NOTICE OF OPEN MEETING

REGIONAL WATER PLANNING GROUP-NETRWPG

Wednesday, October 4, 2023 – 10:00 A.M.

Region 8 Education Service Center
4845 US 271 N
Pittsburg, TX 75686

In compliance with the Texas Open Meetings Act, Chapter 551, of the Texas Government Code, the Regional Water Planning Group D issues this public notice. On October 4, 2023, at 10:00 A.M., the North East Texas Regional Water Planning Group (NETRWPG) will meet in-person. The meeting will be held the Region 8 Education Service Center, 4845 US 271 N, Pittsburg, TX 75686. The NETRWPG will consider and act on the following items:

1. Recognitions. Roll call.
2. Public Comment/participation.
3. Appointment of successor for expiring voting member positions. Terms of each position are for 3 years, commencing on October 1, 2023. Selection process for positions will consider any additional nominations from voting members. Positions to be appointed include positions currently held by Janet McCoy, Donnie Duffie, Allen Beeler, Fred Milton, Russell Acker, George Otstott, Ned Muse, and Harlton Taylor.
4. Discussion and Action as appropriate: Consider appointment of successor to the board member position held by Bob Tardiff. Appointment will be for the remainder of the unexpired term.
5. Review and approval of minutes for July 12, 2023 meeting.
6. Reports from liaisons: TWDB Planner; GMA #8 & #11; Region C & I.
7. Discussion and Action as appropriate: Authorize Riverbend Water Resources District to negotiate and execute all amendments to the TWDB contract for the remainder of this 6th Cycle of Planning to incorporate the full scope of work and total project cost for the 2026 Regional Water Plans.
8. Discussion on possibly offering comments to TWDB on the process of developing municipal population and demand projections.
9. Report and discussion from Region D Technical Consultant providing a summary of the Hydrologic Variance Request for determining water availability for existing sources and water management strategies.
10. Discussion and Action as appropriate: Review, discuss, and consider taking action to authorize the technical consultant to submit a hydrologic variance request to the TWDB on behalf of the NETRWPG consistent with the information provided in this meeting, and approve for the consultant to work with the Chair and Administrator to submit further revisions and make responses to revision requests by TWDB.
11. Report and discussion from Region D Technical Consultant providing a summary of identified Wholesale Water Providers and Major Water Providers, the status of the identification of infeasible strategies, the preliminary process for identifying potentially feasible strategies, and ongoing engagement efforts for the purposes of the 2026 Region D Water Plan.
12. Financial report by Administrator. Approval of invoices of consultant.

13. Discussion and Action as appropriate: Discussion and consider taking action regarding certification of administrative expenses to be submitted to the Texas Water Development Board for reimbursement.
14. Further public comment/participation.
15. Adjourn.

Additional information may be obtained from the Administrative Agency for NETRWPG: Riverbend Water Resources District, 228 Texas Avenue, Suite A, New Boston, Texas 75570; Office Telephone: (903) 831-0091; Office Fax: (903) 831-0096; E-mail: kyledooley@rwrd.org; Website: https://rwrd.org/region-d/; Attn: Kyle Dooley, P.E., Executive Director

MEETING OF THE
North East Texas Regional Water Planning Group
WEDNESDAY, October 4, 2023

Agenda Item 3
Appointment of Successor for Expiring Voting Member Positions

PUBLIC NOTICE FOR EIGHT TERMS STARTING IN OCTOBER OF 2023

Notice is given that the North East Texas Regional Water Planning Group (NETRWPG) is accepting nominations for positions to serve as voting members. Due to the expiring terms of eight positions, appointments will be made for each of the eight terms. State law and the Bylaws of the NETRWPG require diversity in the membership of the NETRWPG. Section 16.053 of the Texas Water Code lists the required interest groups and the requirement that the regional planning groups maintain adequate representation from those interests. Due to existing overlap, members can be selected from any interest group except that a selection must come from each of the following: the electric generating utilities interest group, the small business interest group, and the water utilities interest group. To achieve geographical diversity on a county level, selection for terms starting October of 2023, at least one member must come from the following counties: Rains, Camp, Delta, Marion, Morris, and Upshur. The effort to strive to achieve geographical diversity is found in Article V, Section 4 of the NETRWPG Bylaws. Terms are expiring for positions held by Janet McCoy, Donnie Duffie, Allen Beeler, Fred Milton, Russell Acker, George Otstott, Ned Muse, and Harlton Taylor. In this selection process, NETRWPG will strive to achieve interest group, geographic, ethnic, and gender diversity. To be eligible, a person must be qualified as set forth in the NETRWPG Bylaws. The conditions of membership are set forth in the NETRWPG Bylaws. Term limits are established in the Bylaws. All persons with expiring terms in 2023 are eligible for reappointment. The method for submission of nominations shall be to submit nominations to the principal administrative office of the NETRWPG. The mailing address for such office is Riverbend Water Resources District, 228 Texas Ave. Suite A, New Boston, Texas 75570. The deadline for submission is July 31, 2023.

2023				Term Limited		
Expiring Terms	**Initial Term Began**	**New Electee & Start Date**	**Elected for another term**		**County**	**Interest Group**
Janet McCoy	September-2020			No	Morris	Small Business
Donnie Duffie	September-2020			No	Gregg	Electric Generating
Allen Beeler	September-2020			No	Delta	Environmental
Fred Milton	February-2017			No	Bowie	Water Districts
Russell Acker	September-2017			No	Wood	Counties
George Otstott	*			No	Marion	Water Districts
Ned Muse	September-2017			No	Camp	Municipalities
Harlton Taylor	September-2017			No	Upshur	Water Utilities

* George Otstott replaced Bruce Bradley and is finishing his expiring term. Mr. Otstott is still eligible to serve three full terms.

Nominee	Comment	**Term Number**	**Nominated By**	**County**	**Interest Group**
George Otstott	Reappoint Self (Email 6/20)	1	Self	Marion	Water Districts
Ned Muse	Reappoint Self (Email 6/21)	3	Self	Camp	Municipalities
Russell Acker	Nominated by Wood County Judge and Comm. Court	3	County Judge	Wood	Counties
Greg Carter	Nominated by Donnie Duffie	1	Donnie Duffie	Gregg	Electric Generating
Robert Hurst	Nominated by Delta County Commissioner Court and Judge	1	County Judge	Delta	Counties
Hattie Hackler	Nominated by Richard LeTourneau (Email)	1	Richard LeTourneau	Marion	Agriculture
Janet McCoy	Reappoint Self (Phone Call)	2	Self	Morris	Small Business
Harlton Taylor	Reappoint Self (Phone Call)	3	Self	Upshur	Water Utilities
Fred Milton	Reappoint Self (Phone Call)	3	Self	Bowie	Water Districts

Due to existing overlap, members can be selected from any interest group except that a selection must come from each of the following:
One from the electric generating utilities interest group, the small business interest group, and the water utilities interest group

To achieve geographical diversity on a county level at least one member must come from the following counties:
Rains, Camp, Delta, Marion, Morris, and Upshur

MEETING OF THE
North East Texas Regional Water Planning Group
WEDNESDAY, October 4, 2023

Agenda Item 4
Appointment of Successor to the unexpired term of Voting Member Position

Administrative Summary

At the previous meeting, the board decided to accept the resignation of Bob Tardiff from the board and put out a notice accepting nominations for that position. Staff received one nomination from the City of Lindale. They nominated Cory Moose. This information was forwarded to the Executive Committee for consideration to help with any possible recommendation from the Committee to the full board.

PUBLIC NOTICE

Notice is given that the North East Texas Regional Water Planning Group (NETRWPG) is accepting nominations for a position to serve as a voting member. A vacancy exists due to the resignation of a voting member from Smith County. The voting member was representing the interest group of Agriculture. The position can come from the interest group of Agriculture, but it is not required. In selecting a new voting member, NETRWPG will continue to strive to achieve interest group, geographic, ethnic and gender diversity. To be eligible, a person must be qualified as set forth in the NETRWPG Bylaws. The conditions of membership are set forth in the NETRWPG Bylaws. The method of submission of nominations shall be to submit to the principal administrative office of the NETRWPG. The deadline for submission is August 25, 2023.

The address of such office is: Riverbend Water Resources District
228 Texas Ave, Suite A
New Boston, TX 75570

Northeast Texas Regional Water Planning Group D
Jim Thompson, Chair

June 6, 2023

Dear Mr. Thompson:

I would like to recommend Cory Moose to replace Bob Tardiff as the voting member representing Smith County Municipalities on the NET Regional Water Planning Group D. Cory is the City of Lindale Utility Director and I am confident his experience, education, and training would make him a valuable member of the board. Cory has stated he is willing to serve on the board. I have attached his credentials and professional associations for your consideration.

If I can provide any additional information, please do not hesitate to contact me at 903-882-3422.

Sincerely,

Jeff Daugherty
Mayor
City of Lindale

P.O. Box 130 • Lindale, Texas 75771 • 903-882-3422 • Fax 903-882-4403
www.lindale-tx.gov

MEETING OF THE
North East Texas Regional Water Planning Group
WEDNESDAY, October 4, 2023

Agenda Item 5
July 12, 2023
Meeting Minutes

Minutes of the North East Texas Regional Water Planning Group
July 12, 2023 – 10:00 A.M.

The North East Texas Regional Water Planning Group (NETRWPG) – Region D met in an open meeting on Wednesday, July 12, 2023, at 10:00 A.M. The meeting was held at the Region 8 Education Service Center, 4845 US 271 N, Pittsburg, TX 75686. Notice of the meeting was legally posted.

Jim Thompson called the meeting to order at 10:02 A.M. and welcomed everyone. Introductions were made and a quorum was present. Twenty-two members of the planning group were present in person or represented by a designated alternate.

The following voting members were present:

Russell Acker	David Aikin	Brandon Belcher	John Brooks
Joe Coats	Kevin Chumley	Andy Endsley	Nicolas Fierro
Richard Garza	Cindy Gwinn	Billy Henson	Conrad King
Richard LeTourneau	Janet McCoy	Fred Milton	Ned Muse
Sharron Nabors	George Otstott	Jim Thompson	

The following alternates were present:

Joel Murray	Greg Carter	Cory Moose

The following voting members were absent:

Allen Beeler	Joe Bumgarner	Donnie Duffie	Bob Tardiff
Harlton Taylor			

The public was provided with an opportunity for comment prior to any action being taken by the planning group. There were no public comments at this time.

Fred Milton made a motion to approve the minutes from the March 15, 2023 meeting. Sharron Nabors seconded the motion. Motion carried, all voting aye.

Ron Ellis with the Texas Water Development Board (TWDB) provided an update. The updated plumbing code savings and revised draft demand projections were released on May 5, 2023. The projected revisions deadlines have not changed. The Non-municipal demand revision requests are due 7/14/2023 and Population and Municipal Demand revision requests due 8/11/2023. The population revision summary can be found here: https://www.twdb.texas.gov/waterplanning/data/projections/2027/doc/Summary_PopRevisionRequests.pdf. The Interregional Planning Council met on 11/9/22, 3/9/23, and 5/30/2023. They will meet again on 8/15/23 and 11/30/23. Resources are posted on TWDB IPC web page: http://www.twdb.texas.gov/waterplanning/rwp/ipc/index.asp. Upcoming critical deadlines and upcoming activities, prior to 3/4/2024 technical memo deadline, are to approve projections revision requests, assess availability and supplies, approve and submit hydrologic variance requests, present the process for identifying potentially feasible strategies for the 2026 regional water plan, and identify infeasible strategies and projects from 2021 regional water plan. He also covered bills that passed in the 88th legislative session. House Bill 1565

the TWDB Sunset Bill provides that RWPGs will report on implementation of large projects. They may also plan for conditions worse than the drought of record. These provisions are already in the planning contract. Senate Bill 28 and Senate Joint Resolution 75 with the Texas Water Fund passed. It establishes a $1 billion Texas Water Fund, subject to voter approval, which can provide additional funding for existing TWDB financial assistance programs. Can also fund the New Water Supply for Texas Fund for water supply projects from new sources. At least $250 million of the $1 billion appropriated to the Texas Water Fund must be used for the New Water Supply for Texas Fund. The Texas Water Fund will take effect January 1, 2024, if SJR 75 is approved by the voters. All other provisions of SB 28 take effect September 1, 2023. House Bill 1, the Budget Bill, includes funding for RWPGs. Specific region amounts to be determined and planning contracts amended in Fall 2023. House Bill 4373 and Senate Bill 2108 did not pass. These were identical bills that were Legislative priority bills for TWDB Regional Water Planning. The original bill text would have removed the requirement to place a printed copy of the Initially Prepared Plan (IPP) in each county courthouse and one public library in each county in the planning area. It also would have allowed notice of the IPP hearing to be posted on the planning group's website, instead of published in newspapers. Jim Thompson asked if, with voter approval of Senate Bill 28 that establishes a $1 billion Texas Water Fund, can new reservoirs be built with those funds. Mr. Ellis said that theoretically, they could. Since $250 million of the billion must go towards the new Water for Texas fund, none of that is considered reservoir development. The other $750 million can go through other existing TWDB programs that could theoretically be used for reservoir development. Mr. Thompson asked what kind of process the board needs to go through to have input on how the Texas Water Fund monies are spent. Cindy Gwinn asked what entity requested a Marvin Nichols feasibility study and Mr. Thompson provided that Representative Gary Van Deaver requested it. For more information, please visit the TWDB website and navigate to the 6th planning cycle page. The new webpage can be found here:
https://www.twdb.texas.gov/waterplanning/rwp/planningdocu/2026/index.asp
This page will be updated throughout the cycle with important documents, the working schedule, task organization, newsletters, as well as contract and administrative documents. No action taken.

There were no reports from GMA 8, or GMA 11.

John McFarland, Liaison for Region I, reported that they reviewed general housekeeping policies and reviewed the TWDB projections for non-municipal and agricultural demands. Region I, like Region D, is a large poultry producing area. One of the issues discussed was that the projections are estimated. They are looking into how to get more concrete numbers in the projections for better accuracy.

George Otstott, Liaison for Region C, reported that the Region C board thanked Sharron Nabors for her 15 years of service. They approved the non-municipal use and manufacturing projections. The municipal projections are stunningly high based on the number of people that are flooding into the region.

Jim Thompson provided that Bob Tardiff resigned his position on the Region D Board. Once the resignation is accepted, the bylaws call for opening the position for nominations within

45 days of acceptance and having a deadline for nominations between 30 and 45 days from the date the public notice is posted. Nominations will then be brought back to the Executive Committee and the full voting membership at the next meeting. Mr. Tardiff has officially nominated Cory Moose to replace him on the board. Mr. Moose is the Utilities Director for the City of Lindale. Fred Milton made a motion to accept the resignation of Bob Tardiff and open up the nomination period to appoint a replacement. Cindy Gwinn seconded the motion. Motion carried, all voting aye.

Tony Smith, Carollo Engineers, provided information on ongoing work during the 2026 water planning process. Mr. Smith summarized the budget as well as the calendar and approaching deadlines. He recommends a mixing of differing migration rates at county levels. A 1.0 migration rate accommodates near-term growth for more rapidly growing counties and a 0.5 migration rate avoids over-estimation of long-term decreases in population. There were specific WUGs regarding how they are projecting growth covered in his presentation. A second recommendation by Mr. Smith is the use of the maximum historical GPCD over the 2010-2020 period. This will capture extreme drought conditions observed in the region in the early part of the decade. It reflects a higher per capita usage observed for those WUGs with increasing trends in the region. It utilizes data from TWDB and reported by WUGs. The removal of the subtraction of water efficiency savings due to more efficient plumbing fixtures and appliances from the baseline GPCD is also recommended. After discussion regarding methodology, population projections, water use surveys, and GCPD, Fred Milton made a motion to authorize the technical consultant, Tony Smith, to submit the technical memorandum, populate, and distribute to the TWDB recommended revisions to the draft municipal population and demands for Region D consistent with the information provided in this meeting, and approve for the consultant to work with the Chair and Administrator to submit further revisions and make responses to revision requests by TWDB by August 11, 2023. Greg Carter seconded the motion. Motion carried, all voting aye.

Kyle Dooley presented invoices from Carollo Engineers for payment approval. The invoices are for work spanning from January of 2023 to April of 2023. The total for the four invoices is $37,668.87. Ned Muse made a motion to authorize Kyle Dooley to pay the invoices to Carollo. Sharron Nabors seconded the motion. Motion carried, all voting aye.

The public was provided with a second opportunity to make comments. David Nabors provided that he has heard the east Texas region has lithium in the underground water and asked if anyone has looked into it.

Kyle Dooley asked Tony Smith to provide information on the upcoming deadlines and milestones we need to hit after submitting the technical memo. Mr. Smith provided that we will be looking at sources and water supplies and evaluating infeasible strategies. As part of that we will have to write a hydrologic variance memo for any adjustments we will have to make. There will be new models that will be used. There will be more contact with the WUGs about their supplies. Those milestones need to be hit over the next six months. March 4th is the deadline to submit a technical memorandum discussing findings on infeasible strategies including our methodology for finding the strategies infeasible for this planning cycle. Mr. Dooley provided that there should be 2 meetings between now and March 4th. Mid

to late October for one meeting and as late in February 2024 to give us enough time to make all necessary changes. Expect an email with dates to come soon from Mr. Dooley.

With no further business to discuss, Jim Thompson adjourned the meeting at 11:46 a.m.

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Secretary Date

MEETING OF THE
North East Texas Regional Water Planning Group
WEDNESDAY, October 4, 2023

Agenda Item 6
Reports From Liaisons

Region D TWDB Update 10-4-23

1. Interregional Planning Council update: IPC met on 11/9/22, 3/9/23, 5/30/2023, and 8/15/23. Will meet again on 11/30/23. Resources posted on TWDB IPC web page: http://www.twdb.texas.gov/waterplanning/rwp/ipc/index.asp

2. New One-Pager: *Uncertainty in Regional Water Planning* https://www.twdb.texas.gov/waterplanning/rwp/education/Uncertainty_RegionalWaterPlanning.pdf

3. Upcoming critical deadlines and upcoming activities (prior to 3/4/2024 tech memo deadline):

- Approve projections revision requests
- Assess availability and supplies
- Approve and submit hydrologic variance requests
- Present process for identifying potentially feasible strategies for the 2026 regional water plan
- Identify infeasible strategies and projects from 2021 regional water plan

4. Marvin Nichols Feasibility Review: Request for Information published on 9/29/23; responses requested by 12/1/23. https://www.twdb.texas.gov/waterplanning/rwp/feasibility/index.asp

Identification of Infeasible WMSs in 2021 RWP

Task Background: Texas Water Code, §16.053(h)(10), created by Senate Bill 1511, 85th Legislative Session (2017)

- At a minimum, RWPGs should review the status of recommended strategies and projects with an online decade of **2020 and 2030, involve permitting and/or construction, and are specific major projects (e.g., reservoirs, desal, ASR)** in the 2021 RWPs.
- RWPGs are also encouraged to review additional near-term strategies or projects with lengthy permitting or construction processes.

Infeasible WMSs include those WMSs where proposed sponsors have not taken an affirmative vote or other action to make expenditures necessary to construct or file applications for permits required in connection with implementation of the WMS on a schedule in order for the WMS to be completed by the time the WMS is needed to address drought in the plan.

Determining Feasibility

Affirmative steps by the sponsor may include but are not limited to:

- spending money on the strategy or project (i.e., purchasing land, engineering studies);
- voting to spend money on the strategy or project; and/or
- applying for required federal and/or state permit(s)

for the strategy or project.

Identification of Infeasible WMSs - TO DO

1. Review strategies and projects in the previous RWP; coordinate with project sponsors to determine implementation status and determine infeasibility.

2. Planning groups should review strategies & projects that **require a permit and/or involve construction** and that:

- are shown to be online in **2020** or **2030;**
- are related to new major reservoirs, seawater desalination, DPR, brackish groundwater, ASR, and out of state transfers;
- generally require significant resources and time to implement.

Analysis is ***not*** required for strategies/projects that do not require a permit or involve construction (e.g., conservation, metering).

Identification of Infeasible WMSs - TO DO (Continued)

- **If infeasible WMSs are identified**, a list of the identified infeasible WMSs must be included in the **Technical Memorandum.**
- **If infeasible WMSs are identified**, planning groups ***must amend 2021 plans*** to:
  - Remove an infeasible WMS or WMSP,
  - Revise an infeasible WMS or WMSP to make it feasible (e.g., revise the online decade), and/or
  - Incorporate a new WMS or WMSP to address the identified water need previously met by an infeasible WMS or WMSP that was removed due to infeasibility (or justify municipal unmet need).
- An alternative strategy can be used in place of an infeasible strategy. However, it ***must*** be deemed feasible.

Identification of Infeasible WMSs - TO DO (Continued)

Planning groups are to present the results of their 2021 RWP WMSs/WMSPs infeasibility analysis at the same public meeting where the RWPG also presents methodology for identifying potentially feasible WMSs/WMSPs in their 2026 RWP.

14 Day Public Notice/Comment Period for this is required.

Identification of Infeasible WMSs – Important Deadlines and Deliverables

- Analysis must be completed prior to **March 4, 2024**

  (Technical Memorandum due date)

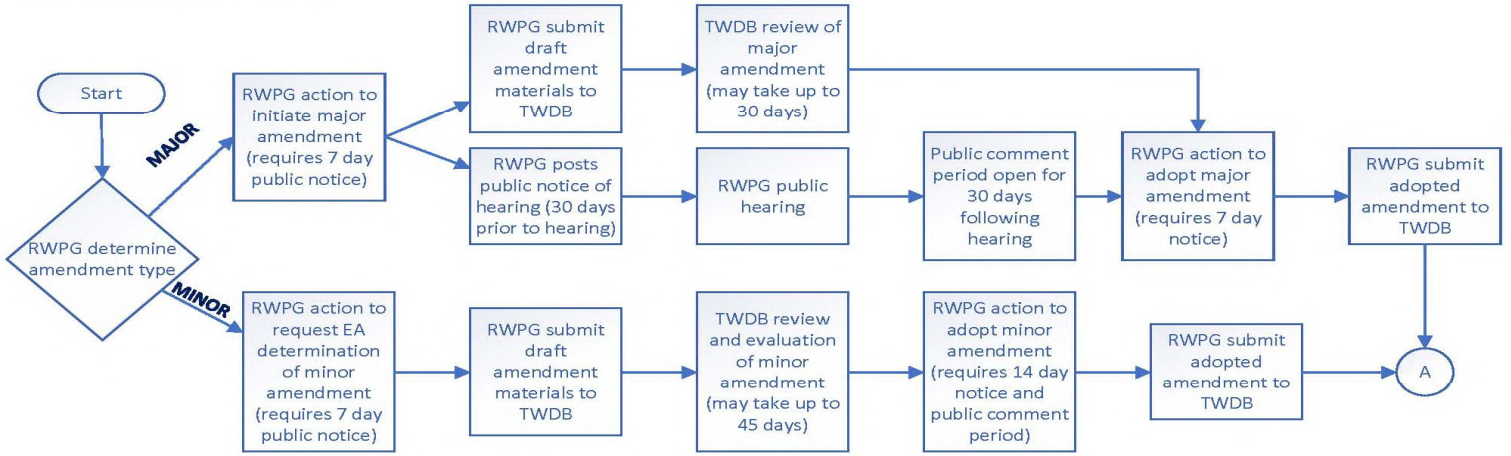
  - Include list of infeasible WMSs in **Technical Memorandum**
  - Note, an analysis does *not* need to be completed for alternative strategies.

