiated: \_\_\_\_\_ am/pm \_\_\_\_\_ date

Dilution water used: \_\_\_\_\_ Receiving water \_\_\_\_\_ Synthetic dilution water

## FATHEAD MINNOW GROWTH DATA

Effluent Concentration	Average Dry Weight in replicate chambers					Mean Dry Weight	CV%*
	A	B	C	D	E		
0%							
32%							
42%							
56%							
75%							
100%							

\* Coefficient of Variation = standard deviation x 100/mean

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TABLE 1 (SHEET 4 OF 4)  
BIOMONITORING REPORTING  
FATHEAD MINNOW GROWTH AND SURVIVAL TEST

FATHEAD MINNOW SURVIVAL DATA

Effluent Concentration	Percent Survival in replicate chambers					Mean percent survival			CV%*
	A	B	C	D	E	24h	48h	7 day	
0%									
32%									
42%									
56%									
75%									
100%									

\* Coefficient of Variation = standard deviation x 100/mean

1. Is the IC<sub>25</sub> for growth less than the critical dilution (94%)? \_\_\_\_\_ YES \_\_\_\_\_ NO
2. Is the IC<sub>25</sub> for survival less than the critical dilution (94%)? \_\_\_\_\_ YES \_\_\_\_\_ NO
3. Enter percent effluent corresponding to each IC<sub>25</sub> below:  
 IC<sub>25</sub> survival = \_\_\_\_\_%  
 IC<sub>25</sub> growth = \_\_\_\_\_%

24-HOUR ACUTE BIOMONITORING REQUIREMENTS: FRESHWATER

The provisions of this section apply to Outfall 001 for whole effluent toxicity (WET) testing.

1. Scope, Frequency, and Methodology

- a. The permittee shall test the effluent for lethality in accordance with the provisions in this section. Such testing will determine compliance with Texas Surface Water Quality Standard 30 TAC § 307.6(e)(2)(B), which requires greater than 50% survival of the appropriate test organisms in 100% effluent for a 24-hour period.
- b. The toxicity tests specified shall be conducted once per six months. Within 90 days of discharge from the 12.0 MGD facility, the permittee shall conduct the following toxicity tests using the test organisms, procedures, and quality assurance requirements specified in this section of the permit and in accordance with "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms," fifth edition (EPA-821-R-02-012) or its most recent update:
  - 1) Acute 24-hour static toxicity test using the water flea (*Daphnia pulex* or *Ceriodaphnia dubia*). A minimum of five replicates with eight organisms per replicate shall be used in the control and each dilution.
  - 2) Acute 24-hour static toxicity test using the fathead minnow (*Pimephales promelas*). A minimum of five replicates with eight organisms per replicate shall be used in the control and each dilution.

The permittee must perform and report a valid test for each test species during the prescribed reporting period. An invalid test must be repeated during the same reporting period. An invalid test is defined as any test failing to satisfy the test acceptability criteria, procedures, and quality assurance requirements specified in the test methods and permit.

- c. In addition to an appropriate control, a 100% effluent concentration shall be used in the toxicity tests. The control and dilution water shall consist of standard, synthetic, moderately hard, reconstituted water.
- d. This permit may be amended to require a WET limit, a best management practice, a chemical-specific limit, or other appropriate actions to address toxicity. The permittee may be required to conduct a toxicity reduction evaluation (TRE) after multiple toxic events.
- e. As the dilution series specified in the Chronic Biomonitoring Requirements includes a 100% effluent concentration, the results from those tests may fulfill the requirements of this Section; any tests performed in the proper time interval may be substituted. Compliance will be evaluated as specified in item a. The 50% survival in 100% effluent for a 24-hour period standard applies to all tests utilizing a 100% effluent dilution, regardless of whether the results are submitted to comply with the minimum testing frequency defined in item b.

2. Required Toxicity Testing Conditions

- a. Test Acceptance – The permittee shall repeat any toxicity test, including the control, if the control fails to meet a mean survival equal to or greater than 90%.
- b. Dilution Water - In accordance with Part 1.c., the control and dilution water shall consist of standard, synthetic, moderately hard, reconstituted water.
- c. Samples and Composites
  - 1) The permittee shall collect one composite sample from Outfall 001.
  - 2) The permittee shall collect the composite samples such that the sample is representative of any periodic episode of chlorination, biocide usage, or other potentially toxic substance being discharged.
  - 3) The permittee shall initiate the toxicity tests within 36 hours after collection of the last portion of the composite sample. The samples shall be maintained at a temperature of 0-6 degrees Centigrade during collection, shipping, and storage.
  - 4) If Outfall 001 ceases discharging during the collection of the effluent composite sample, the requirements for the minimum number of effluent portions are waived. However, the permittee must have collected a composite sample volume sufficient for completion of the required test. The abbreviated sample collection, duration, and methodology must be documented in the full report.
  - 5) The effluent sample shall not be dechlorinated after sample collection.

3. Reporting

All reports, tables, plans, summaries, and related correspondence required in this section shall be submitted to the attention of the Standards Implementation Team (MC 150) of the Water Quality Division.

- a. The permittee shall prepare a full report of the results of all tests conducted pursuant to this permit in accordance with the manual referenced in Part 1.b. for every valid and invalid toxicity test initiated.
- b. The permittee shall routinely report the results of each biomonitoring test on the Table 2 forms provided with this permit.
  - 1) Semiannual biomonitoring test results are due on or before July 20th and January 20th for biomonitoring conducted during the previous 6-month period.
  - 2) Quarterly biomonitoring test results are due on or before April 20th, July 20th, October 20th, and January 20th for biomonitoring conducted during the previous calendar quarter.



- c. Enter the following codes for the appropriate parameters for valid tests only:
  - 1) For the water flea, Parameter TIE3D, enter a “0” if the mean survival at 24 hours is greater than 50% in the 100% effluent dilution; if the mean survival is less than or equal to 50%, enter “1.”
  - 2) For the fathead minnow, Parameter TIE6C, enter a “0” if the mean survival at 24 hours is greater than 50% in the 100% effluent dilution; if the mean survival is less than or equal to 50%, enter “1.”
- d. Enter the following codes for retests only:
  - 1) For retest number 1, Parameter 22415, enter a “0” if the mean survival at 24 hours is greater than 50% in the 100% effluent dilution; if the mean survival is less than or equal to 50%, enter “1.”
  - 2) For retest number 2, Parameter 22416, enter a “0” if the mean survival at 24 hours is greater than 50% in the 100% effluent dilution; if the mean survival is less than or equal to 50%, enter “1.”

#### 4. Persistent Mortality

The requirements of this part apply when a toxicity test demonstrates significant lethality, which is defined as a mean mortality of 50% or greater of organisms exposed to the 100% effluent concentration for 24 hours.

- a. The permittee shall conduct 2 additional tests (retests) for each species that demonstrates significant lethality. The two retests shall be conducted once per week for 2 weeks. Five effluent dilution concentrations in addition to an appropriate control shall be used in the retests. These effluent concentrations are 6%, 13%, 25%, 50% and 100% effluent. The first retest shall be conducted within 15 days of the laboratory determination of significant lethality. All test results shall be submitted within 20 days of test completion of the second retest. Test completion is defined as the 24th hour.
- b. If one or both of the two retests specified in Part 4.a. demonstrates significant lethality, the permittee shall initiate the TRE requirements as specified in Part 5.

#### 5. Toxicity Reduction Evaluation

- a. Within 45 days of the retest that demonstrates significant lethality, the permittee shall submit a general outline for initiating a TRE. The outline shall include, but not be limited to, a description of project personnel, a schedule for obtaining consultants (if needed), a discussion of influent and effluent data available for review, a sampling and analytical schedule, and a proposed TRE initiation date.
- b. Within 90 days of the retest that demonstrates significant lethality, the permittee shall submit a TRE action plan and schedule for conducting a TRE. The plan shall specify the approach and methodology to be used in performing the TRE. A TRE is a step-wise investigation combining toxicity testing with physical and chemical analysis to determine actions necessary to eliminate or reduce effluent toxicity to

a level not effecting significant lethality at the critical dilution. The TRE action plan shall lead to the successful elimination of significant lethality for both test species defined in Part 1.b. At a minimum, the TRE action plan shall include the following:

- 1) **Specific Activities** - The TRE action plan shall specify the approach the permittee intends to utilize in conducting the TRE, including toxicity characterizations, identifications, confirmations, source evaluations, treatability studies, and alternative approaches. When conducting characterization analyses, the permittee shall perform multiple characterizations and follow the procedures specified in the document entitled "Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures" (EPA/600/6-91/003) or alternate procedures. The permittee shall perform multiple identifications and follow the methods specified in the documents entitled "Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R-92/080) and "Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R-92/081). All characterization, identification, and confirmation tests shall be conducted in an orderly and logical progression;
  - 2) **Sampling Plan** - The TRE action plan should describe sampling locations, methods, holding times, chain of custody, and preservation techniques. The effluent sample volume collected for all tests shall be adequate to perform the toxicity characterization/identification/confirmation procedures, and chemical-specific analyses when the toxicity tests show significant lethality. Where the permittee has identified or suspects a specific pollutant and source of effluent toxicity, the permittee shall conduct, concurrent with toxicity testing, chemical-specific analyses for the identified and suspected pollutant and source of effluent toxicity;
  - 3) **Quality Assurance Plan** - The TRE action plan should address record keeping and data evaluation, calibration and standardization, baseline tests, system blanks, controls, duplicates, spikes, toxicity persistence in the samples, randomization, reference toxicant control charts, and mechanisms to detect artifactual toxicity; and
  - 4) **Project Organization** - The TRE action plan should describe the project staff, manager, consulting engineering services (where applicable), consulting analytical and toxicological services, etc.
- c. Within 30 days of submittal of the TRE action plan and schedule, the permittee shall implement the TRE.
  - d. The permittee shall submit quarterly TRE activities reports concerning the progress of the TRE. The quarterly TRE activities reports are due on or before April 20th, July 20th, October 20th, and January 20th. The report shall detail information regarding the TRE activities including:

- 1) results and interpretation of any chemical-specific analyses for the identified and suspected pollutant performed during the quarter;
  - 2) results and interpretation of any characterization, identification, and confirmation tests performed during the quarter;
  - 3) any data and substantiating documentation that identifies the pollutant and source of effluent toxicity;
  - 4) results of any studies/evaluations concerning the treatability of the facility's effluent toxicity;
  - 5) any data that identifies effluent toxicity control mechanisms that will reduce effluent toxicity to the level necessary to eliminate significant lethality; and
  - 6) any changes to the initial TRE plan and schedule that are believed necessary as a result of the TRE findings.
- e. During the TRE, the permittee shall perform, at a minimum, quarterly testing using the more sensitive species. Testing for the less sensitive species shall continue at the frequency specified in Part 1.b.
- f. If the effluent ceases to effect significant lethality, i.e., there is a cessation of lethality, the permittee may end the TRE. A cessation of lethality is defined as no significant lethality for a period of 12 consecutive weeks with at least weekly testing. At the end of the 12 weeks, the permittee shall submit a statement of intent to cease the TRE and may then resume the testing frequency specified in Part 1.b.

This provision accommodates situations where operational errors and upsets, spills, or sampling errors triggered the TRE, in contrast to a situation where a single toxicant or group of toxicants cause lethality. This provision does not apply as a result of corrective actions taken by the permittee. Corrective actions are defined as proactive efforts that eliminate or reduce effluent toxicity. These include, but are not limited to, source reduction or elimination, improved housekeeping, changes in chemical usage, and modifications of influent streams and effluent treatment.

The permittee may only apply this cessation of lethality provision once. If the effluent again demonstrates significant lethality to the same species, the permit will be amended to add a WET limit with a compliance period, if appropriate. However, prior to the effective date of the WET limit, the permittee may apply for a permit amendment removing and replacing the WET limit with an alternate toxicity control measure by identifying and confirming the toxicant and an appropriate control measure.

- g. The permittee shall complete the TRE and submit a final report on the TRE activities no later than 18 months from the last test day of the retest that demonstrates significant lethality. The permittee may petition the Executive Director (in writing) for an extension of the 18-month limit. However, to warrant

an extension the permittee must have demonstrated due diligence in its pursuit of the toxicity identification evaluation/TRE and must prove that circumstances beyond its control stalled the toxicity identification evaluation/TRE. The report shall specify the control mechanism that will, when implemented, reduce effluent toxicity as specified in item 5.h. The report will also specify a corrective action schedule for implementing the selected control mechanism.

- h. Within 3 years of the last day of the test confirming toxicity, the permittee shall comply with 30 TAC § 307.6(e)(2)(B), which requires greater than 50% survival of the test organism in 100% effluent at the end of 24-hours. The permittee may petition the Executive Director (in writing) for an extension of the 3-year limit. However, to warrant an extension the permittee must have demonstrated due diligence in its pursuit of the toxicity identification evaluation/TRE and must prove that circumstances beyond its control stalled the toxicity identification evaluation/TRE.

The permittee may be exempted from complying with 30 TAC § 307.6(e)(2)(B) upon proving that toxicity is caused by an excess, imbalance, or deficiency of dissolved salts. This exemption excludes instances where individually toxic components (e.g., metals) form a salt compound. Following the exemption, this permit may be amended to include an ion-adjustment protocol, alternate species testing, or single species testing.

- i. Based upon the results of the TRE and proposed corrective actions, this permit may be amended to modify the biomonitoring requirements where necessary, require a compliance schedule for implementation of corrective actions, specify a WET limit, specify a best management practice, and specify a chemical-specific limit.
- j. Copies of any and all required TRE plans and reports shall also be submitted to the U.S. EPA Region 6 office, 6WQ-PO.

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TABLE 2 (SHEET 1 OF 2)

## WATER FLEA SURVIVAL

## GENERAL INFORMATION

	Time	Date
Composite Sample Collected		
Test Initiated		

## PERCENT SURVIVAL

Time	Rep	Percent effluent					
		0%	6%	13%	25%	50%	100%
24h	A						
	B						
	C						
	D						
	E						
	MEAN						

Enter percent effluent corresponding to the LC<sub>50</sub> below:24-hour LC<sub>50</sub> = \_\_\_\_\_% effluent

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TABLE 2 (SHEET 2 OF 2)  
FATHEAD MINNOW SURVIVAL

## GENERAL INFORMATION

	Time	Date
Composite Sample Collected		
Test Initiated		

## PERCENT SURVIVAL

Time	Rep	Percent effluent					
		0%	6%	13%	25%	50%	100%
24h	A						
	B						
	C						
	D						
	E						
	MEAN						

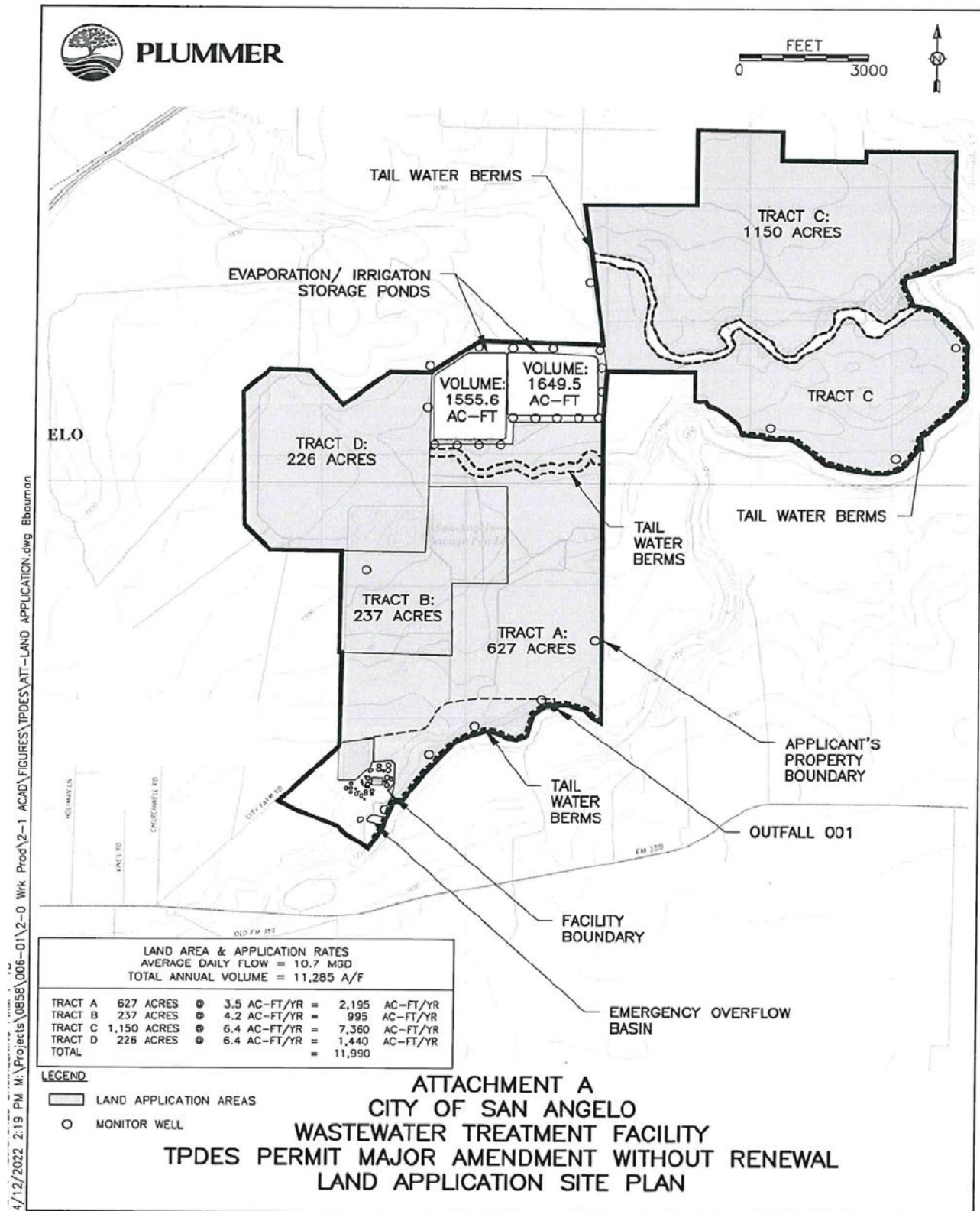
Enter percent effluent corresponding to the LC<sub>50</sub> below:

24-hour LC<sub>50</sub> = \_\_\_\_\_% effluent

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## Attachment A



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## Attachment B

**DOMESTIC WORKSHEET 4.0****POLLUTANT ANALYSES REQUIREMENTS\*****Section 1. Toxic Pollutants**

For pollutants identified in Table 4.0(1), indicate type of sample.

