Appendix A
Populated Explanatory Report Checklist

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Texas Water Development Board			
Desired Future Condition Submission Packet Checklist - Administrative Completeness (part 1)			
Groundwater Management Area: GMA 8			
Reviewing Staff:		**Date Packet Received:**	
		Date E-mail Acknowledgement Sent:	
		Date Review Completed:	
	Citation of Rule	Present in packet and administratively complete	Notes
1. Is a copy of the explanatory report addressing the information required by Texas Water Code §36.108(d-3) and the criteria in Texas Water Code §36.108(d) included? *(refer to Explanatory Report checklist before responding)*	31 TAC §356.32(1)	Yes	- Refer the Executive Summary on Page 1-1 of the Explanatory Report. - Explanatory report included with Submission Package (SP).
2. Is a copy of the resolution of the groundwater management area adopting the desired future condition(s) as required by Texas Water Code §36.108(d-3) included?	31 TAC §356.32(2)	Yes	- Refer Appendix D of the Explanatory Report document. - Explanatory report included with Submission Package (SP).
3. Is a copy of the notice that was posted for the joint planning meeting at which the districts collectively adopted the desired future condition(s) as required by Texas Water Code §36.108(e) and §36.108(e-2) included?	31 TAC §356.32(3)	Yes	- Refer Appendix B of the Explanatory Report document. - Explanatory report included with Submission Package (SP).
4. Is the name of a designated representative of the groundwater management area for TWDB staff to contact as necessary included?	31 TAC §356.32(4)	Yes	Drew Satterwhite, North Texas Groundwater Conservation District
5. Are any groundwater availability model files or aquifer assessments acceptable to the executive administrator used in developing the adopted desired future condition(s) with documentation sufficient to replicate the work included? *(refer to the Groundwater Availability Model Administrative Elements checklist before responding)*	31 TAC §356.32(5)	Yes	- "The Deliverable_GMA8_Run11" model files are available on shared drive and submitted USB. Please refer "Model_files" sub folder within "Deliverable_GMA8_Run11" folder. - A readme file is included with the Model files in SP. Other than the files in SP, Additional information can be provided as needed.
6. Is any other information the executive administrator may require to be able to estimate the modeled available groundwater included?	31 TAC §356.32(6)	Yes	- A readme file is included with the Model files in SP. Other than the files in SP, Additional information can be provided as needed.
Mark elements that are present in the packet with YES Mark elements that are not applicable with NA Mark elements that are missing from the packet with NO			

Texas Water Development Board			
Desired Future Condition Submission Packet Checklist - Groundwater Availability Model Administrative Elements (part 2)			
Groundwater Management Area: GMA 8			
Reviewing Staff:		**Date Packet Received:**	
		Date Review Completed:	
	Citation of Rule	Present in packet and administratively complete	Notes
1. Is a descriptive narrative of the methods and references used to determine the desired future condition(s) included with the desired future condition(s) statements?		Yes	Refer Section 3.0 and 3.1 of the Explanatory Report.
2. Is any other information the executive administrator may require to be able to estimate the modeled available groundwater included?	31 TAC §356.32(6)	Yes	- "The Deliverable_GMA8_Run11" model files are available on shared drive and submitted USB. - A readme file is included with the Model files in SP. Other than the files in SP, Additional information can be provided as needed.
3. If item 2 is no, please list additional information required. (For example, model or GIS files necessary for review)			
Mark elements that are present in the packet with YES			
Mark elements that are not applicable with NA			
Mark elements that are missing from the Packet with NO			

Texas Water Development Board			
Desired Future Condition Submission Packet Checklist - Factors and Technical Elements (part 3)			
Groundwater Management Area: GMA 8			
Reviewing Staff:		**Date Packet Received:**	
		Date Review Completed:	
	Citation of Rule	Present in packet and administratively complete	Notes
1. Does the explanatory report identify each desired future condition?	TWC §36.108(d-3)	Yes	Refer Section 3.0, and Appendix D of the Explanatory Report
2. Does the explanatory report provide the policy and technical justifications for each desired future condition?	TWC §36.108(d-3)	Yes	Refer Section 3.1, 3.1.1, 3.1.2, 3.1.3 of the Explanatory Report.
3. Does the explanatory report include documentation that the factors under Subsection (d) were considered by the districts and a discussion of how the adopted desired future condition(s) impacts each factor?	TWC §36.108(d-3)	Yes	Refer Section 3.2, and 3.2.1 – 3.2.9 of the Explanatory Report.
3a. Did the districts consider aquifer uses or conditions within the management area, including conditions that differ substantially from one geographic area to another?	TWC §36.108(d1)	Yes	Refer Section 3.2.1, Appendices B, G, H, I of the Explanatory Report.
3b. Did the districts consider the water supply needs and water management strategies included in the state water plan?	TWC §36.108(d2)	Yes	Refer Section 3.2.2, Appendices B, G, H, I of the Explanatory Report.
3c. Did the districts consider hydrological conditions, including for each aquifer in the management area the total estimated recoverable storage as provided by the executive administrator, and the average annual recharge, inflows, and discharge?	TWC §36.108(d3)	Yes	Refer Section 3.2.3, Appendices B, E of the Explanatory Report.
3d. Did the districts consider other environmental impacts, including impacts on spring flow and other interactions between groundwater and surface water?	TWC §36.108(d4)	Yes	Refer Section 3.2.4, Appendices B, E, G of the Explanatory Report.
3e. Did the districts consider the impact on subsidence?	TWC §36.108(d5)	Yes	Refer Section 3.2.5, Appendices B, G of the Explanatory Report.
3f. Did the districts consider socioeconomic impacts reasonably expected to occur?	TWC §36.108(d6)	Yes	Refer Section 3.2.6, Appendices B, E, G of the Explanatory Report.
3g. Did the districts consider the impact on the interests and rights in private property, including ownership and the rights of management area landowners and their lessees and assigns in groundwater as recognized under Section 36.002?	TWC §36.108(d7)	Yes	Refer Section 3.2.7, Appendices B of the Explanatory Report.
3h. Did the districts consider the feasibility of achieving the desired future condition(s)?	TWC §36.108(d8)	Yes	Refer Section 3.2.8, Appendices B of the Explanatory Report.
3i. Did the districts consider any other information relevant to the specific desired future condition(s)?	TWC §36.108(d9)	Yes	Refer Section 3.2.9 of the Explanatory Report.
4. Does the explanatory report list other desired future condition options considered, if any, and the reasons why those options were not adopted?	TWC §36.108(d-3)(4)	Yes	Refer Section 4.0 of the Explanatory Report.
5. Does the explanatory report discuss reasons why recommendations made by advisory committees and relevant public comments received by the districts were or were not incorporated into the desired future condition(s)?	TWC §36.108(d-3)(5)	Yes	Refer Section 5.0 of the Explanatory Report.
Mark elements that are present in the packet with YES Mark elements that are missing from the packet with NO			

Texas Water Development Board				
Desired Future Condition Submission Packet Checklist - Groundwater Availability Modeling Technical Elements (part 4)				
Groundwater Management Area: GMA 8				
Groundwater Management Area Coordinator and contact information: Drew Satterwhite, (903) 786-4433, drews@gtua.org				
Reviewing Staff:		**Date Packet Received:** **Date Review Completed:**		
	Present in packet and administratively complete	Notes	Contacted GMA Coordinator (date and by whom)	Additional data received and loaded onto network (date/TWDB staff name)
1. Summary report that includes the following:				
a. Modeling contact information if clarification is needed	Yes	James Beach		
b. Date and year of submittal	Yes	January 4, 2022		
c. Seal by Texas Professional Geoscientist or Engineer	Yes	James Beach, P.G.,		
d. Groundwater Management Area and requested by whom	Yes	GMA 8 - Drew Satterwhite		
e. Description of Desired Future Condition (DFC)	Yes	Resolution August 2021, Refer Section 3.0, and Appendix D of "GMA 8 DFC ER 2021" report.		
f. Approach: Modeling Methods Document to include parameters and assumptions such as:				
i. Groundwater availability model (GAM) version or acceptable alternative model, and version of acceptable pre-/post-processor used, if applicable	Yes	For all elements related to modeling of DFCs, please refer to Technical Memorandum in Appendix E of this Explanatory Report and Model files submitted under separate cover by WSP.		
ii. Table or description of stress periods and corresponding years/months	Yes	See 1. (f) and (i) above - Made all stress periods 365.25 days instead of including the leap year day - Going to extend the model to run for another 10 years to the end of 2080 (2010-2080)		
iii. If the end of the calibration period is different from the start of the predictive simulations, describe assumptions for projecting model from end of calibration to beginning conditions for predictive simulation including pumping, recharge, and related surface water heads. Include targets and hydrographs, as applicable, in appendix as well as electronic copies.	Yes	See 1. (f) and.(i).above Refer Appendix E of "GMA 8 DFC ER 2021 Appendices" document. Modifications in model inputs, pumping inputs, methods and results are discussed in "Summary of Run 11 Predictive Simulation for GMA 8 Joint Planning" technical memorandum.		
iv. Assumption for recharge, i.e. what years averaged and/or drought and related stress periods, etc.	Yes	See 1. (f) and.(i).above Refer Appendix E of "GMA 8 DFC ER 2021 Appendices" document. Modifications in model inputs, pumping inputs, methods and results are discussed in "Summary of Run 11 Predictive Simulation for GMA 8 Joint Planning" technical memorandum.		
v. Assumption for pumping in prediction such as:				
1. Same distribution as end of calibration and increase or decrease per county and layer?	Yes	See 1. (f) and.(i).above Refer Appendix E of "GMA 8 DFC ER 2021 Appendices" document. Modifications in model inputs, pumping inputs, methods and results are discussed in "Summary of Run 11 Predictive Simulation for GMA 8 Joint Planning" technical memorandum.		
2. New wellfields (include maps).	Yes	See 1. (f) and.(i).above For more details well file is included in model files. Please reach out if you need more information.		
3. Some other method—please provide as much detail as needed.	NA	Please reach out if you need more information.		
g. Version of TWDB "model grid" file that associates model grids with counties, groundwater conservation districts, river basins, groundwater management areas, and regional water planning areas within the model study area using a centroid based approach. These files are available to download on each of the respective model web pages noted above.	Yes	See 1. (f) and.(i).above The model files are available on shared drive and submitted USB.		
h. Description of method used to extract data from model; for example, method and assumptions used to average drawdown, etc. Include a description of how dry cells were treated in averaging drawdown.	Yes	See 1. (f) and.(i).above Refer Appendix E of "GMA 8 DFC ER 2021 Appendices" document. Modifications in model inputs, pumping inputs, methods and results are discussed in "Summary of Run 11 Predictive Simulation for GMA 8 Joint Planning" technical memorandum.		
i. Results Section to include appropriate tables of pumping versus drawdown, volume, surface water discharge, etc. by aquifer, layer, etc. as applicable to the DFC statement.	Yes	See 1. (f) and.(i).above - Refer Appendix E of "GMA 8 DFC ER 2021 Appendices" document. Modifications in model inputs, pumping inputs, methods and results are discussed in "Summary of Run 11 Predictive Simulation for GMA 8 Joint Planning" technical memorandum. - Run 11 model results – Pumping summary and water level decline by GCD, County and Aquifer are provided in Appendix E of "GMA 8 DFC ER 2021 Appendices" document. - GMA 8 – Run 11 water budgets are provided in Appendix E of "GMA 8 DFC ER 2021 Appendices " document.		

j. References	Yes	See 1. (f) and.(i).above Refer Appendix E of "GMA 8 DFC ER 2021 Appendices" document. Modifications in model inputs, pumping inputs, methods and results are discussed in "Summary of Run 11 Predictive Simulation for GMA 8 Joint Planning" technical memorandum.		
2. Related model files (MODFLOW), PEST or other automated calibration files (if used), target files (for establishing starting conditions) with appropriate read me files.	Yes	See 1. (f) and.(i).above - The model files are available on shared drive and submitted USB. Please refer "Model_files" sub folder within "Deliverable_GMA8_Run11" folder. - A readme file is included with the Model files in SP. Other than the files in SP, Additional information can be provided as needed.		
Mark elements that are present in the packet with YES				
Mark elements that are not applicable with NA				
Mark elements that are missing from the Packet with NO				