- RWPG-adopted 2021 RWP amendments due to TWDB **June 5, 2024**

Regional and State Water Plan Amendment Process

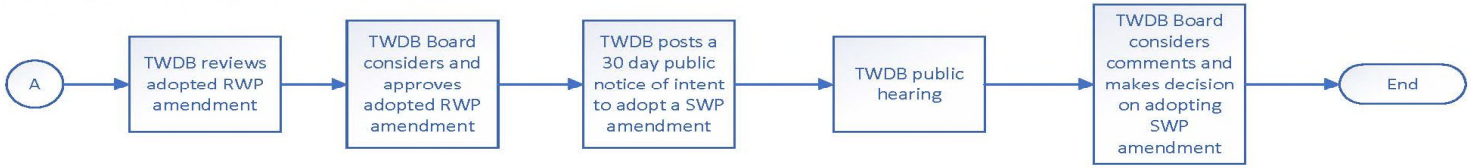
RWPG Amendment Process for RWP

Major amendment process may take approximately three (3) months and includes two (2) RWPG meetings and one (1) hearing. Minor amendment process may take approximately 2.5 months and includes two (2) RWPG meetings.



TWDB Amendment Process for SWP

TWDB amendment process may take approximately three (3) months, subject to the timing of TWDB Board meetings.



Acronyms:
TWDB: Texas Water Development Board
RWPG: Regional Water Planning Group
RWP: Regional Water Plan
SWP: State Water Plan

Updated September 2022

Marvin Nichols Reservoir Feasibility Review

TWDB Budget Rider Language, House Bill 1, 88th Regular Legislative Session

*"Reservoir Project **Feasibility Review**. Out of funds appropriated above, the TWDB shall evaluate the feasibility of the proposed Marvin Nichols Reservoir project to be located on the Sulphur River and upstream of the confluence of the White Oak Creek in Franklin, Titus, and Red River Counties. The review shall analyze the implementation timeline, associated costs, land acquisition considerations, and the economic impact of the proposed project. A **report regarding the findings of the review** shall be prepared and submitted by TWDB to the Legislative Budget Board and Governor no later than **January 5, 2025**."*

Marvin Nichols Reservoir Feasibility Review

- The feasibility review of the project will be performed in accordance with existing statutory (TWC §16.053(h)(10)) and rule (31 TAC §357.34) definitions of feasibility that currently govern the state's water supply planning program.
- The feasibility review work will be performed by agency staff.
- Feasibility review information will be augmented by information received from stakeholders through a Request for Information that was posted in the Texas Register September 29, 2023, and is posted on the TWDB website. Relevant information must be submitted by December 1, 2023, to feasibility@twdb.texas.gov.

Marvin Nichols Reservoir Feasibility Review

- The TWDB anticipates making the draft feasibility report available for public comment prior to it being finalized.
- Once approved by the Executive Administrator, the final report will be delivered to the Legislative Budget Board and Governor.

Questions?

MEETING OF THE
North East Texas Regional Water Planning Group
WEDNESDAY, October 4, 2023

Agenda Item 7
Discussion & Possible Action
Amendments to TWDB Contract

Administrative Summary

At the 4/13/22 meeting, the board authorized Riverbend to execute the first amendment to the TWDB contract. This item, if approved, would authorize Riverbend to negotiate and execute any and all required amendments to the TWDB contract for the remainder of the 6th Cycle of Planning.

MEETING OF THE
North East Texas Regional Water Planning Group
WEDNESDAY, October 4, 2023

Agenda Item 9
Report & Discussion
Hydrologic Variance Request

Region D Water Planning

Consultant Presentation

Tony L. Smith, P.E.

Mount Pleasant, TX | October 4, 2023

2026 Planning Budget Progress (1st Amended)

Task #	Task	Contract Amount	Expended to Date	% Complete
1	Planning Area Description	$16,231	$842.35	5%
2A	Non-Municipal Water Demand Projections	$28,414	$26,937.93	95%
2B	Population & Municipal Water Demand Projections	$47,482	$37,803.96	80%
3	Water Supply Analyses	139,038	$279.00	0.2%
4A	Water Needs Analysis	23,124	$0.00	0%
4B	Identification of Infeasible WMS from 2021 Plan	22,152	$0.00	0%
4C	Technical Memorandum	25,674	$0.00	0%
5A	Identification of Potentially Feasible WMSs and WMS Projects	20,853	$0.00	0%
5B	Evaluation & Recommendation of WMSs	--	--	--
5C	Conservation Recommendations	10,000	$0.00	0%
6	Impacts of Regional Water Plan	12,000	$0.00	0%
7	Drought Response, Activities & Recommendations	12,000	$0.00	0%
8	Recommendations Regarding Unique Stream Segments and/or Reservoir Sites and Legislative & Regional Policy Issues	$10,648	$0.00	0%
9	Implementation and Comparison to the Previous Regional Water Plan	4,334	$0.00	0%
10	Public Participation and Plan Adoption	208,797	$42,928.83	21%
	TOTAL	**$580,747**	**$108,792.07**	**19%**

-Aug 2023

2026 Plan Schedule Detail

Date	Scheduled Events/Tasks
March 2023	Region D Meeting – Approval for submittal of revisions to draft non-municipal projections
July 2023	Region D Meeting – Approval of submittal of revisions to draft municipal population and demand projections
Aug 2023	Submittal of Requested Revisions to Draft Municipal and Non-Municipal Projections (Aug. 11)
Oct 2023	• Tentative TWDB Board adoption of population and demand projections • Region D Meeting – Consideration of action to approve submittal of Hydrologic Variance Request, discussions on lists of WWP/MWPs, infeasible strategies, and process for identifying potentially feasible strategies
Nov 2023 - Jan 2024	Surface water source availability (WAM) determinations, engagement, supply allocations, DB27 input
Feb 2024	Region D Meeting – Consideration of action to approve list of WWP/MWPs, adoption of process for identifying potentially feasible strategies, and submittal of Technical Memorandum with list of identified infeasible strategies from 2021 Brazos G RWP.
March 4, 2024	Required submittal of Technical Memorandum

Today's Discussion

Item 9: Summary of Hydrologic Variance Request

- Methodology for determining surface water availability for existing sources and water management strategies

Item 10: Discussion and Action as Appropriate

- Submittal of Hydrologic Variance Request

Item 11: Consultant Report and Discussion

- Initial list of WWP/MWPs,
- Status on Infeasible WMS/WMSPs
- Preliminary presentation on process for identifying potentially feasible strategies

Terminology

Term	Description
Availability	Maximum amount of raw water that could be produced by a source during a repeat of the Drought of Record, regardless of whether the supply is physically connected to or legally accessible by Water User Groups.
DOR	Drought of Record - The period of time when historical records indicate that natural hydrological conditions would have provided the least amount of water supply.
DWDOR	Drought Worse than the Drought of Record – Recognition of uncertainty in use of drought of record.
Firm Yield	The maximum amount of water that is physically and legally accessible from existing sources for immediate use by a Water User Group under a repeat of Drought of Record conditions."
GAM	Groundwater Availability Models developed for the purposes of Joint Planning
MAG	Modeled Available Groundwater: Aquifer source availability as determined by Groundwater Availability Models
Source Availability	Water available from a given source during critical drought-of-record conditions
Existing Water Supply	Maximum amount of water that is physically and legally accessible from existing sources for immediate use by a Water User Group under a repeat of Drought of Record conditions.
WAM	Water Availability Model – Official model for determining surface water availability for permitting in Texas using historical hydrology, characteristics of water rights, and the prior appropriation doctrine.

09

Source Availability, Water Supply, and Hydrologic Variance Request

Evaluating Source Availability

The amount of water that a user can depend on obtaining during drought of record conditions

- Reservoirs: Firm Yield
- Run of river: Available monthly diversion during driest period of record

Existing Surface Water Supply (cont'd)

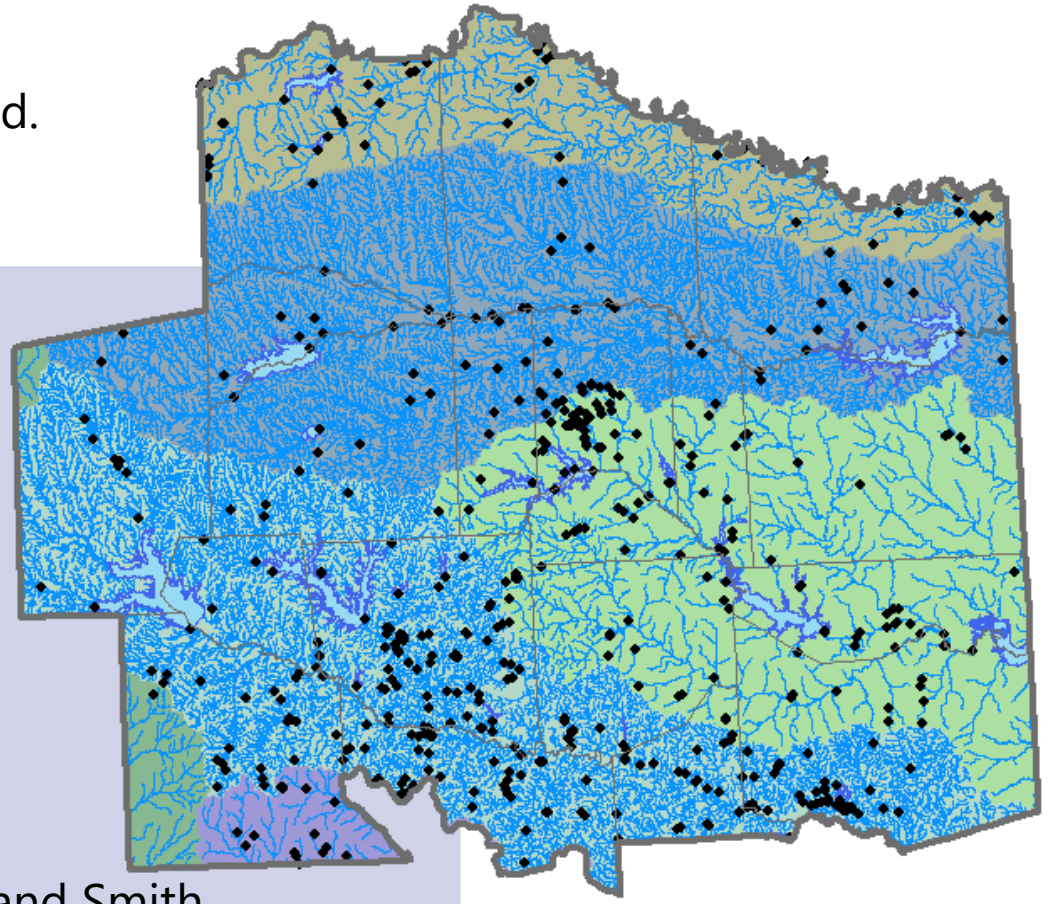
- Based on infrastructure that is currently in place.
- Based on the assumption that all senior downstream water rights are being fully utilized.
- A properly issued water right is no guarantee of access to water.
- Answers "How much water could each WUG already rely on should there be a repeat of the drought of record?"

Water Availability Modeling (WAM)

As required by rule, latest TCEQ WAMs (Run 3) will be used.

Region D River Basins

- Cypress Creek
- Red
- Sabine
- Sulphur
- Neches
  - (small portions of Van Zandt and Smith Counties)
- Trinity
  - (small portions of Hunt and Van Zandt)



Surface Water Sources to be Evaluated

Sabine Source Name	Red River Source Name ****	Sulphur Source Name	Cypress Source Name
Big Sandy Creek Lake / Reservoir	Crook Lake / Reservoir	Big Creek Lake / Reservoir	Bob Sandlin Lake/Reservoir
Brandy Branch Lake / Reservoir	Pat Mayse Lake / Reservoir	Turkey Creek Lake	Caddo Lake / Reservoir
Edgewood City Lake / Reservoir		Chapman/Cooper Lake/Reservoir (Non-System)	Cypress Springs Lake / Reservoir
Lake Fork / Reservoir		Chapman/Cooper Lake/Reservoir (NTMWD)	Ellison Creek Lake / Reservoir
Gladewater Lake / Reservoir		Caney Creek Lake	Gilmer Lake / Reservoir
Greenville City Lake / Reservoir		Langford Lake / Reservoir	Johnson Creek Lake / Reservoir
Hawkins Lake / Reservoir		River Crest Lake / Sulphur Run of the River*	Monticello Lake/Reservoir***
Holbrook Lake / Reservoir		Sulphur Springs Lake	Lake O' the Pines / Reservoir***
Loma Lake / Reservoir		Elliot Creek Lake	Tankersley Lake / Reservoir
Mill Creek Lake / Reservoir		Wright Patman Lake / Reservoir**	Welsh Lake / Reservoir***
Quitman Lake / Reservoir		Sulphur River Combined Run of River	Cypress River Combined Run-of-River
Tawakoni Lake / Reservoir			Grays Creek Run-of-River
Winnsboro Lake / Reservoir			Direct Reuse
Sabine River Combined Run of River			
Direct Re-use			

* River Crest watershed is negligible. This yield will be based on a permit for transfer of up to 10,000 ac-ft/yr from the Sulphur River.

** 180,000 ac-ft/yr is permitted from Wright Patman.

***Monticello and Welsh Reservoirs results will include TCEQ WAM results plus the contractual transfers from Lake O' the Pines, which will correspondingly reduce the Lake O' the Pines availability.

****None of the water in Lake Texoma is considered available to the North East Texas Region due to lack of infrastructure and water rights, thus it is not listed as a supply for Region D.

Regional Planning Rules for Water Availability

Surface Water must be evaluated using TCEQ WAM

- Unmodified Water Availability Model
- WAM for each river basin in the state

"Run 3" version – Full Authorization

- Version used for permitting surface water in Texas
- All water rights use their full authorized amount
- All applicable permit conditions, such as flow requirements, are met
- No return flows
- Uses original reservoir capacities.

For regional planning purposes anticipated sedimentation is a necessary modification performed by RWPGs

- This modification *does not* require a hydrologic variance.
- Methodology for calculating sedimentation rate and revising reservoirs' area-capacity rating curves must be described in Tech Memo, IPP, and final adopted RWP

RWPGs can consider requesting a Surface Water **Hydrologic Variance** to modify the WAM Run 3

For use of an alternative methodology

For any criteria that varies from base requirements

Or is expected to have significant effects on existing supply estimates

RWPG must ensure that

- any resulting estimates are reasonable for drought planning purposes; and
- will reflect conditions expected in the event of near-term, actual drought conditions

Submittal Requirements

A completed surface water hydrologic variance request checklist for each river basin, along with any necessary supporting information.

Documentation of the submittal request being approved by the RWPG at a regular planning group meeting.

Hydrologic Variance Request Summary

Cover Letter

- Documentation of approval for submittal at Oct. 4, 2023 meeting
- Defines approach for firm yields (same for existing and strategies)
- Where providers have studied DWDOR, consider potential impacts within Chapter 8 to inform upon legislative and regional policy recommendations.

carollo

October 4, 2023

Mr. Ron Ellis
Region D Project Manager
Texas Water Development Board
P.O. Box 12321
Austin Texas

Subject: Hydrologic Variance Request for the Determination of Water Availability and Water Supplies for the 2026 North East Texas Regional Water Plan (Region D)

Dear Mr. Ellis:

The North East Texas Regional Water Planning Group (NETRWPG; Region D) met on October 4, 2023 to discuss the process for determining the amount of surface water available from existing surface water sources and future water management strategies using the guidance provided by the Texas Water Development Board (TWDB) in the scope of work for the present cycle of Regional Water Planning. During this meeting, the NETRWPG discussed the approach for determining water availability within the region, noting where specific variances from the standard TWDB guidance will be employed towards development of the 2026 North East Texas Regional Water Plan.

The NETRWPG approved submittal of this letter and the accompanying attachments, requesting that the TWDB allow the NETRWPG to use the approaches detailed herein throughout the regional planning process for analyses that determine surface water availability to existing rights, availability of groundwater sources, and for analyses to determine the potential supplies available from new water management strategies and water management strategy projects.

Surface Water Supplies

The Region D planning area is located primarily within the Cypress Creek, Red River, Sabine, and Sulphur River Basins. Small areas of the region are in the Neches and Trinity River Basins. Surface waters in each of these river basins serve as a source of water to Region D. In its guidelines for Regional Water Planning, the TWDB requires that water availability be based on results derived from the official Texas Commission on Environmental Quality (TCEQ) Water Availability Models (WAMs), unless a hydrologic variance request is submitted.

The TCEQ WAMs, which have been developed for all river basins in Texas, simulate the management, operation, and use of streamflow and reservoirs over a historical period of record, adhering to the prior appropriation doctrine that governs Texas' water right priority system. The TCEQ WAMs are the fundamental tools used to determine surface water availability for water rights permitting and contain information about water rights in each respective river basin.

There are several versions of each of these WAMs. TWDB guidance stipulates that regional water planning groups use the Full Authorization version that TCEQ employs to analyze applications for perpetual water rights. This scenario is often referred to as WAM "Run 3." The assumptions in the TCEQ WAM Run 3 are conservatively

General Assumptions

Assumption	Use for Existing Supplies	Use for Water Management Strategies
General		
Use most recent available versions of the TCEQ WAMs.	X	X
WAM Run 3 - full consumption of existing water rights with no (zero) return flows).	X	X
Modeling of reuse to include consideration of minimum and permitted return flows associated with WUG, including identified return flows from TCEQ WAM Run 8.	X	X
Channel losses based on factors employed within official TCEQ WAMs.	X	X
ASR evaluations will consider surface water availability as determined by the WAM compared to demand, with the firm supply being the maximum demand that could be met assuming a repetition of the period of record drought.		X
Adopted environmental flow standards will be used as incorporated into the applicable official TCEQ WAMs	X	X
For those basins lacking TCEQ adopted environmental flow standards, TWDB consensus planning criteria will be employed in a manner consistent with TWDB guidelines.		X
Subordination of water rights will be modeled in a manner consistent with modeled subordination within the official TCEQ WAMs.	X	X
For municipal and industrial users: Run of the river rights will be determined in accordance with TWDB guidelines which state that the use-appropriate monthly percentage of the annual firm diversion must be satisfied in each and every month of the simulation period for all surface water diversions. Reservoirs will use firm yield unless a change is specifically requested by a reservoir owner and approved by the RWPG and TWDB, as appropriate per TWDB guidelines. The calculated source availabilities will be compared against existing legal and infrastructure constraints (water treatment plants, pipelines, intakes, etc.) and will be constrained if the existing infrastructure or legal capability is not sufficient to facilitate full utilization of the source. The most constrained amount will be used as the firm supply.	X	X
For irrigation users, water supply will be determined using firm reliability (100%). In the absence of any supply information or justification of reliable supplies available in a drought of record, supply values will be set equal to zero.	X	X
For livestock, in the absence of any supply information or justification of reliable supplies available in a drought of record, supply values will be set to zero.	X	X
Sedimentation		
For reservoirs with available volumetric survey information, annual sediment rate will be calculated, and loadings calculated for Year 2030 and Year 2080. Sediment distribution will be calculated using the Empirical Area-Reduction method (more detail on this approach presented in Attachment B) and resultant 2030 and 2080 area-capacity curves developed and employed within WAM. Intervening decadal yields will be linearly interpolated.	X	X

General Assumptions (cont'd)

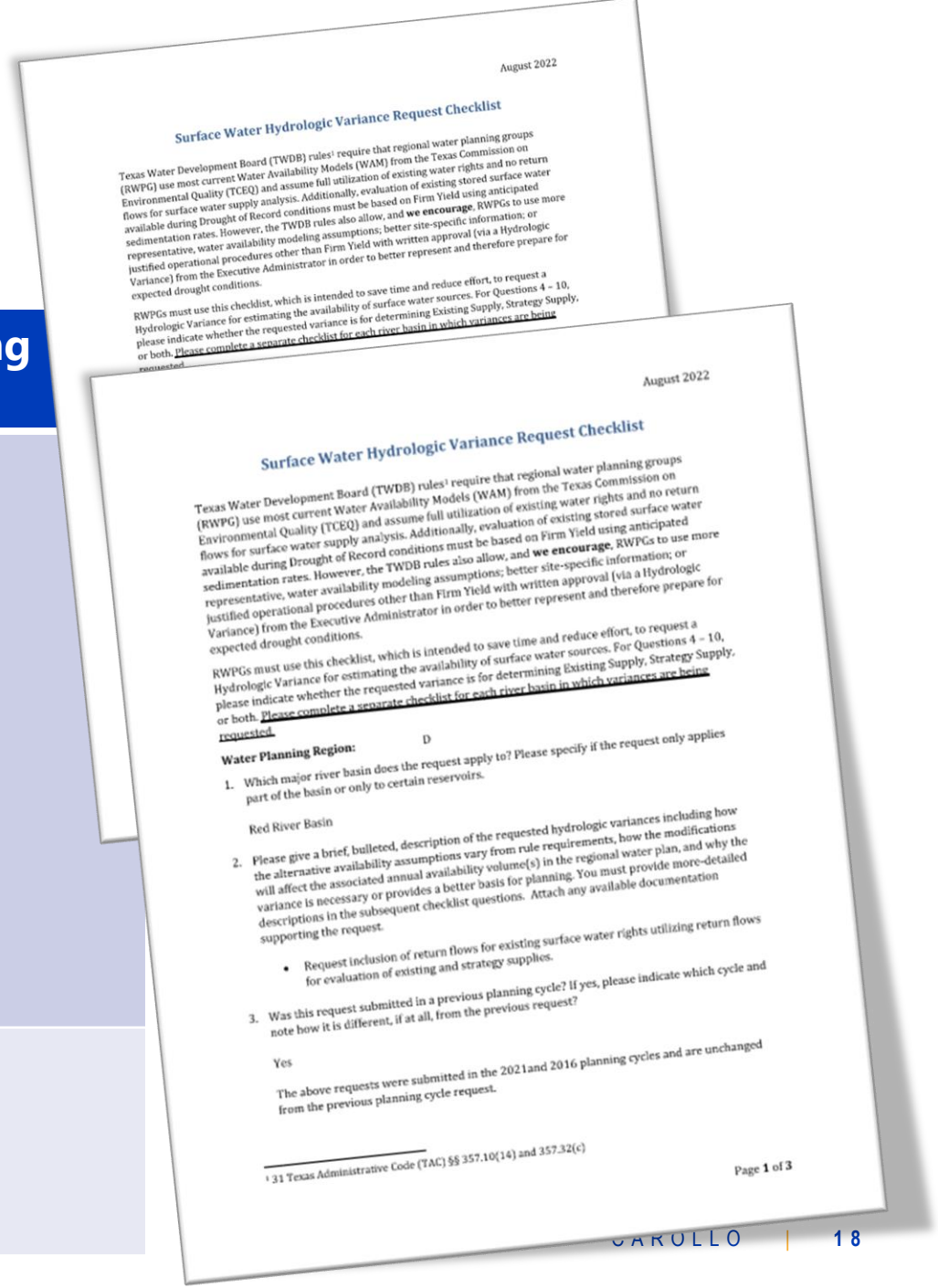
Assumption	Use for Existing Supplies	Use for Water Management Strategies
Groundwater availability will be determined using the adopted Modeled Available Groundwater (MAG) numbers. Local hydrogeologic conditions will be considered when establishing each entity's portion of the MAG. For those WUGs/sellers wherein existing or planned pumpage exceeds MAG amounts, amounts derived and adopted for the purposes of the 2021 Region D Plan will formulate the basis for any necessary detailed analysis of the entity's pumping, typical production of the aquifer, and relevant information from applicable GMAs will be considered towards development of the available groundwater supply for the entity. The capability of current infrastructure's (number of wells, well field capacity, peaking factors, etc.) ability to produce annual supply during drought-of-record conditions will also be considered when evaluating future water management strategies. This information will be based upon information developed for the purposes of the 2021 Region D Plan, and similarly coordinated with TWDB subsequent to submittal of the Technical Memorandum.	X	X

WAMs

Basin	Version	POR	Possible New Version?
Cypress Creek	June 18, 2015	1948-1998	*Yes*
Red River	Oct. 26, 2020	1948-2018	--
Sabine	Aug. 13, 2018	1940-1998	--
Sulphur	Oct. 11, 2019	1940-2017	--
Neches	Region I		
Trinity	Region C		

Modifications

Request	Similar to previous planning cycle?
Requesting inclusion of return flows for existing surface water rights utilizing return flows for evaluation of existing and strategy supplies. This will include evaluations of existing reuse and reuse strategies, consistent with TCEQ approach for evaluations of reuse permit applications.	Yes (2021 and 2016)
Requesting modified WAM to reflect updated sedimentation effects on existing and strategy reservoir firm yields	Yes (2021)



August 2022

Surface Water Hydrologic Variance Request Checklist

Texas Water Development Board (TWDB) rules[1] require that regional water planning groups (RWPG) use most current Water Availability Models (WAM) from the Texas Commission on Environmental Quality (TCEQ) and assume full utilization of existing water rights and no return flows for surface water supply analysis. Additionally, evaluation of existing stored surface water available during Drought of Record conditions must be based on Firm Yield using anticipated sedimentation rates. However, the TWDB rules also allow, and **we encourage**, RWPGs to use more representative, water availability modeling assumptions; better site-specific information; or justified operational procedures other than Firm Yield with written approval (via a Hydrologic Variance) from the Executive Administrator in order to better represent and therefore prepare for expected drought conditions.