Grab ☐Composite ☐

Date and time sample(s) collected:

Table 4.0(1) – Toxics Analysis

<b>Pollutant</b>	<b>AVG Effluent Conc. (µg/l)</b>	<b>MAX Effluent Conc. (µg/l)</b>	<b>Number of Samples</b>	<b>MAL (µg/l)</b>
Acrylonitrile				50
Aldrin				0.01
Aluminum				2.5
Anthracene				10
Antimony				5
Arsenic				0.5
Barium				3
Benzene				10
Benzidine				50
Benzo(a)anthracene				5
Benzo(a)pyrene				5
Bis(2-chloroethyl)ether				10
Bis(2-ethylhexyl)phthalate				10
Bromodichloromethane				10
Bromoform				10
Cadmium				1
Carbon Tetrachloride				2
Carbaryl				5
Chlordane*				0.2
Chlorobenzene				10



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<b>Pollutant</b>	<b>AVG Effluent Conc. (µg/l)</b>	<b>MAX Effluent Conc. (µg/l)</b>	<b>Number of Samples</b>	<b>MAL (µg/l)</b>
Chlorodibromomethane				10
Chloroform				10
Chlorpyrifos				0.05
Chromium (Total)				3
Chromium (Tri) (*1)				N/A
Chromium (Hex)				3
Copper				2
Chrysene				5
p-Chloro-m-Cresol				10
4,6-Dinitro-o-Cresol				50
p-Cresol				10
Cyanide (*2)				10
4,4'- DDD				0.1
4,4'- DDE				0.1
4,4'- DDT				0.02
2,4-D				0.7
Demeton (O and S)				0.20
Diazinon				0.5/0.1
1,2-Dibromoethane				10
m-Dichlorobenzene				10
o-Dichlorobenzene				10
p-Dichlorobenzene				10
3,3'-Dichlorobenzidine				5
1,2-Dichloroethane				10
1,1-Dichloroethylene				10
Dichloromethane				20

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<b>Pollutant</b>	<b>AVG Effluent Conc. (µg/l)</b>	<b>MAX Effluent Conc. (µg/l)</b>	<b>Number of Samples</b>	<b>MAL (µg/l)</b>
1,2-Dichloropropane				10
1,3-Dichloropropene				10
Dicofol				1
Dieldrin				0.02
2,4-Dimethylphenol				10
Di-n-Butyl Phthalate				10
Diuron				0.09
Endosulfan I (alpha)				0.01
Endosulfan II (beta)				0.02
Endosulfan Sulfate				0.1
Endrin				0.02
Ethylbenzene				10
Fluoride				500
Guthion				0.1
Heptachlor				0.01
Heptachlor Epoxide				0.01
Hexachlorobenzene				5
Hexachlorobutadiene				10
Hexachlorocyclohexane (alpha)				0.05
Hexachlorocyclohexane (beta)				0.05
gamma-Hexachlorocyclohexane (Lindane)				0.05
Hexachlorocyclopentadiene				10
Hexachloroethane				20
Hexachlorophene				10
Lead				0.5

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<b>Pollutant</b>	<b>AVG Effluent Conc. (µg/l)</b>	<b>MAX Effluent Conc. (µg/l)</b>	<b>Number of Samples</b>	<b>MAL (µg/l)</b>
Malathion				0.1
Mercury				0.005
Methoxychlor				2
Methyl Ethyl Ketone				50
Mirex				0.02
Nickel				2
Nitrate-Nitrogen				100
Nitrobenzene				10
N-Nitrosodiethylamine				20
N-Nitroso-di-n-Butylamine				20
Nonylphenol				333
Parathion (ethyl)				0.1
Pentachlorobenzene				20
Pentachlorophenol				5
Phenanthrene				10
Polychlorinated Biphenyls (PCB's) (*3)				0.2
Pyridine				20
Selenium				5
Silver				0.5
1,2,4,5-Tetrachlorobenzene				20
1,1,2,2-Tetrachloroethane				10
Tetrachloroethylene				10
Thallium				0.5
Toluene				10
Toxaphene				0.3
2,4,5-TP (Silvex)				0.3

City of San Angelo

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<b>Pollutant</b>	<b>AVG Effluent Conc. (µg/l)</b>	<b>MAX Effluent Conc. (µg/l)</b>	<b>Number of Samples</b>	<b>MAL (µg/l)</b>
Tributyltin (see instructions for explanation)				0.01
1,1,1-Trichloroethane				10
1,1,2-Trichloroethane				10
Trichloroethylene				10
2,4,5-Trichlorophenol				50
TTHM (Total Trihalomethanes)				10
Vinyl Chloride				10
Zinc				5

**(\*1) Determined by subtracting hexavalent Cr from total Cr.**

**(\*2) Cyanide, amenable to chlorination or weak-acid dissociable.**

**(\*3) The sum of seven PCB congeners 1242, 1254, 1221, 1232, 1248, 1260, and 1016.**

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**Section 2. Priority Pollutants**

For pollutants identified in Tables 4.0(2)A-E, indicate type of sample.

Grab ☐ Composite ☐

Date and time sample(s) collected:

**Table 4.0(2)A – Metals, Cyanide, Phenols**

<b>Pollutant</b>	<b>AVG Effluent Conc. (µg/l)</b>	<b>MAX Effluent Conc. (µg/l)</b>	<b>Number of Samples</b>	<b>MAL (µg/l)</b>
Antimony				5
Arsenic				0.5
Beryllium				0.5
Cadmium				1
Chromium (Total)				3
Chromium (Hex)				3
Chromium (Tri) (*1)				N/A
Copper				2
Lead				0.5
Mercury				0.005
Nickel				2
Selenium				5
Silver				0.5
Thallium				0.5
Zinc				5
Cyanide (*2)				10
Phenols, Total				10

(\*1) Determined by subtracting hexavalent Cr from total Cr.

(\*2) Cyanide, amenable to chlorination or weak-acid dissociable

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**Table 4.0(2)B – Volatile Compounds**

<b>Pollutant</b>	<b>AVG Effluent Conc. (µg/l)</b>	<b>MAX Effluent Conc. (µg/l)</b>	<b>Number of Samples</b>	<b>MAL (µg/l)</b>
Acrolein				50
Acrylonitrile				50
Benzene				10
Bromoform				10
Carbon Tetrachloride				2
Chlorobenzene				10
Chlorodibromomethane				10
Chloroethane				50
2-Chloroethylvinyl Ether				10
Chloroform				10
Dichlorobromomethane [Bromo-dichloromethane]				10
1,1-Dichloroethane				10
1,2-Dichloroethane				10
1,1-Dichloroethylene				10
1,2-Dichloropropane				10
1,3-Dichloropropylene [1,3-Dichloropropene]				10
1,2-Trans-Dichloroethylene				10
Ethylbenzene				10
Methyl Bromide				50
Methyl Chloride				50
Methylene Chloride				20
1,1,2,2-Tetrachloroethane				10
Tetrachloroethylene				10
Toluene				10
1,1,1-Trichloroethane				10
1,1,2-Trichloroethane				10
Trichloroethylene				10
Vinyl Chloride				10

City of San Angelo

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**Table 4.0(2)C – Acid Compounds**

<b>Pollutant</b>	<b>AVG Effluent Conc. (µg/l)</b>	<b>MAX Effluent Conc. (µg/l)</b>	<b>Number of Samples</b>	<b>MAL (µg/l)</b>
2-Chlorophenol				10
2,4-Dichlorophenol				10
2,4-Dimethylphenol				10
4,6-Dinitro-o-Cresol				50
2,4-Dinitrophenol				50
2-Nitrophenol				20
4-Nitrophenol				50
P-Chloro-m-Cresol				10
Pentalchlorophenol				5
Phenol				10
2,4,6-Trichlorophenol				10

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**Table 4.o(2)D – Base/Neutral Compounds**

<b>Pollutant</b>	<b>AVG Effluent Conc. (µg/l)</b>	<b>MAX Effluent Conc. (µg/l)</b>	<b>Number of Samples</b>	<b>MAL (µg/l)</b>
Acenaphthene				10
Acenaphthylene				10
Anthracene				10
Benzidine				50
Benzo(a)Anthracene				5
Benzo(a)Pyrene				5
3,4-Benzofluoranthene				10
Benzo(ghi)Perylene				20
Benzo(k)Fluoranthene				5
Bis(2-Chloroethoxy)Methane				10
Bis(2-Chloroethyl)Ether				10
Bis(2-Chloroisopropyl)Ether				10
Bis(2-Ethylhexyl)Phthalate				10
4-Bromophenyl Phenyl Ether				10
Butyl benzyl Phthalate				10
2-Chloronaphthalene				10
4-Chlorophenyl phenyl ether				10
Chrysene				5
Dibenzo(a,h)Anthracene				5
1,2-(o)Dichlorobenzene				10
1,3-(m)Dichlorobenzene				10
1,4-(p)Dichlorobenzene				10
3,3-Dichlorobenzidine				5
Diethyl Phthalate				10
Dimethyl Phthalate				10
Di-n-Butyl Phthalate				10
2,4-Dinitrotoluene				10
2,6-Dinitrotoluene				10
Di-n-Octyl Phthalate				10
1,2-Diphenylhydrazine (as Azo-benzene)				20
Fluoranthene				10
Fluorene				10
Hexachlorobenzene				5
Hexachlorobutadiene				10
Hexachlorocyclo-pentadiene				10



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<b>Pollutant</b>	<b>AVG Effluent Conc. (µg/l)</b>	<b>MAX Effluent Conc. (µg/l)</b>	<b>Number of Samples</b>	<b>MAL (µg/l)</b>
Hexachloroethane				20
Indeno(1,2,3-cd)pyrene				5
Isophorone				10
Naphthalene				10
Nitrobenzene				10
N-Nitrosodimethylamine				50
N-Nitrosodi-n-Propylamine				20
N-Nitrosodiphenylamine				20
Phenanthrene				10
Pyrene				10
1,2,4-Trichlorobenzene				10

City of San Angelo

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**Table 4.0(2)E - Pesticides**

<b>Pollutant</b>	<b>AVG Effluent Conc. (µg/l)</b>	<b>MAX Effluent Conc. (µg/l)</b>	<b>Number of Samples</b>	<b>MAL (µg/l)</b>
Aldrin				0.01
alpha-BHC (Hexachlorocyclohexane)				0.05
beta-BHC (Hexachlorocyclohexane)				0.05
gamma-BHC (Hexachlorocyclohexane)				0.05
delta-BHC (Hexachlorocyclohexane)				0.05
Chlordane				0.2
4,4-DDT				0.02
4,4-DDE				0.1
4,4,-DDD				0.1
Dieldrin				0.02
Endosulfan I (alpha)				0.01
Endosulfan II (beta)				0.02
Endosulfan Sulfate				0.1
Endrin				0.02
Endrin Aldehyde				0.1
Heptachlor				0.01
Heptachlor Epoxide				0.01
PCB-1242				0.2
PCB-1254				0.2
PCB-1221				0.2
PCB-1232				0.2
PCB-1248				0.2
PCB-1260				0.2
PCB-1016				0.2
Toxaphene				0.3

City of San Angelo

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**Section 3. Dioxin/Furan Compounds**

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- A.** Are any of the following compounds used by a contributing industrial user or significant industrial user that is part of the collection system for the facility that you have reason to believe are present in the influent to the WWTP?

Yes ☐ No ☐If **yes**, identify which compound(s) are potentially sent to the facility.

- ☐ 2,4,5-trichlorophenoxy acetic acid  
Common Name 2,4,5-T, CASRN 93-76-5
- ☐ 2-(2,4,5-trichlorophenoxy) propanoic acid  
Common Name Silvex or 2,4,5-TP, CASRN 93-72-1
- ☐ 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate  
Common Name Erbon, CASRN 136-25-4
- ☐ o,o-dimethyl o-(2,4,5-trichlorophenyl) phosphorothioate  
Common Name Ronnel, CASRN 299-84-3
- ☐ 2,4,5-trichlorophenol  
Common Name TCP, CASRN 95-95-4
- ☐ hexachlorophene  
Common Name HCP, CASRN 70-30-4

For each compound identified, provide a brief description of the conditions of its/their presence at the facility.

- B.** Do you know or have any reason to believe that 2,3,7,8 Tetrachlorodibenzo-P-Dioxin (TCDD) or any congeners of TCDD may be present in your effluent?

Yes ☐ No ☐If **yes**, provide a brief description of the conditions for its presence.

If you responded **yes** to either Subsection A **or** B, complete Table 4.0(2)F.

For pollutants identified in Table 4.0(2)F, indicate type of sample.

Grab ☐ Composite ☐

Date and time sample(s) collected:

City of San Angelo

TPDES Permit No. WQ0010641003

**TABLE 4.o(2)F - DIOXIN/FURAN COMPOUNDS**

<b>Compound</b>	<b>Toxic Equivalenc y Factors</b>	<b>Wastewater Concentratio n (ppq)</b>	<b>Wastewater r Equivalent s (ppq)</b>	<b>Sludge Concentratio n (ppt)</b>	<b>Sludge Equivalent s (ppt)</b>	<b>MAL (ppq)</b>
2,3,7,8 TCDD	1					10
1,2,3,7,8 PeCDD	0.5					50
2,3,7,8 HxCDDs	0.1					50
1,2,3,4,6,7,8 HpCDD	0.01					50
2,3,7,8 TCDF	0.1					10
1,2,3,7,8 PeCDF	0.05					50
2,3,4,7,8 PeCDF	0.5					50
2,3,7,8 HxCDFs	0.1					50
2,3,4,7,8 HpCDFs	0.01					50
OCDD	0.0003					100
OCDF	0.0003					100
PCB 77	0.0001					0.5
PCB 81	0.0003					0.5
PCB 126	0.1					0.5
PCB 169	0.03					0.5
Total						

## Response Exhibit 5



# 2021 REGION F WATER PLAN

FINAL PLAN. VOLUME I. MAIN REPORT.