Texas Water Development Board				
Desired Future Condition Submission Packet Checklist - Aquifer Assessments Elements (part 5)				
Groundwater Management Area: GMA 8				
Groundwater Management Area Coordinator and contact information: Drew Satterwhite, (903) 786-4433, drews@gtua.org				
Reviewing Staff:		**Date Packet Received:**		
		Date Review Completed:		
	Present in packet and administratively complete	Absent from packet and not complete	Contacted GMA Coordinator (date and by whom)	Additional data received and loaded onto network (date/TWDB staff name)
1. Summary report that includes the following:				
a. Technical contact information if clarification is needed	See Transmittal Letter			
b. Date and year of submittal	See Transmittal Letter			
c. Seal by Texas Professional Geoscientist or Engineer	See inside cover of the Explanatory Report			
d. Groundwater Management Area and requested by whom	GMA 8 – Drew Satterwhite			
e. Description of Desired Future Condition (DFC)	Resolution August 2021, Refer Section 3.0, and Appendix D of the Explanatory Report.			
f. Approach: Details of the water budget or analytical methods used, as applicable to selected method:				
i. Description and documentation of water budget, analytic formula/model, or other method used	See 1. (f) and (i) from part (4) above Appendix E of the Explanatory Report.			
ii. Recharge assumptions and data	See 1. (f) and (i) from part (4) above Appendix E of the Explanatory Report.			
iii. Water level data used, including hydrographs and maps	See 1. (f) and (i) from part (4) above Appendix E of the Explanatory Report.			
iv. Inflow and outflow data	See 1. (f) and (i) from part (4) above Appendix E of the Explanatory Report.			
v. Hydrologic parameters required for method	See 1. (f) and (i) from part (4) above Refer Section 3 of the Explanatory Report			
vi. Structural data used in method	See 1. (f) and (i) from part (4) above Refer Section 3 of the Explanatory Report			

vii. Formulas and calculations used in assessment	See 1. (f) and (i) from part (4) above Refer Section 3 of the Explanatory Report			
viii. Geographic information system files or references used for assessment	See 1. (f) and (i) from part (4) above Refer Section 3 of the Explanatory Report			
ix. Any other applicable information to assess the aquifer	See 1. (f) and (i) from part (4) above Refer Section 3 of the Explanatory Report			
g. Description of method used to extract data from background data or geographic information file; for example, methods and assumptions used to average drawdown, recharge, or any other relevant method.	See 1. (f) and (i) from part (4) above Refer Section 3 of the Explanatory Report			
h. Results section with appropriate summary tables, as applicable to the DFC statement.	See 1. (f) and (i) from part (4) above Refer Section 3 and Appendix E of the Explanatory Report			
i. References	See 1. (f) and (i) from part (4) above Refer Section 3 of the Explanatory Report.			

Texas Water Development Board				
Desired Future Condition Submission Packet Checklist - Aquifer Assessments Elements (part 5)				
Groundwater Management Area: GMA 8				
Groundwater Management Area Coordinator and contact information: Drew Satterwhite, (903) 786-4433, drews@gtua.org				
Reviewing Staff:		**Date Packet Received:**		
		Date Review Completed:		
	Present in packet and administratively complete	Absent from packet and not complete	Contacted GMA Coordinator (date and by whom)	Additional data received and loaded onto network (date/TWDB staff name)
Mark elements that are present in the packet with YES				
Mark elements that are not applicable with NA				
Mark elements that are missing from the Packet with NO				

Texas Water Development Board

Desired Future Condition Submission Packet Checklist - Non-Relevant Aquifer Elements (part 6)

Groundwater Management Area: GMA8 **Reviewing Staff:**

Required Documentation (31 TAC §356.31(b)):

1. Description, location, and/or map of aquifer or portion of the aquifer.
2. Summary of aquifer characteristics, groundwater demands, and current groundwater uses, including the total estimated recoverable storage as provided by the executive administrator, that support the conclusion that desired future conditions in adjacent or hydraulically connected relevant aquifer(s) will not be affected.
3. Why the aquifer or portion of the aquifer is non-relevant for joint planning.

Aquifers	Present in packet	Notes
1 Nacatoch	Yes	Ch. 6 of the Explanatory Report
2 Blossom	Yes	See 1 above.
3 Brazos River Alluvium	Yes	See 1 above.
4 Cross Timbers	Yes	See 1 above.
5 N/A		

Mark elements that are present in the packet with YES
Mark elements that are not applicable with NA
Mark elements that are missing from the packet with NO

Appendix B
GMA 8 Meeting Agendas (2019 – 2021)

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NOTICE OF MEETING
GROUNDWATER MANAGEMENT AREA 8

Notice is hereby given that the groundwater conservation districts located wholly or partially within Groundwater Management Area (GMA) 8, as designated by the Texas Water Development Board (TWDB), consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Middle Trinity Groundwater Conservation District, North Texas Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Prairielands Groundwater Conservation District, Red River Groundwater Conservation District, Saratoga Underground Water Conservation District, Southern Trinity Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a ***Joint Planning meeting at 10:00 A.M. on May 6, 2019*** at the **Cleburne Conference Center** located at **1501 W. Henderson St., Cleburne, TX 76033**. The meeting will be open to the public. The following items of business will be discussed and potentially acted upon:

1. Invocation.
2. Call meeting to order and establish quorum.
3. Welcome and introductions.
4. Public comment.
5. Consider and act upon approval of minutes from the November 30, 2018, GMA 8 meeting
6. Presentation of Plaque in to Eddie Daniel expressing appreciation for service as GMA 8 Chair
7. Consider and act upon all matters incident and related to the contract and scope of services with WSP for consulting services for DFC development.
8. Consider and act upon all matters incident and related to an Interlocal Agreement regarding Groundwater Management Area 8 Funding for Development of Desired Future Conditions joint planning.
9. Discussion and possible action on potential model runs for this planning cycle.
10. Discussion and possible action on joint planning schedule.
11. Update and possible action on pending legislation that relates to the joint planning process including but not limited to similar rules.
12. Discussion of possible agenda items and dates for next GMA 8 meeting.
13. Closing comments.
14. Adjourn.

Dated this 22nd day of April, 2019

Joe Cooper, Chair
Groundwater Management Area 8

The above agenda schedules represent an estimate of the order for the indicated items and is subject to change at any time. These public meetings are available to all persons regardless of disability. If you require special assistance to attend the meeting, please call (855) 426-4433 at least 24 hours in advance of the meeting to coordinate any special physical access arrangements.

For questions regarding this notice, please contact Velma Starks at (855) 426-4433, at ntgcd@northtexasgcd.org, or at 5100 Airport Drive, Denison, TX 75020.

At any time during the meeting or work session and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Groundwater Management Area 8 may meet in executive session on any of the above agenda items or other lawful items for consultation concerning attorney-client matters (§551.071); deliberation regarding real property (§551.072); deliberation regarding prospective gifts (§551.073); personnel matters (§551.074); and deliberation regarding security devices (§551.076). Any subject discussed in executive session may be subject to action during an open meeting.

NOTICE OF MEETING
GROUNDWATER MANAGEMENT AREA 8

Notice is hereby given that the groundwater conservation districts located wholly or partially within Groundwater Management Area (GMA) 8, as designated by the Texas Water Development Board (TWDB), consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Middle Trinity Groundwater Conservation District, North Texas Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Prairielands Groundwater Conservation District, Red River Groundwater Conservation District, Saratoga Underground Water Conservation District, Southern Trinity Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a ***Joint Planning meeting at 10:00 A.M. on July 26, 2019*** at the **Cleburne Conference Center** located at **1501 W. Henderson St., Cleburne, TX 76033**. The meeting will be open to the public. The following items of business will be discussed and potentially acted upon:

1. Invocation.
2. Call meeting to order and establish quorum.
3. Welcome and introductions.
4. Public comment.
5. Consider and act upon approval of minutes from the May 6, 2019, GMA 8 meeting
6. Update on all matters incident and related to the contract and scope of services with WSP for consulting services for DFC development including the associated GMA 8 Interlocal Agreement.
7. Discussion and possible action on potential model runs for this planning cycle.
8. Discuss plan and schedule for GMA 8 consideration of nine factors required by Texas Water Code Subsections 36.108(d)(1 – 9) in the third round of DFC joint planning
9. Discuss plan for updating and preparing the GMA 8 explanatory report for the third round of DFC joint planning
10. Discussion and possible action on joint planning schedule.
11. Update and possible action on pending legislation that relates to the joint planning process including but not limited to similar rules.
12. Discussion of possible agenda items and dates for next GMA 8 meeting.
13. Closing comments.
14. Adjourn.

Dated this 3rd day of July, 2019 Joe Cooper, Chair
Groundwater Management Area 8

The above agenda schedules represent an estimate of the order for the indicated items and is subject to change at any time. These public meetings are available to all persons regardless of disability. If you require special assistance to attend the meeting, please call (855) 426-4433 at least 24 hours in advance of the meeting to coordinate any special physical access arrangements.

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At any time during the meeting or work session and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Groundwater Management Area 8 may meet in executive session on any of the above agenda items or other lawful items for consultation concerning attorney-client matters (§551.071); deliberation regarding real property (§551.072); deliberation regarding prospective gifts (§551.073); personnel matters (§551.074); and deliberation regarding security devices (§551.076). Any subject discussed in executive session may be subject to action during an open meeting.

NOTICE OF MEETING
GROUNDWATER MANAGEMENT AREA 8

Notice is hereby given that the groundwater conservation districts located wholly or partially within Groundwater Management Area (GMA) 8, as designated by the Texas Water Development Board (TWDB), consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Middle Trinity Groundwater Conservation District, North Texas Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Prairielands Groundwater Conservation District, Red River Groundwater Conservation District, Saratoga Underground Water Conservation District, Southern Trinity Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a ***Joint Planning meeting at 10:00 A.M. on November 22, 2019*** at the **Cleburne Conference Center** located at **1501 W. Henderson St., Cleburne, TX 76033**. The meeting will be open to the public. The following items of business will be discussed and potentially acted upon:

1. Invocation.
2. Call meeting to order and establish quorum.
3. Welcome and introductions.
4. Public comment.
5. Consider and act upon approval of minutes from the July 26, 2019, GMA 8 meeting.
6. Discussion and possible action of upcoming model run inputs.
7. Presentations and discussions regarding Environmental Impacts, Subsidence Impacts, and Hydrological Conditions factors as they relate to Desired Future Conditions pursuant to Texas Water Code Section 36.108(d).
8. Update on similar rules surveys.
9. Receive update from the Texas Water Development Board.
10. Discussion of possible agenda items and dates for next GMA 8 meeting.
11. Closing comments.
12. Adjourn.

Dated this 5th day of November, 2019

Joe Cooper, Chair
Groundwater Management Area 8

The above agenda schedules represent an estimate of the order for the indicated items and is subject to change at any time. These public meetings are available to all persons regardless of disability. If you require special assistance to attend the meeting, please call (855) 426-4433 at least 24 hours in advance of the meeting to coordinate any special physical access arrangements.

For questions regarding this notice, please contact Velma Starks at (855) 426-4433, at ntgcd@northtexasgcd.org, or at 5100 Airport Drive, Denison, TX 75020.

At any time during the meeting or work session and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Groundwater Management Area 8 may meet in executive session on any of the above agenda items or other lawful items for consultation concerning attorney-client matters (§551.071); deliberation regarding real property (§551.072); deliberation regarding prospective gifts (§551.073); personnel matters (§551.074); and deliberation regarding security devices (§551.076). Any subject discussed in executive session may be subject to action during an open meeting.

NOTICE OF MEETING
GROUNDWATER MANAGEMENT AREA 8

Notice is hereby given that the groundwater conservation districts located wholly or partially within Groundwater Management Area (GMA) 8, as designated by the Texas Water Development Board (TWDB), consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Middle Trinity Groundwater Conservation District, North Texas Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Prairielands Groundwater Conservation District, Red River Groundwater Conservation District, Saratoga Underground Water Conservation District, Southern Trinity Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a ***Joint Planning meeting at 10:00 A.M. on February 26, 2020*** at the **Cleburne Conference Center** located at **1501 W. Henderson St., Cleburne, TX 76033**. The meeting will be open to the public. The following items of business will be discussed and potentially acted upon:

1. Invocation.
2. Call meeting to order and establish quorum.
3. Welcome and introductions.
4. Public comment.
5. Consider and act upon approval of minutes from the November 22, 2019, GMA 8 meeting.
6. Discussion and possible action on results from updated NTWGAM run related to Joint Planning in GMA 8.
7. Presentations and discussions regarding Aquifer Uses or Conditions, Supply Needs & Management Strategies, and Private Property Rights factors as they relate to Desired Future Conditions pursuant to Texas Water Code Section 36.108(d).
8. Update on similar rules surveys.
9. Receive update from the Texas Water Development Board.
10. Receive presentation from Texas Water Development Board on Groundwater Availability Model Slivers
11. Discussion and possible action regarding all matters incident and related to Groundwater Availability Model Slivers
12. Discussion of possible agenda items and dates for next GMA 8 meeting.
13. Closing comments.
14. Adjourn.