RWPGs must use this checklist, which is intended to save time and reduce effort, to request a Hydrologic Variance for estimating the availability of surface water sources. For Questions 4 – 10, please indicate whether the requested variance is for determining Existing Supply, Strategy Supply, or both. Please complete a separate checklist for each river basin in which variances are being requested.

Water Planning Region: D

1. Which major river basin does the request apply to? Please specify if the request only applies part of the basin or only to certain reservoirs.

   Red River Basin

2. Please give a brief, bulleted, description of the requested hydrologic variances including how the alternative availability assumptions vary from rule requirements, how the modifications will affect the associated annual availability volume(s) in the regional water plan, and why the variance is necessary or provides a better basis for planning. You must provide more-detailed descriptions in the subsequent checklist questions. Attach any available documentation supporting the request.

   - Request inclusion of return flows for existing surface water rights utilizing return flows for evaluation of existing and strategy supplies.

3. Was this request submitted in a previous planning cycle? If yes, please indicate which cycle and note how it is different, if at all, from the previous request?

   Yes

   The above requests were submitted in the 2021and 2016 planning cycles and are unchanged from the previous planning cycle request.

[1] 31 Texas Administrative Code (TAC) §§ 357.10(14) and 357.32(c)

Page 1 of 3

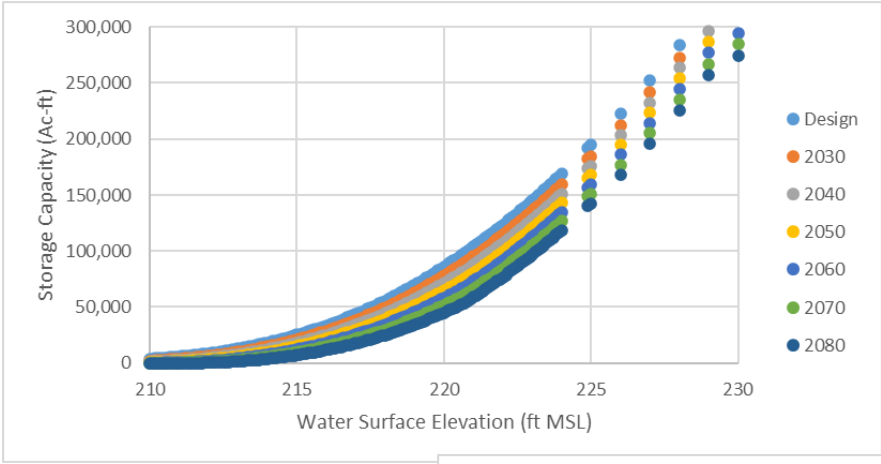
Sedimentation -

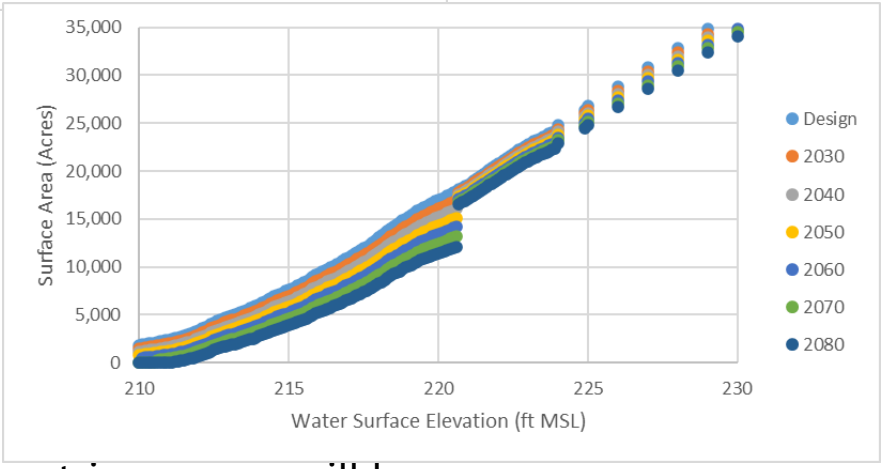
- Reduces storage capacity over time.
- Volumetric surveys allow for the derivation of rates and loadings of sediment to a reservoir.
- Loading can be distributed to determine a revised relation of elevation/area/volume characteristics of the reservoir's storage.

- Sedimentation Methodology is:
  - Not required for Hydrologic Variance, but its inclusion is encouraged by TWDB.
  - Is required within Technical Memorandum, IPP, and final RWP.
  - Consistent with approach used for the purposes of the 2021 Region D Plan.

Sedimentation (Cont'd)

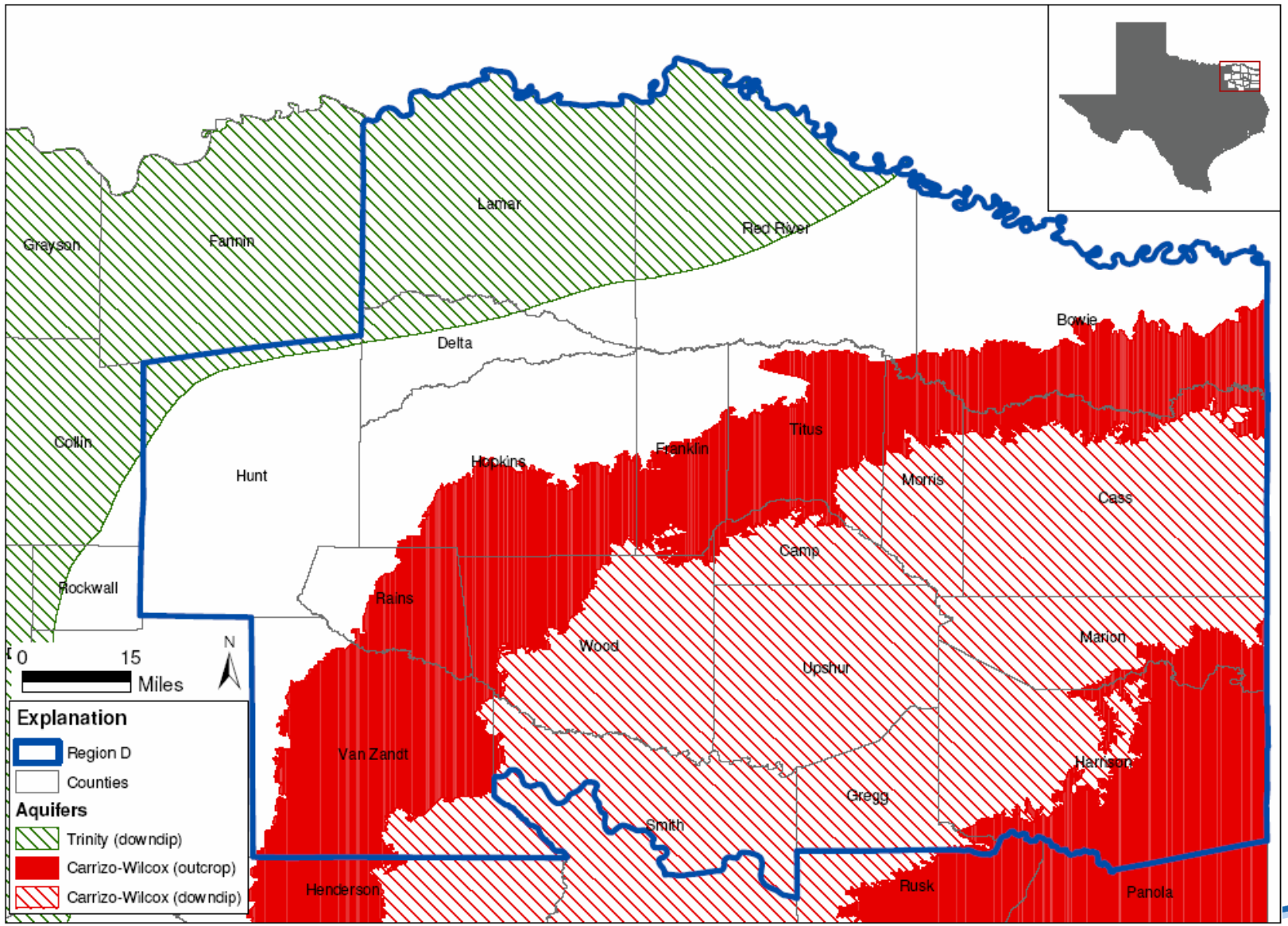
- If no firm yield, that will be assumed throughout planning period.
- Where volumetric surveys are lacking, original area-capacity relations will be used.
- If those are unavailable, most recent area-capacity-elevation relation will be used as baseline.
- If volumetric survey is available, annual sediment rate will be calculated/cited, and loadings calculated for 2030 and 2080.
- Sediment distribution will use USACE Empirical Area Reduction Method (EARM) to determine elevation/area/capacity relations.
- These relations will then be used in WAM to calculate 2030 and 2080 firm yields.
- Intervening decadal firm yields will be linearly interpolated.



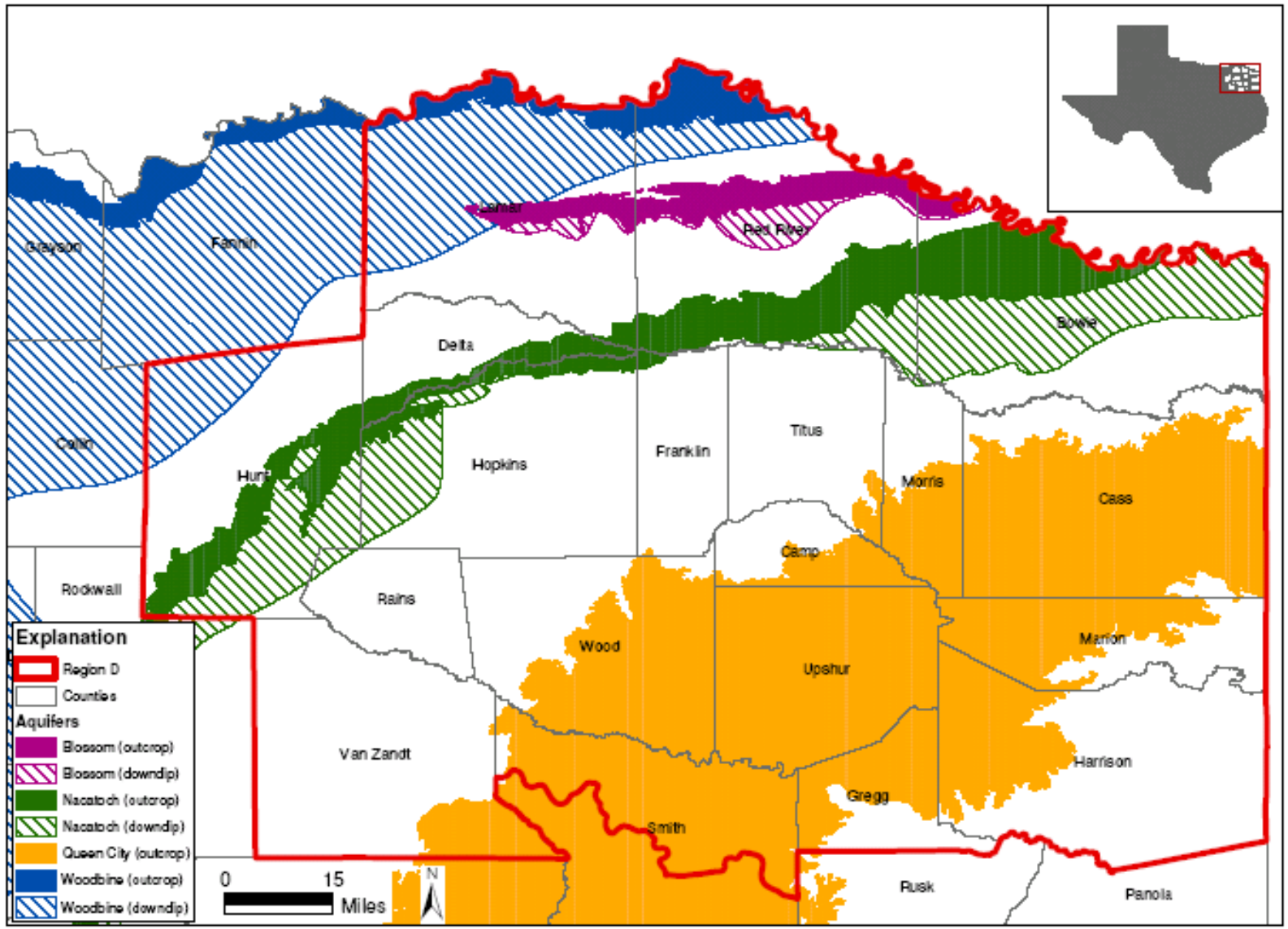


- Most recent volumetric surveys will be employed
- EARM
  - » Reservoir characteristics determine Type (I – V)
  - » Applicable formulae used to generate elevation/area/volume relations.