# 2021 REGION F WATER PLAN

NOVEMBER 2020

Prepared for:

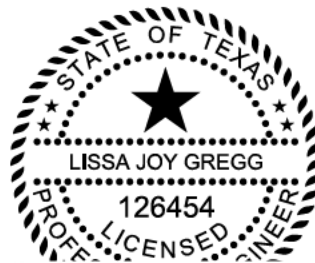
**REGION F WATER PLANNING GROUP**



*Simone Kiel*

10/30/2020

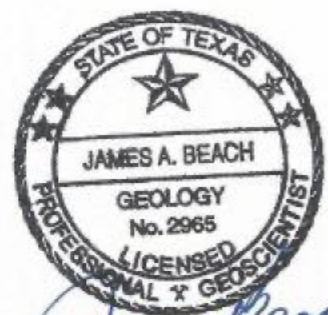
FREESE AND NICHOLS, INC.  
TEXAS REGISTERED  
ENGINEERING FIRM  
F-2144



*Lissa Joy Gregg*

10/30/2020

FREESE AND NICHOLS, INC.  
TEXAS REGISTERED  
ENGINEERING FIRM  
F-2144



*James Beach*

James Beach, WSP  
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Prepared by:

**FREESE AND NICHOLS, INC.**

**WSP**





## 5D.5 City of San Angelo

The City of San Angelo is located in Tom Green County near the center of Region F. As one of the largest cities in the region, it is a major center of employment, trade and cultural activities in the region. The City currently receives water from six sources: Lake Nasworthy, Twin Buttes Reservoir, the Concho River, O.C. Fisher Reservoir, Ivie Reservoir and a well field in McCulloch County (Hickory aquifer). The city also has a contract with CRMWD for water from the Spence Reservoir, but the pipeline needs rehabilitation and is not currently being used. Tom Green County WCID #1 currently utilizes the City of San Angelo's effluent water prior to taking their water supplies (when available) in Twin Buttes. The City plans to convert this to municipal supply as part of the Concho River Water Project. San Angelo will continue to provide wastewater to the irrigators when it is not needed as municipal supply.

Table 5D-16 is a comparison of the Region F supply and water demand for the City of San Angelo and its customers. San Angelo supplies all the treated water to Goodfellow Air Force Base and about half of the manufacturing demand in Tom Green County. The City also has a contract with the Upper Colorado River Authority (UCRA) to supply up to 1,000 acre-feet per year.

There is a small reliable supply from three of the City's run-of-river permits but under strict priority analysis there is no reliable supply from the San Angelo Reservoir system. However, these reservoirs are used by the City during most years but may not be reliable during extreme drought years. As such only, a portion of the supply theoretically available from the subordination model is shown as available to City of San Angelo. This supply is expected to decrease over time due to reduction in yield from sedimentation. The City of San Angelo is actively pursuing other strategies to replace supplies from their surface water system. The contracts between the City and CRMWD specify that San Angelo is entitled to 6 percent of the safe yield of Spence Reservoir and 16.54 percent of the safe yield of Ivie. Since the City cannot physically take water from Spence due to the poor condition of the pipeline, San Angelo has no current supply from this source. Due to cost, quality, and reliability concerns, the City of San Angelo does not plan to rehabilitate the Spence Pipeline at this time.

The City of San Angelo is currently authorized to divert 2,750 plus any banked water from their Hickory well field which increases their supply to 12,000 acre-feet per year over time. Currently, the City can treat up to 8 MGD (8,960 AFY) of this supply. Increases in well field and treatment capacity are considered in this plan as a strategy.





**Table 5D-16**  
**Comparison of Supply and Demand for the City of San Angelo**  
 -Values are in Acre-Feet per Year-

<i><b>Supplies</b></i>	<b>Supply 2020</b>	<b>Supply 2030</b>	<b>Supply 2040</b>	<b>Supply 2050</b>	<b>Supply 2060</b>	<b>Supply 2070</b>
Concho River	214	214	214	214	214	214
San Angelo System (with subordination) <sup>a</sup>	1,670	1,575	1,480	1,385	1,290	1,195
Ivie Reservoir (with subordination) <sup>b</sup>	5,349	5,209	5,070	4,930	4,791	4,651
McCulloch County Well Field (Hickory Aquifer)	8,960	8,960	8,960	8,960	8,960	8,960
Municipal Conservation	467	541	567	602	639	679
<b>Total Availability</b>	<b>16,660</b>	<b>16,499</b>	<b>16,291</b>	<b>16,091</b>	<b>15,894</b>	<b>15,699</b>
<i><b>Demands</b></i>	<b>Demand 2020</b>	<b>Demand 2030</b>	<b>Demand 2040</b>	<b>Demand 2050</b>	<b>Demand 2060</b>	<b>Demand 2070</b>
City of San Angelo	17,924	19,657	20,494	21,556	22,847	24,250
UCRA	1,000	1,000	1,000	1,000	1,000	1,000
Goodfellow Air Force Base	513	568	596	629	666	707
Manufacturing, Tom Green County	425	481	481	481	481	481
<b>Total Demand</b>	<b>19,862</b>	<b>21,706</b>	<b>22,571</b>	<b>23,666</b>	<b>24,994</b>	<b>26,438</b>
<i><b>Surplus (Shortage)</b></i>	<b>Surplus (Shortage) 2020</b>	<b>Surplus (Shortage) 2030</b>	<b>Surplus (Shortage) 2040</b>	<b>Surplus (Shortage) 2050</b>	<b>Surplus (Shortage) 2060</b>	<b>Surplus (Shortage) 2070</b>
<b>Surplus (Shortage)</b>	<b>(3,202)</b>	<b>(5,207)</b>	<b>(6,280)</b>	<b>(7,575)</b>	<b>(9,100)</b>	<b>(10,739)</b>

<sup>a</sup> Includes Twin Buttes, Lake Nasworthy, and O.C. Fisher; includes contracted portion to UCRA and future contractual increases. Shown as less than what is theoretically available from the WMS.

<sup>b</sup> 16.54% of the safe yield of Ivie with subordination. As part of the West Texas Water Partnership, the Lake Ivie supplies may be reallocated among the cities of Abilene, Midland, and San Angelo. However, this has not yet occurred, so the current contract amounts are shown in the table above. The Partnership will follow up on initial conversations with the CRMWD to explore necessary methodologies and agreements to implement a cooperative use strategy of the Partnership's collective Ivie supplies. Meetings between the parties are anticipated in the late fall/early winter of 2020/2021.

Through the standard procedure and discussions with the City of San Angelo, potentially feasible water management strategies were developed for further evaluation. A few strategies were discussed but not considered feasible at this time. These include system optimization and voluntary redistribution through lease or purchase of existing water rights. The system optimization strategy looks at the potential benefit from operating the Twin Buttes, Nasworthy, and O.C. Fisher's reservoirs as a system. The City of San Angelo currently operates its reservoirs in this fashion and likely experiences a small benefit. However, since the yield of the reservoirs under

the extended Colorado WAM is negligible, this strategy was not further evaluated. It is recommended however that San Angelo continue to operate their reservoirs as a system to obtain optimal supply. Voluntary redistribution of existing water rights is a strategy where the City would enter into purchase or lease agreements for existing water rights currently held by other users. The City of San Angelo has purchased existing water rights in the past and may continue to purchase other water rights on a willing-buyer willing-seller basis if the cost is not prohibitive. Diversions for these rights could be moved to one of San Angelo's existing diversion points, or the rights

could simply not be exercised, eliminating the possibility of a priority call. The City has been approached by individuals wishing to sell their water rights, but the high costs have made this option unfeasible. If there was a cost-effective opportunity to purchase or lease water rights in

the future, the City of San Angelo may want to move forward with this strategy. Region F has not identified any specific rights for purchase at this time, so no quantity, costs or impacts can be developed at this time.

The following strategies were identified as potentially feasible for the City of San Angelo:

- Municipal Conservation
- Subordination
- Brush Control
- Indirect reuse for municipal use (Concho River Water Project)
- Hickory Well Field Expansion in McCulloch County
- Development of Pecos Valley and Edwards-Trinity aquifer supplies in Southwest Pecos County
- Development of Edwards-Trinity aquifer supplies in Schleicher County
- Desalination of Additional Groundwater Supplies
- West Texas Water Partnership

Full strategy evaluations are included in Appendix C.

## **5D.5.1 San Angelo Recommended Water Management Strategies**

### ***Municipal Conservation***

This strategy pro-actively reduces municipal water demands through public education and outreach, inclining rate structure to discourage high water use, a water waste ordinance, a landscape ordinance for new construction, and time of day outdoor watering limits. These efforts are expected to reduce the City of San Angelo's demands by about 2 percent throughout the planning horizon.

### ***Brush Control***

Certain species of brush can drastically reduce the water yield in a watershed. By replacing water intensive brush species with less water intensive native plants, increased runoff to the reservoirs is possible during normal and wet periods. Funding for this type of project may be available through the Water Supply Enhancement Program of the Texas State Soil and Water Conservation Board (TSSWCB), though none was allocated in 2019. The TSSWCB has already completed feasibility studies for the O.C. Fisher, Twin Buttes and Lake

Nasworthy watersheds. To date, nearly half of this land has already been treated for brush. However, in order to continue to realize these water savings, brush must be continually retreated. The reservoir yields shown under subordination include hydrology through the end of 2016. Therefore, all savings gained by previous treatment of brush are shown in the modeled yield of these reservoirs under subordination. However, any future brush treatments could yield small amounts of additional savings. According to the TSSWCB annual reports, on average, about 500 to 3,000 acres of brush per year are treated in this area.

### ***Subordination***

The subordination strategy increases the supply to San Angelo's reservoirs by changing the strict priority modeling assumptions utilized in WAM Run 3 such that downstream senior water right holders do not make priority calls on upstream users in Region F. As discussed previously, supplies from the subordination strategy will be available in most years but may not be reliable

in extreme drought years. Because of this, the supplies from this strategy were limited from what is theoretically available from the subordination model for San Angelo. For the purposes of this plan, the subordination strategy for San Angelo increases the City's surface water system (Twin Buttes, Lake Nasworthy, and O.C. Fisher Reservoirs) supplies increase from 0 acre-feet to 1,670 acre-feet in 2020 and decrease to about 1,200 acre-feet by 2070 due to sedimentation in the reservoirs. The subordination strategy is discussed in detail in Chapter 5C and in Appendix C. Region F recognizes that a subordination agreement is not within the authority of the Regional Water Planning Group. Such an agreement must be developed by the water rights holders themselves, including the City of San Angelo.

### ***Concho River Water Project***

The City of San Angelo recently completed a long-range water supply study which identified the Concho River Water Project as the next major water supply for the City. The project is an indirect reuse project that will provide approximately 8,400 acre-feet of water as municipal supply. The project will release highly treated wastewater into the Concho River where it will be diverted approximately 8 miles downstream and treated for municipal use. The project includes permitting, and water and wastewater treatment plant upgrades. The capital costs associated with these upgrades are estimated at nearly \$117 million.

### ***Hickory Aquifer Well Field Expansion in McCulloch County***

The City of San Angelo operates a well field project in McCulloch County that pumps groundwater from the Hickory aquifer. This project consists of 15 wells and a transmission system that transports water to the City. This system has the capability to pump about 12,000 acre-feet per year (10.8 MGD) and has infrastructure in place to treat 8,960 acre-feet per year (8 MGD). Based on the current treatment capacity, this project can provide up

to 8,960 acre-feet per year according to their agreement with the Hickory Underground Water District and utilizing banked water. Starting in 2026, the City's permitted supply increases to an annual amount of 10,000 acre-feet. The project's permitted supply will reach its ultimate capacity of 12,000 acre-feet by 2036. In order to reach this full capacity, the City will need to add additional wells, increase their radium treatment capacity, and upgrade some pump stations along the pipeline route. No additional pipelines or increases in pipeline capacity are required. The capital costs associated with these upgrades are estimated at \$66 million.

### ***West Texas Water Partnership***

The Cities of Midland, San Angelo, and Abilene formed the West Texas Water Partnership (the Partnership or WTWP) to evaluate long-term water supplies the Partnership could develop jointly. The WTWP recently contracted for groundwater from the Edwards-Trinity Plateau Aquifer in Pecos County (GMA 7). The total contracted supply is 28,400 acre-feet per year (15,000 acre-feet per year to Midland, 5,000 acre-feet per year to San Angelo, and 8,400 acre-feet per year to Abilene). Approximately 12 new groundwater supply wells would be drilled in Pecos County to provide 28,400 acre-feet of supply per year. The groundwater would then be transported by pipeline to Midland and San Angelo. Abilene would exchange its share of groundwater from Pecos County for a portion of Midland's and San Angelo's water from Ivie Reservoir. The Partnership will follow up on initial conversations with the CRMWD to explore necessary methodologies and agreements to implement a cooperative use strategy of the Partnership's collective Ivie supplies. Meetings between the parties are anticipated in the late fall/early winter of 2020/2021. This results in more groundwater going to Midland and San Angelo by the exchanged amounts. Advanced treatment will be required for a portion of the groundwater flow to meet regulatory standards and recovery stages are anticipated to reduce losses to be comparable to conventional water treatment processes.

## 5D.5.2 San Angelo Water Management Plan Summary

### San Angelo Recommended Water Management Strategies

- Municipal Conservation
- Subordination
- Brush Control
- Concho River Water Project (Indirect Reuse)
- Hickory Well Field Expansion in McCulloch County
- West Texas Water Partnership

Table 5D- 17 shows the supply amounts from each strategy and the needs after implementation of the recommended strategies for San Angelo. The costs for each recommended strategy are summarized in Table 5D- 18.

Primary strategies for San Angelo include the Concho River Water Project and expansion of the City's Hickory Well Field. Figure 5D-5 illustrates the recommended water management plan for San Angelo. This plan indicates that the recommended strategies will be able to meet all of San Angelo's projected needs throughout the planning horizon.

**Table 5D-17**  
**Recommended Water Management Strategies for the City of San Angelo**  
-Values are in Acre-Feet per Year-

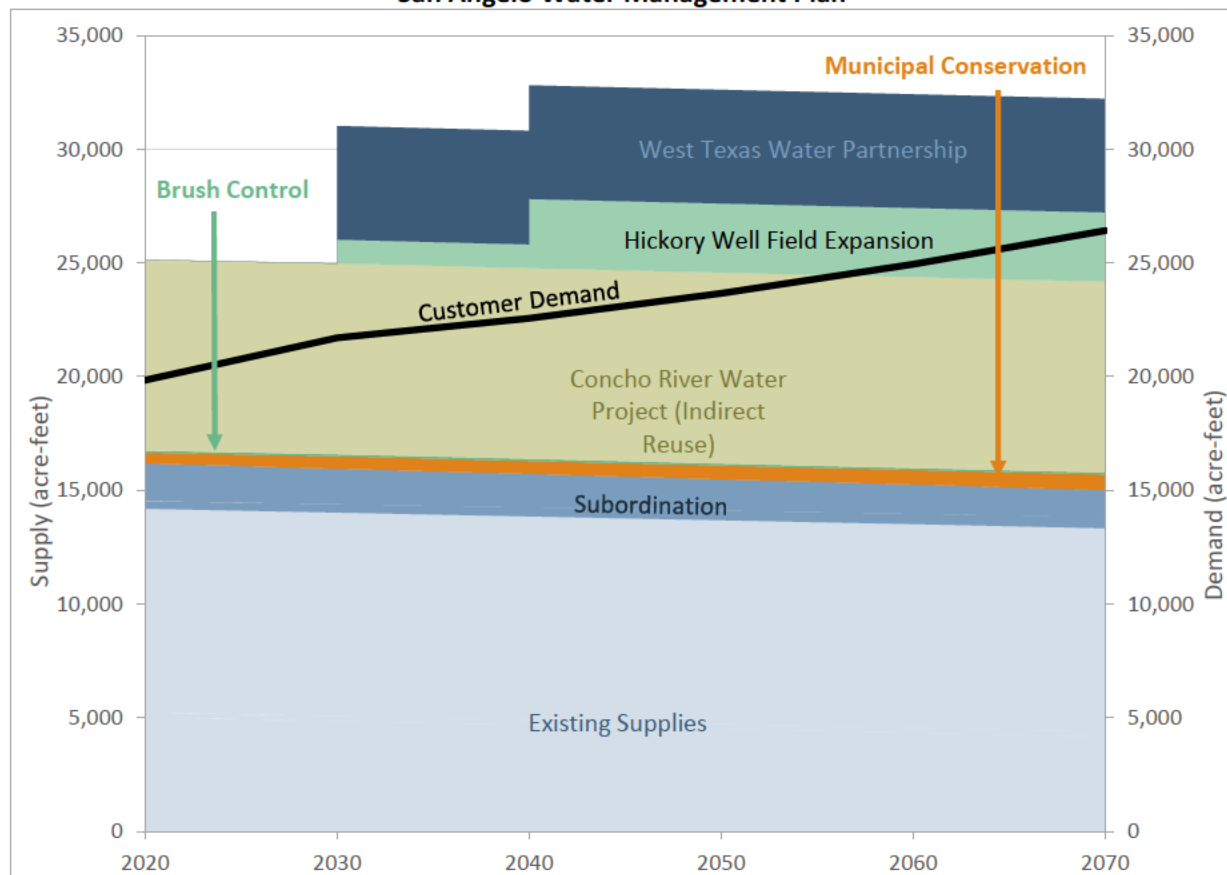
	2020	2030	2040	2050	2060	2070
Surplus (Shortage) before Recommend Strategies	(3,202)	(5,207)	(6,280)	(7,575)	(9,100)	(10,739)
<b>Recommended Strategies</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<i>Subordination - Ivie Contract</i>	329	359	391	421	453	483
<i>Subordination - San Angelo System</i>	1,670	1,575	1,480	1,385	1,290	1,195
<i>Municipal Conservation</i>	467	541	567	602	639	679
Brush Control	90	90	90	90	90	90
Concho River Project (Indirect Reuse)	8,400	8,400	8,400	8,400	8,400	8,400
Hickory Well Field Expansion	0	1,040	3,040	3,040	3,040	3,040
West Texas Water Partnership	0	5,000	5,000	5,000	5,000	5,000
<b>Total Supply from Recommended Strategies</b>	<b>8,490</b>	<b>14,530</b>	<b>16,530</b>	<b>16,530</b>	<b>16,530</b>	<b>16,530</b>
	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<b>Surplus (Shortage) after Recommended Strategies</b>	<b>5,288</b>	<b>9,323</b>	<b>10,250</b>	<b>8,955</b>	<b>7,430</b>	<b>5,791</b>
<i>Management Supply Factor</i>	1.3	1.4	1.5	1.4	1.3	1.2

Strategies in grey italics were included in the previous calculation of surplus (shortages). They are included in this table for completeness but are not included in the total to avoid double counting.