Dated this 27th day of January, 2020

Joe Cooper, Chair
Groundwater Management Area 8

The above agenda schedules represent an estimate of the order for the indicated items and is subject to change at any time. These public meetings are available to all persons regardless of disability. If you require special assistance to attend the meeting, please call (855) 426-4433 at least 24 hours in advance of the meeting to coordinate any special physical access arrangements.

For questions regarding this notice, please contact Velma Starks at (855) 426-4433, at ntgcd@northtexasgcd.org, or at 5100 Airport Drive, Denison, TX 75020.

At any time during the meeting or work session and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Groundwater Management Area 8 may meet in executive session on any of the above agenda items or other lawful items for consultation concerning attorney-client matters (§551.071); deliberation regarding real property (§551.072); deliberation regarding prospective gifts (§551.073); personnel matters (§551.074); and deliberation regarding security devices (§551.076). Any subject discussed in executive session may be subject to action during an open meeting.

NOTICE OF MEETING
GROUNDWATER MANAGEMENT AREA 8

Join by computer, tablet or smartphone at the following link:
https://global.gotomeeting.com/join/308505565

or

Join by phone 1-646-749-3112 with access code: 308-505-565

Friday, May 15, 2020 – 10:00 a.m.

Notice is hereby given that the groundwater conservation districts located wholly or partially within Groundwater Management Area (GMA) 8, as designated by the Texas Water Development Board (TWDB), consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Middle Trinity Groundwater Conservation District, North Texas Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Prairielands Groundwater Conservation District, Red River Groundwater Conservation District, Saratoga Underground Water Conservation District, Southern Trinity Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a Joint Planning meeting at 10:00 A.M. on May 15, 2020.

Notice is hereby given that, in accordance with Governor Abbott's March 16, 2020, action to temporarily suspend certain provisions of the Texas Open Meetings Act, a Joint Planning Meeting will be held via telephone and video conference call beginning at 10:00 a.m. on May 15, 2020. Any member of the public who wishes to participate remotely may do so through the remote access options provided above.

The following items of business will be discussed and potentially acted upon:

1. Invocation.
2. Call meeting to order and establish quorum.
3. Welcome and introductions.
4. Public comment.
5. Consider and act upon approval of minutes from the February 26, 2020, GMA 8 meeting.
6. Discussion and possible action on results from updated NTWGAM run related to Joint Planning in GMA 8. Discussion will include changes made in Upper Trinity GCD, Prairielands GCD, Southern Trinity GCD, Clearwater UWCD, Central Texas GCD, and Williamson and Travis County.
7. Presentation and discussion regarding Socioeconomic Impacts, Feasibility of Desired Future Conditions (DFCs), and Other Relevant Information factors as they relate to Desired Future Conditions (DFCs) adoption pursuant to Texas Water Code Section 36.108(d).
8. Update on similar rules surveys.
9. Receive update from Texas Water Development Board.

10. Discussion of possible agenda items and dates for next GMA 8 meeting.
11. Closing comments.
12. Adjourn.

Dated this 30th day of April, 2020

Joe Cooper, Chair
Groundwater Management Area 8

The above agenda schedules represent an estimate of the order for the indicated items and is subject to change at any time. These public meetings are available to all persons regardless of disability. If you require special assistance to attend the meeting, please call (855) 426-4433 at least 24 hours in advance of the meeting to coordinate any special physical access arrangements.

For questions regarding this notice, please contact Velma Starks at (855) 426-4433, at ntgcd@northtexasgcd.org, or at 5100 Airport Drive, Denison, TX 75020.

At any time during the meeting or work session and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Groundwater Management Area 8 may meet in executive session on any of the above agenda items or other lawful items for consultation concerning attorney-client matters (§551.071); deliberation regarding real property (§551.072); deliberation regarding prospective gifts (§551.073); personnel matters (§551.074); and deliberation regarding security devices (§551.076). Any subject discussed in executive session may be subject to action during an open meeting.

NOTICE OF MEETING
GROUNDWATER MANAGEMENT AREA 8

Join by computer, tablet or smartphone at the following link:
https://global.gotomeeting.com/join/484143909

or

Join by phone 408-650-3123 with access code: 484-143-909

Friday, August 7, 2020 – 10:00 a.m.

Notice is hereby given that the groundwater conservation districts located wholly or partially within Groundwater Management Area (GMA) 8, as designated by the Texas Water Development Board (TWDB), consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Middle Trinity Groundwater Conservation District, North Texas Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Prairielands Groundwater Conservation District, Red River Groundwater Conservation District, Saratoga Underground Water Conservation District, Southern Trinity Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a **Joint Planning meeting at 10:00 A.M. on August 7, 2020.**

Notice is hereby given that, in accordance with Governor Abbott's March 16, 2020, action to temporarily suspend certain provisions of the Texas Open Meetings Act, a Joint Planning Meeting will be held via telephone and video conference call beginning at 10:00 a.m. on August 7, 2020. Any member of the public who wishes to participate remotely may do so through the remote access options provided above.

The following items of business will be discussed and potentially acted upon:

1. Invocation.
2. Call meeting to order and establish quorum.
3. Welcome and introductions.
4. Public comment.
5. Consider and act upon approval of minutes from the May 15, 2020, GMA 8 meeting.
6. Discussion and possible action on results from the Central Texas Llano Uplift model run.
7. Discuss and possible action regarding GMA 8 declaration of non-relevant aquifers.
8. Presentation, discussion and possible action on options for Desired Future Conditions statements and next steps to establish proposed Desired Future Conditions.
9. Discussion and possible action on margin of error language for the Desired Future Conditions Statement.
10. Consider and act upon adopting a resolution regarding the reassignment of GMA boundaries between GMA 8 and GMA 6.

11. Consider and act upon adopting a resolution regarding the reassignment of GMA boundaries between GMA 8 and GMA 7.
12. Consider and act upon adopting a resolution regarding the reassignment of GMA boundaries between GMA 8 and GMA 9.
13. Discussion of possible agenda items and dates for next GMA 8 meeting.
14. Closing comments.
15. Adjourn.

Dated this 15th day of July, 2020

Joe Cooper, Chair
Groundwater Management Area 8

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At any time during the meeting or work session and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Groundwater Management Area 8 may meet in executive session on any of the above agenda items or other lawful items for consultation concerning attorney-client matters (§551.071); deliberation regarding real property (§551.072); deliberation regarding prospective gifts (§551.073); personnel matters (§551.074); and deliberation regarding security devices (§551.076). Any subject discussed in executive session may be subject to action during an open meeting.

NOTICE OF MEETING
GROUNDWATER MANAGEMENT AREA 8

Join by computer, tablet or smartphone at the following link:
https://global.gotomeeting.com/join/889909501

or

Join by phone 872-240-3212 with access code: 889-909-501

Tuesday, October 27, 2020 – 10:00 a.m.

Notice is hereby given that the groundwater conservation districts located wholly or partially within Groundwater Management Area (GMA) 8, as designated by the Texas Water Development Board (TWDB), consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Middle Trinity Groundwater Conservation District, North Texas Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Prairielands Groundwater Conservation District, Red River Groundwater Conservation District, Saratoga Underground Water Conservation District, Southern Trinity Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a **Joint Planning meeting at 10:00 A.M. on October 27, 2020.**

Notice is hereby given that, in accordance with Governor Abbott's March 16, 2020, action to temporarily suspend certain provisions of the Texas Open Meetings Act, a Joint Planning Meeting will be held via telephone and video conference call beginning at 10:00 a.m. on October 27, 2020. Any member of the public who wishes to participate remotely may do so through the remote access options provided above.

The following items of business will be discussed and potentially acted upon:

1. Invocation.
2. Call meeting to order and establish quorum.
3. Welcome and introductions.
4. Public comment.
5. Consider and act upon approval of minutes from the August 7, 2020, GMA 8 meeting.
6. Receive update from the Texas Water Development Board.
7. Presentation and discussion of the 9 factors pursuant to Texas Water Code Section 36.108(d).
8. Discussion and possible action on margin of error language for the Desired Future Conditions Statements.
9. Discussion and possible action on a resolution to adopt proposed Desired Future Conditions.
10. Discussion and possible action regarding next steps in adopting Desired Future Conditions.
11. Discuss similar rules survey.

12. Discussion of possible agenda items and dates for next GMA 8 meeting.
13. Closing comments.
14. Adjourn.

Dated this 7th day of October, 2020

Joe Cooper, Chair
Groundwater Management Area 8

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For questions regarding this notice, please contact Velma Starks at (855) 426-4433, at ntgcd@northtexasgcd.org, or at 5100 Airport Drive, Denison, TX 75020.

At any time during the meeting or work session and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Groundwater Management Area 8 may meet in executive session on any of the above agenda items or other lawful items for consultation concerning attorney-client matters (§551.071); deliberation regarding real property (§551.072); deliberation regarding prospective gifts (§551.073); personnel matters (§551.074); and deliberation regarding security devices (§551.076). Any subject discussed in executive session may be subject to action during an open meeting.

Appendix C
GMA 8 Boundary Amendment Letters

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Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

March 12, 2021

Mr. Drew Satterwhite
General Manager
North Texas Groundwater Conservation District
P.O. Box 508
Gainesville, TX 76241

Dear Mr. Satterwhite:

We received your request, dated December 8, 2020, to amend the boundaries of groundwater management areas 6 and 8 pursuant to 31 Texas Administrative Code (TAC) § 356.22. Based on our staff's technical and administrative review of the request and supporting documentation, the Board approved the request on March 10, 2021. TWDB staff will make the necessary changes to the data files as described in TAC § 356.22 and will notify you when the changes are complete.

By copy of this letter, and in compliance with TAC § 356.22(b), I am also informing the affected districts of this action.

Please feel free to contact Natalie Ballew of our Groundwater staff at 512-463-2779 or natalie.ballew@twdb.texas.gov if you have any questions regarding this action or need any further information.

Sincerely,

Jeff Walker Digitally signed by Jeff Walker Date: 2021.03.23 14:35:41 -05'00'

Jeff Walker
Executive Administrator

c w/o enc: Doug Shaw, Upper Trinity Groundwater Conservation District
Mike McGuire, Rolling Plains Groundwater Conservation District
John T. Dupnik, P.G., Deputy Executive Administrator of Water Science and Conservation
Larry French, P.G., Groundwater
Natalie Ballew, P.G., Groundwater

Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

May 19, 2021

Mr. Ronald G. Fieseler, P.G.
Chairman, Groundwater Management Area 9
Blanco-Pedernales Groundwater Conservation District
P.O. Box 1516
Johnson City, TX 78636

Dear Mr. Fieseler:

We received your two requests, dated March 2, 2021 and April 20, 2021, to amend the boundaries of groundwater management areas 8, 9, and 10 pursuant to 31 Texas Administrative Code (TAC) § 356.22. Based on staff technical and administrative review of the requested boundary changes and supporting documentation, it has been determined that the changes qualify as administrative corrections and have been approved. TWDB staff will make the necessary changes to the data files as described in TAC § 356.22 and will notify you when the change is complete.

By copy of this letter, and in compliance with TAC § 356.22(b), I am also informing the affected districts of this action.

Please feel free to contact Natalie Ballew of our Groundwater staff at 512-463-2779 or natalie.ballew@twdb.texas.gov if you have any questions regarding this action or need any further information.