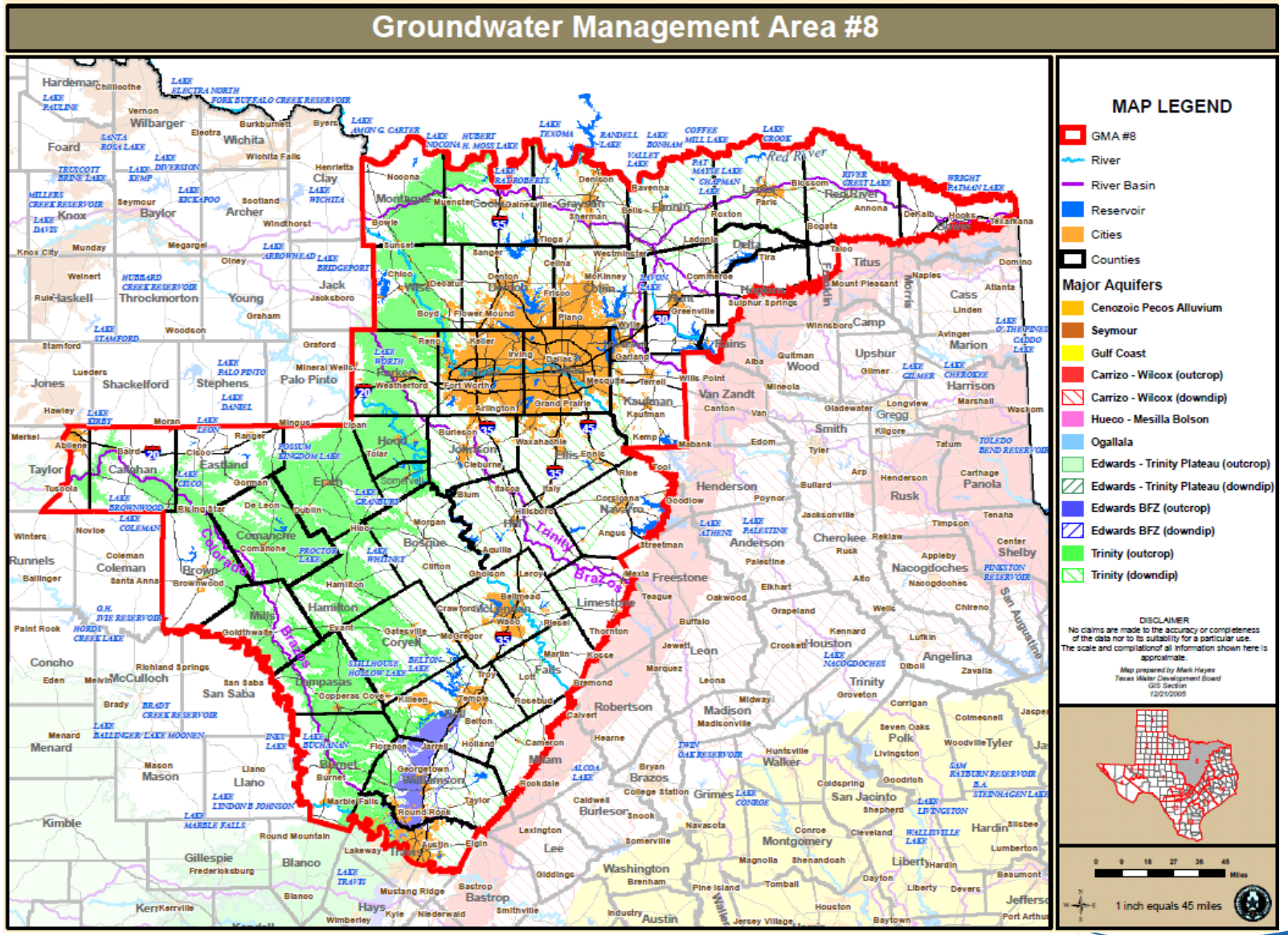
Major Aquifers in Region D



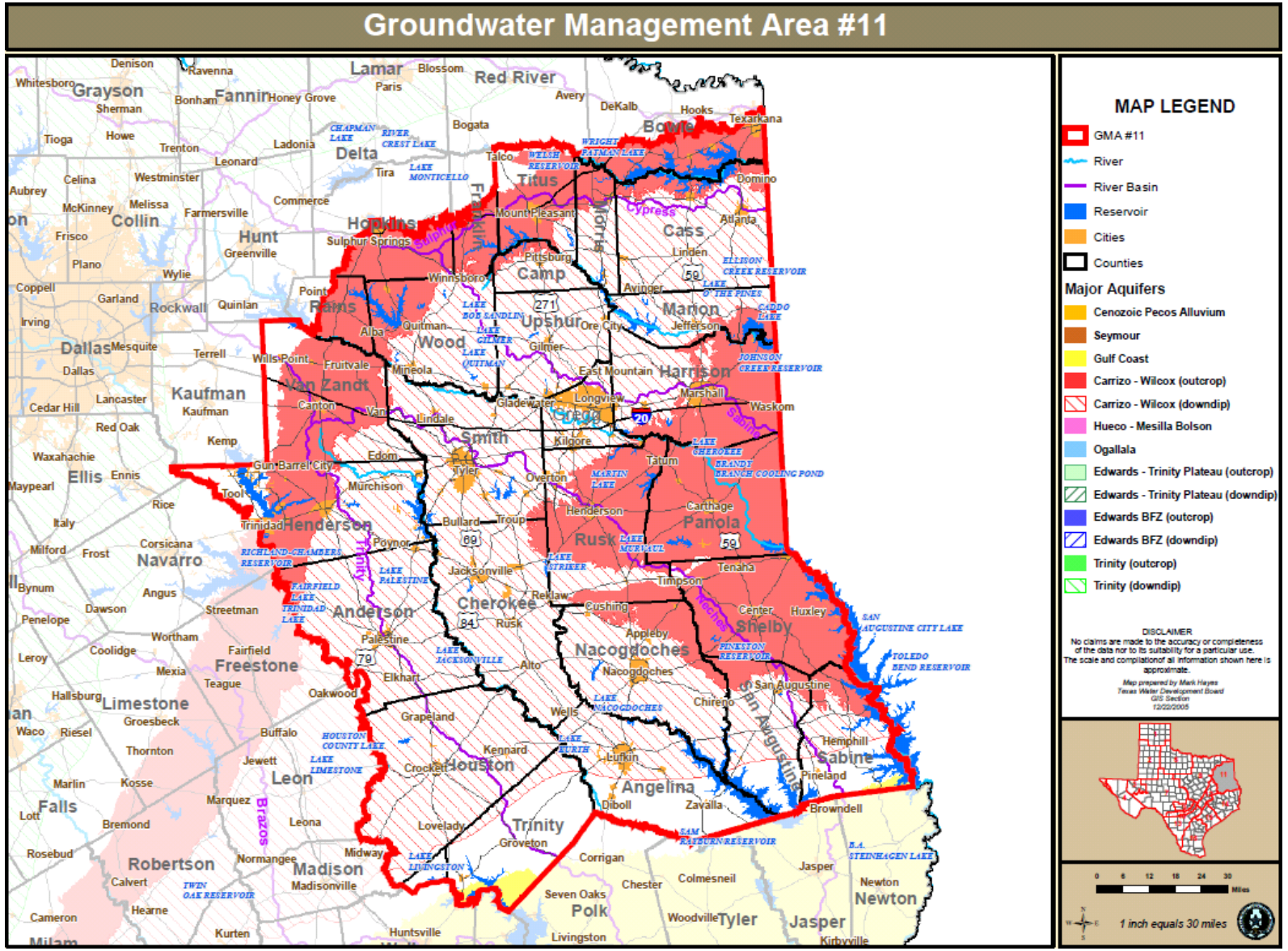
Minor Aquifers in Region D



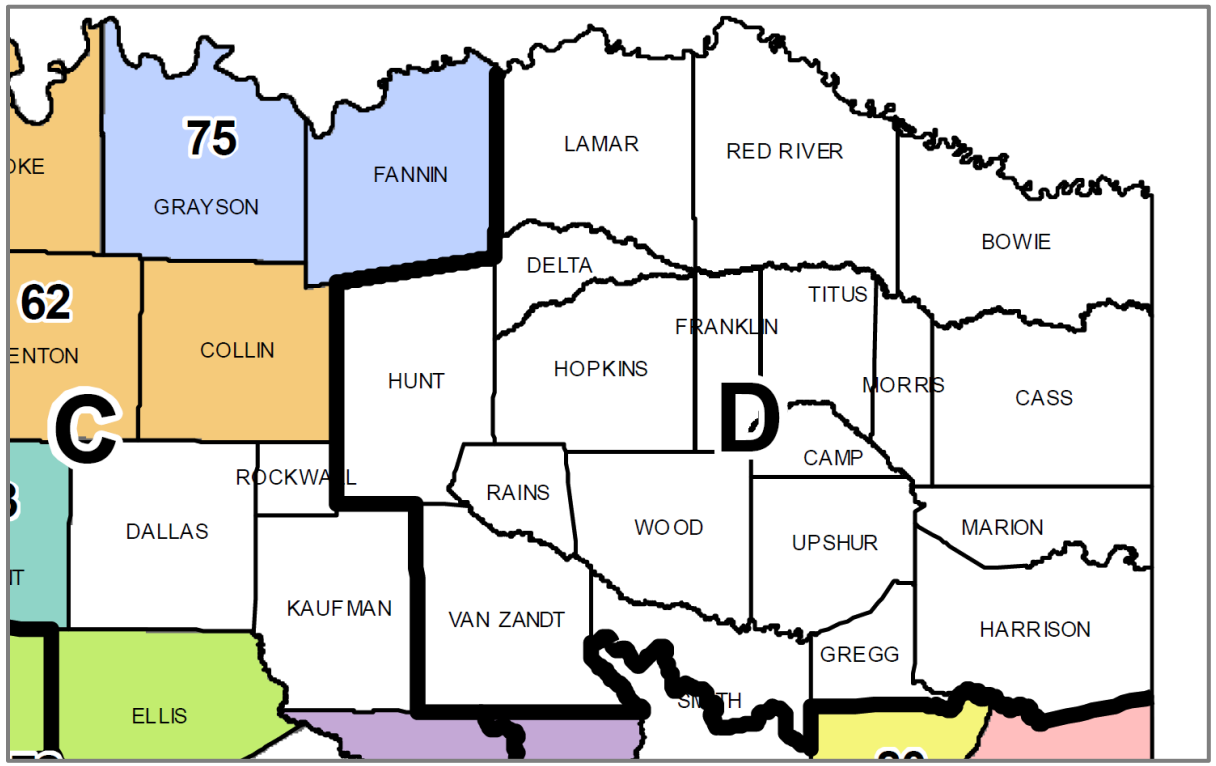
Groundwater Management Area #8



Groundwater Management Area #11



No Groundwater Conservation Districts in Region D



Because there are no GCDs in Region D, Region D is allowed (by law) to determine the groundwater availability for regional water planning purposes

Notes on groundwater availability

Determined by MAGs

- Derived from Joint Planning Process
- Based on Desired Future Conditions (DFCs) through actions of Groundwater Conservation Districts (GCDs) and Groundwater Management Areas (GMAs)

Groundwater Hydrologic Variance Requests

- MAG reallocation w/written support of relevant GCDs and GMA
- MAG Peak Factor – adjustment for pumping variations between wet/dry conditions that accommodates annual MAG for planning purposes
- Must be consistent with relevant aquifer's MAG
- Limited to shifts within a county only

Region D unique capability

- While required to align with MAGs for relevant aquifers in adjacent areas regulated by a GCD
- RWPG has capability to establish groundwater availability for areas in the region where no GCD exists
- This process will occur after submittal of Technical Memorandum

MEETING OF THE
North East Texas Regional Water Planning Group
WEDNESDAY, October 4, 2023

Agenda Item 10
Consider Action to Submit a Hydrologic Variance Request to TWDB

10

Consideration of Action to Approve Submittal of Hydrologic Variance Request

Discussion and Action as appropriate

Action

- Authorize the technical consultant to submit a hydrologic variance request to the TWDB on behalf of the NETRWPG consistent with the information provided in this meeting, and approve for the consultant to work with the Chair and Administrator to submit further revisions and make responses to revision requests by TWDB.

8911 North Capital of Texas Highway
Building 2, Suite 2200 / Austin, Texas 78759
P 512-453-5383
carollo.com

October 4, 2023

This document is released for the purpose of information exchange review and planning only under the authority of Tony L. Smith, P.E., September 21, 2023, TX PE#92620.

Mr. Ron Ellis
Region D Project Manager
Texas Water Development Board
P.O. Box 12321
Austin Texas

Subject: Hydrologic Variance Request for the Determination of Water Availability and Water Supplies for the 2026 North East Texas Regional Water Plan (Region D)

Dear Mr. Ellis:

The North East Texas Regional Water Planning Group (NETRWPG; Region D) met on October 4, 2023 to discuss the process for determining the amount of surface water available from existing surface water sources and future water management strategies using the guidance provided by the Texas Water Development Board (TWDB) in the scope of work for the present cycle of Regional Water Planning. During this meeting, the NETRWPG discussed the approach for determining water availability within the region, noting where specific variances from the standard TWDB guidance will be employed towards development of the 2026 North East Texas Regional Water Plan.

The NETRWPG approved submittal of this letter and the accompanying attachments, requesting that the TWDB allow the NETRWPG to use the approaches detailed herein throughout the regional planning process for analyses that determine surface water availability to existing rights, availability of groundwater sources, and for analyses to determine the potential supplies available from new water management strategies and water management strategy projects.

Surface Water Supplies

The Region D planning area is located primarily within the Cypress Creek, Red River, Sabine, and Sulphur River Basins. Small areas of the region are in the Neches and Trinity River Basins. Surface waters in each of these river basins serve as a source of water to Region D. In its guidelines for Regional Water Planning, the TWDB requires that water availability be based on results derived from the official Texas Commission on Environmental Quality (TCEQ) Water Availability Models (WAMs), unless a hydrologic variance request is submitted.

The TCEQ WAMs, which have been developed for all river basins in Texas, simulate the management, operation, and use of streamflow and reservoirs over a historical period of record, adhering to the prior appropriation doctrine that governs Texas' water right priority system. The TCEQ WAMs are the fundamental tools used to determine surface water availability for water rights permitting and contain information about water rights in each respective river basin.

There are several versions of each of these WAMs. TWDB guidance stipulates that regional water planning groups use the Full Authorization version that TCEQ employs to analyze applications for perpetual water rights. This scenario is often referred to as WAM "Run 3." The assumptions in the TCEQ WAM Run 3 are conservatively

modeled for permitting purposes, allowing for consideration of water supply availability under drought-of-record conditions to ensure water demands can be met under critical circumstances.

For the purposes of the development of the 2026 Region D Water Plan, the "Run 3" WAMs for each of the aforementioned river basins will be updated to determine surface water availabilities in the region. To reflect the current and future conditions of the region, the following hydrologic variances are summarized below. Hydrologic variance request forms provided by the TWDB have been completed for each river basin, and are included in Attachment A. The methodology for estimating and modeling impacts of sedimentation on the surface water reservoirs are detailed in Attachment B.

Firm Yield

"Firm Yield" is defined in the Texas Administrative Code 31 TAC §357.10 (14) as the:

> "maximum amount of water that is physically and legally accessible from existing sources for immediate use by a Water User Group under a repeat of Drought of Record conditions."

In accordance with regional water planning rules and guidance, firm yields for existing reservoirs and water management strategies contemplating a reservoir within Region D will be reported within the 2026 Region D Plan based on the modeled results from the applicable WAM for the basin in which the reservoir is located.

Drought Worse than the Drought of Record

Per TWDB guidance, regional water plans must address water supply needs during a repeat of the drought of record. The generated values of supplies, demands, and population all have associated ranges of uncertainty. Although the limited regional planning resources may not support evaluating a range of or multiple scenarios and although assessments of the likelihood of droughts potentially worse than the drought of record (DWDOR) are not required, RWPGs may choose to consider scenarios and/or qualitatively address uncertainty and DWDOR in their region. Such assessments can be used to more explicitly recognize or acknowledge the relative uncertainties in the planning process and the potential risks without necessarily modifying the plan to mitigate those risks.

If evaluations performed by water providers within Region D include considerations of potential impacts of a DWDOR, these evaluations will be documented within Chapter 8 of the 2026 Region D Plan and considered for informing upon legislative and regional policy recommendations of the NETRWPG within that chapter.

General Hydrologic Assumptions

The NETRWPG will assess surface water availability in a manner that accurately reflects water supplies that are available for use. The NETRWPG requests that the TWDB approve the following assumptions for use in representing existing supplies and potential future surface water supplies in the 2026 Region D Water Plan. The WAMs containing the necessary modifications to the TCEQ WAM that incorporate these assumptions will be referred to as the "Region D WAMs." A general summary of the models and assumptions to be employed for the evaluation of existing water supply and water management strategies (WMS's) is provided below.

Assumption	Use for Existing Supplies	Use for Water Management Strategies
General		
Use most recent available versions of the TCEQ WAMs.	X	X
WAM Run 3 - full consumption of existing water rights with no (zero) return flows).	X	X
Modeling of reuse to include consideration of minimum and permitted return flows associated with WUG, including identified return flows from TCEQ WAM Run 8.	X	X
Channel losses based on factors employed within official TCEQ WAMs.	X	X
ASR evaluations will consider surface water availability as determined by the WAM compared to demand, with the firm supply being the maximum demand that could be met assuming a repetition of the period of record drought.		X
Adopted environmental flow standards will be used as incorporated into the applicable official TCEQ WAMs	X	X
For those basins lacking TCEQ adopted environmental flow standards, TWDB consensus planning criteria will be employed in a manner consistent with TWDB guidelines.		X
Subordination of water rights will be modeled in a manner consistent with modeled subordination within the official TCEQ WAMs.	X	X

Assumption	Use for Existing Supplies	Use for Water Management Strategies
For municipal and industrial users: Run of the river rights will be determined in accordance with TWDB guidelines which state that the use-appropriate monthly percentage of the annual firm diversion must be satisfied in each and every month of the simulation period for all surface water diversions. Reservoirs will use firm yield unless a change is specifically requested by a reservoir owner and approved by the RWPG and TWDB, as appropriate per TWDB guidelines. The calculated source availabilities will be compared against existing legal and infrastructure constraints (water treatment plants, pipelines, intakes, etc.) and will be constrained if the existing infrastructure or legal capability is not sufficient to facilitate full utilization of the source. The most constrained amount will be used as the firm supply.	X	X
For irrigation users, water supply will be determined using firm reliability (100%). In the absence of any supply information or justification of reliable supplies available in a drought of record, supply values will be set equal to zero.	X	X
For livestock, in the absence of any supply information or justification of reliable supplies available in a drought of record, supply values will be set to zero.	X	X

Assumption	Use for Existing Supplies	Use for Water Management Strategies
Sedimentation		
For reservoirs with available volumetric survey information, annual sediment rate will be calculated, and loadings calculated for Year 2030 and Year 2080. Sediment distribution will be calculated using the Empirical Area-Reduction method (more detail on this approach presented in Attachment B) and resultant 2030 and 2080 area-capacity curves developed and employed within WAM. Intervening decadal yields will be linearly interpolated.	X	X
The most recent volumetric survey information will be utilized. For reservoirs lacking volumetric surveys, original area-capacity relations within TCEQ WAM Run 3 will be assumed constant.	X	X
Groundwater Supplies		
Groundwater availability will be determined using the adopted Modeled Available Groundwater (MAG) numbers. Local hydrogeologic conditions will be considered when establishing each entity's portion of the MAG. For those WUGs/sellers wherein existing or planned pumpage exceeds MAG amounts, amounts derived and adopted for the purposes of the 2021 Region D Plan will formulate the basis for any necessary detailed analysis of the entity's pumping, typical production of the aquifer, and relevant information from applicable GMAs will be considered towards development of the available groundwater supply for the entity. The capability of current infrastructure's (number of wells, well field capacity, peaking factors, etc.) ability to produce annual supply during drought-of-record conditions will also be considered when evaluating future water management strategies. This information will be based upon information developed for the purposes of the 2021 Region D Plan, and similarly coordinated with TWDB subsequent to submittal of the Technical Memorandum.	X	X

Cypress Creek Basin WAM

For the Cypress Creek River Basin, the most recently available official TCEQ WAM Run 3 (ver. June 18, 2015) will be employed for all availability analyses in the basin using the modeled hydrologic period of 1948-1998.

An updated WAM reflecting an extended hydrologic period has been under development by TCEQ and others but has not yet been made publicly available by TCEQ. If the updated official WAM for the Cypress Creek River Basin becomes available prior to the completion of the source water availability modeling task for the purposes of the 2026 Region D Water Plan, the NETRWPG respectfully requests the option to use this updated model for the calculation of water availabilities for existing sources and future strategies within the Cypress Creek River Basin.

Red River Basin WAM

For the Red River Basin, the most recently available official TCEQ WAM Run 3 (ver. Oct. 26, 2021) will be employed for all availability analyses in the basin using the modeled hydrologic period of 1948-2018.

Sabine River Basin WAM

For the Sabine River Basin, the most recently available official TCEQ WAM Run 3 (ver. August 13, 2018) will be employed for all availability analyses in the basin using the modeled hydrologic period of 1940-1998.

Sulphur River Basin WAM

For the Sulphur River Basin, the most recently available official TCEQ WAM Run 3 (ver. Oct. 11, 2019) will be employed for all availability analyses in the basin using the modeled hydrologic period of 1940-2017.

Lake Chapman is currently used by water providers in Region D and Region C and is represented within the official WAM by individual water rights. To assess the firm yield of Lake Chapman, the NETRWPG requests to model the reservoir as a single pool, with supplies then assigned proportionally based on each providers' water rights. This will be done in a coordinated matter with Region C to ensure a consistent representation of the reservoir and supply availability.

The TCEQ WAM Run3 will be modified to correct an error in drainage area for control point C10 (Sulphur River near Talco) as identified by FNI (2012) (see Attachment C):

> "In the original TCEQ WAM, primary control point C10, the Sulphur River near Talco (USGS 07343200, aka Sulphur River below Talco 07343210), had a drainage area that was smaller than the next upstream point C20. This results in a flow discontinuity which may impact water availability. Apparently the USGS moved the gage downstream just after the naturalized flows were developed for the Sulphur WAM. For this model, we are using a drainage area for C10 of 1,365 square miles, the drainage area of the gage for the period of the naturalized flows. This is the drainage area used in the original Sulphur WAM."

It has been confirmed that this difference remains in the latest TCEQ Sulphur WAM (October 11, 2019); thus, this correction will be made to all Region D evaluations employing the Sulphur WAM.

Other WAMs

For the purposes of the 2026 Region D Water Plan, for the Neches River Basin the NETRWPG requests use of the Neches WAM model as modified by the Region I RWPG as approved by the TWDB for all availability analyses in the basin. For the Trinity River Basin, the NETRWPG requests use of the Trinity WAM model as modified by the Region C RWPG and approved by the TWDB for all availability analyses in the basin.

Specifics regarding surface water availability modeling of each river basin are presented by basin in the completed hydrologic variance forms provided in Attachment A. Considerations regarding the simulation of reservoir conditions with respect to sedimentation effects are then subsequently detailed in Attachment B. Supporting documentation is provided within Attachment C.

If you have any questions regarding this request, please contact me at your convenience. We appreciate the TWDB's consideration of this request.

Sincerely,
CAROLLO ENGINEERS, INC.

Tony L. Smith, P.E.
Project Manager

tls

Enclosures: Attachments A, B, C

cc: Jim Thompson
Kyle Dooley
Stan Hayes

Surface Water Hydrologic Variance Request Checklist

Texas Water Development Board (TWDB) rules[1] require that regional water planning groups (RWPG) use most current Water Availability Models (WAM) from the Texas Commission on Environmental Quality (TCEQ) and assume full utilization of existing water rights and no return flows for surface water supply analysis. Additionally, evaluation of existing stored surface water available during Drought of Record conditions must be based on Firm Yield using anticipated sedimentation rates. However, the TWDB rules also allow, and **we encourage**, RWPGs to use more representative, water availability modeling assumptions; better site-specific information; or justified operational procedures other than Firm Yield with written approval (via a Hydrologic Variance) from the Executive Administrator in order to better represent and therefore prepare for expected drought conditions.

RWPGs must use this checklist, which is intended to save time and reduce effort, to request a Hydrologic Variance for estimating the availability of surface water sources. For Questions 4 – 10, please indicate whether the requested variance is for determining Existing Supply, Strategy Supply, or both. Please complete a separate checklist for each river basin in which variances are being requested.

Water Planning Region: D

1. Which major river basin does the request apply to? Please specify if the request only applies part of the basin or only to certain reservoirs.

   Cypress Creek Basin

2. Please give a brief, bulleted, description of the requested hydrologic variances including how the alternative availability assumptions vary from rule requirements, how the modifications will affect the associated annual availability volume(s) in the regional water plan, and why the variance is necessary or provides a better basis for planning. You must provide more-detailed descriptions in the subsequent checklist questions. Attach any available documentation supporting the request.

   - Request inclusion of return flows for existing surface water rights utilizing return flows for evaluation of existing and strategy supplies.

3. Was this request submitted in a previous planning cycle? If yes, please indicate which cycle and note how it is different, if at all, from the previous request?

   Yes

   The above requests were submitted in the 2021and 2016 planning cycles and are unchanged from the previous planning cycle request.

[1] 31 Texas Administrative Code (TAC) §§ 357.10(14) and 357.32(c)

4. Are you requesting to extend the period of record beyond the current applicable WAM hydrologic period? If yes, please describe the proposed methodology. Indicate whether you believe there is a new drought of record in the basin.

   No

   Choose an item.

   Click or tap here to enter text.

5. Are you requesting to use a reservoir safe yield? If yes, please describe in detail how the safe yield would be calculated and defined, which reservoir(s) it would apply to, and why the modification is needed or preferrable for drought planning purposes.

   No

   Choose an item.

   Click or tap here to enter text.

6. Are you requesting to use a reservoir yield other than firm yield or safe yield? If yes, please describe, in a bulleted list, each modification requested including how the alternative yield was calculated, which reservoir(s) it applies to, and why the modification is needed or preferrable for drought planning purposes. Examples of alternative reservoir yield analyses may include using an alternative reservoir level, conditional reliability, or other special reservoir operations.

   No

   Choose an item.

   Click or tap here to enter text.

7. Are you requesting to use a different model (such as a RiverWare or Excel-based models) than RUN 3 of the applicable TCEQ WAM? If yes, please describe the model being considered including how it incorporates water rights and prior appropriation and how it is more conservative than RUN 3 of the applicable TCEQ WAM.

   No

   Choose an item.

   Click or tap here to enter text.

8. Are you requesting to use a modified TCEQ WAM? If yes, please describe in a bulleted list all modifications in detail including all specific changes to the WAM and whether the modified WAM is more conservative than the TCEQ WAM RUN 3. Examples of WAM modifications may

include adding subordination agreements, contracts, updated water rights, modified spring flows, updated lake evaporation, updated sedimentation[2], system or reservoir operations, or special operational procedures into the WAM.

Yes

Existing and Strategy Supply

Updated sedimentation will be represented within the WAM for the determination of reservoir firm yields for existing and strategy supply. A description of the sedimentation methodology to be employed is provided in Attachment B.

9. Are you requesting to include return flows in the modeling? If yes, are you doing so to model an indirect reuse water management strategy (WMS)? Please provide complete details regarding the proposed methodology for determining reuse WMS availability.

   Yes

   Existing and Strategy Supply

   Evaluations of reuse strategies will use the minimum monthly return flows from the most recent 10-yr historical discharge data of the WUG for which consideration of an indirect reuse water management strategy is evaluated. This approach is consistent with the methods employed by TCEQ in their evaluations of reuse during their permitting process where the permitted, minimum historical, and present discharges relevant to a particular WUG are all considered in the evaluation of a reuse permit.

10. Are any of the requested Hydrologic Variances also planned to be used by another region for the same basin? If yes, please indicate the other Region. Please indicate if unknown.

    No

    Click or tap here to enter text.

11. Please describe any other variance requests not captured on this checklist or add any other information regarding the variance requests on this checklist.

    Not Applicable

[2] Updating anticipated sedimentation rates does not require a hydrologic variance under 31 TAC § 357.10(14). The Technical Memorandum will require providing details regarding the sedimentation methodology utilized. Please consider providing that information with this request.

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Water Planning Region: D

1. Which major river basin does the request apply to? Please specify if the request only applies part of the basin or only to certain reservoirs.

   Red River Basin

2. Please give a brief, bulleted, description of the requested hydrologic variances including how the alternative availability assumptions vary from rule requirements, how the modifications will affect the associated annual availability volume(s) in the regional water plan, and why the variance is necessary or provides a better basis for planning. You must provide more-detailed descriptions in the subsequent checklist questions. Attach any available documentation supporting the request.

   - Request inclusion of return flows for existing surface water rights utilizing return flows for evaluation of existing and strategy supplies.

3. Was this request submitted in a previous planning cycle? If yes, please indicate which cycle and note how it is different, if at all, from the previous request?

   Yes

   The above requests were submitted in the 2021and 2016 planning cycles and are unchanged from the previous planning cycle request.