**Table 5D-18**  
**Costs for the Recommended Strategies for the City of San Angelo**

Strategy	Capital Cost (Million \$)	Unit Cost (\$/1,000 gal)	
		With Debt Service	After Debt Service
Municipal Conservation	---	NA	NA
Subordination	---	NA	NA
Brush Control	---	NA	\$1.50
Concho River Water Project	\$117	\$3.84	\$0.83
Hickory Well Field Expansion	\$66	\$7.12	\$3.18
West Texas Water Partnership	\$549.1	\$5.47	\$1.24

**Figure 5D-5  
San Angelo Water Management Plan**



### **San Angelo Alternative Water Management Strategies**

The City of San Angelo is considering additional strategies which may be implemented if additional supplies are needed or if one or more of the recommended strategies is determined to be no longer feasible. Alternative water management strategies for San Angelo include:

- Development of Edwards-Trinity aquifer supplies in Schleicher County
- Development of Pecos Valley and Edwards-Trinity aquifer supplies in Southwest Pecos County
- Desalination of Additional Groundwater Supplies. This was not selected as recommended WMS because there are more cost-effective strategies available to meet San Angelo's needs.
- West Texas Water Partnership (Alternative Version) – This is another possible version of the West Texas Water Partnership strategy where a new pipeline will be built to deliver water to Midland's existing T-bar system only. Under normal operations, all the physical Pecos County groundwater would be supplied to Midland. The Partnership would then develop a cooperative use agreement to make water from the O.H. Ivie reservoir available to the other two cities (5,000 acre-feet per year to San Angelo and 8,400 acre-feet per year to Abilene). If a mutually beneficial cooperative strategy can be developed between the Partnership and the CRMWD, the need for a pipeline between Midland and San Angelo described in the recommended strategy could be eliminated. Meetings between the parties are anticipated in the late fall/early winter of 2020/2021. Details of negotiations between parties are beyond the scope of regional water planning and the implementation of the strategy is contingent upon all parties reaching a mutually agreeable solution.

## Response Exhibit 6



June 2, 2023

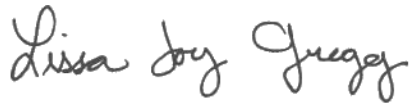
Jason Hill  
Managing Attorney  
J.T. Hill  
3800 North Lamar Boulevard, Suite 200  
Austin, Texas 78756

Re: 2019 San Angelo Water Conservation Plan and Region F

To Whom It May Concern:

I served on the consultant team for the development of the 2021 Region F Water Plan. Upon review of our files, we have a copy of a 2019 San Angelo Water Conservation and Drought Contingency Plan adopted on September 3, 2019, and referenced it during the development of the 2021 Region F Water Plan. This plan was obtained by Region F on or before November 12, 2019.

Sincerely,



Lissa Gregg  
Engineer, Freese and Nichols, Consultant for the Region F Water Planning Group

## Response Exhibit 7



**RESOLUTION 2023-058**

**RESOLUTION OF THE CITY OF SAN ANGELO, TEXAS ADOPTING A SUPPLEMENT TO THE 2019 WATER CONSERVATION**

**WHEREAS**, the City of San Angelo began pursuing the Concho River Water Project in 2020 as part of its continuing efforts to create additional water supplies and to make prudent uses of its current water supplies to meet the growing water needs of the community; and

**WHEREAS**, one component of the Concho River Water Project includes obtaining a water use permit that will allow the City to divert water that is created by the project so that the City can treat it for additional beneficial use by the City's water customers; and

**WHEREAS**, the City has submitted an application to the Texas Commission on Environmental Quality to secure the needed water use permit; and

**WHEREAS**, Title 30, Chapter 288, of the Texas Administrative Code requires the City to document its analysis of additional water supply options and demonstrate how the Concho River Water Project complements the City's water conservation goals; and

**WHEREAS**, the City has developed a supplement to its 2019 Water Conservation Plan that reflects how the Concho River Water Project will work in conjunction with, and will strengthen, the City's current and proposed water conservation efforts; and

**WHEREAS**, the City finds that the proposed supplement is a timely and important demonstration of the City's commitment to the prudent uses of its water supplies and its efforts to consider a variety of alternative water supply options, as well as a reflection of how the Concho River Water Project will complement the City's water conservation efforts.

**NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF SAN ANGELO, TEXAS THAT:**

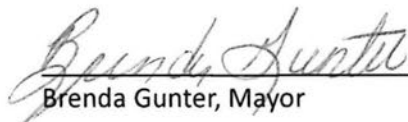
That the "City of San Angelo 2019 Water Conservation Plan Supplement" as proposed be adopted and incorporated for all purposes into the 2019 Water Conservation Plan.

**ADOPTED this the 6<sup>th</sup> day of June 2023.**

**THE CITY OF SAN ANGELO, TEXAS:**

**ATTEST:**

  
Heather Stastny, City Clerk

  
Brenda Gunter, Mayor

**APPROVED AS TO FORM:**

  
Theresa James, City Attorney

## **City of San Angelo 2019 Water Conservation Plan Supplement**

Long-term regional water supply planning efforts indicate that San Angelo will experience a water supply deficit beginning in 2030 that is projected to grow through 2070. As part of its commitment to ensure adequate water supplies for future generations, the City of San Angelo commissioned a broad-based evaluation of feasible water supply options for potential incorporation into the City's existing water supply portfolio. This significant effort led to the creation of the City of San Angelo Water Supply Engineering Feasibility Study. The study was completed in October 2018.

The Water Supply Engineering Feasibility Study identified the leading option for the City's next water supply—the Concho River Project. The Concho River Project involves the beneficial reuse of flows discharged at the City's proposed new outfall on the Concho River from what will be an upgraded wastewater treatment plant. After being treated, the water will be transported using the bed and banks of the Concho River to a downstream diversion point. From there, the water will be piped to the City's water treatment plant, where it will be treated to drinking water standards. This indirect reuse plan will rely on treated effluent that will have never been discharged into the Concho River prior to this effort.

This supplement to the 2019 City of San Angelo Water Conservation Plan was developed to document the City of San Angelo's additional efforts to conserve and reuse its water resources—particularly through development of the City's Concho River Project.

### **Consistency With Water Conservation Plan Goals and Objectives**

The Concho River Project supports the City's proposed use of water with consideration of the goals and objectives of the Water Conservation Plan by stretching its current and future water supplies through reuse. The use of the diverted flows will be a continuation of the City's beneficial use and consumption of its existing supplies. The plan to apply this water to the currently authorized beneficial use is the product of reasonable diligence on the City's part, and it is an additional reflection of the City's commitment to conserve and maximize the beneficial use of its water supplies without waste.

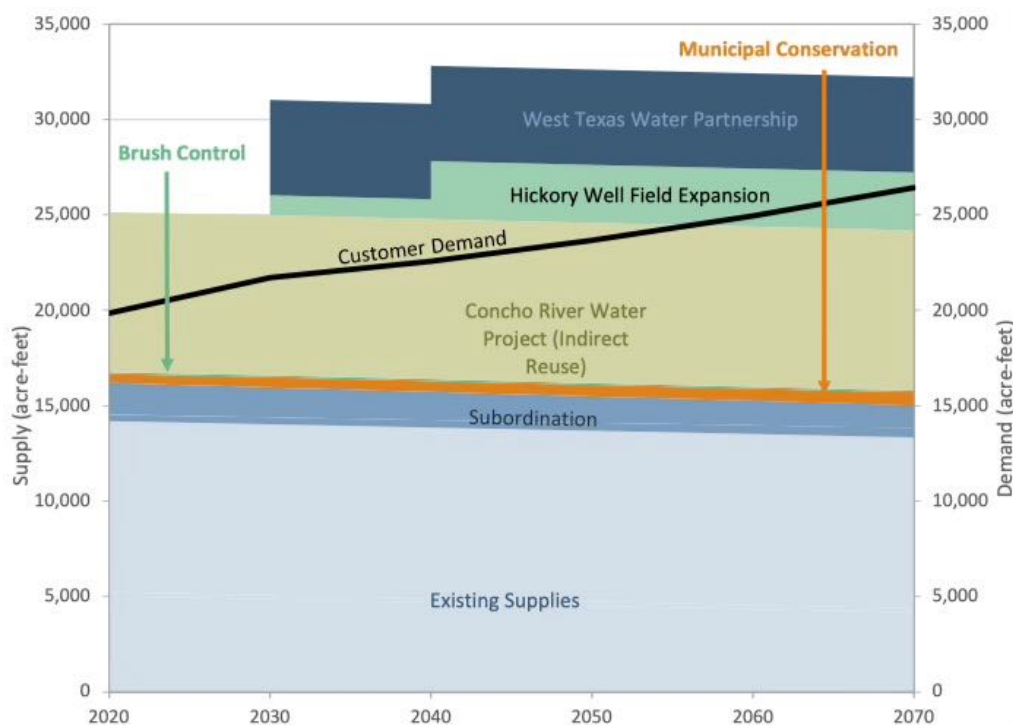
The Concho River Project is an effort to extend San Angelo's current surface water and groundwater supplies. It will do so by adding a reliable source that will help meet water needs for decades to come. The Concho River Project will complement the City's efforts to reach the five-year and 10-year goals of the Water Conservation Plan.

### **Conservation Alternatives**

The Concho River Project works in conjunction with the City's existing robust water conservation efforts outlined in the Water Conservation Plan. As noted in the approved 2021 Region F Water Plan, the City of San Angelo's water conservation strategy is a proactive effort to reduce water demands "through public education and outreach,

inclining rate structure to discourage high water use, a water waste ordinance, a landscape ordinance for new construction, and time of day outdoor watering limits.” These conservation efforts have led to a low gallons-per-capita-per-day water use average for City water customers. Municipal conservation as a demand-reduction tool has been, and continues to be, a recommended and implemented water management strategy for San Angelo.

Even when including the City’s comprehensive five-year and 10-year water conservation goals and strategies, however, the City is still projected to experience a water supply deficit by 2030. The graphic below illustrates the significant need for the Concho River Project even when considering water conservation. (2021 Region F Water Plan 5D-25)

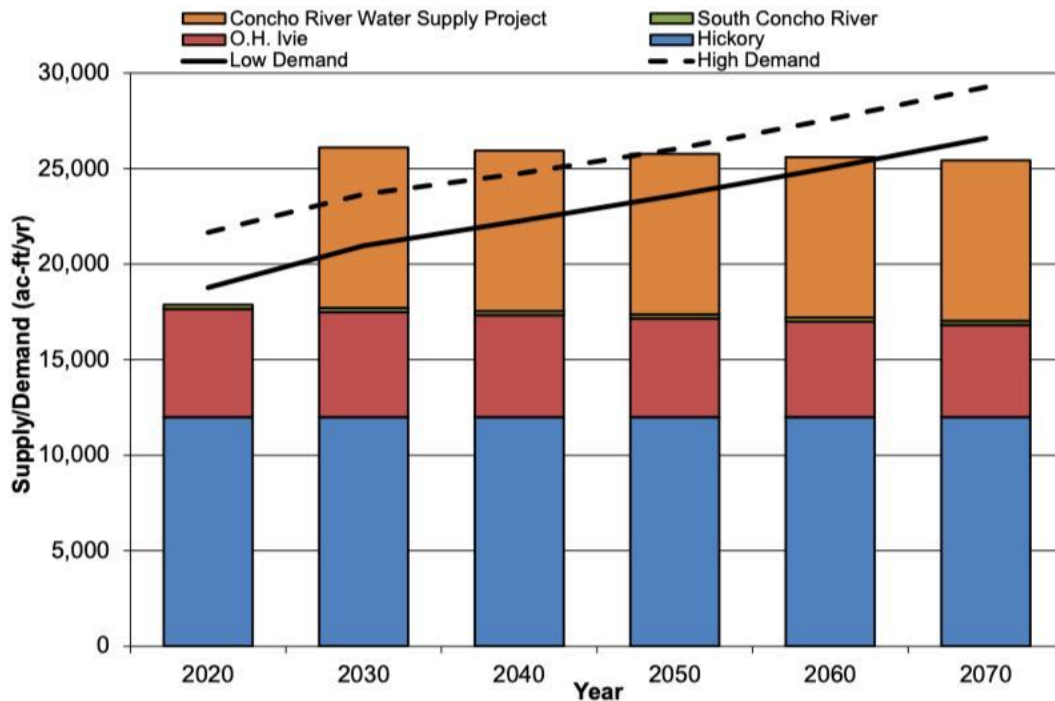


While an important component of the City’s water supply portfolio, the anticipated two-percent demand reduction from water conservation will not offset the significant water demand increases over the regional water planning horizon. Conservation—in the context of consumption-reduction measures—is not a feasible alternative on its own to the Concho River Project.

However, the Concho River Project will improve the efficiency in the use of the City’s water supplies and will by its nature increase the recycling and reuse of water so that the City’s existing water supplies will be made available for future uses. The Concho River Project is by definition a water conservation project.

### Other feasible alternatives

Before recommending the Concho River Project, engineers and City staff studied 24 possible water supply alternatives. Those included six groundwater strategies, three purchased water strategies, eight water reuse strategies, and seven miscellaneous strategies. The analysis team concluded that the Concho River Project would be a reliable and cost-effective source that will produce water at an affordable cost with a relatively quick delivery potential and low environmental impact. The project will produce about 7.5 million gallons per day when completed. By comparison, the Hickory Aquifer is currently capable of producing eight million gallons per day, although that is being expanded to 12 MGD.