Sincerely,

Jeff Walker Digitally signed by Jeff Walker Date: 2021.05.19 20:37:17 -05'00'

Jeff Walker
Executive Administrator

c w/o enc: Drew Satterwhite, North Texas Groundwater Conservation District
Michael Redman, Barton Springs Edwards Aquifer Conservation District
John T. Dupnik, P.G., Deputy Executive Administrator of Water Science and Conservation
Larry French, P.G., Groundwater
Natalie Ballew, P.G., Groundwater

Appendix D
GMA 8 DFC Adoption Resolution (*July* 26, 2022)

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RESOLUTION NO. 2022-07-26-02
ADOPTING DESIRED FUTURE CONDITIONS
FOR RELEVANT AQUIFERS IN GROUNDWATER MANAGEMENT AREA 8

THE STATE OF TEXAS §
§
GROUNDWATER MANAGEMENT AREA 8 §
§
GROUNDWATER CONSERVATION DISTRICTS §

WHEREAS, Section 36.108 of the Texas Water Code requires groundwater conservation districts located entirely or partially within a groundwater management area ("GMA") designated by the Texas Water Development Board ("TWDB") to adopt desired future conditions ("DFCs") for the relevant aquifers located within the GMA;

WHEREAS, the groundwater conservation districts located entirely or partially within Groundwater Management Area 8 ("GMA 8") as of the date of this resolution are as follows: Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Middle Trinity Groundwater Conservation District, North Texas Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Prairielands Groundwater Conservation District, Red River Groundwater Conservation District, Saratoga Underground Water Conservation District, Southern Trinity Groundwater Conservation District, and Upper Trinity Groundwater Conservation District (collectively referenced hereinafter as "the GMA 8 Districts");

WHEREAS, after consideration of multiple GAM runs and other data and information relevant to the development of DFCs as required by Sections 36.108(d)-(d-3) of the Texas Water Code, the representatives of the GMA 8 Districts voted to approve proposed DFCs for the relevant aquifers in GMA 8 at a public meeting held on October 27, 2020;

WHEREAS, pursuant to Section 36.108(d-3) of the Texas Water Code, the representatives of the GMA 8 Districts voted to adopt the DFCs for the relevant aquifers in GMA 8 at a public meeting held on November 4, 2021;

WHEREAS, the GMA 8 Districts also voted to approve the Explanatory Report as required by Section 36.108(d-3) at the November 4, 2021, GMA 8 meeting;

WHEREAS, during the TWDB's administrative completeness review of the resolution and Explanatory Report pursuant to Sections 36.108(d-3)-(d-4) of the Texas Water Code, TWDB identified minor and substantive corrections needed to Attachment B of the "Resolution to Adopt Desired Future Conditions for Relevant Aquifers in Groundwater Management Area 8" and to the Explanatory Report adopted by the representatives of the GMA 8 Districts on November 4, 2021;

WHEREAS, the GMA 8 Districts find that certain revisions to the DFCs adopted at the November 4, 2021, GMA 8 meeting are necessary to make the minor and substantive corrections identified by the TWDB;

WHEREAS, the GMA 8 Districts find that all deadlines set forth in Section 36.108 of the Texas Water Code related to DFC proposal for adoption and final adoption of the DFCs by GMA 8 have been met;

WHEREAS, the GMA 8 Districts find that all prior actions taken and factors considered by the GMA 8 Districts related to this round of joint planning are each valid and support the revisions necessary to correct the DFCs in compliance with the statutory requirements;

WHEREAS, the corrections identified to the DFCs are considered to be suggested revisions to the proposed DFCs pursuant to Section 36.108(d-3) of the Texas Water Code;

WHEREAS, in order to finally adopt the revised DFCs, as required by Section 36.108(d-3) of the Texas Water Code, the representatives of the GMA 8 Districts convened for a meeting, which was duly noticed and open to the public, this day, July 26, 2022, at 10:00 a.m. at the Prairielands Groundwater Conservation District Office, to take up and consider the adoption of the DFCs for all relevant aquifers within GMA 8;

WHEREAS, of the eleven (11) GMA 8 Districts, the meeting this day was attended by duly appointed voting representatives from the following districts (as indicated):

- ☐ Central Texas Groundwater Conservation District
- ☐ Clearwater Underground Water Conservation District
- ☐ Middle Trinity Groundwater Conservation District
- ☐ North Texas Groundwater Conservation District
- ☐ Northern Trinity Groundwater Conservation District
- ☐ Post Oak Savannah Groundwater Conservation District
- ☐ Prairielands Groundwater Conservation District
- ☐ Red River Groundwater Conservation District
- ☐ Saratoga Underground Water Conservation District
- ☐ Southern Trinity Groundwater Conservation District
- ☐ Upper Trinity Groundwater Conservation District;

WHEREAS, the GMA 8 Districts find that the notice and meeting requirements to review, consider, and adopt DFCs for all relevant aquifers within GMA 8 have been and are satisfied, with a true and correct copy of each of the notices required under Section 36.108(e) of the Texas Water Code attached hereto in Attachment A and incorporated herein for all purposes;

WHEREAS, the GMA 8 Districts have documented in the Explanatory Report required under Section 36.108(d-3) of the Texas Water Code all consideration of the factors and criteria required for adopting DFCs under Section 36.108 of the Texas Water Code and necessary conforming changes have been made to the Explanatory Report as identified in TWDB's administrative completeness review; and

WHEREAS, the GMA 8 Districts find that the adoption of the DFCs provided herein are in each instance merited and necessary to support the management of groundwater resources within the boundaries of the GMA 8 Districts in a manner consistent with the requirements of Chapter 36, Water Code.

NOW, THEREFORE, BE IT RESOLVED BY THE REPRESENTATIVES OF THE GROUNDWATER CONSERVATION DISTRICTS WITHIN GROUNDWATER MANAGEMENT AREA 8:

1. Each of the affirmations and recitals set forth above are true and correct and fully incorporated into this resolution.

2. No less than two-thirds (2/3) of the authorized voting representatives of the GMA 8 Districts hereby adopt the DFCs for the relevant aquifers within GMA 8 as those set forth in Attachment B to this resolution, which is fully incorporated herein. For purposes of all calculations related to the adopted DFCs that are conducted by the TWDB, the GMA 8 Districts assume the model results are consistent with the proposed DFCs if the average drawdowns calculated by the TWDB are within five percent (5%) or five feet (5'), whichever is larger, of the proposed DFC drawdown values.

3. The revisions to the DFCs identified in Attachment C to this resolution, which is fully incorporated herein, are those revisions identified under Section 36.108(d-3) of the Texas Water Code that are necessary in order for the district-wide and county-wide scale DFC values to align with the aquifer-wide DFC values as set forth in the model results.

4. The GMA 8 Districts and their agents and representatives, individually and collectively, are further authorized to take any and all actions necessary to implement this resolution, including but not limited to the additional actions required for adoption of the DFCs in accordance with Section 36.108 of the Texas Water Code.

AND IT IS SO ORDERED.

PASSED AND ADOPTED on this 26th day of July, 2022.

ATTEST:

Central Texas Groundwater Conservation District

Clearwater Underground Water Conservation District

Middle Trinity Groundwater Conservation District

North Texas Groundwater Conservation District

Northern Trinity Groundwater Conservation District

Post Oak Savannah Groundwater Conservation District

Prairielands Groundwater Conservation District

Red River Groundwater Conservation District

Saratoga Underground Water Conservation District

Southern Trinity Groundwater Conservation District

Upper Trinity Groundwater Conservation District

ATTACHMENT A

NOTICE OF MEETING
GROUNDWATER MANAGEMENT AREA 8

Notice is hereby given that the groundwater conservation districts located wholly or partially within Groundwater Management Area (GMA) 8, as designated by the Texas Water Development Board (TWDB), consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Middle Trinity Groundwater Conservation District, North Texas Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Prairielands Groundwater Conservation District, Red River Groundwater Conservation District, Saratoga Underground Water Conservation District, Southern Trinity Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a **Joint Planning meeting at 10:00 A.M. on July 26, 2022** at the **Prairielands Groundwater Conservation District Office** located at **208 Kimberly Dr., Cleburne, Texas 76031**. The meeting will be open to the public. The following items of business will be discussed and potentially acted upon:

1. Invocation.
2. Call meeting to order and establish quorum.
3. Welcome and introductions.
4. Public comment.
5. Consider and act upon approval of minutes from the November 4, 2021, GMA 8 meeting.
6. Consider and act upon election of Chair and Vice Chair for GMA 8.
7. Consider and act upon Resolution 2022-07-26-01 for Appreciation of Joe B. Cooper.
8. Consider and act upon approving GMA 8 Resolution 2022-07-26-02 adopting the amended Desired Future Conditions for relevant aquifers in GMA 8.
9. Consider and act upon the amended GMA 8 Explanatory Report, including consideration of comments received and corresponding revisions to the Explanatory Report, authorization for the administrative District to make any necessary non-substantive revisions, and submission of all required documentation to the Texas Water Development Board.
10. Consider and possibly act upon all matters incident and related to updating the Groundwater Availability Model for the Northern Trinity and Woodbine Aquifers, including the process for selecting a consultant to perform the modeling work.
11. TWDB presentation on the Brackish Resources Characterization of the Woodbine Aquifer
12. Updates from the TWDB
13. Discussion of possible agenda items and dates for next GMA 8 meeting.
14. Closing comments.

15. Adjourn.

Dated this 6th day of July 2022

Mitchell Sodek, Vice Chair
Groundwater Management Area 8

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ATTACHMENT B

Attachment B: Desired Future Conditions (DFCs) adopted by District Representatives in GMA 8 for all relevant aquifers.

Table 1 – GMA 8 DFCs adopted at an aquifer-wide scale for Northern Trinity and Woodbine aquifers based on total average drawdown in feet (both unconfined and confined drawdown). Planning period from January 1, 2010 through December 31, 2080.

GMA 8 Adopted DFCs -Aquifer-Wide Scale	
Woodbine	146
Paluxy	193
Glen Rose	148
Twin Mountain	345
Travis Peak	207
Hensell	148
Hosston	262
Antlers	193

Table 2 – GMA 8 DFCs adopted at a GCD scale for Northern Trinity and Woodbine aquifers (except for Upper Trinity GCD, see below for Upper Trinity GCD) based on total average drawdown in feet (both unconfined and confined drawdown). Planning period from January 1, 2010 through December 31, 2080.

GMA 8 Adopted DFCs - GCD Scale								
GCD	Wood-bine	Paluxy	Glen Rose	Twin Mtn	Travis Peak	Hensell	Hosston	Antlers
Central Texas GCD	—	—	2	—	19	7	21	—
Clearwater UWCD	—	17	83	—	333	145	375	—
Middle Trinity GCD	—	5	29	8	98	77	124	12
North Texas GCD	263	690	366	601	—	—	—	305
Northern Trinity GCD	6	105	163	348	—	—	—	177
Post Oak Savannah GCD	—	—	241	—	412	261	412	—
Prairielands GCD	44	44	142	170	323	201	364	—
Red River GCD	209	830	335	405	291	—	—	321
Saratoga UWCD	—	—	1	—	6	1	11	—
Southern Trinity GCD	6	41	148	—	504	242	582	—

Table 3 – GMA 8 DFCs adopted for Upper Trinity GCD for Northern Trinity and Woodbine aquifers based on total average feet of drawdown, discretized based on outcrop and downdip extent. Planning period from January 1, 2010 through December 31, 2080.

GMA 8 Adopted DFCs – Upper Trinity GCD		
Antlers	**Outcrop**	**47**
	Downdip	**154**
Paluxy	**Outcrop**	**6**
	Downdip	**2**
Glen Rose	**Outcrop**	**15**
	Downdip	**45**
Twin Mtn	**Outcrop**	**10**
	Downdip	**70**

Table 4 – GMA 8 DFCs adopted at a county scale for Northern Trinity and Woodbine aquifers (except for Upper Trinity GCD counties, see Table 5 below for these counties) based on total average drawdown in feet (both unconfined and confined drawdown). Planning period from January 1, 2010 through December 31, 2080.

GMA 8 Adopted DFCs - County Scale								
County	Wood-bine	Paluxy	Glen Rose	Twin Mtn	Travis Peak	Hensell	Hosston	Antlers
Bell	—	17	83	—	333	145	375	—
Bosque	—	6	53	—	189	139	232	—
Bowie	—	—	—	—	—	—	—	—
Brown	—	2	1	—	2	1	1	2
Burnet	—	—	2	—	19	7	21	—
Callahan	—	—	—	—	—	—	—	1
Collin	482	729	366	560	—	—	—	596
Comanche	—	—	2	—	4	2	3	12
Cooke	2	—	—	—	—	—	—	191
Coryell	—	5	15	—	107	70	141	—
Dallas	137	346	288	515	415	362	419	—
Delta	—	279	198	—	202	—	—	—
Denton	22	558	367	752	—	—	—	416
Eastland	—	—	—	—	—	—	—	4
Ellis	76	128	220	413	380	290	390	—
Erath	—	6	6	8	25	12	35	14
Falls	—	159	238	—	505	296	511	—
Fannin	259	709	305	400	291	—	—	269
Franklin	—	—	—	—	—	—	—	—
Grayson	163	943	364	445	—	—	—	364
Hamilton	—	2	4	—	26	14	38	—
Hill	20	45	149	—	365	211	413	—
Hopkins	—	—	—	—	—	—	—	—
Hunt	631	610	326	399	35	—	—	—
Johnson	4	-57	66	184	235	120	329	—
Kaufman	242	311	305	427	372	349	345	—
Lamar	42	100	107	—	125	—	—	132
Lampasas	—	—	1	—	6	1	11	—
Limestone	—	199	301	—	433	214	445	—
McLennan	6	41	148	—	504	242	582	—
Milam	—	—	241	—	412	261	412	—
Mills	—	1	1	—	9	2	13	—
Navarro	110	139	266	—	343	295	343	—
Rains	—	—	—	—	—	—	—	—

Table 4 – GMA 8 DFCs adopted at a county scale for Northern Trinity and Woodbine aquifers (except for Upper Trinity GCD counties, see Table 5 below for these counties) based on total average drawdown in feet (both unconfined and confined drawdown). Planning period from January 1, 2010 through December 31, 2080.