[1] 31 Texas Administrative Code (TAC) §§ 357.10(14) and 357.32(c)

4. Are you requesting to extend the period of record beyond the current applicable WAM hydrologic period? If yes, please describe the proposed methodology. Indicate whether you believe there is a new drought of record in the basin.

   No

   Choose an item.

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5. Are you requesting to use a reservoir safe yield? If yes, please describe in detail how the safe yield would be calculated and defined, which reservoir(s) it would apply to, and why the modification is needed or preferrable for drought planning purposes.

   No

   Choose an item.

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6. Are you requesting to use a reservoir yield other than firm yield or safe yield? If yes, please describe, in a bulleted list, each modification requested including how the alternative yield was calculated, which reservoir(s) it applies to, and why the modification is needed or preferrable for drought planning purposes. Examples of alternative reservoir yield analyses may include using an alternative reservoir level, conditional reliability, or other special reservoir operations.

   No

   Choose an item.

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7. Are you requesting to use a different model (such as a RiverWare or Excel-based models) than RUN 3 of the applicable TCEQ WAM? If yes, please describe the model being considered including how it incorporates water rights and prior appropriation and how it is more conservative than RUN 3 of the applicable TCEQ WAM.

   No

   Choose an item.

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8. Are you requesting to use a modified TCEQ WAM? If yes, please describe in a bulleted list all modifications in detail including all specific changes to the WAM and whether the modified WAM is more conservative than the TCEQ WAM RUN 3. Examples of WAM modifications may

include adding subordination agreements, contracts, updated water rights, modified spring flows, updated lake evaporation, updated sedimentation[2], system or reservoir operations, or special operational procedures into the WAM.

Yes

Existing and Strategy Supply

Updated sedimentation will be represented within the WAM for the determination of reservoir firm yields for existing and strategy supply. A description of the sedimentation methodology to be employed is provided in Attachment B.

9. Are you requesting to include return flows in the modeling? If yes, are you doing so to model an indirect reuse water management strategy (WMS)? Please provide complete details regarding the proposed methodology for determining reuse WMS availability.

   Yes

   Existing and Strategy Supply

   Only return flows authorized in existing surface water rights and modeled in the existing WAM Run 3 will be included in the analysis. Evaluations of reuse strategies will use the return flows from TCEQ WAM Run 8. This approach is consistent with the methods employed by TCEQ in their evaluations of reuse during their permitting process where the permitted, minimum historical, and present discharges relevant to a particular WUG are all considered in the evaluation of a reuse permit.

10. Are any of the requested Hydrologic Variances also planned to be used by another region for the same basin? If yes, please indicate the other Region. Please indicate if unknown.

    No

    Click or tap here to enter text.

11. Please describe any other variance requests not captured on this checklist or add any other information regarding the variance requests on this checklist.

    Not Applicable.

[2] Updating anticipated sedimentation rates does not require a hydrologic variance under 31 TAC § 357.10(14). The Technical Memorandum will require providing details regarding the sedimentation methodology utilized. Please consider providing that information with this request.

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Water Planning Region: D

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   Sabine River Basin

2. Please give a brief, bulleted, description of the requested hydrologic variances including how the alternative availability assumptions vary from rule requirements, how the modifications will affect the associated annual availability volume(s) in the regional water plan, and why the variance is necessary or provides a better basis for planning. You must provide more-detailed descriptions in the subsequent checklist questions. Attach any available documentation supporting the request.

   - Request inclusion of return flows for existing surface water rights utilizing return flows for evaluation of existing and strategy supplies.

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[1] 31 Texas Administrative Code (TAC) §§ 357.10(14) and 357.32(c)

4. Are you requesting to extend the period of record beyond the current applicable WAM hydrologic period? If yes, please describe the proposed methodology. Indicate whether you believe there is a new drought of record in the basin.

   No

   Choose an item.

   Click or tap here to enter text.

5. Are you requesting to use a reservoir safe yield? If yes, please describe in detail how the safe yield would be calculated and defined, which reservoir(s) it would apply to, and why the modification is needed or preferrable for drought planning purposes.

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6. Are you requesting to use a reservoir yield other than firm yield or safe yield? If yes, please describe, in a bulleted list, each modification requested including how the alternative yield was calculated, which reservoir(s) it applies to, and why the modification is needed or preferrable for drought planning purposes. Examples of alternative reservoir yield analyses may include using an alternative reservoir level, conditional reliability, or other special reservoir operations.

   No

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7. Are you requesting to use a different model (such as a RiverWare or Excel-based models) than RUN 3 of the applicable TCEQ WAM? If yes, please describe the model being considered including how it incorporates water rights and prior appropriation and how it is more conservative than RUN 3 of the applicable TCEQ WAM.

   No

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include adding subordination agreements, contracts, updated water rights, modified spring flows, updated lake evaporation, updated sedimentation[2], system or reservoir operations, or special operational procedures into the WAM.

Yes

Existing and Strategy Supply

Updated sedimentation will be represented within the WAM for the determination of reservoir firm yields for existing and strategy supply. A description of the sedimentation methodology to be employed is provided in Attachment B.

9. Are you requesting to include return flows in the modeling? If yes, are you doing so to model an indirect reuse water management strategy (WMS)? Please provide complete details regarding the proposed methodology for determining reuse WMS availability.

   Yes

   Existing and Strategy Supply

   Evaluations of reuse strategies will use the minimum monthly return flows from the most recent 10-yr historical discharge data of the WUG for which consideration of an indirect reuse water management strategy is evaluated. This approach is consistent with the methods employed by TCEQ in their evaluations of reuse during their permitting process where the permitted, minimum historical, and present discharges relevant to a particular WUG are all considered in the evaluation of a reuse permit.

10. Are any of the requested Hydrologic Variances also planned to be used by another region for the same basin? If yes, please indicate the other Region. Please indicate if unknown.

    No

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    Not Applicable

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Water Planning Region: D

1. Which major river basin does the request apply to? Please specify if the request only applies part of the basin or only to certain reservoirs.

   Sulphur River Basin

2. Please give a brief, bulleted, description of the requested hydrologic variances including how the alternative availability assumptions vary from rule requirements, how the modifications will affect the associated annual availability volume(s) in the regional water plan, and why the variance is necessary or provides a better basis for planning. You must provide more-detailed descriptions in the subsequent checklist questions. Attach any available documentation supporting the request.

   - Request to correct the TCEQ WAM Run3 for the Sulphur River Basin for the drainage area at Control Point C10.
   - Request inclusion of return flows for existing surface water rights utilizing return flows for evaluation of existing and strategy supplies.
   - Request modeling of Lake Chapman as one pool instead of multiple pools to facilitate calculation of the firm yield.

3. Was this request submitted in a previous planning cycle? If yes, please indicate which cycle and note how it is different, if at all, from the previous request?

   Yes

[1] 31 Texas Administrative Code (TAC) §§ 357.10(14) and 357.32(c)

The above requests were submitted in the 2021and 2016 planning cycles and are unchanged from the previous planning cycle request.

4. Are you requesting to extend the period of record beyond the current applicable WAM hydrologic period? If yes, please describe the proposed methodology. Indicate whether you believe there is a new drought of record in the basin.

   No

   Choose an item.

   Click or tap here to enter text.

5. Are you requesting to use a reservoir safe yield? If yes, please describe in detail how the safe yield would be calculated and defined, which reservoir(s) it would apply to, and why the modification is needed or preferrable for drought planning purposes.

   No

   Choose an item.

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6. Are you requesting to use a reservoir yield other than firm yield or safe yield? If yes, please describe, in a bulleted list, each modification requested including how the alternative yield was calculated, which reservoir(s) it applies to, and why the modification is needed or preferrable for drought planning purposes. Examples of alternative reservoir yield analyses may include using an alternative reservoir level, conditional reliability, or other special reservoir operations.

   No

   Choose an item.

   Click or tap here to enter text.

7. Are you requesting to use a different model (such as a RiverWare or Excel-based models) than RUN 3 of the applicable TCEQ WAM? If yes, please describe the model being considered including how it incorporates water rights and prior appropriation and how it is more conservative than RUN 3 of the applicable TCEQ WAM.

   No

   Choose an item.

   Click or tap here to enter text.

8. Are you requesting to use a modified TCEQ WAM? If yes, please describe in a bulleted list all modifications in detail including all specific changes to the WAM and whether the modified WAM is more conservative than the TCEQ WAM RUN 3. Examples of WAM modifications may include adding subordination agreements, contracts, updated water rights, modified spring flows, updated lake evaporation, updated sedimentation[2], system or reservoir operations, or special operational procedures into the WAM.

   Yes

   Existing and Strategy Supply

   The TCEQ WAM Run3 will be modified to correct an error in drainage area for control point C10 (Sulphur River near Talco) as identified by FNI (2012) (see Attachment C):

   > "In the original TCEQ WAM, primary control point C10, the Sulphur River near Talco (USGS 07343200, aka Sulphur River below Talco 07343210), had a drainage area that was smaller than the next upstream point C20. This results in a flow discontinuity which may impact water availability. Apparently the USGS moved the gage downstream just after the naturalized flows were developed for the Sulphur WAM. For this model, we are using a drainage area for C10 of 1,365 square miles, the drainage area of the gage for the period of the naturalized flows. This is the drainage area used in the original Sulphur WAM."

   It has been confirmed that this difference remains in the latest TCEQ Sulphur WAM (October 11, 2019); thus, this correction will be made to all Region D evaluations employing the Sulphur WAM. Specifically, the .DIS file will be modified as follows:

```
** FNI Change - Changed the drainage area for C10 to match USGS drainage area at Sulphur
River Near Talco (1,365 mi2) prior to May 21, 1997.
WP   C10    1365    69.6    43.4
**WP   C10 1353.24    69.6    43.4
```

   Lake Chapman is currently used by water providers in Region D and Region C and is represented within the official WAM by individual water rights. To assess the firm yield of Lake Chapman, the NETRWPG requests to model the reservoir as a single pool, with supplies then assigned proportionally based on each providers' water rights. This will be done in a coordinated matter with Region C to ensure a consistent representation of the reservoir and supply availability.

   Updated sedimentation will be represented within the WAM for the determination of reservoir firm yields for existing and strategy supply. A description of the sedimentation methodology to be employed is provided in Attachment B.

9. Are you requesting to include return flows in the modeling? If yes, are you doing so to model an indirect reuse water management strategy (WMS)? Please provide complete details regarding the proposed methodology for determining reuse WMS availability.

[2] Updating anticipated sedimentation rates does not require a hydrologic variance under 31 TAC § 357.10(14). The Technical Memorandum will require providing details regarding the sedimentation methodology utilized. Please consider providing that information with this request.

Yes

Existing and Strategy Supply

Evaluations of reuse strategies will use the return flows from TCEQ WAM Run 8. This approach is consistent with the methods employed by TCEQ in their evaluations of reuse during their permitting process where the permitted, minimum historical, and present discharges relevant to a particular WUG are all considered in the evaluation of a reuse permit.

10. Are any of the requested Hydrologic Variances also planned to be used by another region for the same basin? If yes, please indicate the other Region. Please indicate if unknown.

    No

    Click or tap here to enter text.

11. Please describe any other variance requests not captured on this checklist or add any other information regarding the variance requests on this checklist.

    Not Applicable.

NORTH EAST TEXAS REGIONAL WATER PLANNING GROUP

2026 Region D Water Plan

Project No.: 200343

Date: October 4, 2023

Prepared By: Michael Pinckney, P.E. and Tony Smith P.E.

Reviewed By:

Subject: Methodology to Estimate Revised Reservoir Storage Volume Capacity and Surface Area Curves for Use in Estimating Existing and Strategy Reservoir Source Availabilities for Future Planning Decades for the purposes of 2026 Texas Regional Water Plan

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This document is released for the purpose of information exchange review and planning only under the authority of Tony L. Smith, P.E., 9/21/2023, Texas, PE #92620.

SIMULATION OF RESERVOIR CONDITIONS (SEDIMENTATION)

Reservoir sedimentation reduces the storage capacity of a reservoir, impacting the beneficial uses of reservoirs such as water supply, flood control, hydropower, navigation, and recreation. Surveys of volumetric storage in a reservoir allow for the derivation of rates and loadings of sediment to the reservoir. The annual loading can then be distributed to determine a revised elevation-area-capacity curve which reflects the distribution of the total volume of sediment accumulated at the end of an analysis period. The resultant area-capacity relationship can then be incorporated into an applicable Water Availability Model (WAM) for a given reservoir.

Generally, for the purposes of the 2026 Region D Plan, if a reservoir is calculated to have no firm yield, that result will be assumed for all decades in the 2030-2080 planning horizon. For those reservoirs lacking volumetric surveys, original area-capacity relations employed within WAM Run 3 will be assumed constant. If original area-capacity-elevation relations are not available, the most recent area-capacity-elevation relation for a reservoir will be used as a baseline for future projections. For reservoirs with available volumetric survey information, an annual sediment rate will be calculated or cited from available information, and loadings calculated for Year 2030 and Year 2080. Sediment distribution within the reservoir will be calculated using the Empirical Area Reduction Method (described below), and resultant 2030 and 2080 area-capacity curves will be developed and employed within the applicable WAM to calculate 2030 and 2080 firm yields. The intervening decadal firm yields will then be linearly interpolated.

Empirical Area-Reduction Method

USACE (1989) describes methods for estimating the distribution of sediment deposits in reservoirs. It is noted that empirical methods offer a simple approach useful as a "first approximation," but that their use sacrifices consideration of unique interactions between numerous factors affecting the distribution of

sediment deposits in a given reservoir. Such factors include a reservoir's size, shape, sediment quantities and characteristics, sediment sources, progressive vegetative growth on frequently exposed deposits, consolidation of deposits, basin hydrology, and regulation of the reservoir (USACE, 1989).

While five empirical methods are considered in USACE (1989), two are noted as being the most widely used: the Area-Increment Method and the Empirical Area Reduction Method. For the Area-Increment Method, USACE (1989) notes that, "under extreme reservoir operation conditions, or unusual reservoir shape, the Empirical Area Reduction Method should be used," but also notes that both the Area-Increment method and Empirical Area Reduction method, "tend to overpredict the volume of deposits in the conservation pool."

Such a tendency is considered in the present context as being reasonably conservative, as such an overprediction in the volume of sediment deposits would limit the volume available in the conservation pool. More detailed information and modeling beyond the present scope of the regional planning process would be necessary to provide a more detailed characterization of sediment distribution for individual reservoirs in Region D. Given these considerations, it has been assumed that the Empirical Area Reduction Method is sufficient for the purposes of the 2026 Region D Plan. A brief summary of the Empirical Area Reduction Method to be employed for distribution of sediment is provided below.

The Empirical Area-Reduction Method for calculating the distribution of sediment deposits in a reservoir was developed by Borland and Miller (1958) for the Bureau of Reclamation. The basic equation of the empirical area-reduction method is expressed as

$$S = \int_{o}^{y_0} A d_y + \int_{y_0}^{H} K a_p d_y$$

Where,

S = Total sediment volume distributed in the reservoir, typically the volume anticipated to occur in a planning period, e.g. 100-years

o = The original zero elevation of the dam

y_o = The zero elevation of the dam after sediment inflow

A = Reservoir surface area at depth y

d_y = incremental depth

H = Total depth of reservoir commonly determined by the normal water surface

K = a constant of proportionality for converting relative areas to actual areas for a given reservoir

a_p = relative area

p = relative depth

The equation for relative area is expressed as:

$$a_p = C p^m (1-p)^n$$

Where, C, m and n are coefficients for four standard reservoir types, summarized in Table 1 as reported by the Sedimentation Section of the Bureau of Reclamation (1962). Values were originally developed by Borland & Miller (1958) and have since been refined by Lara (1962).

Table 1: Reservoir types and values of M, C, m, and n

Reservoir Type	Standard Classification	M	C	m	n
Lake	I	3.5-4.5	5.074	1.85	0.35
Flood Plain Foothill	II	2.5-3.5	2.487	0.57	0.41
Hill	III	1.5-2.5	16.967	1.15	2.32
Gorge	IV	1.0-1.5	1.486	-0.25	1.34

Per Borland and Miller (1958), reservoirs are classified based on a shape factor (M). The shape factor is found by plotting reservoir depth as the ordinate against reservoir capacity as the abscissa, on a log-log plot. The reciprocal of the slope of the line passing through the data points is defined as M. The Sedimentation Section of the Bureau of Reclamation (1962) developed a computational procedure employing the empirical area-reduction methodology.

In the 2016 Region D Plan, the most significant impacts to reservoir storage due to sedimentation were observed in Lake Wright Patman. Given the significance of known sedimentation issues for the lake, specific application of the above approach is demonstrated below in the context of the available information base. The approach described below, where determined to be relevant in Region D reservoirs, will be employed for those reservoirs where consideration of significant sedimentation effects is warranted.

Lake Wright Patman

Lake Wright Patman (originally known as Lake Texarkana) was authorized in 1946 as a part of a comprehensive plan for flood control in the Red River Basin (TWDB 2003). The deliberate impoundment of Lake Wright Patman began June 27, 1956, the reservoir water level reached conservation pool elevation in February 1957. The reported original volumetric capacity of the reservoir is 158,000 ac-ft (TWDB, 2010). Two volumetric surveys of the reservoir have been performed by TWDB over the last several decades, described below:

1997 Hydrographic Survey

The Texas Water Development Board conducted a hydrographic survey of Wright Patman Lake during the period December 16 – January 16, 1997 to determine the capacity of the lake at the conservation pool and when the lake was in the flood pool (TWDB 2003). The results of this TWDB survey indicate that the lake's capacity at the conservation pool elevation of 220.6 ft. mean sea level (msl) was 110,900 acre-feet and the area was 18,994 acres. At elevation 230 ft. (msl) the volume was determined to be 392,740 acre-feet with an area of 34,882 acres (TWDB 2003). The estimated reduction in storage capacity at elevation 220.6 ft. (msl) since 1956 was 34,400 acre-ft or 1,147 acre-ft per year. At elevation 230 ft. (msl), the reduction in storage calculated was 44,510 acre-feet or 1,483.7 acre-feet per year (TWDB 2003).

2010 Hydrographic Survey

The Texas Water Development Board conducted a hydrographic survey of Lake Wright Patman during the period between March 26 – June 7, 2010 to determine the volumetric capacity of the

lake. The results of the TWDB's 2010 survey indicate that the lake's 2010 capacity at the conservation pool elevation of 220.6 ft. (msl) was 97,927 acre-feet, with an area of 18,247 acres. Additionally, refinements in the methodology for calculating reservoir capacity from collected bathymetry prompted the TWDB to re-analyze the 1997 volumetric survey data (TWDB 2010). This re-analysis of the 1997 TWDB volumetric survey resulted in an updated 1997 capacity estimate at 220.6 ft. (msl) of 115,715 acre-feet using the 1997 survey data.

TWDB then calculated sediment rates at 220.6 ft (msl) for three scenarios:

1. The difference between the 2010 surveyed capacity and the original design capacity estimate;
2. The difference between the 2010 surveyed capacity and an estimation of the pre-impoundment capacity performed in 2010; and
3. The difference between the 2010 surveyed capacity and the revised 1997 surveyed capacity estimate.

These calculations and supporting data are presented in Table 2.

Table 2 - Capacity loss comparisons for Lake Wright Patman (recreated from TWDB 2010)

	Comparisons @ 220.6		
	Volume (acre-ft)		**Pre-impoundment (acre-ft)**
Survey	**Comparison #1**	**Comparison #2**	**Comparison #3**
Original design estimate[a]	158,000	< >	< >
TWDB pre-impoundment estimate based on 2010 survey	< >	< >	137,336[b]
1997 TWDB volumetric survey (revised)	< >	115,638	< >
2010 volumetric survey	97,927	97,927	97,927
Volume difference (acre-ft)	60,073 (38%)	17,711 (15.3%)	39,409 (28.7%)
Number of years	54	13	54
Capacity loss rate (acre-ft/year)	1,112	1,362	730

[a] Source: (TWDB, 1974), note: Wright Patman Dam was completed on May 19, 1954, and deliberate impoundment began on June 27, 1956.

[b] 2010 TWDB surveyed capacity of 97,927 acre-feet plus 2010 TWDB surveyed sediment volume of 39,409 acre-feet.

In July 2018, Riverbend Water Resources District contracted a volumetric and sedimentation survey of Lake Wright Patman, which was conducted between July 17, 2018 and August 23, 2018 by Arroyo Environmental Consultants, LLC and partner firm Aqua Strategies Inc. The results of Arroyo's survey indicate that the lake's capacity at the conservation pool elevation of 220.6 ft. (msl) was 96,430 acre-feet

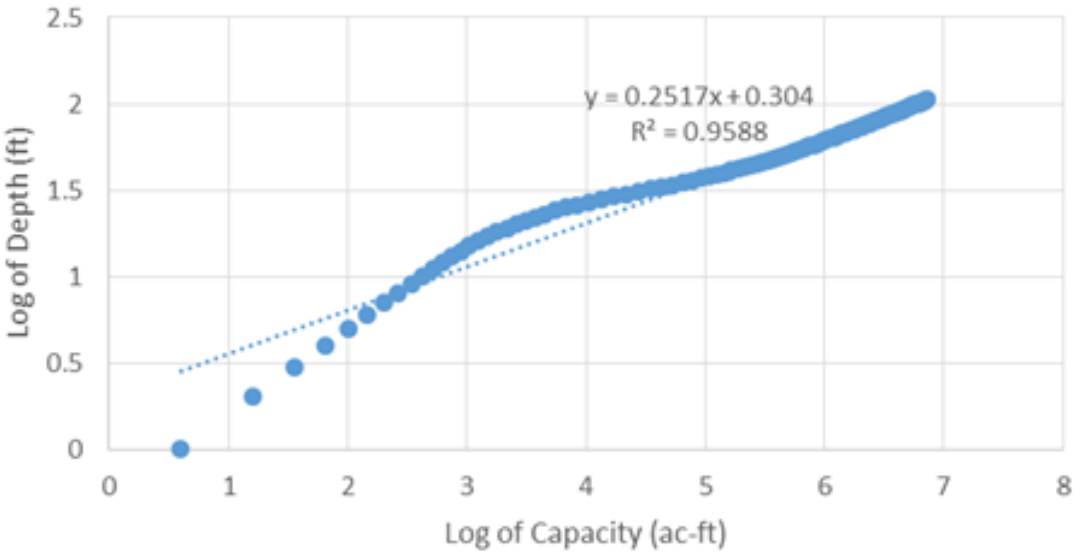
and the area was 17,907 acres. At elevation 224 ft. (msl) the volume was determined to be 168,736 acre-feet with an area of 24,343 acres (Arroyo 2019).