The Region F Regional Water Planning Group recognized the feasibility of the Concho River Project and included it as a recommended strategy in the approved 2021 Region F Water Plan. The recommendation followed the planning group's comprehensive analysis of existing and proposed water supply strategies for the City of San Angelo, including multiple supply alternatives, as shown in the tables below. (2021 Region F Water Plan 5D-24)

**Recommended Water Management Strategies for the City of San Angelo**

-Values are in Acre-Feet per Year-

	2020	2030	2040	2050	2060	2070
Surplus (Shortage) before Recommend Strategies	(3,202)	(5,207)	(6,280)	(7,575)	(9,100)	(10,739)
<b>Recommended Strategies</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<i>Subordination - Ivie Contract</i>	329	359	391	421	453	483
<i>Subordination - San Angelo System</i>	1,670	1,575	1,480	1,385	1,290	1,195
<i>Municipal Conservation</i>	467	541	567	602	639	679
Brush Control	90	90	90	90	90	90
Concho River Project (Indirect Reuse)	8,400	8,400	8,400	8,400	8,400	8,400
Hickory Well Field Expansion	0	1,040	3,040	3,040	3,040	3,040
West Texas Water Partnership	0	5,000	5,000	5,000	5,000	5,000
<b>Total Supply from Recommended Strategies</b>	<b>8,490</b>	<b>14,530</b>	<b>16,530</b>	<b>16,530</b>	<b>16,530</b>	<b>16,530</b>
	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<b>Surplus (Shortage) after Recommended Strategies</b>	<b>5,288</b>	<b>9,323</b>	<b>10,250</b>	<b>8,955</b>	<b>7,430</b>	<b>5,791</b>
<i>Management Supply Factor</i>	1.3	1.4	1.5	1.4	1.3	1.2

*Strategies in grey italics were included in the previous calculation of surplus (shortages). They are included in this table for completeness but are not included in the total to avoid double counting.*

**Costs for the Recommended Strategies for the City of San Angelo**

Strategy	Capital Cost (Million \$)	Unit Cost (\$/1,000 gal)	
		With Debt Service	After Debt Service
Municipal Conservation	---	NA	NA
Subordination	---	NA	NA
Brush Control	---	NA	\$1.50
Concho River Water Project	\$117	\$3.84	\$0.83
Hickory Well Field Expansion	\$66	\$7.12	\$3.18
West Texas Water Partnership	\$549.1	\$5.47	\$1.24

The approved 2021 Region F Water Plan Recommended Water Management Strategies for San Angelo include:

- Municipal conservation
- Subordination
- Brush control
- *Concho River Water Project*
- Hickory wellfield expansion
- West Texas Water Partnership (Pecos County groundwater supply)

In addition, the approved 2021 Region F Water Plan identifies several alternative management strategies for San Angelo. These are alternatives that the planning group determined could be developed in the future to further compliment the City's recommended strategies, or that can serve as alternatives in the event one or more recommended strategies becomes infeasible. These include Edwards-Trinity aquifer supply development in Schleicher County, Pecos Valley and Edwards-Trinity aquifer supplies in Southwest Pecos County, desalination of Additional Groundwater Supplies, and West Texas Water Partnership/Pecos County wellfield (alternative delivery option).

**City of San Angelo**

**WRPERM No. 13741**

June 8, 2023

*Reuse Accounting Plan for Conveyance and Diversion of San Angelo's Treated  
Wastewater Effluent on the Concho River*

Contact

Mr. Chris Kozlowski

(512) 239-1801

## Sarah Henderson

---

**From:** Sarah Henderson  
**Sent:** Friday, May 26, 2023 5:22 PM  
**To:** 'Jason Hill'  
**Subject:** RE: City of San Angelo Application No. 13741 for a Water Use Permit  
**Attachments:** City of San Angelo\_13741\_Tech RFI\_Extension Response\_26May2023.pdf

Jason,  
Please find the attached response to your extension request.  
Have a nice weekend,  
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

---

**From:** Jason Hill <[REDACTED]>  
**Sent:** Thursday, May 25, 2023 4:59 PM  
**To:** Sarah Henderson <sarah.henderson@tceq.texas.gov>  
**Cc:** Kathy Alexander <kathy.alexander@tceq.texas.gov>; Brooke McGregor <brooke.mcgregor@tceq.texas.gov>  
**Subject:** City of San Angelo Application No. 13741 for a Water Use Permit

Sarah, the City has compiled most of the information you requested in your April 28 request for information. However, one component of the response requires the City Council review and approval. Unfortunately, the item did not make the most recent council agenda. It will be set for agenda on the City's next regular meeting date, which is currently scheduled for June 6.

To make sure that you get the best available information in response to your RFI, I am requesting that the City be given until June 9, 2023, to submit its response. If you need any additional information from me to consider this request for an extension to respond, please let me know at your earliest convenience.

Thank you.

**Jason Hill**  
ATTORNEY



3800 North Lamar Blvd., Suite 200



Jon Niermann, *Chairman*  
Emily Lindley, *Commissioner*  
Bobby Janecka, *Commissioner*  
Erin E. Chancellor, *Interim Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

May 26, 2023

Mr. Jason Hill  
J.T. Hill PLLC  
3800 North Lamar Blvd., Suite 200  
Austin, Texas 78756

VIA E-MAIL

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 Limited Mailed Notice  
Concho River, Colorado River Basin  
Tom Green County

Dear Mr. Hill:

This acknowledges the request, on May 25, 2023, for an extension of time to respond to the Texas Commission on Environmental Quality request for additional information letter dated April 28, 2023.

An extension is granted until June 9, 2023, and after that date the application may be returned pursuant to Title 30 Texas Administrative Code § 281.19. No further extensions will be granted associated with this request for information.

If you have any questions concerning this matter, please contact Ms. Sarah Henderson at [sarah.henderson@tceq.texas.gov](mailto:sarah.henderson@tceq.texas.gov) or by telephone at (512) 239-2535.

Sincerely,

A handwritten signature in black ink, appearing to read "B. Galvan".

Bert Galvan, Manager  
Water Rights Permitting and Availability Section  
Water Availability Division

BG/sh

cc: Mr. Shane Kelton, City of San Angelo



## Sarah Henderson

---

**From:** Jason Hill [REDACTED]  
**Sent:** Thursday, May 25, 2023 4:59 PM  
**To:** Sarah Henderson  
**Cc:** Kathy Alexander; Brooke McGregor  
**Subject:** City of San Angelo Application No. 13741 for a Water Use Permit

Sarah, the City has compiled most of the information you requested in your April 28 request for information. However, one component of the response requires the City Council review and approval. Unfortunately, the item did not make the most recent council agenda. It will be set for agenda on the City's next regular meeting date, which is currently scheduled for June 6.

To make sure that you get the best available information in response to your RFI, I am requesting that the City be given until June 9, 2023, to submit its response. If you need any additional information from me to consider this request for an extension to respond, please let me know at your earliest convenience.

Thank you.

**Jason Hill**  
ATTORNEY



3800 North Lamar Blvd., Suite 200  
Austin, Texas 78756  
[REDACTED] | (512) 806-1060

## Sarah Henderson

---

**From:** Sarah Henderson  
**Sent:** Friday, April 28, 2023 5:31 PM  
**To:** [REDACTED]  
**Subject:** City of San Angelo Water Use Permit No. 13741 - Request for Information  
**Attachments:** City of San Angelo\_13741\_Tech RFI\_28Apr2023.pdf

Mr. Kelton,  
Please find the attached letter requesting additional information.  
A response is requested by May 29, 2023.

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

Jon Niermann, *Chairman*  
Emily Lindley, *Commissioner*  
Bobby Janecka, *Commissioner*  
Erin E. Chancellor, *Interim Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

April 28, 2023

Mr. Shane Kelton  
Executive Director of Public Works  
City of San Angelo  
301 W. Beauregard Avenue  
San Angelo, Texas 76903

**VIA E-MAIL**

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 Limited Mailed Notice  
Concho River, Colorado River Basin  
Tom Green County

Dear Mr. Kelton:

Additional information is required to complete technical review.

1. Submit a revised *City of San Angelo Water Rights Accounting Plan* that incorporates this application, or a new stand-alone accounting plan for this application, that would demonstrate how the City would ensure compliance with the terms and conditions of any permit granted for this application. The accounting plan must account for, at minimum, discharged return flows, channel losses, travel time (if applicable) and the amount of return flows available for diversion at the requested diversion point.
2. Confirm the latitude and longitude of the requested diversion point in decimal degrees, to at least six decimal places. Staff notes that the latitude and longitude coordinates provided in the application are not consistent with the map.
3. Provide a copy of Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0010641003.
4. Provide additional information concerning the submitted water conservation and drought contingency plans.
  - a. Documentation of coordination with the regional water planning group for the applicant's service area in order to ensure consistency with the appropriate approved regional water plan(s).

- b. Data and information to comply with Title 30 Texas Administrative Code (TAC) § 288.7 that:
  - i. supports the applicant's proposed use of water with consideration of the water conservation goals of the water conservation plan,
  - ii. evaluates conservation as an alternative to the proposed appropriation; and
  - iii. evaluates any other feasible alternative to new water development.

The information requested is considered essential by the Executive Director to make recommendations to the Commission on whether the application can be granted. Please provide the requested information by May 29, 2023 or the application may be returned pursuant to Title 30 TAC § 281.19. Alternatively, you may have the question of the necessity of the requested data (or the sufficiency of the information already submitted) referred to the Commission for a decision. To be considered, a request for a referral must be provided by May 29, 2023.

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

Sincerely,

*Sarah Henderson*

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

## Sarah Henderson

---

**From:** Jason Hill [REDACTED] >  
**Sent:** Thursday, April 6, 2023 10:41 AM  
**To:** Sarah Henderson  
**Cc:** Kathy Alexander; Kelton, Shane  
**Subject:** City of San Angelo Application No. 13741 for a Water Use Permit

Sarah, the POC for the city on this application is now Shane Kelton, City of San Angelo Executive Director of Public Works. He can be reached at 301 W. Beauregard Ave., San Angelo, Texas 76903; (325) 657-4206. I've copied Shane on this email as well.

Let me know if there's anything we can do for you.

Many thanks,

Jason

Jason Hill  
Attorney

JT HILL  
Land | Water | Law  
[www.jthill.com](http://www.jthill.com)  
(512) 806-1060

## Sarah Henderson

---

**From:** Sarah Henderson  
**Sent:** Tuesday, April 6, 2021 9:43 AM  
**To:** Strube, Allison  
**Subject:** RE: City of San Angelo WRPERM No. 13741  
**Attachments:** SanAngelo\_13741\_Correction\_ADC\_Letter\_6April2021.pdf

Ms. Strube,  
Per your request and for your records, please find the attached correction letter.

The address listed in the letter is the address provided in the original application. If incorrect, please let me know.

Feel free to contact me if I can be of any further assistance.

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

---

**From:** Strube, Allison <[REDACTED]>  
**Sent:** Monday, April 5, 2021 1:15 PM  
**To:** Sarah Henderson <sarah.henderson@tceq.texas.gov>  
**Subject:** RE: City of San Angelo WRPERM No. 13741

Good Afternoon Sarah,

Thank you for sending. Please note that I did not receive this letter either electronically or by mail. Can you please confirm that my email and mailing addresses are updated for this permit?

Also, do you believe it would be possible to get a revised administratively complete letter noting the change to "Concho River, Colorado River Basin"? I want to make sure it is all as it should be as we move through this process.

Thank you,

**Allison Strube, PE**  
**Director of Water Utilities**  
**City of San Angelo, Texas**  
(325) 657-4209 (w)  
[www.cosatx.us](http://www.cosatx.us)



---

**From:** Sarah Henderson <[sarah.henderson@tceq.texas.gov](mailto:sarah.henderson@tceq.texas.gov)>  
**Sent:** Wednesday, March 31, 2021 12:17 PM

**To:** Strube, Allison [REDACTED]  
**Subject:** RE: City of San Angelo WRPERM No. 13741

**CAUTION: This email was received from an EXTERNAL source, use caution when clicking links or opening attachments.**

Ms. Strube,

Thank you for your email.

The referenced application was administratively complete as of December 30, 2020 (attached) and is currently in technical review.

Please note the heading mistakenly refers to the Concho River Basin and has since been corrected in the file to reflect the Colorado River Basin.

Feel free to contact me with any further 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

---

**From:** Strube, Allison <[REDACTED]>  
**Sent:** Tuesday, March 30, 2021 7:04 PM  
**To:** Sarah Henderson <[sarah.henderson@tceq.texas.gov](mailto:sarah.henderson@tceq.texas.gov)>  
**Subject:** RE: City of San Angelo WRPERM No. 13741

Good Evening Sarah,

I wanted to follow up regarding the Administrative Complete document regarding the subject permit. My understanding was that once payment was received as discussed below, the City of San Angelo would be deemed Administrative Complete on this matter. Can you please provide an update?

**Allison Strube, PE**  
**Director of Water Utilities**

---

**From:** Sarah Henderson <[sarah.henderson@tceq.texas.gov](mailto:sarah.henderson@tceq.texas.gov)>  
**Sent:** Wednesday, December 9, 2020 8:56 AM  
**To:** Strube, Allison <[REDACTED]>  
**Subject:** RE: City of San Angelo WRPERM No. 13741

**CAUTION: This email was received from an EXTERNAL source, use caution when clicking links or opening attachments.**

Ms. Strube,

You can mail the check to:

Texas Commission on Environmental Quality  
Attn: Ms. Sarah Henderson  
P.O. Box 13087/MC-160  
Austin, TX 78711-3087

OR

Texas Commission on Environmental Quality  
Cashiers Office  
P.O. Box 13087/MC-214  
Austin, TX 78711-3087

Please reference Water Use Permit No. 13741/City of San Angelo

Thank you,  
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

---

**From:** Strube, Allison <[REDACTED]>  
**Sent:** Wednesday, December 9, 2020 8:36 AM  
**To:** Sarah Henderson <[sarah.henderson@tceq.texas.gov](mailto:sarah.henderson@tceq.texas.gov)>  
**Subject:** RE: City of San Angelo WRPERM No. 13741

Sarah,

We are placing the attached check in the mail today via FedEx. Can you please provide me the physical address for sending as it was not stated in the letter?

Thank you,

**Allison Strube, PE**  
**Director of Water Utilities**

---

**From:** Sarah Henderson <[sarah.henderson@tceq.texas.gov](mailto:sarah.henderson@tceq.texas.gov)>  
**Sent:** Friday, November 20, 2020 5:11 PM  
**To:** Strube, Allison <[REDACTED]>  
**Subject:** City of San Angelo WRPERM No. 13741

**CAUTION: This email was received from an EXTERNAL source, use caution when clicking links or opening attachments.**



Ms. Strube,

Please find the attached request regarding the referenced water use permit application. 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

This message (including any attachments) is intended only for the use of the individual or entity to which it is addressed and may contain information that is non-public, proprietary, privileged, confidential, and may constitute attorney work product or be exempt from disclosure under one or more of the following sections of the Texas Public Information Act: SECS. 552.101, 552.103 or 552.107. If you are not the intended recipient, you are hereby notified that any use, dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, notify us immediately by telephone and (i) destroy this message if a facsimile or (ii) delete this message immediately if this is an electronic communication. Thank you.

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you are hereby notified that any use, dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, notify us immediately by telephone and (i) destroy this message if a facsimile or (ii) delete this message immediately if this is an electronic communication. Thank you.

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Jon Niermann, *Chairman*  
Emily Lindley, *Commissioner*  
Bobby Janecka, *Commissioner*  
Toby Baker, *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

April 6, 2021

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, Colorado River Basin  
Tom Green County

Dear Ms. Strube:

The referenced application was declared administratively complete and filed with the Office of the Chief Clerk; however, the letter to the City of San Angelo stating as such, dated December 30, 2020, inadvertently referenced the Concho River, Concho River Basin in the heading. The heading has been corrected to reference the Concho River, Colorado River Basin and was filed with the Office of the Chief Clerk on January 22, 2021. The original administrative complete date of December 30, 2020 remains unchanged.

If you have any questions concerning this matter please contact me via email at [sarah.henderson@tceq.texas.gov](mailto: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

# 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    ☒ YES    ☐ NO

Jon Niermann, *Chairman*  
Emily Lindley, *Commissioner*  
Bobby Janecka, *Commissioner*  
Toby Baker, *Executive Director*



## 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](mailto: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



16-DEC-20 04:15 PM

TCEQ - A/R RECEIPT REPORT BY ACCOUNT NUMBER

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

S. Henderson

RECEIVED

DEC 16 2020

Water Availability Division



16-DEC-20 04:15 PM

TCEQ - A/R RECEIPT REPORT BY ACCOUNT NUMBER

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

Total (Fee Code): -\$14,301.50

Grand Total: -\$31,986.56

S. Henderson

RECEIVED

DEC 16 2020

Water Availability Division

**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



Jon Niermann, *Chairman*  
Emily Lindley, *Commissioner*  
Bobby Janecka, *Commissioner*  
Toby Baker, *Executive Director*



## 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 *
<u>Notice Fee (270 WR holders x \$0.94)</u>	<u>\$ 253.80</u>
<b>Total Fees</b>	<b>\$ 14,667.80</b>
<b><u>Fees Received</u></b>	<b><u>\$ 112.50</u></b>
<b>Fees Due</b>	<b>\$ 14,555.30</b>

\*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](mailto: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



20-OCT-20 11:48 AM

TCEQ - A/R RECEIPT REPORT BY ACCOUNT NUMBER

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

RECEIVED  
OCT 21 2020  
Water Availability Division



20-OCT-20 11:48 AM

TCEQ - A/R RECEIPT REPORT BY ACCOUNT NUMBER

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

RECEIVED  
OCT 21 2020  
Water Availability Division

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.