GMA 8 Adopted DFCs - County Scale								
County	Wood-bine	Paluxy	Glen Rose	Twin Mtn	Travis Peak	Hensell	Hosston	Antlers
Red River	2	24	40	—	57	—	—	15
Rockwall	275	433	343	466	—	—	—	—
Somervell	—	4	4	50	64	17	120	—
Tarrant	6	105	163	348	—	—	—	177
Taylor	—	—	—	—	—	—	—	0
Travis	—	—	90	—	219	68	226	—
Williamson	—	—	78	—	220	89	225	—

Table 5 – GMA 8 DFCs adopted at a county scale for Upper Trinity GCD counties for Northern Trinity and Woodbine aquifers based on total average drawdown in feet for outcrop and downdip areas. Planning period from January 1, 2010 through December 31, 2080.

GMA 8 Adopted DFCs - Upper Trinity GCD by county (O-Outcrop, D-Downdip)				
County	Antlers	Paluxy	Glen Rose	Twin Mtn
Hood -O	—	6	9	13
Hood-D	—	—	39	72
Montague-O	40	—	—	—
Montague-D	—	—	—	—
Parker-O	42	6	20	7
Parker-D	—	2	50	68
Wise-O	60	—	—	—
Wise-D	154	—	—	—

Table 6 – GMA 8 DFCs in acre-feet per month spring/stream flow adopted for the Edwards (BFZ) Aquifer. Planning period from January 1, 2010 through December 31, 2080. DFCs are in acre-feet per month spring/stream flow in Bell, Travis, and Williamson counties.

County	DFC
Bell	Maintain at least 100 acre-feet per month of stream/spring flow in Salado Creek during a repeat of the drought of record
Travis	Maintain at least 42 acre-feet per month of aggregated stream/spring flow during a repeat of the drought of record
Williamson	Maintain at least 60 acre-feet per month of aggregated stream/spring flow during a repeat of the drought of record

Table 7 – GMA 8 DFCs adopted at a county scale for the Llano Uplift Aquifers based on total average feet of drawdown. Planning period from January 1, 2010 through December 31, 2080.

County	Ellenburger-San Saba Aquifer	Hickory Aquifer	Marble Falls Aquifer
Brown	3	3	3
Burnet	12	11	11
Lampasas	16	16	16
Mills	9	9	9

ATTACHMENT C

ATTACHMENT C – REVISIONS TO DFCs PROPOSED FOR ADOPTION

Woodbine Aquifer – GCD Scale

GCD	Proposed DFC (in feet)	Adopted DFC (in feet)
North Texas GCD	123	263
Prairielands GCD	35	44

Trinity Aquifer – County Scale

County	Glen Rose	
	Proposed DFC (in feet)	Adopted DFC (in feet)
Travis	83	90

Trinity Aquifer – GCD Scale

GCD	Glen Rose		Hensell		Hosston	
	DFC Proposed (in feet)	Adopted DFC (in feet)	DFC Proposed (in feet)	Adopted DFC (in feet)	DFC Proposed (feet)	Adopted DFC (in feet)
Middle Trinity GCD	20	29	58	77	108	124

GCD	Paluxy		Glen Rose		Twin Mountains	
	DFC Proposed (in feet)	Adopted DFC (in feet)	DFC Proposed (in feet)	Adopted DFC (in feet)	DFC Proposed (in feet)	Adopted DFC (in feet)
North Texas GCD	465	690	300	366	485	601

GCD	Paluxy	
	DFC Proposed (in feet)	Adopted DFC (in feet)
Saratoga UWCD	2	Not applicable (—)

"DFC Proposed" means the DFC proposed for adoption by resolution approved at the October 27, 2020, GMA 8 meeting.
"Adopted DFC" means the DFC adopted by resolution approved at the July 26, 2022, GMA 8 meeting.

Appendix E
Technical Memo – Summary of Run 11 Predictive Simulation for GMA 8 Joint Planning

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TECHNICAL MEMO

TO: Drew Satterwhite, General Manager, NTGCD

FROM: James Beach, P.G., and Brant Konetchy

SUBJECT: Summary of Run 11 Predictive Simulation for GMA 8 Joint Planning

DATE: December 18, 2020

INTRODUCTION

WSP conducted a predictive simulation in support of the Groundwater Management Area (GMA) 8 joint planning effort. The work we conducted was designed to provide the GMA 8 districts with necessary and sufficient information for discussing potential desired future conditions with the other members of GMA 8. Our work involved using the Groundwater Availability Model of the Northern Trinity and Woodbine Aquifers (NTWGAM) (Kelley, Ewing, Jones, Deeds, & Hamlin, 2014) to simulate potential production within the model area and evaluate the simulated response of the aquifers within GMA 8. We will identify the described simulation as "GMA 8 Run 11" or "Run 11" in this report.

MODIFICATION OF MODEL INPUTS

Run 11 used the NTWGAM to simulate potential production and made the following changes to the model from the Run 10 version. The first change was to extend the model run by an additional ten years placing the end model data at the end of 2080. The second was to change all stress periods from actual days in a year (365 or 366 for leap year) to a constant 365.25 days. This change was made to make annual pumpage volumes (and resulting Managed Available Groundwater (MAG) estimates) consistent and to not have any variation due to difference in model stress period lengths. The last change was to move the drought of record recharge rates to the last three years of the model run from 2078 until the end of 2080.

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MODIFICATION OF PUMPING INPUTS

Run 11 pumping used Run 10 pumping (Beach, 2016) as the base pumping rate. Run 11 was modified by extending the pumping of Run 10 by an additional 10 years, as well as making changes in four different groundwater conservation districts (GCD) and in two counties. As with previous pumping inputs all pumping is kept at a constant rate starting in 2010. The exception to this is in Southern Trinity GCD (McLennan County) which requested changes to the first 10 years of pumping (2010-2019). Changes to Clearwater Underground Water Conservation District (CUWCD), Prairielands GCD, Southern Trinity GCD, Upper Trinity GCD, and Travis and Williamson county are shown in the tables below. The adjustment column shows the change from Run 10 pumping rates to Run 11 pumping rates. Negative values indicate a decrease in pumping rate and positive value indicating an increase in pumping rate.

Table 1: Clearwater UWCD updated pumping in Run 11.

Aquifer	Run 10 (AFY)	Adjustment (AFY)	Run 11 (AFY)
Glen Rose	972	-697	275
Hensell	1,097	3	1,100
Hosston	7,179	721	7,900
Total	9,248	27	9,275

Table 2: Prairielands GCD updated pumping in Run 11.

Aquifer	Run 10 (AFY)	Adjustment (AFY)	Run 11 (AFY)
Hensell	3,603	-3,207	397
Pearsall	98	1,848	1,946
Hosston	13,237	1,358	14,596
Total	29,887	0	29,887

Table 3: Travis County updated pumping Run 11.

Aquifer	Run 10 (AFY)	Adjustment (AFY)	Run 11 (AFY)
Glen Rose	973	-873	100
Hensell	1,144	1,156	2,300
Hosston	2,799	1,401	4,200
Total	4,916	1,684	6,600

Table 4: Williamson County updated pumping in Run 11.

Aquifer	Run 10 (AFY)	Adjustment (AFY)	Run 11 (AFY)
Glen Rose	689	-539	150
Hensell	752	848	1,600
Hosston	1,934	-184	1,750
Total	3,375	125	3,500

Table 5: Upper Trinity GCD updated pumping in Run 11.

Aquifer	O/D	County	Run 10 (AFY)	Adjustment (AFY)	Run 11 (AFY)
Glen Rose	Outcrop	Hood	654	138	792
Glen Rose	Downdip	Hood	103	22	125
Paluxy	Outcrop	Hood	159	0	159
Twin Mountains	Outcrop	Hood	3,674	1,351	5,025
Twin Mountains	Downdip	Hood	7,854	2,914	10,768
Antlers	Outcrop	Montague	3,878	2,236	6,114
Antlers	Downdip	Montague			
Antlers	Outcrop	Parker	2,899	6	2,905
Antlers	Downdip	Parker			
Glen Rose	Outcrop	Parker	2,290	1,394	3,684
Glen Rose	Downdip	Parker	874	532	1,406
Paluxy	Outcrop	Parker	2,609	5	2,614

Aquifer	O/D	County	Run 10 (AFY)	Adjustment (AFY)	Run 11 (AFY)
Paluxy	Downdip	Parker	50	0	50
Twin Mountains	Outcrop	Parker	1,074	220	1,294
Twin Mountains	Downdip	Parker	2,083	444	2,527
Antlers	Outcrop	Wise	7,702	1,404	9,106
Antlers	Downdip	Wise	2,058	381	2,439
-	-	Total	37,961	11,048	49,009

Table 6: Southern Trinity GCD updated pumping in Run 11.

Year	Hosston Run 10 (AFY)	Adjustement for Hosston (AFY)	Hosston Run 11 (AFY)
2010	15,937	-4,135	11,802
2011	15,937	-4,635	11,302
2012	15,937	-5,361	10,576
2013	15,937	-6,978	8,959
2014	15,937	-8,424	7,513
2015	15,937	-7,565	8,372
2016	15,937	-7,074	8,863
2017	15,937	-7,929	8,008
2018	15,937	-8,130	7,807
2019	15,937	-8,135	7,802
2020-2070	15,937	0	15,937

METHODOLOGY

WSP used the same methodology as the Beach and others (2016) report to calculate and report the results from Run 11. A summary of the methodology is included below, and any changes or differences made are included in discussion.

- Simulations were conducted with the Texas Water Development Board (TWDB) approved version of the NTWGAM with modification discussed above.
- Initial water levels remained the same as the January 1st, 2010 water levels taken from the transient calibration of the NTWGAM.
- Instances in which initial water levels were below the bottom of the aquifer at the start of the simulation were omitted from any calculations.
- Instances in which water levels fell below the bottom of the aquifer during the model simulation had their water levels set to the bottom of the aquifer and were still used in the calculations.
- Model cells were assigned spatial location (i.e. County, district, GMA, etc.) based on the TWDB grid shapefiles for the Woodbine and Trinity.
- Model cells were assigned to aquifers based on their model IBND values and were only used for calculations if they were also considered part of the official aquifer boundary which was given as the "AQ_Active" value is equal to 1 from the grid shapefiles.
- Aquifer hydrogeologic regions were also assigned to each model cell based on the aquifer regions developed during the creation of the NTWGAM and documented in Kelley and others (2014).
- All calculations were performed on a cell-by-cell basis. Specifically, for each cell the calculation for water level difference was performed, and then the results were summarized based on the county, GCD, aquifer, etc.
- The transmissivity weighted method remained the same as in Beach and others (2016) and was used to calculate aquifers that are composed of multiple aquifer layers within the NTWGAM.

MODEL RESULTS

Results for the Run 11 simulation are summarized by GCD, County, and Aquifer and are contained in three different tables. The first group of tables summarize the pumping rates (in acre-feet per year, (AFY) for each decade starting in 2010 and ending 2080 (for each GCD or county). The second table shows the average water level decline or "drawdown" (if feet) for each GCD/County and Aquifer. The third group of tables provide a summary of the MODFLOW water budget components by decade for each GCD and county.

All model results are shown as tables and in order by GCD. After each GCD table summary will follow the individual counties that make up the GCD. For example, Red River GCD results showing pumping rates is immediately followed by Fannin and Grayson county pumping rate tables.

BIBLIOGRAPHY

Beach, J.A., M. Keester, and B. Konetchy. (2016). *Results of Predicitve Simulations in Support of GMA 8 Joint Planning- NTGCD GAM 8 Run 10.* Austin: LBG-Guyton Associates.

Kelley, V., Ewing, J., Jones, T. L., Deeds, N., & Hamlin, S. (2014). *Updated Groundwater Availability Model of the Northern Trinity and Woodbine Aqiufers.* Austin: INTERA Incorperated.