Based on the data collected in the survey, Arroyo estimated the pre-impoundment volume to be 126,752 ac-ft at elevation 220.6 ft. (msl) and 205,121 ac-ft at elevation 224 ft. (msl). The estimated reduction in storage capacity at elevation 220.6 ft. (msl) since 1956, based on the estimated pre-impoundment volume, was 30,322 acre-ft or 489 acre-ft per year. At elevation 224 ft. (msl), the reduction in storage calculated was 36,385 acre-ft or 587 acre-ft per year. Relative to the original design volume estimates, at elevation 220.6 ft. (msl) there is an estimated capacity loss of 61,570 ac-ft and at elevation 224.0 ft. (msl) a capacity loss of 71,459 ac-ft (Arroyo 2019).

Arroyo (2019) estimates annual losses in Lake Wright Patman's capacity ranges between 187 and 993 acre-feet (based on the original, re-analyzed 1997, and 2010 capacities, respectively) at 220.6 ft (msl) due to sedimentation below the conservation pool elevation. Given that Lake Wright Patman is a flood control reservoir, it is thus necessary to derive an overall sedimentation rate for the entire reservoir (i.e., from bottom elevation up to the top of dam elevation) to develop overall area-capacity relations.

To develop the overall sedimentation rate for use in projecting future reservoir sedimentation, the rate of capacity loss due to sedimentation at 220.6 ft (msl) has been assumed as 714 ac-ft/yr, as this loss rate derives from an average of the comparison of the Arroyo 2018 surveyed capacity of 96,430 ac-ft compared to the original estimated design capacity of 158,000 ac-ft, 2010 estimated pre-impoundment volume of 137,366 ac-ft, and the 2018 estimated pre-impoundment volume of 126,752 ac-ft. This estimated rate is not as aggressive a loss rate as the 1,362 ac-ft/yr rate derived from comparing the 2010 to the 1997 TWDB surveys, but represents the longer term effects of sediment deposition in the reservoir at 220.6 ft. (msl).
Using the original design elevation-area-capacity relationship as a basis, the shape factor (M) is calculated using the previously described log-log plot of reservoir depth vs. capacity (Borland and Miller, 1958), as shown in Figure 1 for Lake Wright Patman.

Figure 1 - Log-Log Plot of Reservoir Depth vs. Capacity with Best Fit Regression for Lake Wright Patman



The resultant shape factor is the reciprocal of the slope of the best fit regression (i.e. M = 1/.2517 = 3.97). The standards classification for this shape factor for Lake Wright Patman is a "Type I" reservoir. Thus, the equation for the calculation of relative area to be used in the Empirical Area Reduction Method for Lake Wright Patman is as follows:

$$a_p = 5.074p^{1.85}(1-p)^{0.35} \qquad \text{(Eq. 1)}$$

With an equation for relative area and the original design relationship between elevation, area, and capacity for the reservoir, a calculated sedimentation volume at a known elevation to be distributed from the original design capacity curve to the surveyed capacity curve, and a sedimentation rate for future sedimentation, area-capacity relationships at future decadal times over the planning horizon (2030 - 2080) can be developed.

Per the Riverbend Water Resource District's request during the development of the 2021 RWP, the new Elevation Area Capacity data developed by Arroyo in 2018-2019 and given the operating characteristics of the conservation pool of Wright Patman, a pair of sedimentation rates were identified for planning use. The first sedimentation rate of 714 ac-ft/yr is applied to all elevations equal to or below 220.6 ft. (msl) and a sedimentation rate of 824 ac-ft per year is utilized for elevations below 224.9 ft. (msl). Given that the use of K is for modeling the area of sedimentation, more than one K value could be used in the EARM wherein a K value applies at specific elevation ranges. Thus, a single application of the EARM can be derived that meets the observed sedimentation volumes at elevations 220.6 ft. (msl) and 224.9 ft. (msl).

Thus, using the reported sedimentation volume between 1956 and 2018, the original design area capacity curve is adjusted to reflect the distribution of the sediment present in 2018. Using the assumed rate of capacity loss in Lake Wright Patman of 714 ac-ft/yr at elevation 220.6 ft. (msl) and 824 ac-ft/yr at elevation 224.9 ft (msl) for 2018 through the planning decades and the Empirical Area Reduction Method results in new elevation-area-capacity relations for 2030 - 2080 (see Figures 2 and 3). These decadal relations of reservoir area and capacity are then incorporated as inputs to the Sulphur WAM.

Figure 2 - Decadal Relations of Volume to Water Surface Elevation for Lake Wright Patman from Application of Empirical Area Reduction Method for Distribution of Sediment Deposits using Annual Capacity Loss Rate of 714 ac-ft/yr for elevation 220.6 ft. (msl) and below and 824 ac-ft/yr for elevations above 220.6 ft. (msl).

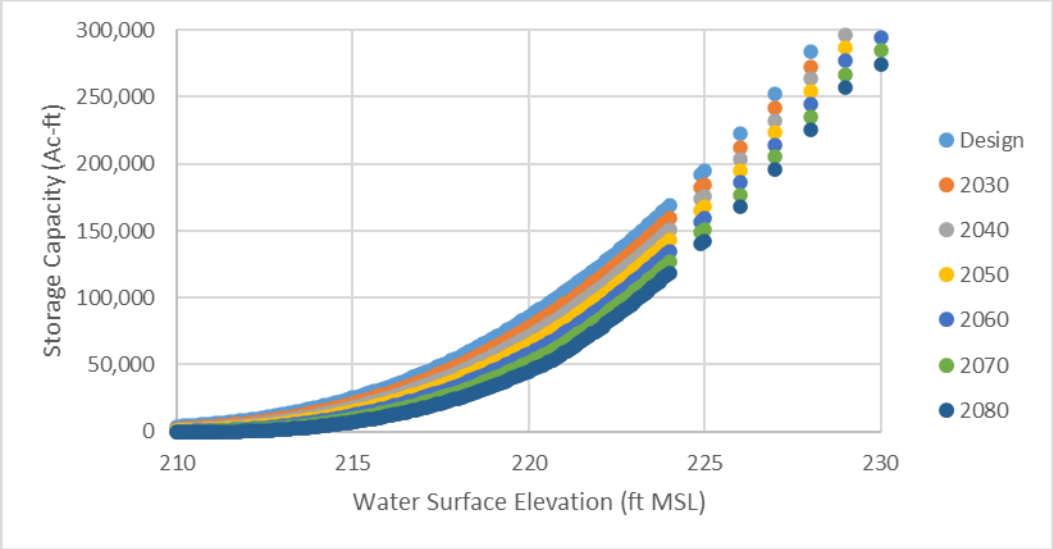
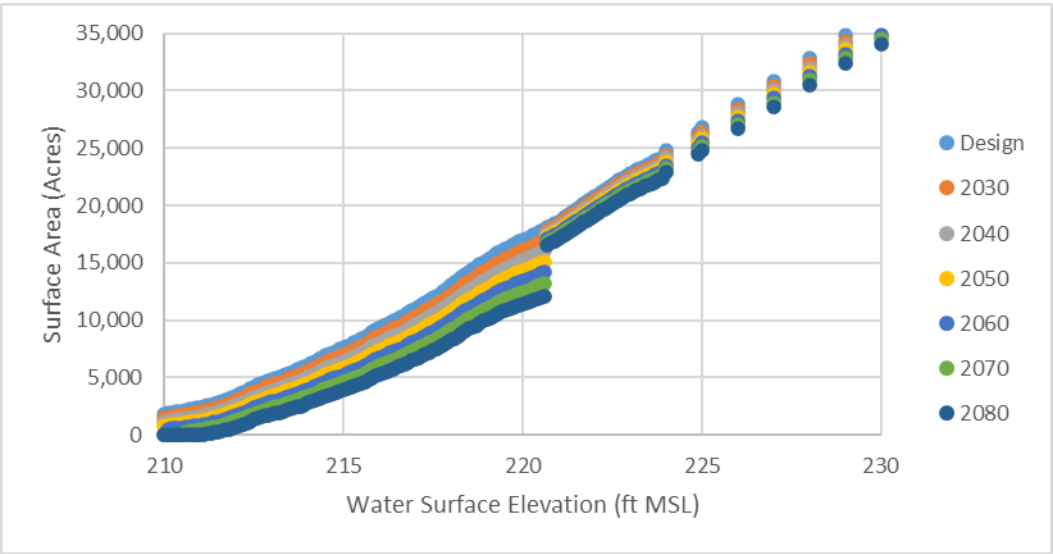


Figure 3: Decadal Relations of Area to Water Surface Elevation for Lake Wright Patman from Application of Empirical Area Reduction Method for Distribution of Sediment Deposits using Annual Capacity Loss Rate of 714 ac-ft/yr for elevation 220.6 ft. (msl) and below and 824 ac-ft/yr for elevations above 220.6 ft. (msl).



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TO: File

CC: Becky Griffith, Tony Smith (Espey)

FROM: Jon Albright and Jeremy Rice

SUBJECT: Modifications to the Sulphur WAM and Preliminary Yields

DATE: July 16, 2012

PROJECT: MHP11453

Freese and Nichols Inc. (FNI) has developed an updated version of the Sulphur Water Availability Model (WAM). This model will be used as the basis for all WAM modeling in the Sulphur Basin Watershed Overview Project. These modifications are primarily based on the Texas Water Development Board's Site Protection Study. The following changes were made to the Sulphur WAM:

- Use of current Storage-Area relationships for Lakes Wright Patman and Jim Chapman
- Use of one pool to model Lake Jim Chapman (this facilitates analyzing the impact of changes on the performance of the reservoir).
- Addition of Lake Ralph Hall based on code from TCEQ.
- Addition of Marvin Nichols Site 1a, Parkhouse I, Parkhouse II and Talco sites.
- Manual input of naturalized flows at the Marvin Nichols and Parkhouse I and II sites to correct for problems with drainage areas in the original Sulphur WAM.
- Changes to correct errors in drainage area for control point C10 (Sulphur River near Talco)

Each of these changes is discussed in more detail below.

Preliminary Reservoir Yields

We have used this model to calculate preliminary firm yields of Marvin Nichols 1a and Parkhouse I and II assuming current sediment conditions, with Lake Ralph Hall in place (see Table 1). Note that these yields are slightly different than the Site Protection Study. There are several reasons for this. First, we are assuming current sediment conditions at Lake Wright Patman and Lake Chapman, where the Site Protection Study used original sediment conditions (Run 3). Second, we are assuming overdraft operation of Lake Ralph Hall without environmental bypass, while the Site Protection Study assumed firm yield operation of Ralph Hall with

Consensus Bypass. Third, the Site Protection Study yields in Table 1 are the yields without environmental bypass from the Site Protection Study with the estimated impact of Lake Ralph Hall subtracted from the yield. Since the operation of Lake Ralph Hall is different in the Site Protection Study than in the current study, the impact on yield may be a little different. Finally, the Site Protection Study had the flow discontinuity at control point C10, which may have slightly impacted yields.

Table 1: Preliminary Firm Yields

Proposed Reservoir	**Calculated Firm Yield** (acre-feet per year)	**Site Protection Study Firm Yield** (acre-feet per year)	**Difference** (acre-feet per year)
Marvin Nichols 1a	595,000	596,900	-1,900
Parkhouse I	124,600	124,400	200
Parkhouse II	121,800	119,900	1,900

Future yields calculated for the Sulphur Watershed Overview will assume different sediment conditions for Patman, Chapman and Ralph Hall. However, specific sediment scenarios have not been identified at this time.

Yields of the Talco site will be developed at a later date.

Modifications to Sulphur WAM

Lake Chapman

In the TCEQ WAM, Lake Chapman is modeled with three individual pools, reflecting the three water rights in the reservoir. For this study Lake Chapman is modeled as a single pool. This change facilitates analyzing impacts of other projects on the overall performance of Lake Chapman. The instream flow requirements and diversion were also combined into a single IF and WR record. The model for this study uses the 2007 TWDB Volumetric Survey of Lake Chapman rather than the original storage and area characteristics in the TCEQ WAM.

Changes to DAT File

Change instream flow so that it comes from one pool instead of being divided among 3 pools. This release is continuous and not limited to inflow as in the TCEQ code.

```
**IF   A40     951        19651119       3                 IF4797
**WSRCHAP1   81470                                           1
**IF   A40    2285        19651119       3                 IF4798
```

```
**WSRCHAP2  114265                                          1      -1
**IF   A40    3619        19651119       3                 IF4799
**WSRCHAP3  114265                                          1      -1
**
**
** FNI change: since we are using one pool, we need to change to one IF (5 cfs)
**
IF   A40    3619        19651119       3              IF_Chapman
WSRCHAP1  298930
OR   A40                              -1
```

Change from three pools (corresponding to the three water rights in the lake) to a single pool. Redistribute amounts among the various users reflecting current conditions. EA, EF and AF records no longer needed so they are commented out.

```
**WR   A40   38520   4797M19651119   1                                  4797AM_1       A    4797
**WSRCHAP1   81470                                          1
**
** North Texas Municipal Water District
**WR   A40   54000    479819651119                                      4798_1       A    4798
**WSRCHAP2  114265                                          1      -1
** City of Irving
**WR   A40   54000   4799M19651119                                     4799M_1       A    4799
**WSRCHAP3  114265                                          1      -1
```

```
**
** Upper Trinity Regional Water District
WR   A40   16106   4797M19651119   1                              4797M_UTRWD Chapman    4797
WSRCHAP1  298930                           38598
**
** Local demand (Sulphur Spr and Cooper)
WR   A40   19200   4797M19651119   1                              4797M_SSPRS Chapman    4797
WSRCHAP1  298930                           38598
```

```
**
** North Texas Municipal Water District
WR   A40    3214    479819651119                                    4797_NTMWD Chapman    4797
WSRCHAP1  298930                          38598
**
WR   A40   54000    479819651119                                      4798_1 Chapman    4798
WSRCHAP1  298930                          38598
**
** City of Irving
WR   A40   54000   4799M19651119                                     4799M_1 Chapman    4799
WSRCHAP1  298930                          38598
**WSRCHAP1  304101                            31101
**



** Original TCEQ WAM.  Since we are using one pool we do not need
**EA     1       3  RCHAP1  RCHAP2  RCHAP3
**EF     0       0     .26     .37
**AF     0       0     .26     .60       1
**
```

Storage and area relationships from 2007 TWDB survey.

```
**SVRCHAP1       0    2000    8000   20000   45000   63000   85000  132000  194000  239000  255000  310000
**SA             0     850    1925    2920    5625    6525    8100   10800   13800   16400   17200   19305
**
**FNI Change Based on 2007 Volumetric Survery
**ELEV (ft)  396     402     408     414     420     424     428     432     436     438     439     440
SVRCHAP1       0     901   10189   31426   64164   92257  128478  175115  232754  264866  281565  298930
SA             0     746    2471    4549    6349    7851   10412   12908   15668   16457   16976   17958
**
```

Lake Wright Patman

Lake Wright Patman is operated by the Corps of Engineers. The Corps uses seasonally varying conservation storage, defined by a rule curve. There are two rule curves for the reservoir:

- Interim Curve – the curve used for current operation of the reservoir.

- Ultimate Curve – the curve in the Texas Water Right (and the WAM) and certain contracts with the Corps.

Note that there are no downstream releases in the setup. At this time we are planning to include any downstream releases in the yield of the reservoir. This model also uses current area and storage relationships from the draft 2010 volumetric survey.

Changes to DAT File

```
** FNI Change: Update storage numbers for Patman: 2010 Survey, 297505 af is capacity at 228.6 ft, 87300
af is capacity at 220 ft

** FNI Change - add group identified for Patman

**

WR   F60   14572   4836M19510305                                          4836M1  PATMAN    4836

**  Interim Curve - Texarkana Contract Minimum (220 ft)

**WSPATMAN  262808                          87300   98162

**

**  Ultimate Curve - Texarkana Contract Minimum (220 ft)

WSPATMAN  298084                          87300  200411

**

WR   F60   10428   4836M19570217                                          4836M2  PATMAN    4836

WSPATMAN  298084                          87300

**

WR   F60   20000   4836M19670919                                          4836M3  PATMAN    4836

**  WR 4836I -  maximize out of basin transfers for full paper right runs (1,2,3,4,6), transfers
deducted from most junior WR fo

WSPATMAN  298084                          87300

**

WR   F60   35000   4836I19570217                                          4836I1  PATMAN    4836

WSPATMAN  298084                          87300

**

WR   F60  100000   4836I19670919                                          4836I2  PATMAN    4836

WSPATMAN  298084                          87300
```

The Sulphur WAM was also modified to use the Draft 2010 TWDB Volumetric Survey of Lake Wright Patman. This survey was extended to higher elevations using previous surveys

```
**SVPATMAN       0    6670   64795  108195  166445  213845  240195  268445  298495  330345  364095  399695

**SA             0    1350   12100   16900   22000   25400   27300   29200   30900   32800   34700   36500
```

```
** FNI change: update SVSA to 2010 survey
**Elev       194     214     219     222     224     226     230     235     241     248     255     260
SVPATMAN       0   18531   70925  125611  171069  220465  340658  542648  858115 1338792 1950548 2473806
SA             0    6243   15397   21231   23924   25435   34882   45924   59567   77777   97430  111880
**
```

Interim and Ultimate curves using 2010 survey

```
**  Monthly Storage Variable Limits
**
** Wright Patman
**
** FNI change - based on Interim Rule Curve and 2010 survey
**Month      JAN     FEB     MAR     APR     MAY     JUN     JUL     AUG     SEP     OCT     NOV     DEC
**Elev    220.60  220.60  220.60  224.90  227.44  226.92  226.29  225.67  225.06  220.60  220.60  220.60
**MSPATMAN   98162   98162   98162  192965  262808  246994  227884  212193  196902   98162   98162   98162
**
** FNI change - based on Ultimate Rule Curve and 2010 survey
**Month      JAN     FEB     MAR     APR     MAY     JUN     JUL     AUG     SEP     OCT     NOV     DEC
**Elev    224.90  224.90  224.90  226.80  228.60  228.60  228.50  227.80  226.80  226.10  225.50  225.20
MSPATMAN  192965  192965  192965  243345  298084  298084  295043  273755  243345  223023  207932  200411
**
```

Ralph Hall

TCEQ provided a version of the DAT file for the Sulphur WAM with Lake Ralph on October 6, 2011. This code is for overdraft operation of the reservoir. Typical instream flow bypass criteria are not proposed for this reservoir. The following changes were made to the FNI Sulphur WAM.

Changes to DAT file

```
** FNI Change - Added used pattern for Ralph Hall
UC  HALL  0.0730  0.0650  0.0590  0.0850  0.0690  0.0880
UC        0.1230  0.1470  0.1130  0.0870  0.0520  0.0390
**
```

```
** FNI Change - Added in Ralph Hall
CP158211     B10                     7             A70               0
**
```

```
** FNI Change - Added Ralph Hall
WR158211   45000    HALL20040813       1                                    15821F          15821F
WS158211  180000
**



** FNI Change - Added Ralph Hall
** ELEVATION 460     470     480     490     500     510     520     530     540     550     560     564
SV158211       0      57     397    1027    2357    7521   21849   47989   90104  152630  238693  280506
SA             0    17.9    49.6    79.1     208     941    2003    3307    5189    7345    9914   10985
**
```

Changes to DIS file

TCEQ did not provide a copy of the DIS file. Thus the drainage area was taken from the 2007 TWDB Reservoir Site Protection Study. Memos from TCEQ associated with the draft permit give the drainage area as 102.74 square miles.

```
** FNI change - Added lake Ralph Hall
FD158211     B10       0
** Drainage area based on 2007 Reservoir Site Protection Study
WP158211     101
```

Marvin Nichols 1a, Parkhouse I and Parkhouse II

Code for Marvin Nichols 1a and Parkhouse I and II are from the Reservoir Site Protection Study. The Site Protection Study model used manually calculated naturalized flows for each of these projects rather than using the model to calculate the flows. The drainage areas in the Sulphur WAM do not match USGS drainage areas. In our opinion, USGS drainage areas are more likely to be accurate. The manually calculated flows are based on the USGS drainage areas. These flows were input at new primary control points. The new flows are included with the setup files that accompany this memo.

The Reservoir Site Protection Study model also included evaporation rates for the new projects. Unlike other evaporation data in the Sulphur WAM, these evaporation rates include corrections for effective runoff based on the naturalized flow at the new primary control points. WRAP does not allow evaporation adjustments at primary control points. The new evaporation files are included with the setup files that accompany this memo.

Changes to DAT file

```
** FNI Change - Municipal Use for Marvin Nichols and Parkhouse (I and II) from Site Protection Study
UC   MUN  0.0651  0.0607  0.0648  0.0697  0.0802  0.0951
UC        0.1161  0.1176  0.1034  0.0905  0.0715  0.0653
**


** FNI Change - Parkhouse South (I) new primary conntrol point C200
**    additional control points A,B and C for application of instream flows
**CP   A10     C60                      1            D120      -3       0
CP   A10    C200                      1            D120      -3       0
CP  C200   C200A                      1                      -3
CP C200A   C200B                      2    C200    NONE
CP C200B   C200C                      2    C200    NONE
CP C200C     C60                      2    C200    NONE
**CP  C110     C60                      7            D120               0
CP  C110    C200                      7            D120               0


** FNI Change - Parkhouse North (II) new primary control point C105
**    additional control points A,B and C for application of instream flows
** CP   B10     C90                       1            D120      -3       0
**
CP   B10    C105                      1             A70      -3       0
CP  C105   C105A                      1                      -3       0
CP C105A   C105B                      2    C105    NONE      -3       0
CP C105B     C90                      2    C105    NONE      -3       0
**



** FNI Change - Marvin Nichols new primary control point E175
**    additional control points A,B for application of instream flows
**CP  E250     E10                      7             E60               0
**CP  E240     E10                      7             E60               0
CP  E250    E175                      7            E60               0
CP  E240    E175                      7            E60               0
CP  E175   E175A                      1                      -3       0
CP E175A   E175B                      2    E175    NONE      -3       0
CP E175B     E10                      2    E175    NONE      -3       0
**
**  FNI change - CPs E190, E200, E210, and E220 used to flow into E180, which has been eliminated.
**    change to flow into Marvin Nichols
**CP  E220     E10                      7             E60               0
**CP  E210     E10                      7             E60               0
**CP  E200     E10                      7             E60               0
**CP  E190     E10                      7             E60               0
CP  E220    E175                      7            E60               0
CP  E210    E175                      7            E60               0
CP  E200    E175                      7            E60               0
CP  E190    E175                      7            E60               0
**CP  D120     D40                      7                              0
```

```
**CP  D110     D40                      7            D120              0
**CP  D100     D40                      7            D120              0



*****************************************************************
**  PROPOSED PROJECTS FOR STUDY
**
** FNI Change added Parkhouse I
WR  C200  143600     MUN30000105                                    PARKHOUSE I
WSPARK I  651712
**
** FNI Change added Parkhouse II
WR  C105  148700     MUN30000105   1   0       0                   PARKHOUSE II
WSPARKII  330871
**
** FNI Change - added Marvin Nichols
WR  E175  600900     MUN30000105   1   0       0                 MARVIN_NICHOLS
WSMARVIN 1562669                               0
**



**  FNI Change - Marvin Nichols
**  Area-Capacity Relationship from Site Protection Study:
SVMARVIN       0   23155   42283  101593  229008  483319  614963  765728 1087776 1309166 1562669 1701463
SA             0    5381    7480   12295   20072   30778   35047   40681   51337   59365   67392   71406
** FNI Change - Parkhouse I from Site Protectoin Study
SVPARK I       0   12600   49057  121267  204814  265446  357065  466684  567951  680825  802444  932332
SA             0    2925    6168   10120   13752   16566   20084   23808   26828   29372   31439   33506
** FNI Change - Parkhouse II from Site Protection Study
SVPARKII       0     595    2113    7440   17983   34004   55512   83780  144687  215361  263249  330871
SA             0     111     226    1556    2660    3750    4916    6392    8919   11282   12662   14387
**
```

Changes to DIS file

```
** FNI Change - New control point for Parkhouse I:
WP  C200   655.0
```

```
WP C200A   655.0
FD C200A    C200      -1
WP C200B   655.0
FD C200B    C200      -1
WP C200C   655.0
FD C200C    C200      -1
**
** FNI Change - New Control Point for Parkhouse II
**
WP  C105   421.0
WP C105A   421.0
FD C105A    C105      -1
WP C105B   421.0
FD C105B    C105      -1
**
** FNI Change - New control point for Marvin Nichols
WP  E175  1889.0
WP E175A  1889.0
FD E175A    E175      -1
WP E175B  1889.0
FD E175B    E175      -1
```

Talco Site

At this time the setup for the Talco site is under development. The project will be at control point C10, which is a primary control point.