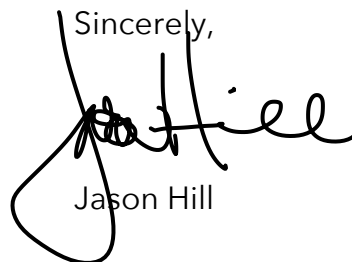
The City's drinking water sources, and therefore its resulting wastewater effluent, may at any time be comprised of varying percentages of groundwater and

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 **Administrative Information Report**  
N Additional Co-Applicant Information  
N Additional Co-Applicant Signature Pages  
Y Written Evidence of Signature Authority  
Y **Technical Information Report**  
Y USGS Map (or equivalent)  
Y Map Showing Project Details  
Y Original Photographs  
N Water Availability Analysis  
Y **Worksheet 1.0**  
N Recorded Deeds for Irrigated Land  
N Consent For Irrigation Land  
N **Worksheet 1.1**  
N Addendum to Worksheet 1.1  
Y **Worksheet 1.2**  
N Addendum to Worksheet 1.2  
N **Worksheet 2.0**  
N Additional W.S 2.0 for Each Reservoir  
N Dam Safety Documents  
N Notice(s) to Governing Bodies  
N Recorded Deeds for Inundated Land  
N Consent For Inundation Land

Y/N

Y **Worksheet 3.0**  
N Additional W.S 3.0 for each Point  
Y Recorded Deeds for Diversion Points  
Y Consent For Diversion Access  
Y **Worksheet 4.0**  
N TPDES Permit(s)  
Y WWTP Discharge Data  
N 24-hour Pump Test  
N Groundwater Well Permit  
N Signed Water Supply Contract  
Y **Worksheet 4.1**  
Y **Worksheet 5.0**  
N Addendum to Worksheet 5.0  
Y **Worksheet 6.0**  
Y Water Conservation Plan(s)  
Y Drought Contingency Plan(s)  
Y Documentation of Adoption  
Y **Worksheet 7.0**  
N Accounting Plan  
Y **Worksheet 8.0**  
Y Fees

#### 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 \*

☒ 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:

<input type="checkbox"/> Individual	<input type="checkbox"/> Sole Proprietorship-D.B.A.
<input type="checkbox"/> Partnership	<input type="checkbox"/> Corporation
<input type="checkbox"/> Trust	<input type="checkbox"/> Estate
<input type="checkbox"/> Federal Government	<input type="checkbox"/> State Government
<input type="checkbox"/> County Government	<input checked="" type="checkbox"/> City Government
<input type="checkbox"/> Other Government	<input type="checkbox"/> 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**

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**

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**

- 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**

## 6. SIGNATURE PAGE (Instructions, Page. 11)

Applicant:

I, Daniel Valenzuela

(Typed or printed name)

City Manager

(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: \_\_\_\_\_



(Use blue ink)

Date: \_\_\_\_\_

October 14, 2020

Subscribed and Sworn to before me by the said

on this 14<sup>th</sup> day of October, 2020.

My commission expires on the 2<sup>nd</sup> day of October, 2022.

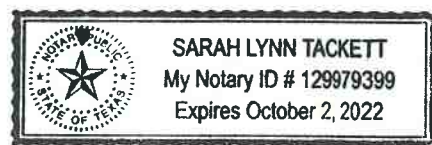


Notary Public

Tom Green

County, Texas

[SEAL]



***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**



## 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:

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

**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:
- 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.
  - 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.***

- Submit Worksheet 1.1, Interbasin Transfers, for any request to change the place of use which moves State Water to another river basin.
- See Worksheet 1.2, Marshall Criteria, and submit if required.
- 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	
<b>x</b>	From an on-channel reservoir	<b>Existing</b>
	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/gwdbbrpt.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.

☒ 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

☒ Perennial - normally flowing

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

☒ 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

☒ 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?

- ☒ 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](mailto: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 <b>Amount (\$)</b> . 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, <b>excluding Irrigation Use</b> . 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**

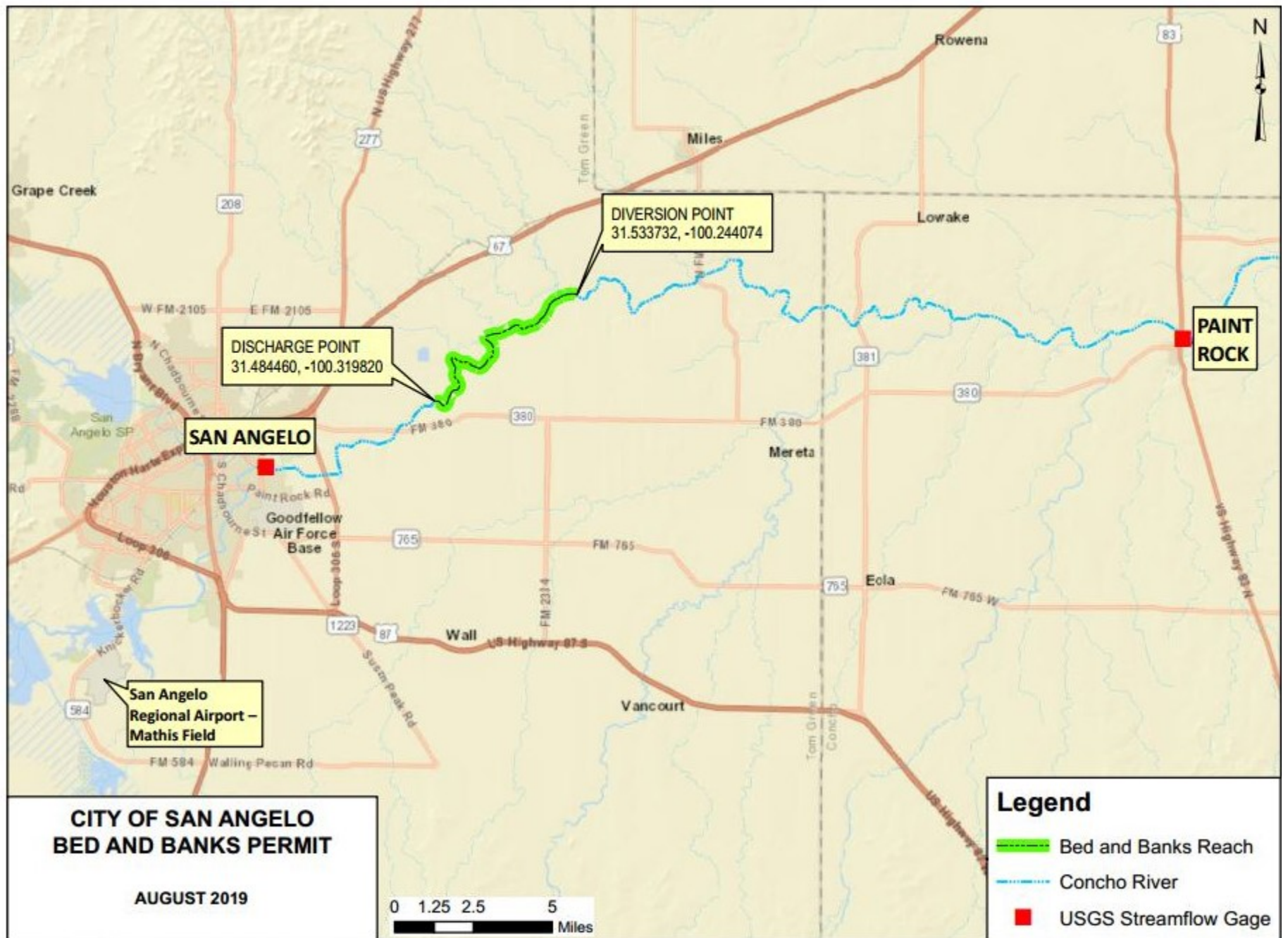
	Description	Amount (\$)
Filing Fee	Amendment: \$100	
	<b>OR</b> Sever and Combine: \$100 x _____ of water rights to combine	
Recording Fee		\$12.50
Mailed Notice	Additional notice fee to be determined once application is submitted.	
TOTAL INCLUDED		\$

### 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		<b>\$112.50</b>

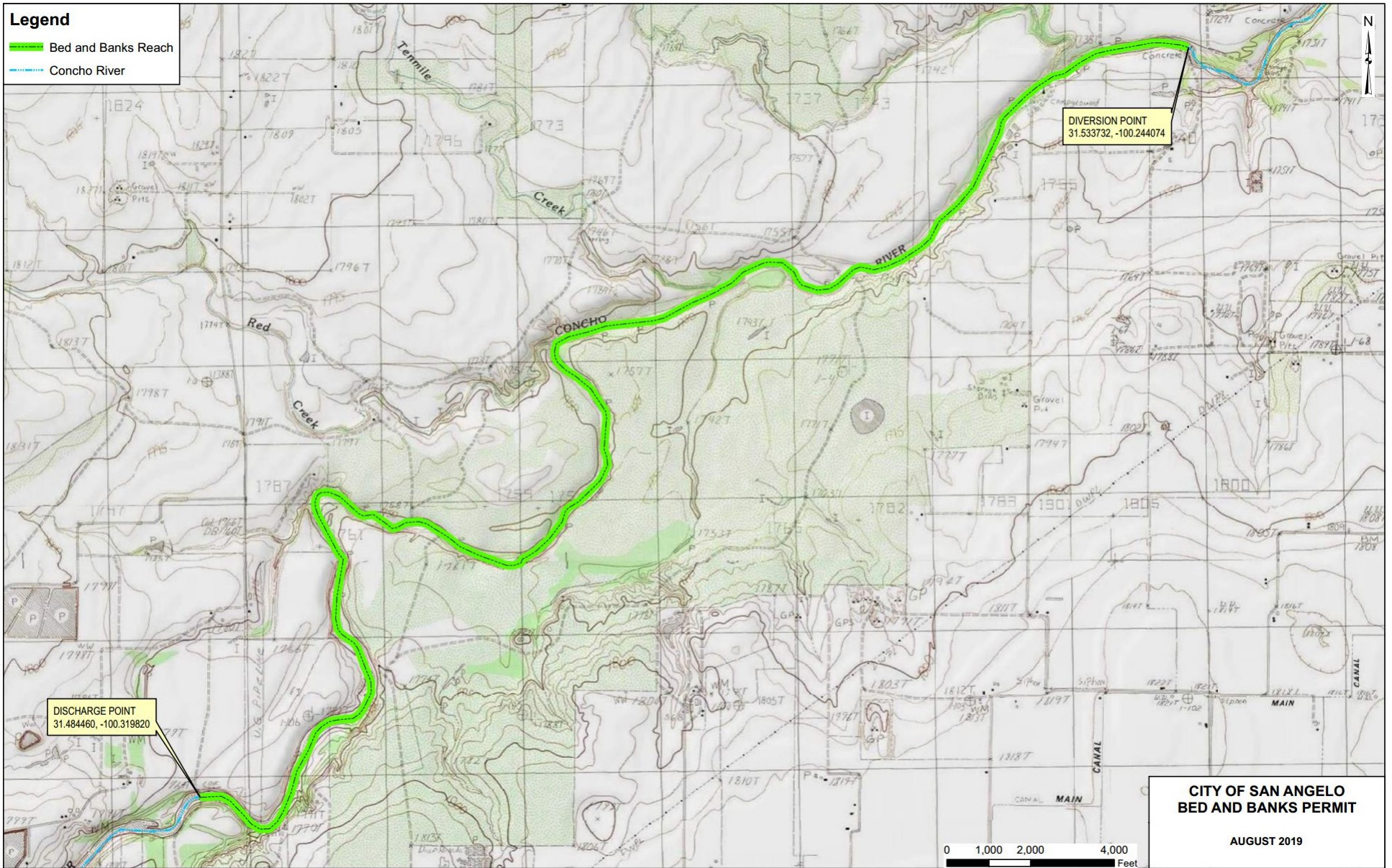
## **APPENDIX C**

### **Maps**



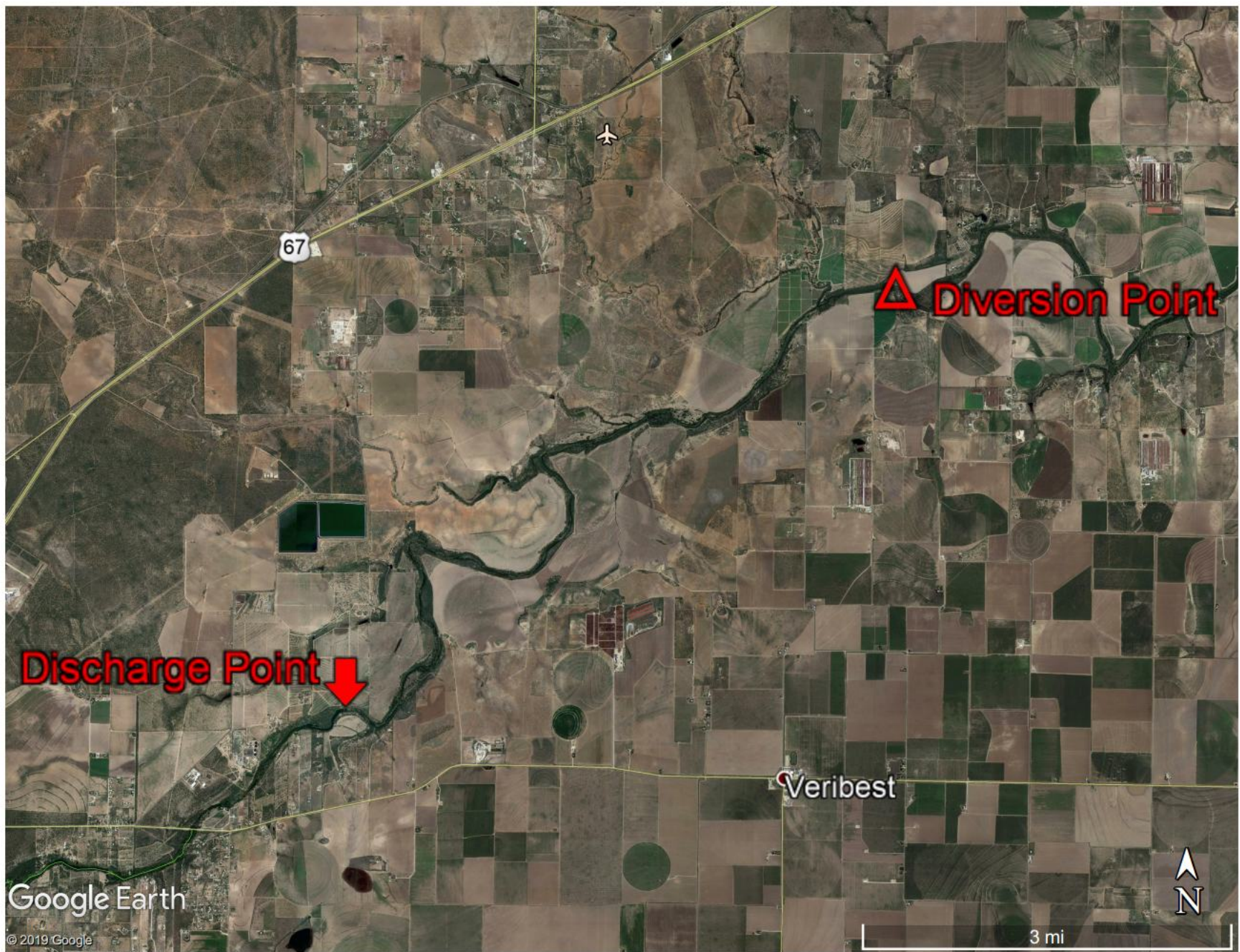
**Map 1 – General Location Map Showing Bed and Banks Conveyance Reach of Concho River**