Run 11 Model Results
Pumping Summary and Water Level Decline
by GCD, County, and Aquifer

Central Texas GCD MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	–	–	–	–	–	–	–	–
GlenRose	148	148	148	148	148	148	148	148
Hensell	2,662	2,662	2,662	2,662	2,662	2,662	2,662	2,662
Hosston	887	887	887	887	887	887	887	887
Antlers	–	–	–	–	–	–	–	–
TravisPeak	3,747	3,747	3,747	3,747	3,747	3,747	3,747	3,747
TwinMnts	–	–	–	–	–	–	–	–

Burnet County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	–	–	–	–	–	–	–	–
GlenRose	148	148	148	148	148	148	148	148
Hensell	2,662	2,662	2,662	2,662	2,662	2,662	2,662	2,662
Hosston	887	887	887	887	887	887	887	887
Antlers	–	–	–	–	–	–	–	–
TravisPeak	3,747	3,747	3,747	3,747	3,747	3,747	3,747	3,747
TwinMnts	–	–	–	–	–	–	–	–

Central Texas GCD DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Central Texas GCD	–	–	2	–	19	7	21	–
Burnet County	–	–	2	–	19	7	21	–

Clearwater UWCD MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	–	–	–	–	–	–	–	–
GlenRose	275	275	275	275	275	275	275	275
Hensell	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Hosston	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,900
Antlers	–	–	–	–	–	–	–	–
TravisPeak	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000
TwinMnts	–	–	–	–	–	–	–	–

Bell County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	0	0	0	0	0	0	0	0
GlenRose	275	275	275	275	275	275	275	275
Hensell	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Hosston	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,900
Antlers	–	–	–	–	–	–	–	–
TravisPeak	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000
TwinMnts	–	–	–	–	–	–	–	–

Clearwater UWCD DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Clearwater UWCD	–	17	83	–	333	145	375	–
Bell County	–	17	83	–	333	145	375	–

Middle Trinity GCD MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	417	417	417	417	417	417	417	417
GlenRose	1,968	1,968	1,968	1,968	1,968	1,968	1,968	1,968
Hensell	11,379	11,379	11,379	11,379	11,379	11,379	11,379	11,379
Hosston	18,183	18,183	18,183	18,183	18,183	18,183	18,183	18,183
Antlers	8,473	8,473	8,473	8,473	8,473	8,473	8,473	8,473
TravisPeak	30,045	30,045	30,045	30,045	30,045	30,045	30,045	30,045
TwinMnts	5,020	5,020	5,020	5,020	5,020	5,020	5,020	5,020

Bosque County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	357	357	357	357	357	357	357	357
GlenRose	729	729	729	729	729	729	729	729
Hensell	3,837	3,837	3,837	3,837	3,837	3,837	3,837	3,837
Hosston	3,765	3,765	3,765	3,765	3,765	3,765	3,765	3,765
Antlers	–	–	–	–	–	–	–	–
TravisPeak	7,683	7,683	7,683	7,683	7,683	7,683	7,683	7,683
TwinMnts	–	–	–	–	–	–	–	–

Comanche County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	0	0	0	0	0	0	0	0
GlenRose	41	41	41	41	41	41	41	41
Hensell	204	204	204	204	204	204	204	204
Hosston	5,869	5,869	5,869	5,869	5,869	5,869	5,869	5,869
Antlers	5,843	5,843	5,843	5,843	5,843	5,843	5,843	5,843
TravisPeak	6,164	6,164	6,164	6,164	6,164	6,164	6,164	6,164
TwinMnts	–	–	–	–	–	–	–	–

Coryell County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	0	0	0	0	0	0	0	0
GlenRose	120	120	120	120	120	120	120	120
Hensell	2,197	2,197	2,197	2,197	2,197	2,197	2,197	2,197
Hosston	2,163	2,163	2,163	2,163	2,163	2,163	2,163	2,163
Antlers	–	–	–	–	–	–	–	–
TravisPeak	4,374	4,374	4,374	4,374	4,374	4,374	4,374	4,374
TwinMnts	–	–	–	–	–	–	–	–

Erath County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	61	61	61	61	61	61	61	61
GlenRose	1,078	1,078	1,078	1,078	1,078	1,078	1,078	1,078
Hensell	5,140	5,140	5,140	5,140	5,140	5,140	5,140	5,140
Hosston	6,387	6,387	6,387	6,387	6,387	6,387	6,387	6,387
Antlers	2,630	2,630	2,630	2,630	2,630	2,630	2,630	2,630
TravisPeak	11,824	11,824	11,824	11,824	11,824	11,824	11,824	11,824
TwinMnts	5,020	5,020	5,020	5,020	5,020	5,020	5,020	5,020

Middle Trinity GCD DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Middle Trinity GCD	–	5	21	8	98	68	124	12
Bosque County	–	6	53	–	189	139	232	–
Comanche County	–	2	2	–	4	2	3	12
Coryell County	–	5	15	–	107	70	141	–
Erath County	–	6	6	8	25	12	35	14

North Texas GCD MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	8,664	8,664	8,664	8,664	8,664	8,664	8,664	8,664
Paluxy	6,370	6,370	6,370	6,370	6,370	6,370	6,370	6,370
GlenRose	422	422	422	422	422	422	422	422
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	29,041	29,041	29,041	29,041	29,041	29,041	29,041	29,041
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	10,574	10,574	10,574	10,574	10,574	10,574	10,574	10,574

Collin County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	4,254	4,254	4,254	4,254	4,254	4,254	4,254	4,254
Paluxy	1,548	1,548	1,548	1,548	1,548	1,548	1,548	1,548
GlenRose	83	83	83	83	83	83	83	83
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	1,962	1,962	1,962	1,962	1,962	1,962	1,962	1,962
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	2,202	2,202	2,202	2,202	2,202	2,202	2,202	2,202

Cooke County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	800	800	800	800	800	800	800	800
Paluxy	–	–	–	–	–	–	–	–
GlenRose	–	–	–	–	–	–	–	–
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	10,521	10,521	10,521	10,521	10,521	10,521	10,521	10,521
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	–	–	–	–	–	–	–	–

Denton County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	3,609	3,609	3,609	3,609	3,609	3,609	3,609	3,609
Paluxy	4,823	4,823	4,823	4,823	4,823	4,823	4,823	4,823
GlenRose	339	339	339	339	339	339	339	339
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	16,557	16,557	16,557	16,557	16,557	16,557	16,557	16,557
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	8,372	8,372	8,372	8,372	8,372	8,372	8,372	8,372

North Texas GCD DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
North Texas GCD	263	690	366	603	–	–	–	308
Collin County	482	729	366	560	–	–	–	596
Cooke County	2	–	–	–	–	–	–	191
Denton County	20	558	367	752	–	–	–	416

Northern Trinity GCD MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	1,139	1,139	1,139	1,139	1,139	1,139	1,139	1,139
Paluxy	8,963	8,963	8,963	8,963	8,963	8,963	8,963	8,963
GlenRose	793	793	793	793	793	793	793	793
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	6,922	6,922	6,922	6,922	6,922	6,922	6,922	6,922

Tarrant County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	1,139	1,139	1,139	1,139	1,139	1,139	1,139	1,139
Paluxy	8,963	8,963	8,963	8,963	8,963	8,963	8,963	8,963
GlenRose	793	793	793	793	793	793	793	793
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	6,922	6,922	6,922	6,922	6,922	6,922	6,922	6,922

Northern Trinity GCD DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Northern Trinity GCD	6	105	163	348	–	–	–	177
Tarrant County	6	105	163	348	–	–	–	177

Post Oak Savannah GCD MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	–	–	–	–	–	–	–	–
GlenRose	–	–	–	–	–	–	–	–
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	–	–	–	–	–	–	–	–
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	–	–	–	–	–	–	–	–

Milam County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	–	–	–	–	–	–	–	–
GlenRose	0	0	0	0	0	0	0	0
Hensell	0	0	0	0	0	0	0	0
Hosston	0	0	0	0	0	0	0	0
Antlers	–	–	–	–	–	–	–	–
TravisPeak	0	0	0	0	0	0	0	0
TwinMnts	–	–	–	–	–	–	–	–

Post Oak Savannah GCD DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Post Oak Savannah GCD	–	–	241	–	412	261	412	–
Milam County	–	–	241	–	412	261	412	–

Prairielands GCD MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	4,642	4,642	4,642	4,642	4,642	4,642	4,642	4,642
Paluxy	3,250	3,250	3,250	3,250	3,250	3,250	3,250	3,250
GlenRose	1,944	1,944	1,944	1,944	1,944	1,944	1,944	1,944
Hensell	361	361	361	361	361	361	361	361
Hosston	14,337	14,337	14,337	14,337	14,337	14,337	14,337	14,337
Antlers	–	–	–	–	–	–	–	–
TravisPeak	16,595	16,595	16,595	16,595	16,595	16,595	16,595	16,595
TwinMnts	343	343	343	343	343	343	343	343

Ellis County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	2,074.0	2,074.0	2,074.0	2,074.0	2,074.0	2,074.0	2,074.0	2,074.0
Paluxy	442.0	442.0	442.0	442.0	442.0	442.0	442.0	442.0
GlenRose	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
Hensell	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hosston	5,545.0	5,545.0	5,545.0	5,545.0	5,545.0	5,545.0	5,545.0	5,545.0
Antlers	–	–	–	–	–	–	–	–
TravisPeak	5,676.0	5,676.0	5,676.0	5,676.0	5,676.0	5,676.0	5,676.0	5,676.0
TwinMnts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hill County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	587.0	587.0	587.0	587.0	587.0	587.0	587.0	587.0
Paluxy	352.0	352.0	352.0	352.0	352.0	352.0	352.0	352.0
GlenRose	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0
Hensell	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Hosston	3,610.0	3,610.0	3,610.0	3,610.0	3,610.0	3,610.0	3,610.0	3,610.0
Antlers	–	–	–	–	–	–	–	–
TravisPeak	4,685.0	4,685.0	4,685.0	4,685.0	4,685.0	4,685.0	4,685.0	4,685.0
TwinMnts	–	–	–	–	–	–	–	–

Johnson County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	1,981.0	1,981.0	1,981.0	1,981.0	1,981.0	1,981.0	1,981.0	1,981.0
Paluxy	2,442.0	2,442.0	2,442.0	2,442.0	2,442.0	2,442.0	2,442.0	2,442.0
GlenRose	1,633.0	1,633.0	1,633.0	1,633.0	1,633.0	1,633.0	1,633.0	1,633.0
Hensell	119.0	119.0	119.0	119.0	119.0	119.0	119.0	119.0
Hosston	4,251.0	4,251.0	4,251.0	4,251.0	4,251.0	4,251.0	4,251.0	4,251.0
Antlers	–	–	–	–	–	–	–	–
TravisPeak	4,472.0	4,472.0	4,472.0	4,472.0	4,472.0	4,472.0	4,472.0	4,472.0
TwinMnts	278.0	278.0	278.0	278.0	278.0	278.0	278.0	278.0

Somervell County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
GlenRose	146.0	146.0	146.0	146.0	146.0	146.0	146.0	146.0
Hensell	217.0	217.0	217.0	217.0	217.0	217.0	217.0	217.0
Hosston	930.0	930.0	930.0	930.0	930.0	930.0	930.0	930.0
Antlers	–	–	–	–	–	–	–	–
TravisPeak	1,762.0	1,762.0	1,762.0	1,762.0	1,762.0	1,762.0	1,762.0	1,762.0
TwinMnts	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0

Prairielands GCD DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Prairielands GCD	44	44	142	170	323	207	369	–
Ellis County	76	128	220	413	380	290	390	–
Hill County	20	45	149	–	365	211	413	–
Johnson County	4	−57	66	184	235	120	329	–
Somervell County	–	4	4	50	64	17	120	–

Red River GCD MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	12,450	12,450	12,450	12,450	12,450	12,450	12,450	12,450
Paluxy	–	–	–	–	–	–	–	–
GlenRose	–	–	–	–	–	–	–	–
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	12,804	12,804	12,804	12,804	12,804	12,804	12,804	12,804
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	–	–	–	–	–	–	–	–

Fannin County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	4,924	4,924	4,924	4,924	4,924	4,924	4,924	4,924
Paluxy	–	–	–	–	–	–	–	–
GlenRose	–	–	–	–	–	–	–	–
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	2,088	2,088	2,088	2,088	2,088	2,088	2,088	2,088
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	–	–	–	–	–	–	–	–

Grayson County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	7,526	7,526	7,526	7,526	7,526	7,526	7,526	7,526
Paluxy	0	0	0	0	0	0	0	0
GlenRose	0	0	0	0	0	0	0	0
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	10,716	10,716	10,716	10,716	10,716	10,716	10,716	10,716
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	0	0	0	0	0	0	0	0

Red River GCD DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Red River GCD	211	720	308	405	291	–	–	321
Fannin County	259	709	305	400	291	–	–	269
Grayson County	163	943	364	445	–	–	–	364

Saratoga UWCD MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	–	–	–	–	–	–	–	–
GlenRose	68	68	68	68	68	68	68	68
Hensell	713	713	713	713	713	713	713	713
Hosston	857	857	857	857	857	857	857	857
Antlers	–	–	–	–	–	–	–	–
TravisPeak	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
TwinMnts	–	–	–	–	–	–	–	–