Correction to Drainage Areas

In the original TCEQ WAM, primary control point C10, the Sulphur River near Talco (USGS 07343200, aka Sulphur River below Talco 07343210), had a drainage area that was smaller than the next upstream point C20. This results in a flow discontinuity which may impact water availability. Apparently the USGS moved the gage downstream just after the naturalized flows were developed for the Sulphur WAM. For this model, we are

using a drainage area for C10 of 1365 square miles, the drainage area of the gage for the period of the naturalized flows. This is the drainage area used in the original Sulphur WAM.

Changes to DIS file

```
** FNI Change - Changed the drainage area for C10 to match USGS drainage area at Sulphur River Near
Talco (1,365 mi2) prior to May 21, 1997.

WP   C10    1365    69.6    43.4

**WP   C10 1353.24    69.6    43.4

**
```

MEETING OF THE
North East Texas Regional Water Planning Group
WEDNESDAY, October 4, 2023

Agenda Item 11
Region D Technical Consultant Report

11

Technical Consultant Report and Discussion

Summary of Discussion Items

1. WWP/MWP List
2. Status on Identification of Infeasible Strategies from 2021 Plan
3. Preliminary Process for Identifying Feasible Strategies for 2026 Plan
4. Path forward

Wholesale Water Providers (WWP) and Major Water Providers (MWP)

WWP – Must sell or deliver (or plan to sell or deliver) wholesale water at some point in the 50-year planning horizon.

- RWPGs determine which WWPs to use in their plan development
- Specific analysis and reporting requirements

MWP are a subset of WUGs and WWPs

- Identified and designated by RWPG to be of particular significance to the region's water supply.
- In 2021 Plan, MWPs were identified as WWPs (still required separate reporting).

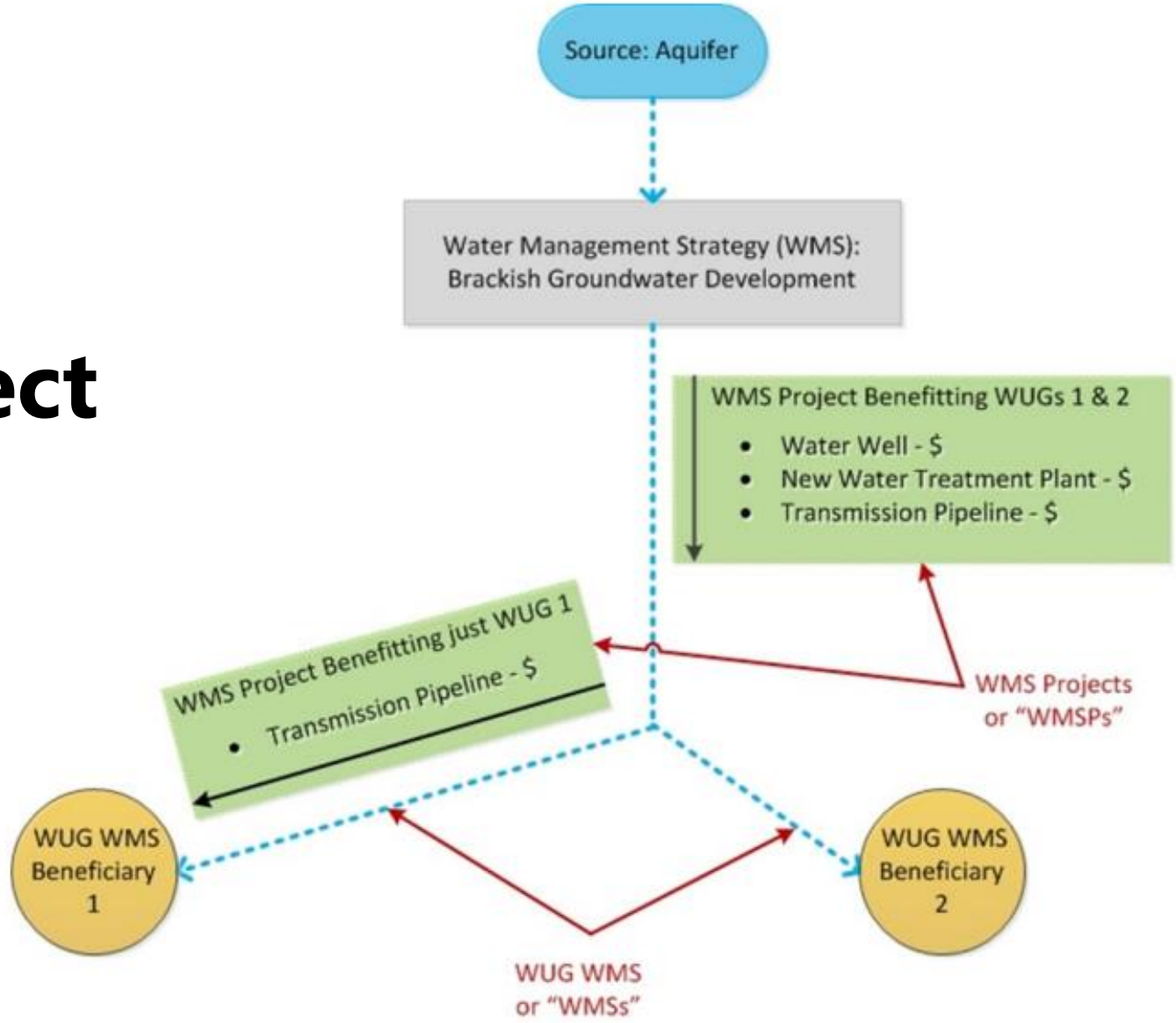
Past WWP/MWPs with 2026 additions

Wholesale Water Provider	Wholesale Customers
Bi County WSC	Manufacturing, Camp County Steam Electric Power, Titus County
Bright Star Salem SUD	South Rains SUD
Cash SUD	Lone Oak, City of Quinlan, City of
Cherokee Water Company	Longview, City of
	Southwestern Electric Power Company (SWEPCO)
Commerce, City of	Gafford Chapel WSC West Delta WSC
	Maloy WSC Texas A&M University
	North Hunt SUD
Cooper, City of	Delta County MUD, County-Other, Delta, County-Other, Hunt
Emory, City of	East Tawakoni, South Rains SUD
Franklin County Water District	Cypress Springs SUD Mt. Vernon, City of
	Winnsboro, City of
Gladewater, City of	County-Other, Gregg County-Other, Smith County-Other, Upshur
Golden WSC	Manufacturing, Van Zandt
Grand Saline, City of	Manufacturing, Van Zandt
Greenville, City of	Caddo Mills, City of Manufacturing
	Jacobia WSC Mining
	Shady Grove WSC
Hughes Springs, City of	Holly Springs WSC
Kilgore, City of	Cross Roads SUD County-Other, Gregg
Lamar County Water Supply District	410 WSC Pattonville WSC
	Blossom, City of Red River County WSC
	Deport, City of Reno, City of
	Detroit, City of Roxton, City of
	Manufacturing Toco, City of

Wholesale Water Provider	Wholesale Customers
Longview, City of	Elderville WSC Manufacturing
	Gum Springs WSC White Oak, City of (raw water)
	Hallsville, City of
Marshall, City of	Cypress Valley WSC Manufacturing
	Gill WSC Talley WSC
	Leigh WSC
Mt. Pleasant, City of	Tri Water SUD Manufacturing
	Lake Bob Sandlin State Park Winfield, City of
Northeast Texas Municipal Water District	Avinger, City of Longview, City of Daingerfield, City of Marshall, City of Diana SUD, Mims WSC, Harleton WSC, City of Ore City, City of Hughes Springs, City of Pittsburg, City of Jefferson, SWEPCO, City of Lone Star, Luminant, Lone Star Steel, Tryon Road SUD
Paris, City of	Lamar County WSD
	Manufacturing Steam Electric
Point, City of	Maunfacturing, Rains County
Riverbend Water Resources District / Texarkana (TX), City of	City of Annona, Manufacturing – Bowie County, City of Atlanta, City of Maud, City of Avery, City of Nash, Central Bowie WSC, City of New Boston, Oak Grove WSC, City of Domino, City of Hooks
	Red River Water Corp., Macedonia Eylau MUD, City of Redwater, Manufacturing – Cass County, City of Wake Village, Federal Correctional Institution, TexAmericas Center
Sabine River Authority*	Ables Springs WSC Kilgore, City of
	Cash SUD Longview, City of
	Combined Consumers SUD Mac Bee SUD
	Commerce, City of Point, City of
	Eastman Chemicals Quitman, City of
	Edgewood, City of Release from TXU
	Emory, City of South Tawakoni WSC
	Greenville, City of West Tawakoni, City of
	Henderson, City of Wills Point, City of
	Bright Star-Salem
Sulphur River MWD	Sulphur Springs, City of
Sulphur Springs, City of	Brashear WSC North Hopkins WSC
	Brinker WSC Pleasant Hill WSC
	Gafford Chapel WSC Shady Grove WSC #2
	Martin Springs WSC Manufacturing
	Mining Livestock
Titus County FWD #1	Mt. Pleasant, City of Luminant
Tri SUD	Mining, Titus County
White Oak, City of	County-Other, Gregg County-Other, Upshur

Water Management Strategy Structure

WMS
&
WMS Project



Potentially Feasible Water Management Strategies

- Statutory and Rule Requirements
  - TWC §16.053(e)(5); and
  - 31 TAC §357.34(c))
- RWPGs must consider, but are not limited to considering, 24 types of WMSs for all identified water needs.
- Technical Memorandum, IPP, and Final RWP must include:
  - The documented process used by the RWPG to identify potentially feasible WMS;
  - The list or table of all identified WMSs that were considered potentially feasible, to date, for meeting a need in the region per 31 TAC §357.12(b).
  - If no potentially feasible WMSs are identified or recommended for an identified water need, then the RWP must document the reason.

“Infeasible WMSs include those WMSs where proposed sponsors have not taken an affirmative vote or other action to make expenditures necessary to construct or file applications for permits required in connection with implementation of the WMS on a schedule in order for the WMS to be completed by the time the WMS is needed to address drought in the plan.”

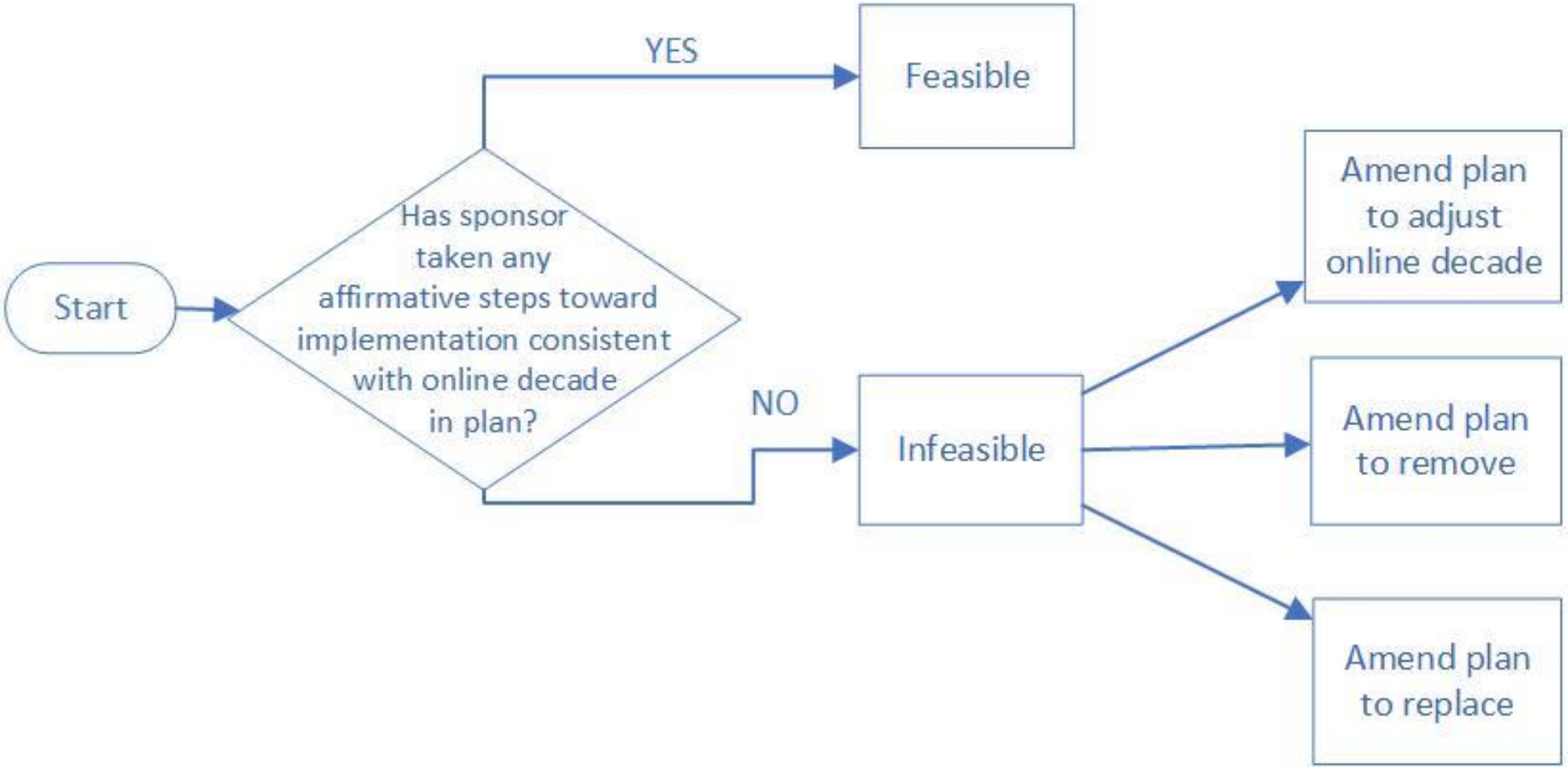
Statutory Language behind the New Requirement to Identify Infeasible WMSs

Infeasibility Review

Focus on reviewing 2021 Plan's strategies and projects **that require a permit and/or involve construction** and that:

- are shown to be online **by the 2020** (no later than January 5, 2023) or **2030 decade**,
- Related to:
  - new major reservoirs,
  - seawater desalination,
  - direct potable reuse,
  - brackish groundwater,
  - aquifer storage and recovery, and
  - out of state water transfers;
- Generally required for implementation either:
  - significant resources;
  - significant time.

Comparison of 2021 to Draft 2026 Population Projections



Infeasibility Review (cont'd)

TWDB recognizes information may be difficult to obtain or may not be available for some WUG categories

- e.g., county-wide water user groups that are to be implemented by private parties

RWPG may therefore not be able to determine infeasibility for some strategies or projects.

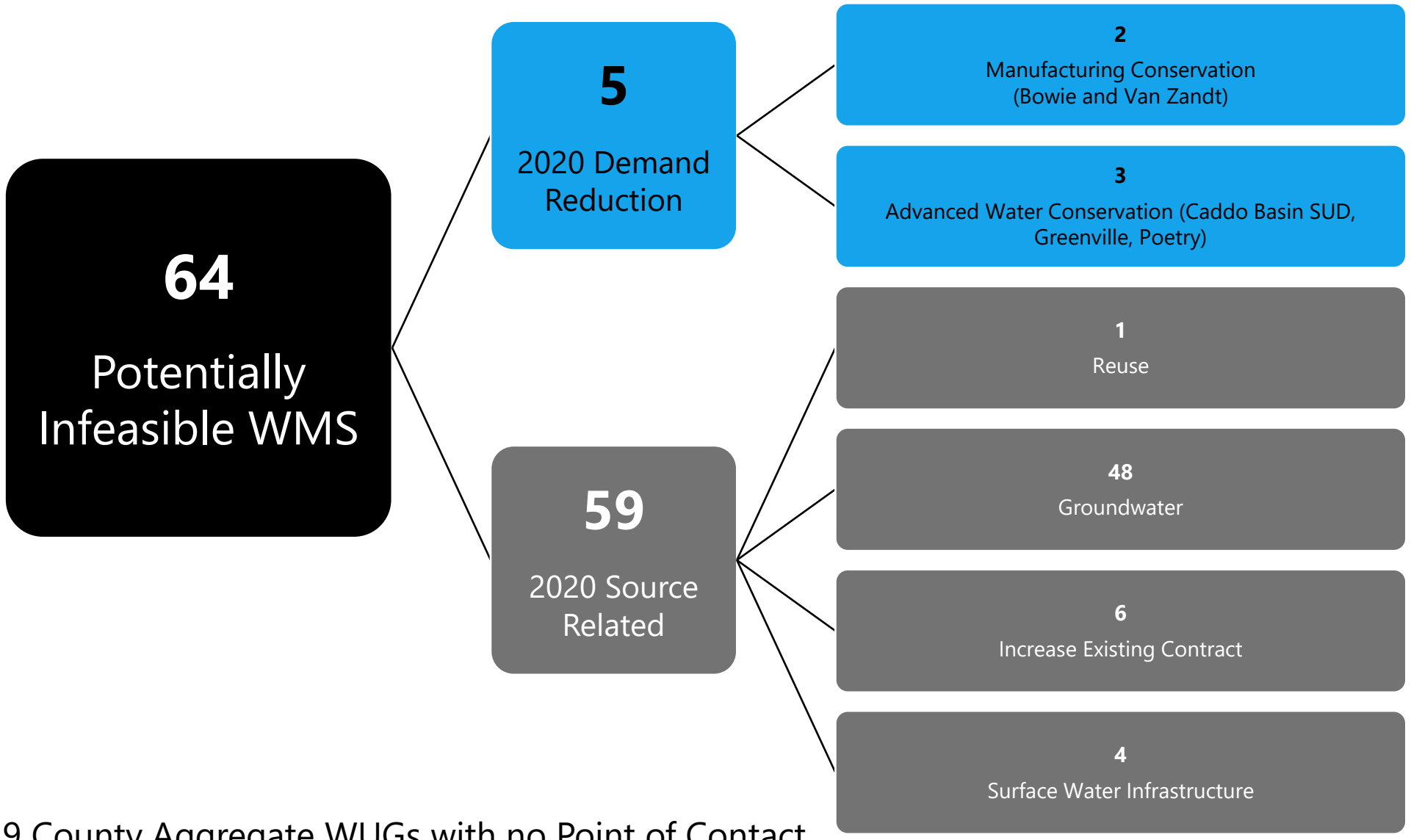
- 39 in Region D

Engagement / Survey

- Project Name
- Project Sponsor
- Online Decade
- Date of Affirmative Action
- State Water Right Status
  - » Application filed?
  - » Admin complete?
  - » Draft released by TCEQ?
  - » Issued?
- Federal 404 Permit Status
  - » Applied for?
  - » Issued?

- Planning/Design/Construction Status
  - Type/Amount of study/testing/design performed to date (%)
  - Land Acquisition?
  - Started Construction?
  - Completed construction?
- Est. Funds Expended to Date
- Pertinent Details

Summary of Potential Infeasible 2020 WMS to be Investigated



Number Identified as Infeasible	Remaining
0	-
0	-
0	-
0	Canton Celeste Edom WSC North Hunt SUD
0	
0	

*39 County Aggregate WUGs with no Point of Contact

WMS Projects online by 2020

55 WMS Projects

- None identified as infeasible to date
- 3 remaining
  - Canton
  - Edom WSC
  - North Hunt SUD

Status on Identification of Infeasible Water Management Strategies from 2021 Region D Plan

Conservation strategies do not require construction or permit

Strategies for county aggregates excluded

For those requiring construction/permit, affirmative actions included:

- Project constructed
- Funding applications submitted
- Partial implementation
- Purchase of sites
- Permitting underway
- Feasibility/Design underway
- Test wells constructed
- Redevelopment of existing wells to increase capacity at same source

31 TAC 357.12(b)

- Public meeting to determine the process for identifying potentially feasible Water Management Strategies (WMSs)
- Document process and incorporate input received
- List all possible potentially feasible WMSs

Identifying and Evaluating WMSs

- TWDB allows flexibility in selecting method
- Criteria determined by Planning Group
- Should receive public comment on proposed process
- Should be an equitable and consistent evaluation and application of all potentially feasible WMSs for each water supply need.

TWDB Guidelines for Identifying Water Management Strategies

Evaluate the net quantity, reliability, and cost of water delivered to users during drought conditions (does not include distribution of water after treatment).

Evaluate Environmental Factors

- Environmental water needs
- Wildlife habitat
- Cultural resources
- Adopted environmental flow standards

Impacts on other water resources of the State

Discussion of threats to agricultural or natural resources

TWDB Guidelines for Identifying Water Management Strategies

- Consideration of interbasin transfer
- Consideration of third party social and economic impacts resulting from voluntary redistribution of water
- Impacts on key water quality parameters
- Consideration of existing infrastructure (pipelines, other facilities)
- Any other factors as deemed relevant by the regional water planning group

31 TAC 357.34(c)

Potentially feasible water management strategies may include, but are not limited to:

- Expanded use of existing supplies including:
  - system optimization and conjunctive use of water resources,
  - reallocation of reservoir storage to new uses,
  - voluntary redistribution of water resources including contracts, water marketing, regional water banks, sales, leases, options, subordination agreements, and financing agreements, subordination of existing water rights through voluntary agreements,
  - enhancements of yields of existing sources, and
  - improvement of water quality including control of naturally occurring chlorides.