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





Map 3 – Aerial View of Bed and Banks Conveyance Reach





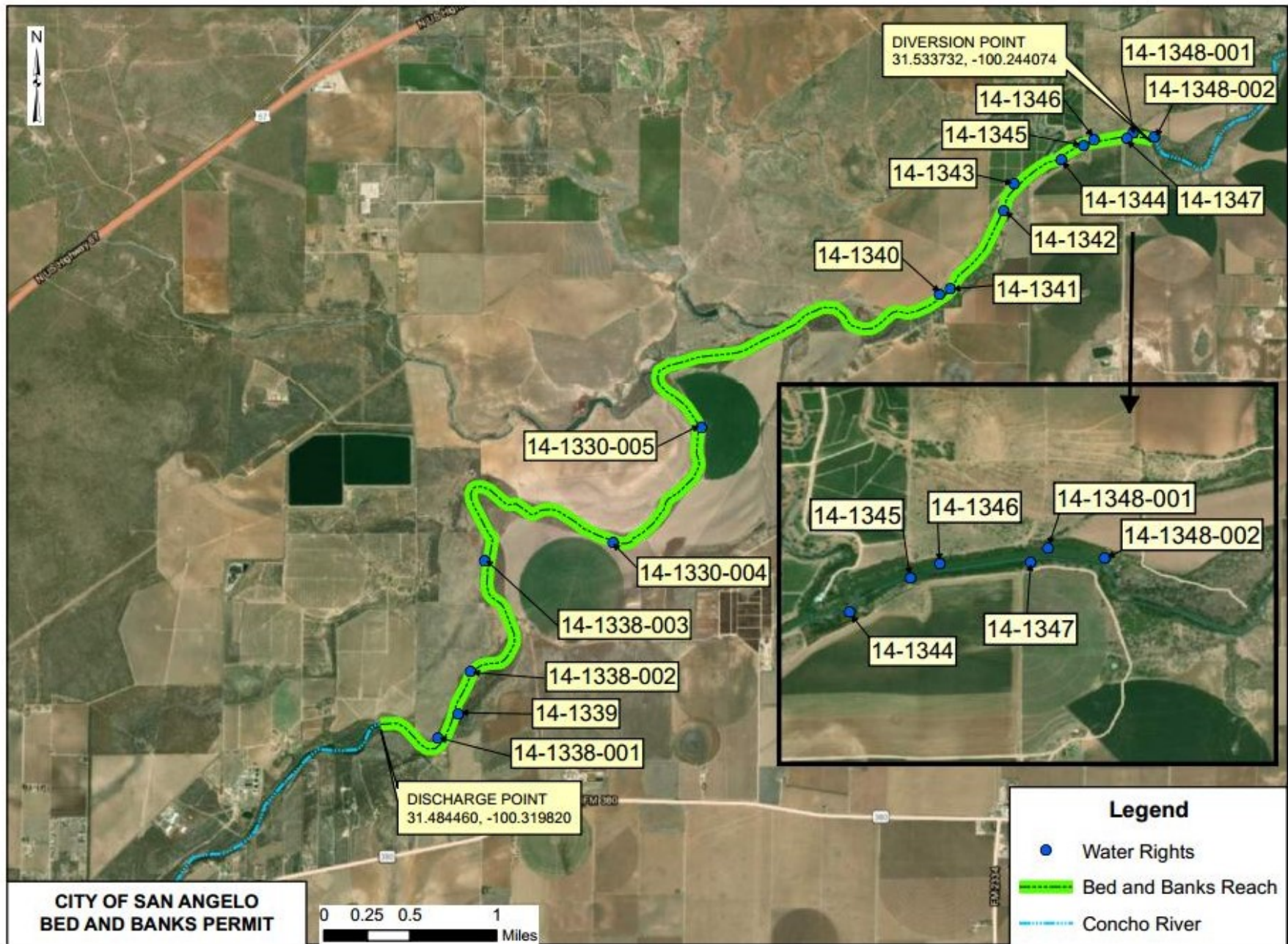
**Map 4 – Discharge Point at Upstream End of Bed and Banks Conveyance Reach**





**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.

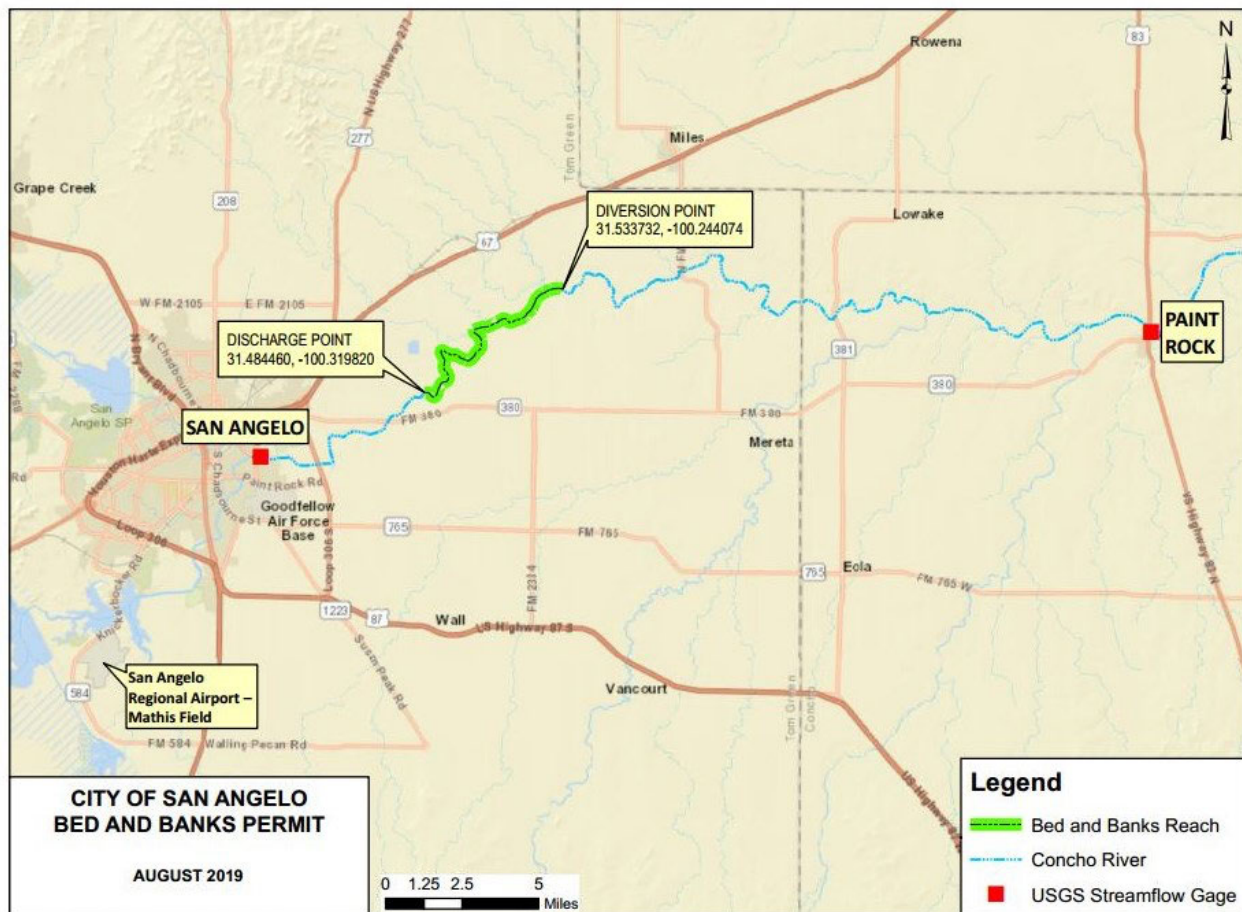


Figure 1 General Location Map for City of San Angelo Reuse Project



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**

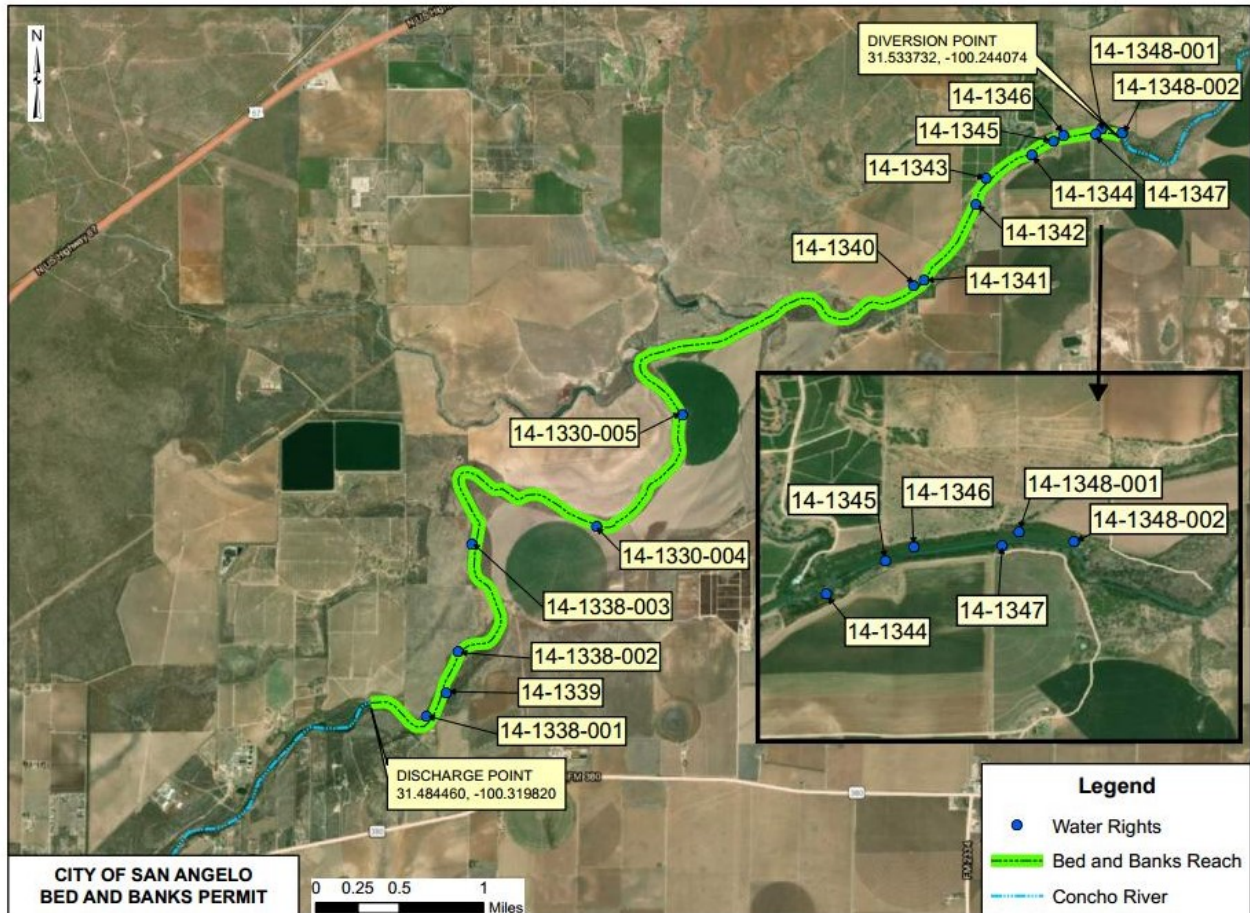
The discharge point at the upper end of the proposed conveyance reach of the Concho River is located approximately 5.4 river miles downstream from Loop 306 on the east side of San Angelo. It is immediately below an existing dam authorized under Certificate of Adjudication No. 14-1337 that is owned by 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<sup>1</sup>. 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:

$$\text{GAIN/LOSS} = \text{PAINT ROCK FLOW} + \text{TOTAL DIVERSIONS} - \text{SAN ANGELO FLOW}$$

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

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<sup>1</sup> 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)	<b>RAINFALL CRITERIA (Inches)</b>								
(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)	<b>RESULTS</b>								
(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

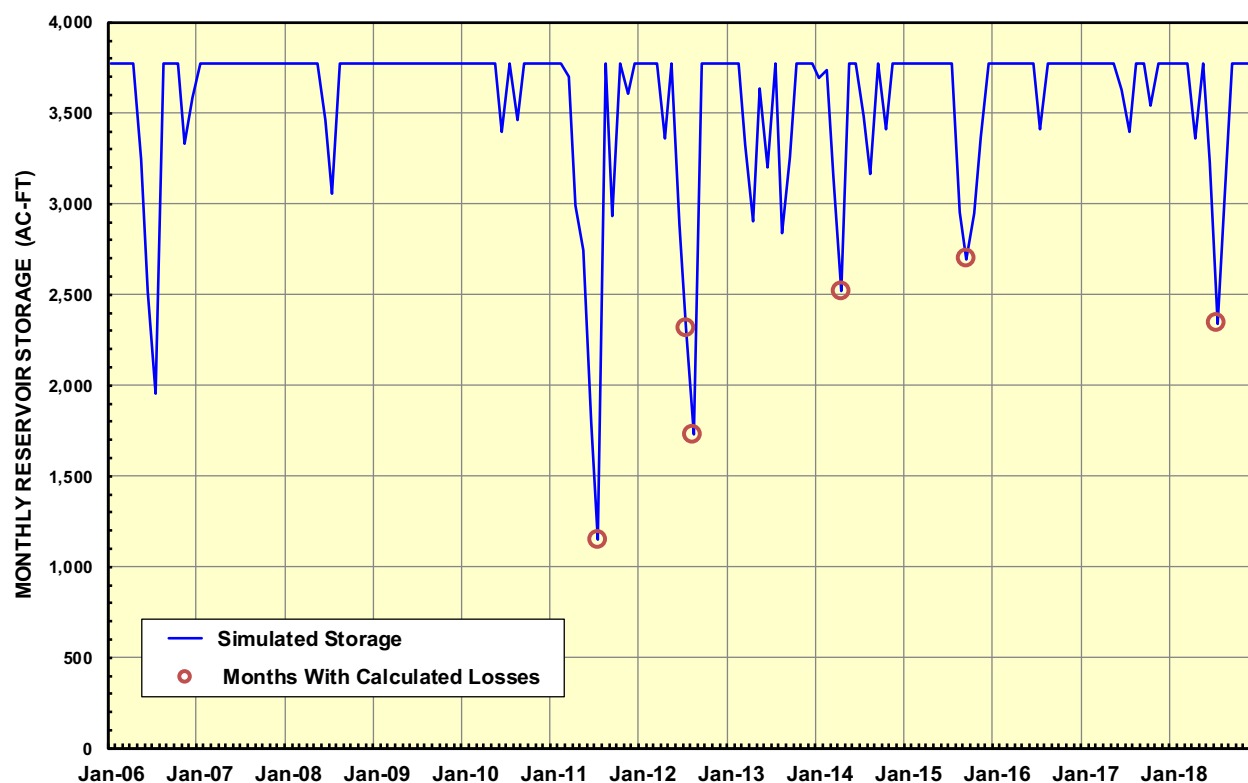
The percentage loss values in Row 9 of Table 3 are all considered to be relatively high with respect to what would normally be considered typical natural percentage losses for alluvial channel streams similar to this segment of the Concho River. For this reason, further investigations of the circumstances 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

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CITY OF SAN ANGELO WATER UTILITIES

SEPTEMBER 3, 2019



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

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## 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

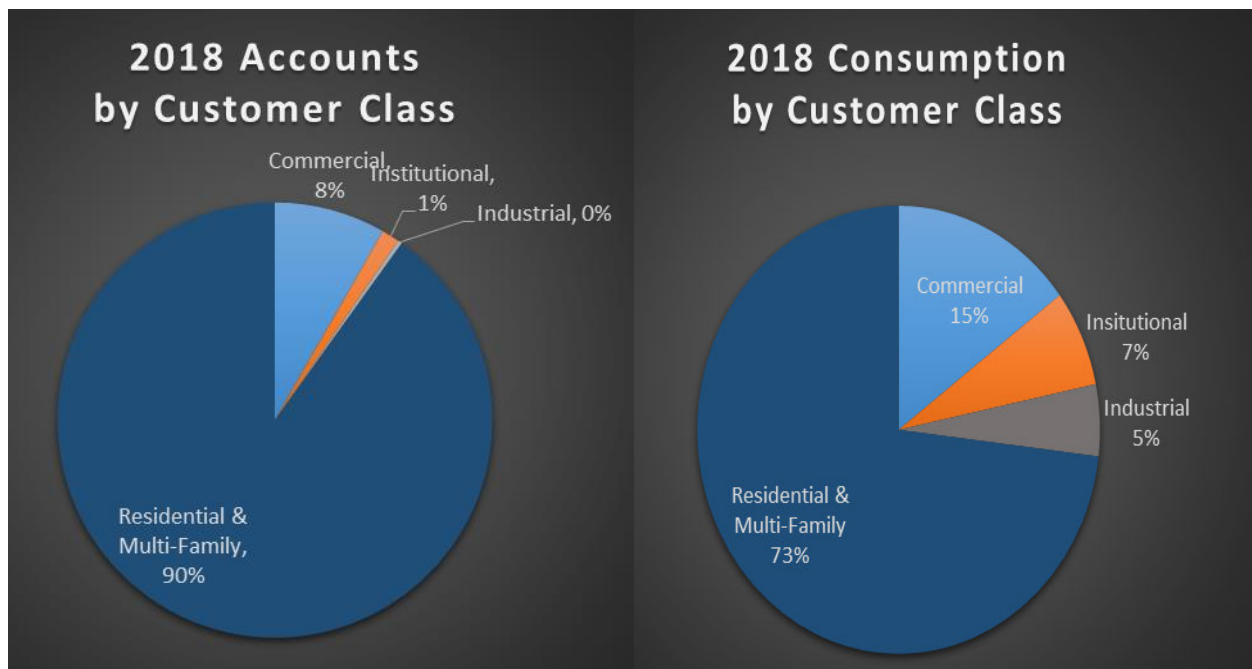
Water consumption in the City of San Angelo is driven by a wide variety of domestic, commercial, industrial, and institutional needs. With more than 35,000 accounts, the City is responsible for addressing a wide variety of factors that influence water availability and demand.