Lampasas County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	0	0	0	0	0	0	0	0
GlenRose	68	68	68	68	68	68	68	68
Hensell	713	713	713	713	713	713	713	713
Hosston	857	857	857	857	857	857	857	857
Antlers	–	–	–	–	–	–	–	–
TravisPeak	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
TwinMnts	–	–	–	–	–	–	–	–

Saratoga UWCD DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Saratoga UWCD	–	1	1	–	6	1	11	–
Lampasas County	–	1	1	–	6	1	11	–

Southern Trinity GCD MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	–	–	–	–	–	–	–	–
GlenRose	–	–	–	–	–	–	–	–
Hensell	4,701	4,701	4,701	4,701	4,701	4,701	4,701	4,701
Hosston	11,809	15,948	15,948	15,948	15,948	15,948	15,948	15,948
Antlers	–	–	–	–	–	–	–	–
TravisPeak	16,510	20,649	20,649	20,649	20,649	20,649	20,649	20,649
TwinMnts	–	–	–	–	–	–	–	–

McLennan County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	0	0	0	0	0	0	0	0
Paluxy	0	0	0	0	0	0	0	0
GlenRose	0	0	0	0	0	0	0	0
Hensell	4,701	4,701	4,701	4,701	4,701	4,701	4,701	4,701
Hosston	11,809	15,948	15,948	15,948	15,948	15,948	15,948	15,948
Antlers	–	–	–	–	–	–	–	–
TravisPeak	16,510	20,649	20,649	20,649	20,649	20,649	20,649	20,649
TwinMnts	–	–	–	–	–	–	–	–

Southern Trinity GCD DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Southern Trinity GCD	6	41	148	–	504	242	582	–
McLennan County	6	41	148	–	504	242	582	–

Upper Trinity GCD MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	2,818	2,818	2,818	2,818	2,818	2,818	2,818	2,818
GlenRose	6,005	6,005	6,005	6,005	6,005	6,005	6,005	6,005
Hensell	50	50	50	50	50	50	50	50
Hosston	72	72	72	72	72	72	72	72
Antlers	20,535	20,535	20,535	20,535	20,535	20,535	20,535	20,535
TravisPeak	122	122	122	122	122	122	122	122
TwinMnts	19,457	19,457	19,457	19,457	19,457	19,457	19,457	19,457

Hood County (Downdip) MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	–	–	–	–	–	–	–	–
GlenRose	124.0	124.0	124.0	124.0	124.0	124.0	124.0	124.0
Hensell	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
Hosston	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0
Antlers	–	–	–	–	–	–	–	–
TravisPeak	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0
TwinMnts	10,619.0	10,619.0	10,619.0	10,619.0	10,619.0	10,619.0	10,619.0	10,619.0

Hood County (Outcrop) MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0
GlenRose	790.0	790.0	790.0	790.0	790.0	790.0	790.0	790.0
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	–	–	–	–	–	–	–	–
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	5,024.0	5,024.0	5,024.0	5,024.0	5,024.0	5,024.0	5,024.0	5,024.0

Montague County (Downdip) MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	–	–	–	–	–	–	–	–
GlenRose	–	–	–	–	–	–	–	–
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	–	–	–	–	–	–	–	–
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	–	–	–	–	–	–	–	–

Montague County (Outcrop) MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	–	–	–	–	–	–	–	–
GlenRose	–	–	–	–	–	–	–	–
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	6,114.0	6,114.0	6,114.0	6,114.0	6,114.0	6,114.0	6,114.0	6,114.0
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	–	–	–	–	–	–	–	–

Parker County (Downdip) MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
GlenRose	1,406.0	1,406.0	1,406.0	1,406.0	1,406.0	1,406.0	1,406.0	1,406.0
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	–	–	–	–	–	–	–	–
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	2,528.0	2,528.0	2,528.0	2,528.0	2,528.0	2,528.0	2,528.0	2,528.0

Parker County (Outcrop) MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	2,609.0	2,609.0	2,609.0	2,609.0	2,609.0	2,609.0	2,609.0	2,609.0
GlenRose	3,685.0	3,685.0	3,685.0	3,685.0	3,685.0	3,685.0	3,685.0	3,685.0
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	2,899.0	2,899.0	2,899.0	2,899.0	2,899.0	2,899.0	2,899.0	2,899.0
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	1,286.0	1,286.0	1,286.0	1,286.0	1,286.0	1,286.0	1,286.0	1,286.0

Wise County (Downdip) MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	–	–	–	–	–	–	–	–
GlenRose	–	–	–	–	–	–	–	–
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	2,439.0	2,439.0	2,439.0	2,439.0	2,439.0	2,439.0	2,439.0	2,439.0
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	–	–	–	–	–	–	–	–

Wise County (Outcrop) MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	–	–	–	–	–	–	–	–
GlenRose	–	–	–	–	–	–	–	–
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	9,083.0	9,083.0	9,083.0	9,083.0	9,083.0	9,083.0	9,083.0	9,083.0
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	–	–	–	–	–	–	–	–

UTGCD DFC Results

Name	O/D	Paluxy	Glen Rose	Twin Mnts	Antlers
Upper Trinity GCD	Outcrop	6	14	11	50
Upper Trinity GCD	Downdip	2	49	70	154
Hood County	Downdip	–	39	72	–
Hood County	Outcrop	6	9	13	–
Montague County	Downdip	–	–	–	–
Montague County	Outcrop	–	–	–	40
Parker County	Downdip	2	50	68	–
Parker County	Outcrop	6	20	7	42
Wise County	Downdip	–	–	–	154
Wise County	Outcrop	–	–	–	59

Dallas County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	2,798	2,798	2,798	2,798	2,798	2,798	2,798	2,798
Paluxy	359	359	359	359	359	359	359	359
GlenRose	131	131	131	131	131	131	131	131
Hensell	0	0	0	0	0	0	0	0
Hosston	0	0	0	0	0	0	0	0
Antlers	–	–	–	–	–	–	–	–
TravisPeak	0	0	0	0	0	0	0	0
TwinMnts	3,201	3,201	3,201	3,201	3,201	3,201	3,201	3,201

Dallas County DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Dallas County	137	346	288	515	415	362	419	–

Delta County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	56	56	56	56	56	56	56	56
GlenRose	0	0	0	0	0	0	0	0
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	–	–	–	–	–	–	–	–
TravisPeak	0	0	0	0	0	0	0	0
TwinMnts	–	–	–	–	–	–	–	–

Delta County DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Delta County	–	279	198	–	202	–	–	–

Falls County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	0	0	0	0	0	0	0	0
GlenRose	0	0	0	0	0	0	0	0
Hensell	0	0	0	0	0	0	0	0
Hosston	1,435	1,435	1,435	1,435	1,435	1,435	1,435	1,435
Antlers	–	–	–	–	–	–	–	–
TravisPeak	1,435	1,435	1,435	1,435	1,435	1,435	1,435	1,435
TwinMnts	–	–	–	–	–	–	–	–

Falls County DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Falls County	–	159	238	–	505	296	511	–

Hamilton County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	0	0	0	0	0	0	0	0
GlenRose	218	218	218	218	218	218	218	218
Hensell	1,672	1,672	1,672	1,672	1,672	1,672	1,672	1,672
Hosston	385	385	385	385	385	385	385	385
Antlers	–	–	–	–	–	–	–	–
TravisPeak	2,209	2,209	2,209	2,209	2,209	2,209	2,209	2,209
TwinMnts	–	–	–	–	–	–	–	–

Hamilton County DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Hamilton County	–	2	4	–	26	14	38	–

Hunt County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	763	763	763	763	763	763	763	763
Paluxy	3	3	3	3	3	3	3	3
GlenRose	0	0	0	0	0	0	0	0
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	–	–	–	–	–	–	–	–
TravisPeak	0	0	0	0	0	0	0	0
TwinMnts	0	0	0	0	0	0	0	0

Hunt County DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Hunt County	631	610	326	399	350	–	–	–

Kaufman County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	0	0	0	0	0	0	0	0
Paluxy	0	0	0	0	0	0	0	0
GlenRose	0	0	0	0	0	0	0	0
Hensell	0	0	0	0	0	0	0	0
Hosston	0	0	0	0	0	0	0	0
Antlers	–	–	–	–	–	–	–	–
TravisPeak	0	0	0	0	0	0	0	0
TwinMnts	0	0	0	0	0	0	0	0

Kaufman County DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Kaufman County	242	311	305	427	372	349	345	–

Lamar County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	49	49	49	49	49	49	49	49
Paluxy	8	8	8	8	8	8	8	8
GlenRose	0	0	0	0	0	0	0	0
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	0	0	0	0	0	0	0	0
TravisPeak	0	0	0	0	0	0	0	0
TwinMnts	–	–	–	–	–	–	–	–

Lamar County DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Lamar County	42	100	107	–	125	–	–	132

Limestone County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	0	0	0	0	0	0	0	0
GlenRose	0	0	0	0	0	0	0	0
Hensell	0	0	0	0	0	0	0	0
Hosston	0	0	0	0	0	0	0	0
Antlers	–	–	–	–	–	–	–	–
TravisPeak	0	0	0	0	0	0	0	0
TwinMnts	–	–	–	–	–	–	–	–

Limestone County DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Limestone County	–	199	301	–	433	214	445	–

Mills County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	–	–	–	–	–	–	–	–
Paluxy	6	6	6	6	6	6	6	6
GlenRose	189	189	189	189	189	189	189	189
Hensell	607	607	607	607	607	607	607	607
Hosston	1,469	1,469	1,469	1,469	1,469	1,469	1,469	1,469
Antlers	–	–	–	–	–	–	–	–
TravisPeak	2,277	2,277	2,277	2,277	2,277	2,277	2,277	2,277
TwinMnts	–	–	–	–	–	–	–	–

Mills County DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Mills County	–	1	1	–	9	2	13	–

Navarro County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	5	5	5	5	5	5	5	5
Paluxy	0	0	0	0	0	0	0	0
GlenRose	0	0	0	0	0	0	0	0
Hensell	0	0	0	0	0	0	0	0
Hosston	0	0	0	0	0	0	0	0
Antlers	–	–	–	–	–	–	–	–
TravisPeak	0	0	0	0	0	0	0	0
TwinMnts	–	–	–	–	–	–	–	–

Navarro County DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Navarro County	110	139	266	–	343	295	343	–

Red River County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	2	2	2	2	2	2	2	2
Paluxy	177	177	177	177	177	177	177	177
GlenRose	0	0	0	0	0	0	0	0
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	0	0	0	0	0	0	0	0
TravisPeak	0	0	0	0	0	0	0	0
TwinMnts	–	–	–	–	–	–	–	–

Red River County DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Red River County	2	24	40	–	57	–	–	15

Rockwall County MAG Results (AFY)

Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Woodbine	0	0	0	0	0	0	0	0
Paluxy	0	0	0	0	0	0	0	0
GlenRose	0	0	0	0	0	0	0	0
Hensell	–	–	–	–	–	–	–	–
Hosston	–	–	–	–	–	–	–	–
Antlers	–	–	–	–	–	–	–	–
TravisPeak	–	–	–	–	–	–	–	–
TwinMnts	0	0	0	0	0	0	0	0

Rockwall County DFC Results

Name	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Rockwall County	275	433	343	466	–	–	–	–

GMA 8 – RUN 11 WATER BUDGETS

Values in the table are for the various water budget components obtained for the indicated decadal year in acre-feet per year (AFY). The water budget components and the obtained positive & negative values are explained below

- **Storage** – (+) positive values indicate water being added to the aquifer storage, (-) negative values indicate water leaving the aquifer storage
- **Pumping** – (-) negative value indicates water being pumped out through wells
- **SW (Surface Water) and GW (Ground Water) interactions** – (+) positive value indicates volume of water entering the aquifer through loosing surface water bodies; (-) negative value indicates volume of water leaving the aquifer and discharging into surface water bodies including springs, lakes, streams and rivers
- **Recharge** - (+) positive value only and indicates water entering the aquifer via recharge
- **Vertical Leakage Upper**- (+) positive value indicates water entering the layer from overlying formation; (-) negative value indicates water leaving the aquifer to overlying formation
- **Vertical Leakage Lower** – (+) positive value indicates water entering the aquifer from underlying formation; (-) negative value indicates water leaving the aquifer to underlying formation
- **Lateral Flow** – (+) positive value indicates water entering the aquifer from outside the county boundaries; (-) negative value indicates water leaving the aquifer to outside the county boundaries