31 TAC 357.34(c) – cont'd

Potentially feasible water management strategies may include, but are not limited to:

- New supply development including:
  - construction and improvement of surface water and groundwater resources,
  - brush control,
  - precipitation enhancement,
  - desalination,
  - water supply that could be made available by cancellation of water rights based on data provided by the Commission,
  - rainwater harvesting, and
  - aquifer storage and recovery.

31 TAC 357.34(c) – cont'd

Potentially feasible water management strategies may include, but are not limited to:	Conservation and drought management measures including demand management.
	Reuse of wastewater.
	Interbasin transfers of surface water.
	Emergency transfers of surface water including a determination of the part of each water right for non-municipal use in the RWPA that may be transferred without causing unreasonable damage to the property of the non-municipal water rights holder in accordance with Texas Water Code §11.139 (relating to Emergency Authorizations).

Region D has historically used four general categories of WMSs

1. Groundwater
2. Surface Water
3. Advanced Water Conservation
4. Water Reuse

Groundwater

Groundwater WMSs can include:

Development of new supply

- e.g., drilling additional wells

Receipt of a contract supply from another provider

Consideration of advanced treatment scenarios

- e.g., demineralization, removal of iron, manganese, or fluoride

Groundwater

Surface Water

There are three main types of surface water strategies

Contractual supply from another provider

- water purchase contracts

Development of new supply

- new run-of-the river diversions,
- new reservoirs,
- enhanced yields of existing sources

Consideration of interbasin transfer

Advanced Water Conservation

Advanced water conservation is the reduction in water use on a per capita water demand

Advanced water conservation will be considered as a feasible strategy when the users or the water system uses more than a specified threshold

Region D has previously adopted 140 gallons/person/day

Advanced Water Conservation

works by implementing the following measures:	Implement plumbing code requirements for more efficient fixtures and low volume toilets
	Family clothes washer rebates
	Irrigation audits
	Rainwater harvesting
	Rain barrels
	Commercial coin-operated clothes washer rebates

Water Reuse

Includes the direct use of reclaimed water for non-potable purposes, e.g.,

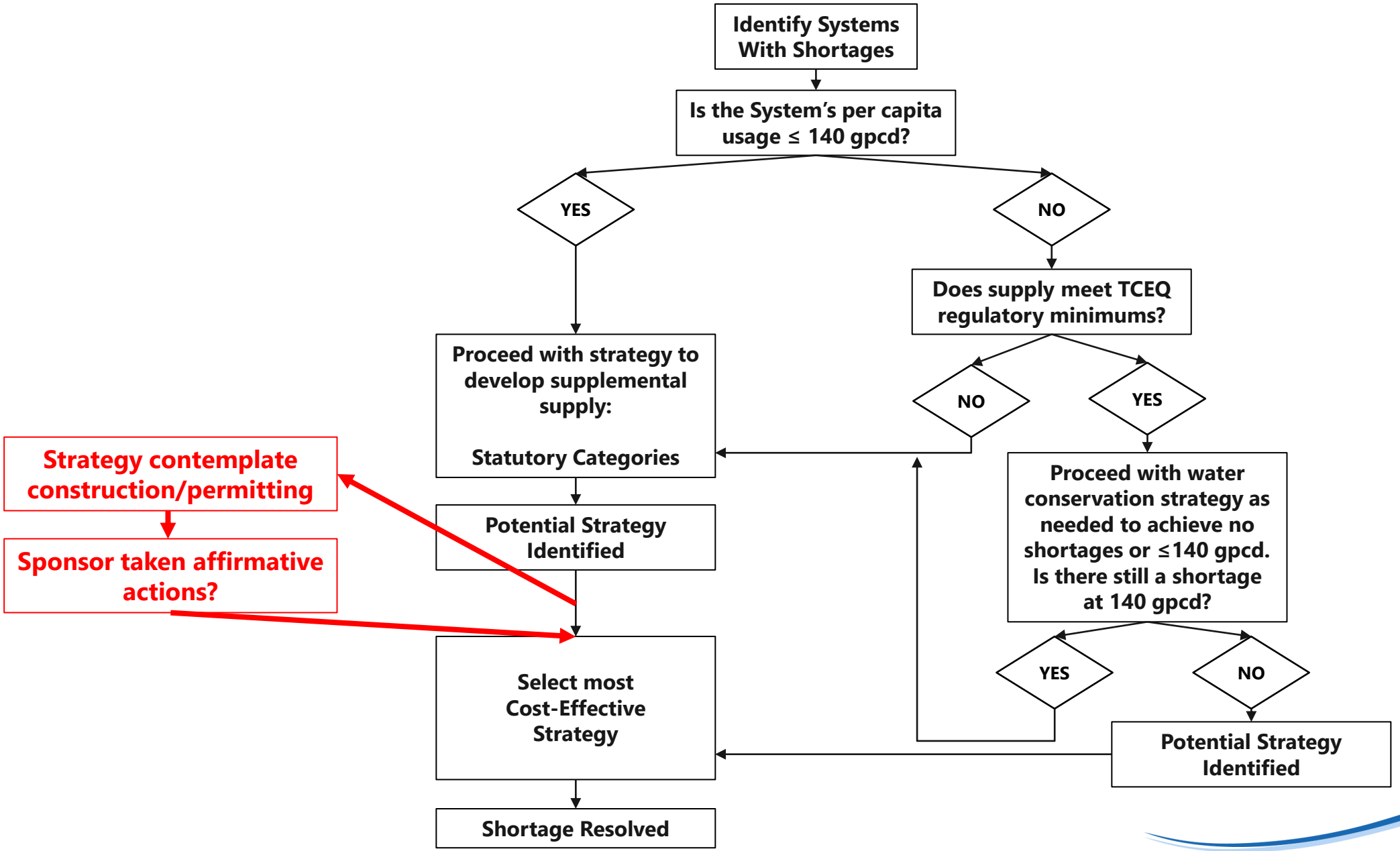
Irrigation,

Industrial,

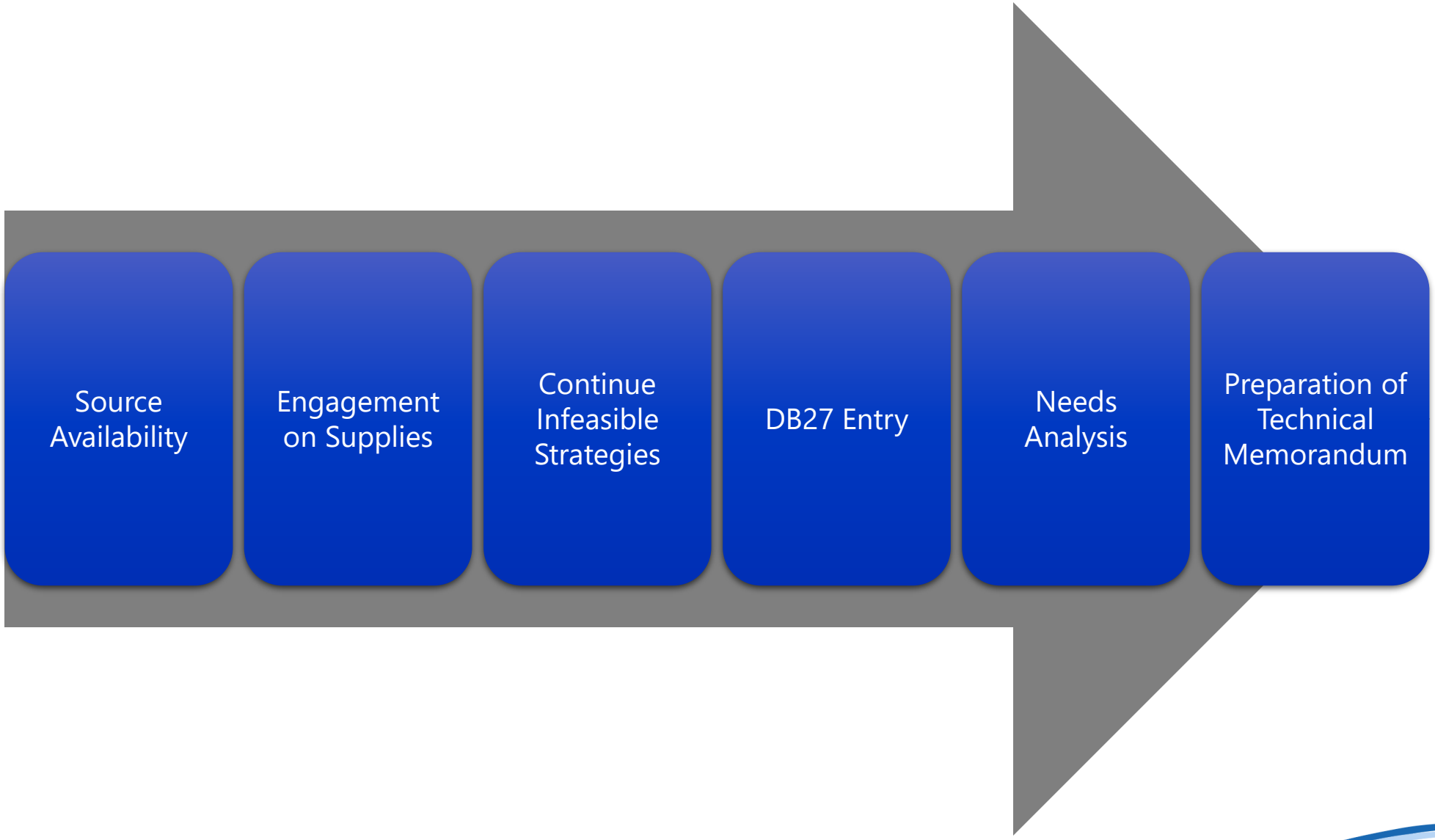
Steam electric cooling water.

Only applicable to entities with a central wastewater collection and treatment system.

Water Management Strategy Evaluation Process



Path Forward



Tony L. Smith, P.E.
TLSmith@carollo.com

MEETING OF THE
North East Texas Regional Water Planning Group
WEDNESDAY, October 4, 2023

Agenda Item 12
Financial Report

8911 N. Capital of Texas Hwy North, Suite 2200, Austin, TX 78759
P. 512.453.5383 F. 512.453.0101

August 28, 2023

Mr. Kyle Dooley, P.E.
Executive Director/CEO
228 Texas Ave., Suite A
New Boston, TX 75570

RE: July 2023 Invoice – 2026 Region D Water Planning
(TWDB Contract No. 2148302556 / Carollo # 200343)

Dear Mr. Dooley:

Please find the attached invoice for services performed from May 2023 through July 2023, under the above referenced contract. The Carollo Team has been working on the following items for the 2026 Region D Regional Water Plan:

Task No.	Task Description	Current Progress	Future Progress	Problems Encountered/Resolution
1	Planning Area Description	Initial development of information for chapter.	Continued development of information and draft chapter.	n/a
2A	Non-Municipal Water Demand Projections	Development of revisions, compilation of information, and submittal of proposed revisions to TWDB.	Review and respond to comments received on revision request for non-municipal demands.	None.
2B	Population and Municipal Water Demand Projections	Continued outreach to WUGs and WWPs, development of recommended revision requests, submittal of request to TWDB.	Review and respond to comments received on revision request for non-municipal demands.	None.
8	Recommendations Regarding Unique Stream Segments and/or Reservoir Sites and Legislative & Regional Policy Issues	n/a	n/a	n/a
10	Public Participation and Plan Adoption	Continued internal project coordination, engagement.	Continued internal project coordination and engagement.	None.

Should you have any questions regarding this matter, please don't hesitate to contact me.

Sincerely,

Carollo Engineers, Inc.

Tony L. Smith, P.E.
Project Manager

TLS;

Enclosures

carollo
Engineers...Working Wonders With Water®

[redacted]

Attn: Mr. Kyle Dooley, P.E., Executive Director/CEO
228 Texas Ave., Suite A
New Boston, TX 75570

August 28, 2023
Project No.: 200343
Invoice No.: FB40517

Regional Water Plan for the North East Texas Regional Water Planning Group (Region D RWPG)
Total Contract: $200,691

Professional Services from May 01, 2023 to July 31, 2023

Task 2A 00002A Non-Municipal Water Demand Projections

Professional Personnel

		Hours		Rate	Amount	
Project Professional						
	Smith, Tony	3.5		86.05	301.20	
	Totals	3.5			301.20	
			Fringe	301.20	451.80	
			Overhead	451.80	895.17	
	Total Labor					**895.17**
Additional Fees						
Profit					81.33	
	Total Additional Fees				**81.33**	**81.33**

Billing Limits	**Current**	**Prior**	**To Date**
Total Billings	976.50	19,907.44	20,883.94
Limit			24,152.00
Remaining			3,268.06

Task Total **$ 976.50**

Task 2B 00002B Population and Municipal Water Demand Projections

Professional Personnel

		Hours		Rate	Amount	
Project Professional						
	Smith, Tony	9.5		86.05	817.55	
Professional						
	Pinckney, Michael	2.0		73.72	147.44	
Technicians						
	Harkins, Christian	16.0		45.96	735.35	
	Totals	27.5			1,700.34	
			Fringe	1,700.34	2,550.49	
			Overhead	2,550.49	5,053.37	
	Total Labor					**5,053.37**
Additional Fees						
Profit					459.13	
	Total Additional Fees				**459.13**	**459.13**

Billing Limits	**Current**	**Prior**	**To Date**
Total Billings	5,512.50	25,311.47	30,823.97
Limit			42,734.00
Remaining			11,910.03

Task Total **$ 5,512.50**

Task 10 000100 Public Participation and Plan Adoption

Professional Personnel

		Hours	Rate	Amount	
Project Professional					
	Smith, Tony	18.5	86.05	1,592.07	
Technicians					
	Harkins, Christian	4.0	45.96	183.84	
	Totals	22.5		1,775.91	
			Fringe 1,775.91	2,663.84	
			Overhead 2,663.84	5,277.96	
	Total Labor				**5,277.96**
Additional Fees					
Profit				479.54	
	Total Additional Fees			**479.54**	**479.54**

Billing Limits	**Current**	**Prior**	**To Date**
Total Billings	5,757.50	30,364.90	36,122.40
Limit			56,750.00
Remaining			20,627.60

Task Total **$ 5,757.50**

Project 200343.0S 2026 Region D - SUBS

TASK 1 000010 Planning Area Description

Consultants

Sub-Consultants

6/16/2023	HEI	VO1054017	842.35	
	Total Consultants		**842.35**	**$ 842.35**

Task Total **$ 842.35**

TASK 2B 00002B Population and Municipal Water Demand Projections

Consultants

Sub-Consultants

6/16/2023	HEI	VO1054017	4,748.00	
	Total Consultants		**4,748.00**	**$ 4,748.00**

Task Total **$ 4,748.00**

Subconsultant Total **$ 5,590.35**

Billing Limits	**Current**	**Prior**	**To-Date**
Total Billings	5,590.35	8,532.50	14,122.85
Limit			52,611.00
Remaining			38,488.15

Project Total **$ 17,836.85**

Retainage

Current Retainage	891.84 (5% of 17,836.85)	**- 891.84**
Prior Retainage	4,205.80	
Retainage To-Date	5,097.64	

Please Pay This Amount **$ 16,945.01**

Budget Category Breakdown

Salaries & Wages	3,777.45
Fringe	1,888.68
Overhead	5,560.37
Profit	1,020.00
Travel	0.00
Other Expenses	0.00
Subcontractor Services	5,590.35
Total	17,836.85
Retainage	- 891.84
Total	16,945.01

Project Summary

Contract Amount	200,691.00
Less Current Invoice	16,945.01
Less Total Retainage to Date	5,097.64
Less Prior Amount Invoiced	79,910.51
Balance Remaining	98,737.84

Remit To: P.O. Box 30835 | Salt Lake City, UT 84130-0835 | United States
Phone: 1-800-523-5822

Outstanding Invoices

Number	Date	Balance	Retainage	Now Due
FB32678	3/8/2023	6,039.12	317.85	6,039.12
FB34383	3/22/2023	7,951.48	418.50	7,951.48
FB35294	4/25/2023	6,380.67	335.82	6,380.67
FB36203	5/9/2023	17,297.60	910.40	17,297.60
Total		**37,668.87**	**1,982.57**	**37,668.87**

For any questions regarding this invoice please contact us at ClientInvoicing@carollo.com.

HAYES ENGINEERING, INC.
Texas Registered Engineering Firm F-1465
2126 Alpine Road, Longview, TX 75601-3401

Attn: Mr. Tony Smith, P.E., Project Manager
Carollo Engineers, Inc.
8911 Capital of Texas Highway North, Bldg 2 Ste. 2200
Austin, TX 78759

1-May-23
Project No.: 200343
Invoice No.: 11343

Regional Water Plan for the North East Texas Regional Water Planning Group (Region D RWPG)
Total Sub-Contract: $49,455

Professional Services from April 01, 2023 to April 30, 2023

Task 1 1 Planning Area Description

Professional Personnel

		Hours	Rate	Amount
Project Professional				
	Hayes, Stanley	4.0	67.00	268.00
Professional				
	Lightle, Austin	0.0	48.07	0.00
Administrative				
	Coleman, Paula	4.0	20.00	80.00
	Totals	8.0		348.00
			Fringe	155.38
			Overhead	313.20
	Total Labor			**816.58**
Additional Fees				
Profit				25.77
	Total Additional Fees			**25.77**

Billing Limits	**Current**	**Prior**	**To Date**
Total Billings	842.35	0.00	842.35
Limit			1,435.00
Remaining			592.65

Task Total **$ 842.35**

Task 2B	00002B	Population and Municipal Water Demand Projections					
Professional Personnel							
			Hours		**Rate**	**Amount**	
Project Professional							
	Hayes, Stanley		5.0		67.00	335.00	
Professional							
	Lightle, Austin		6.0		48.07	288.42	
Professional							
	White, Landon		39.0		32.50	1267.50	
		Totals	50.0			1,890.92	
				Fringe		844.30	
				Overhead		1,890.92	
		Total Labor					**4,626.14**
Additional Fees							
Profit						121.86	
		Total Additional Fees					**121.86**

Billing Limits	**Current**	**Prior**	**To Date**
Total Billings	4,748.00	0.00	4,748.00
Limit			4,748.00
Remaining			0.00

Task Total	**$**	**4,748.00**

		Project Total	**$ 5,590.35**

Retainage

Current Retainage	279.52 (5% of $5,590.35)	**279.52**
Prior Retainage	426.63	
Retainage To-Date	706.15	

	Please Pay This Amount	**$ 5,310.83**

Budget Category Breakdown

Salaries & Wages	2,238.92
Fringe	999.68
Overhead	2,204.12
Profit	147.63
Travel	0.00
Other Expenses	0.00
Subcontractor Services	0.00
Sub-Total	5,590.35
Less Retainage	279.52
Total	5,310.83

Project Summary

Contract Amount	49,455.00
Less Current Invoice	5,310.83
Less Total Retainage to Date	706.15
Less Prior Amount Invoiced	8,105.87
Balance Remaining	35,332.15

Remit To: 2126 Alpine Road | Longview, TX 75601 | United States
Phone: 1-903-758-2010

Outstanding Invoices

Number	Date	Balance	Retainage		Now Due
10939	8/31/2022	2,932.50	0.00	Paid	0.00
11301	4/7/2023	5,600.00	426.63		5,173.37
11343	5/1/2023	5590.35	279.52		5,310.83
Total		**14,122.85**	**706.15**		**10,484.20**

For any questions regarding this invoice please contact us at stan@hayesengineering.net

2126 ALPINE RD.
LONGVIEW, TX 75601
(903) 758-2010
stan@hayesengineering.net
www.hayesengineering.net

HAYES ENGINEERING

INVOICE

BILL TO
Carollo Engineers, Inc.
8911 Capital of Texas Hwy. North,
Bldg. 2, Ste. 2200
Austin, TX 78759

INVOICE #	DATE	TERMS	DUE DATE
11343	05/01/2023	Net 30	05/31/2023

AMOUNT BILLED TO DATE	PROJECT NAME
$14,122.85	Region D Round 6 #200343

	DESCRIPTION	QTY	RATE	AMOUNT
Task 1	Planning Area Description	0.587	1,435.00	842.35
Task 2A	Non-Municipal Water Demand Projections	1	4,262.00	4,262.00
Task 2B	Population and Municipal water Demand Projections	1	4,748.00	4,748.00
Task 10	Public Participation and Plan Adoption	0.1095	39,000.00	4,270.50
40 Less Previous Invoices		-1	8,532.50	-8,532.50
			Subtotal:	5,590.35
Less Retainage		-1	279.52	-279.52

6/4/2023 Invoice is being revised to reflect Retainage withheld.

BALANCE DUE **$5,310.83**

HAYES ENGINEERING, INC.
Texas Registered Engineering Firm F-1465
2126 Alpine Road, Longview, TX 75601-3401

2126 Alpine Road, Longview, TX 75601
PHONE 903-758-2010 FAX 903-758-2099

May 1, 2023

Attn: Mr. Tony Smith, P.E., Project Manager
Carollo Engineers, Inc.
8911 Capital of Texas Highway North, Bldg 2 Ste. 2200
Austin, TX 78759

RE: April 2023 Invoice – 2026 Region D Water Planning
(TWDB Contract No. 2148302556 / Carollo # 200343/Hayes #CARO2101 Inv# 11343)

Dear Mr. Smith:

Please find the attached invoice for services performed in April 2023, under the above referenced contract. Hayes Engineering has been working on the following items for the development of the 2026 Region D Water Plan.

Task No.	Task Description	Current Progress	Future Progress	Problems Encountered/Resolution
1	Planning Area Description	Organizing WUG folders for the planning area and reviewing splits	n/a	None.
2B	Population and Municipal Water Demand Projections	Preparation of survey material, review of water use surveys, organizing files for tracking responses.	Distribution of survey material, discussions with WUGs.	None.

Should you have any questions regarding this matter, please don't hesitate to contact me.

Sincerely,

Hayes Engineering, Inc.

Stanley Hayes, P.E.
President

Enclosures

MEETING OF THE
North East Texas Regional Water Planning Group
WEDNESDAY, October 4, 2023

Agenda Item 13
Discussion & Possible Action
Certification of Administrative Expenses

Administrative Summary

At the 6/29/22 meeting, the board approved a motion to certify adminstrative costs annually. As per the regional water planning rules, there is a requirement that, during a public meeting, there is a certification that administrative costs are eligible for reimbursement and that they are correct and necessary. Once the certification is acted on, reimbursement requests can be submitted as part of the overall pay requests to TWDB. This item would be a consideration of that needed certification.