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
<b>Total</b>	<b>3,368,185</b>	<b>3,378,329</b>	<b>3,690,436</b>	<b>3,592,861</b>



## B. Accounts by Customer Class

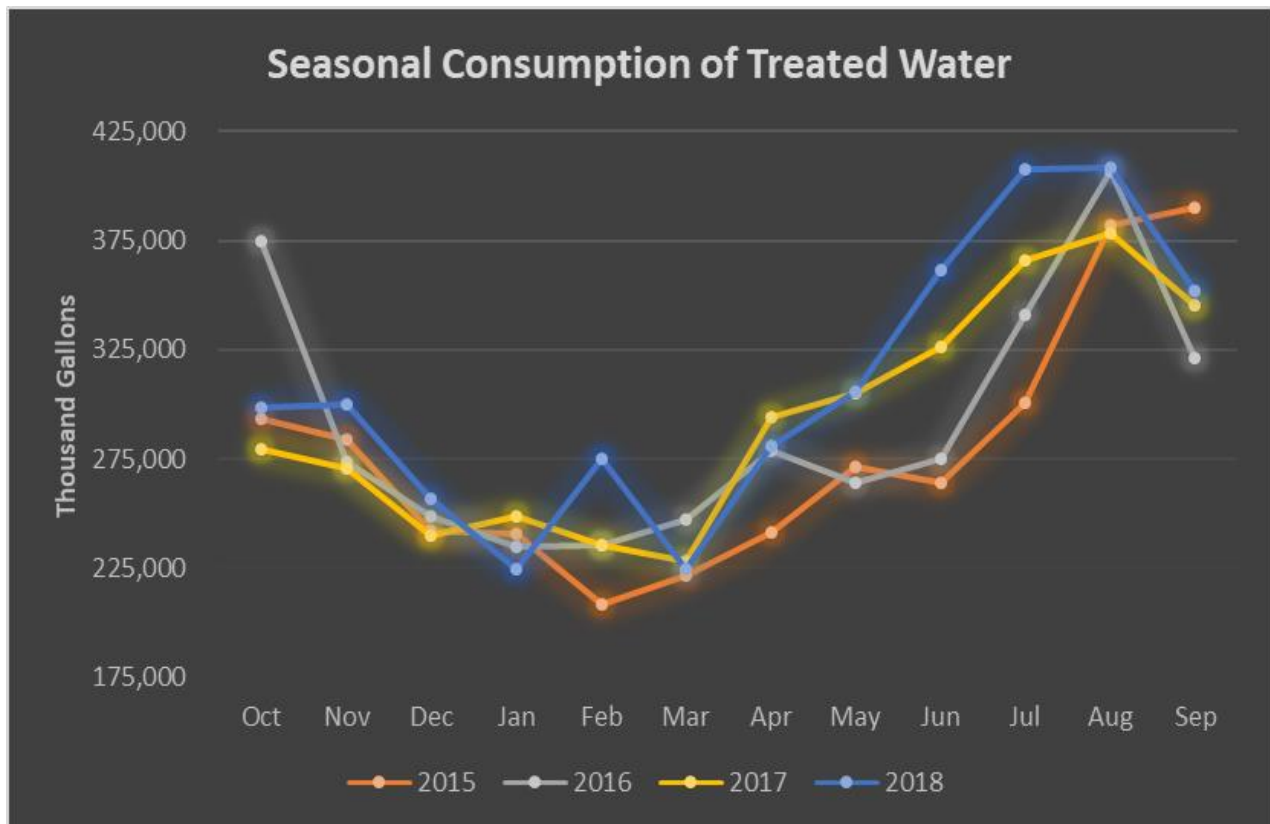
In 2018, residential and multi-family accounts made up 90 percent of all accounts, commercial made up 8 percent, institutional 1 percent, and industrial less than 1 percent.

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

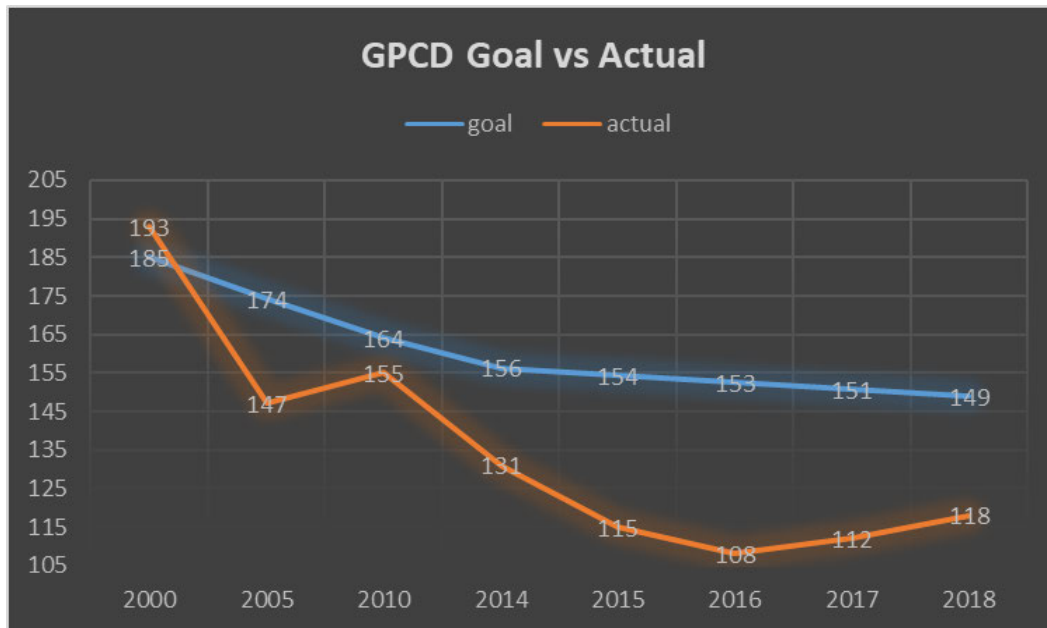
The City of San Angelo's Water Conservation Plan is focused on two efficiency goals. The first and most immediate goal is to reduce summertime peak pumping. The second goal is to reduce overall per capita consumption by 1.2 percent per year starting from the City's 2000 consumption of 185 gallons per 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 4<sup>th</sup> and 5<sup>th</sup> 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.

## Evaluation of HET Distribution Program

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<sup>3</sup> 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

## 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

## 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
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Attached file(s):

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

## 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

## 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	



## 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.

## 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 %
<b>Total</b>	<b>34,907</b>	<b>100.00 %</b>

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

## 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

## 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
<b>Total</b>	<b>3,580,050,000</b>	<b>3,585,827,000</b>	<b>3,393,565,000</b>	<b>3,417,893,000</b>	<b>3,573,299,000</b>

## 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
<b>Total</b>	<b>4,584,392,000</b>	<b>4,404,703,000</b>	<b>4,333,820,000</b>	<b>4,736,452,000</b>	<b>4,659,230,000</b>

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



## 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 %

## 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 %
<b>Total</b>	<b>30,899</b>	<b>0</b>	<b>30,899</b>	<b>100.00 %</b>

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

## 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
<b>Total</b>	<b>3,055,902,000</b>	<b>2,780,677,000</b>	<b>2,999,403,000</b>	<b>3,118,543,000</b>	<b>3,011,587,000</b>

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	
<b>Total</b>	<b>3,055,902,000</b>



## UTILITY PROFILE FOR RETAIL WATER SUPPLIER

### C. Wastewater System Data Comment

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

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*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 10<sup>th</sup> day of September, 2019.

**THE CITY OF SAN ANGELO**  
  
**JULIA ANTILLEY, CITY CLERK**

## ARTICLE 11.05 - WATER CONSERVATION AND DROUGHT CONTINGENCY PLAN<sup>[9]</sup>

Footnotes:

--- (9) ---

**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
5/8"	\$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
5/8"	\$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.
- *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 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 <u>2024</u>	10-yr Goal for year <u>2029</u>
Total GPCD <sup>1</sup>	116	118	138	130
Residential GPCD <sup>2</sup>	68	69	68	65
Water Loss (GPCD) <sup>3</sup>	10	15	13	10
Water Loss (Percentage) <sup>4</sup>	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*

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

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CITY OF SAN ANGELO WATER UTILITIES

SEPTEMBER 3, 2019



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

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# 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**

Official Minute Record  
August 4, 2020

Volume 2020  
Page 386

**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

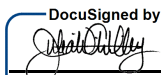
**WHEREAS**, the City Council of the City of San Angelo intends to grant Daniel Valenzuela, as the City Manager of the City of San Angelo, full authority to sign all documents and take all such other necessary action related to water rights permitting and other water use permitting and permitting amendments, 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:**

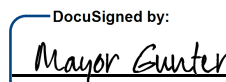
That Daniel Valenzuela, as the City Manager for the City of San Angelo, is delegated full authority to sign all documents and take all such other necessary action related to water rights permitting and other water use permitting and permitting amendments, as well as all other regulatory matters involving 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 4<sup>th</sup> day of August, 2020.**


**ATTEST:**

DocuSigned by:  
  
Julia Antiney, City Clerk

**THE CITY OF SAN ANGELO, TEXAS:**

DocuSigned by:  
  
Brenda Gunter, Mayor

**APPROVED AS TO FORM:**

DocuSigned by:  
  
Theresa James, City Attorney

**ATTACHMENT 2**

**February 10, 2005 Special Warranty Deed**

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 1/2, 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 1/2, 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.

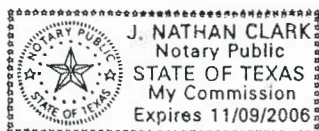
In this deed, "including" means "including, without limitation."

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)



Nathan Clark  
Notary Public, State of Texas  
F:\WP\CLIENTS\7715.sjf\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;



EXHIBIT A

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



EXHIBIT A

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.

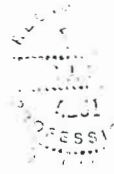
Thence with the North line of said "330.7 Ac." tract and near the center of Douglas Loop, S.89°18'19"E. 1726.93 feet to the place of beginning and containing 310.12 acres of land including 0.87 acre in Douglas Loop.

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

Page 3 of 3

Exhibit A

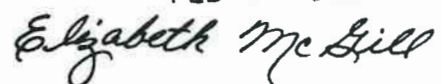
FILED FOR RECORD  
2005 FEB 14 PM 1:04  
ELIZABETH MCGILL  
COUNTY CLERK  
COUNTY OF TOM GREEN, TEXAS

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 and entered into as of the 1st day of SEPTEMBER, 1985, between the COLORADO RIVER MUNICIPAL WATER DISTRICT (hereinafter called "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 "District Act"), pursuant to Article XVI, Section 59, of the Constitution of the State of Texas and the CITY OF SAN ANGELO, TEXAS (hereinafter called "City") a political subdivision of the State of Texas in Tom Green County, Texas, operating under 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 the Texas Department of Water Resources, an application for a permit to construct a dam and reservoir on the Colorado River and impound water behind said dam in Coleman, Concho, and Runnels Counties, Texas, said reservoir being commonly referred 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 construction 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 of 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, restraint of government and people, civil disturbances, explosions, breakage or accidents to machinery, pipelines or canals, partial or entire failure of water supply, or on account of any other causes not reasonably within the control of the party claiming such inability.

Section 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.

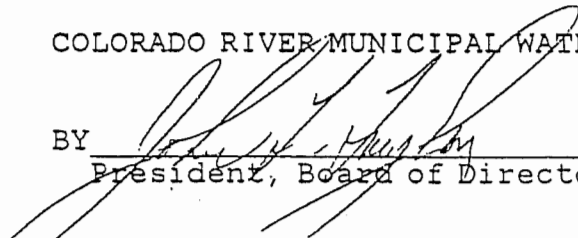
Section 17. VENUE.

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.

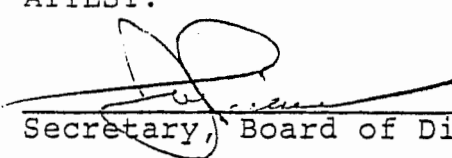
IN WITNESS WHEREOF, the parties hereto acting under authority of their respective governing bodies have caused this Contract to be duly executed in several counterparts, each of which shall constitute an original, all as of the day and year first above written, which is the date of this Contract.

COLORADO RIVER MUNICIPAL WATER DISTRICT

BY

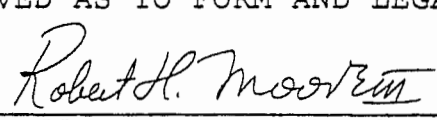
  
President, Board of Directors

ATTEST:

  
Secretary, Board of Directors

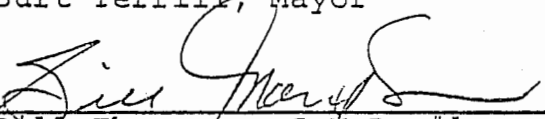
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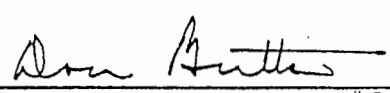
APPROVED AS TO FORM AND LEGALITY

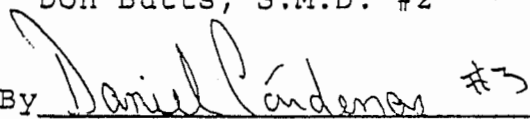
  
ATTORNEYS FOR THE DISTRICT

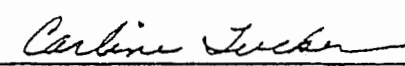
CITY OF SAN ANGELO, TEXAS

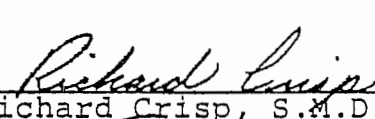
By   
Burt Terrill, Mayor

By   
Bill Thompson, S.M.D. #1

By   
Don Butts, S.M.D. #2

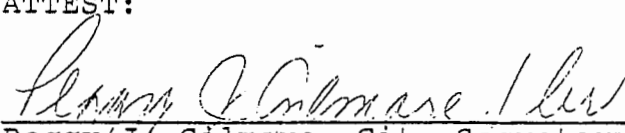
By  #3  
Daniel Cardenas, S.M.D. #3

By   
Carline Tucker, S.M.D. #4

By   
Richard Crisp, S.M.D. #5

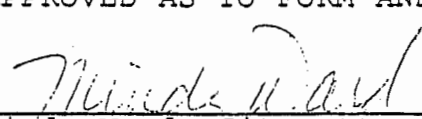
By   
Tim Edwards, S.M.D. #6

ATTEST:

  
Peggy/J. Gilmore, City Secretary

(CITY SEAL)

APPROVED AS TO FORM AND LEGALITY

  
Mindy Ward, City Attorney