Bell County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	42	44	45	46	47	47	48	49
Recharge	7	7	7	7	7	7	7	5
Vertical Leakage Upper	−3,742	−3,311	−3,091	−2,931	−2,814	−2,721	−2,649	−2,562
Vertical Leakage Lower	3,639	3,204	2,982	2,820	2,701	2,609	2,535	2,448
Lateral Flow	12	12	12	12	12	11	11	11
Net from other zones	−91	−95	−97	−99	−101	−101	−103	−103
Mass Balance	0	0	0	0	0	0	0	0

Bell County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−14,047	−13,105	−12,243	−11,399	−11,066	−10,851	−10,691	−10,194
Recharge	14,278	14,278	14,278	14,278	14,278	14,278	14,278	9,182
Vertical Leakage Upper	10,176	8,728	7,226	5,700	5,153	4,815	4,569	8,759
Vertical Leakage Lower	3,627	3,192	2,970	2,808	2,689	2,597	2,523	2,436
Lateral Flow	13	12	12	12	12	12	12	11
Net from other zones	13,816	11,932	10,208	8,520	7,854	7,424	7,104	11,206
Mass Balance	0	0	0	0	0	0	0	0

Bell County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	10	15	14	9	6	5	4	6
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−95	−99	−102	−103	−103	−103	−103	−101
Recharge	299	299	299	299	299	299	299	187
Vertical Leakage Upper	705	1,855	2,475	2,855	3,080	3,223	3,316	3,479
Vertical Leakage Lower	−834	−1,981	−2,594	−2,967	−3,189	−3,330	−3,422	−3,479
Lateral Flow	10	10	10	10	10	9	9	9
Net from other zones	−119	−116	−109	−102	−99	−98	−97	9
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Bell County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−33	34	36	22	14	10	7	6
Pumping	−275	−275	−275	−275	−275	−275	−275	−275
SW and GW Interactions	−7,812	−7,434	−7,217	−7,029	−6,865	−6,721	−6,596	−6,190
Recharge	6,619	6,619	6,619	6,619	6,619	6,619	6,619	3,871
Vertical Leakage Upper	9,838	10,229	10,408	10,406	10,300	10,153	9,996	11,988
Vertical Leakage Lower	−1,399	−2,551	−3,039	−3,313	−3,474	−3,577	−3,645	−3,687
Lateral Flow	874	812	685	599	546	512	490	477
Net from other zones	9,313	8,490	8,054	7,692	7,372	7,088	6,841	8,778
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Bell County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	279	50	44	25	15	10	7	6
Pumping	−1,101	−1,101	−1,101	−1,101	−1,101	−1,101	−1,101	−1,101
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1,341	2,551	3,039	3,313	3,475	3,577	3,645	3,687
Vertical Leakage Lower	−693	−1,678	−2,131	−2,384	−2,538	−2,638	−2,704	−2,747
Lateral Flow	174	178	149	147	149	152	153	155
Net from other zones	822	1,051	1,057	1,076	1,086	1,091	1,094	1,095
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Bell County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	272	172	141	86	54	35	23	17
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	693	1,678	2,131	2,384	2,537	2,638	2,704	2,746
Vertical Leakage Lower	−922	−1,853	−2,215	−2,395	−2,506	−2,581	−2,631	−2,664
Lateral Flow	−43	3	−57	−75	−85	−92	−96	−99
Net from other zones	−272	−172	−141	−86	−54	−35	−23	−17
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Bell County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	4,354	613	465	284	184	122	83	59
Pumping	−7,900	−7,900	−7,900	−7,900	−7,900	−7,900	−7,900	−7,900
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	876	1,853	2,215	2,395	2,506	2,581	2,631	2,664
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	2,670	5,434	5,220	5,221	5,210	5,197	5,186	5,177
Net from other zones	3,546	7,287	7,435	7,616	7,716	7,778	7,817	7,841
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Bosque County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−1,528	−1,074	−819	−641	−522	−435	−367	−282
Vertical Leakage Lower	1,505	1,052	797	619	501	414	346	261
Lateral Flow	23	22	22	22	21	21	21	21
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Bosque County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−24,343	−22,319	−21,759	−21,424	−21,186	−20,998	−20,843	−19,926
Recharge	27,487	27,487	27,487	27,487	27,487	27,487	27,487	15,825
Vertical Leakage Upper	19,694	16,099	15,234	14,741	14,384	14,095	13,853	23,766
Vertical Leakage Lower	1,482	1,029	774	597	479	392	324	239
Lateral Flow	23	23	23	23	22	22	22	22
Net from other zones	21,199	17,151	16,031	15,361	14,885	14,509	14,199	24,027
Mass Balance	0	0	0	0	0	0	0	0

Bosque County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	18	5	6	4	2	2	1	3
Pumping	−357	−357	−357	−357	−357	−357	−357	−357
SW and GW Interactions	−7,031	−6,402	−6,229	−6,115	−6,032	−5,969	−5,919	−5,585
Recharge	3,683	3,683	3,683	3,683	3,683	3,683	3,683	2,061
Vertical Leakage Upper	15,433	15,154	15,396	15,542	15,581	15,580	15,563	16,568
Vertical Leakage Lower	−4,895	−5,878	−6,459	−6,822	−7,019	−7,140	−7,219	−7,270
Lateral Flow	180	197	189	180	174	170	167	165
Net from other zones	10,718	9,473	9,126	8,900	8,736	8,610	8,511	9,463
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Bosque County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	133	40	46	25	15	10	7	7
Pumping	−729	−729	−729	−729	−729	−729	−729	−729
SW and GW Interactions	−8,697	−7,614	−7,175	−6,850	−6,605	−6,408	−6,246	−5,700
Recharge	4,827	4,827	4,827	4,827	4,827	4,827	4,827	2,602
Vertical Leakage Upper	17,462	16,279	15,982	15,694	15,403	15,129	14,884	16,069
Vertical Leakage Lower	−4,622	−5,634	−6,189	−6,489	−6,647	−6,741	−6,802	−6,842
Lateral Flow	323	445	413	372	341	320	305	293
Net from other zones	13,163	11,090	10,206	9,577	9,097	8,708	8,387	9,520
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Bosque County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	743	149	146	73	43	28	19	16
Pumping	−3,837	−3,837	−3,837	−3,837	−3,837	−3,837	−3,837	−3,837
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	4,622	5,634	6,189	6,489	6,646	6,740	6,802	6,842
Vertical Leakage Lower	−2,877	−3,656	−4,289	−4,540	−4,667	−4,744	−4,794	−4,827
Lateral Flow	1,349	1,710	1,791	1,815	1,815	1,813	1,810	1,806
Net from other zones	3,094	3,688	3,691	3,764	3,794	3,809	3,818	3,821
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Bosque County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	404	131	110	52	30	19	13	10
Pumping	−81	−81	−81	−81	−81	−81	−81	−81
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2,878	3,656	4,288	4,540	4,667	4,744	4,793	4,827
Vertical Leakage Lower	−3,054	−3,552	−4,086	−4,249	−4,335	−4,389	−4,424	−4,449
Lateral Flow	−147	−154	−231	−262	−281	−293	−301	−307
Net from other zones	−323	−50	−29	29	51	62	68	71
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Bosque County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1,132	373	255	122	71	45	31	23
Pumping	−3,765	−3,765	−3,765	−3,765	−3,765	−3,765	−3,765	−3,765
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	3,054	3,553	4,086	4,249	4,335	4,389	4,424	4,449
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−421	−161	−576	−606	−641	−669	−690	−707
Net from other zones	2,633	3,392	3,510	3,643	3,694	3,720	3,734	3,742
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Brown County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2,081	2,079	2,074	2,070	2,067	2,064	2,061	2,057
Vertical Leakage Lower	−2,070	−2,069	−2,064	−2,060	−2,057	−2,054	−2,051	−2,048
Lateral Flow	−11	−10	−10	−10	−10	−10	−10	−9
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Brown County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2,070	2,069	2,064	2,060	2,057	2,054	2,052	2,048
Vertical Leakage Lower	−2,059	−2,059	−2,054	−2,050	−2,047	−2,044	−2,042	−2,039
Lateral Flow	−11	−10	−10	−10	−10	−10	−10	−9
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Brown County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2,578	2,569	2,561	2,554	2,550	2,547	2,544	2,536
Vertical Leakage Lower	−2,558	−2,549	−2,541	−2,535	−2,531	−2,528	−2,525	−2,517
Lateral Flow	−20	−20	−20	−19	−19	−19	−19	−19
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Brown County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	22	22	22	22	22	22	22	12
Vertical Leakage Upper	2,536	2,527	2,519	2,514	2,510	2,505	2,502	2,505
Vertical Leakage Lower	−2,544	−2,536	−2,528	−2,523	−2,519	−2,515	−2,512	−2,505
Lateral Flow	−14	−13	−13	−13	−13	−12	−12	−12
Net from other zones	−22	−22	−22	−22	−22	−22	−22	−12
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Brown County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	−4	−4	−4	−4	−4	−4	−4	−4
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	400	400	400	400	400	400	400	224
Vertical Leakage Upper	2,144	2,136	2,127	2,123	2,118	2,115	2,112	2,280
Vertical Leakage Lower	−2,432	−2,424	−2,415	−2,410	−2,405	−2,401	−2,398	−2,390
Lateral Flow	−108	−108	−108	−109	−109	−110	−110	−110
Net from other zones	−396	−396	−396	−396	−396	−396	−396	−220
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Brown County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	−34	−34	−34	−34	−34	−34	−34	−34
SW and GW Interactions	−249	−245	−241	−238	−234	−231	−228	−221
Recharge	712	712	712	712	712	712	712	406
Vertical Leakage Upper	2,219	2,202	2,186	2,174	2,162	2,152	2,142	2,427
Vertical Leakage Lower	−2,267	−2,256	−2,247	−2,241	−2,237	−2,233	−2,229	−2,222
Lateral Flow	−132	−134	−135	−135	−135	−135	−135	−135
Net from other zones	−180	−188	−196	−202	−210	−216	−222	70
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Brown County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1	0	0	0	0	0	0	1
Pumping	−1,424	−1,424	−1,424	−1,424	−1,424	−1,424	−1,424	−1,424
SW and GW Interactions	−3,241	−3,173	−3,122	−3,077	−3,037	−3,001	−2,967	−2,906
Recharge	4,196	4,196	4,196	4,196	4,196	4,196	4,196	2,380
Vertical Leakage Upper	4,553	4,406	4,295	4,199	4,115	4,039	3,967	5,653
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−844	−832	−823	−817	−813	−809	−805	−798
Net from other zones	3,709	3,574	3,472	3,382	3,302	3,230	3,162	4,855
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Burnet County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	3,146	3,880	4,233	4,484	4,668	4,803	4,902	4,989
Vertical Leakage Lower	−3,171	−3,905	−4,257	−4,508	−4,691	−4,826	−4,925	−5,012
Lateral Flow	25	25	24	24	23	23	23	23
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Burnet County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	3,171	3,904	4,257	4,507	4,691	4,826	4,925	5,012
Vertical Leakage Lower	−3,196	−3,929	−4,281	−4,531	−4,714	−4,849	−4,948	−5,035
Lateral Flow	25	25	24	24	23	23	23	23
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Burnet County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	10,756	11,619	12,005	12,276	12,472	12,612	12,712	12,767
Vertical Leakage Lower	−10,732	−11,595	−11,980	−12,251	−12,447	−12,587	−12,687	−12,742
Lateral Flow	−24	−24	−25	−25	−25	−25	−25	−25
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Burnet County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	−148	−148	−148	−148	−148	−148	−148	−148
SW and GW Interactions	−4,397	−3,969	−3,725	−3,530	−3,367	−3,223	−3,094	−2,701
Recharge	10,565	10,565	10,565	10,565	10,565	10,565	10,565	5,935
Vertical Leakage Upper	8,961	8,969	8,865	8,747	8,616	8,468	8,310	12,210
Vertical Leakage Lower	−9,743	−10,610	−10,997	−11,271	−11,468	−11,610	−11,711	−11,768
Lateral Flow	−841	−838	−835	−833	−831	−829	−828	−827
Net from other zones	−1,623	−2,479	−2,967	−3,357	−3,683	−3,971	−4,229	−385
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Burnet County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	134	2	2	1	1	1	1	2
Pumping	−2,666	−2,666	−2,666	−2,666	−2,666	−2,666	−2,666	−2,666
SW and GW Interactions	−1,963	−1,844	−1,788	−1,746	−1,713	−1,685	−1,662	−1,582
Recharge	1,909	1,909	1,909	1,909	1,909	1,909	1,909	1,079
Vertical Leakage Upper	11,759	12,388	12,663	12,854	12,985	13,071	13,126	13,853
Vertical Leakage Lower	−6,404	−7,132	−7,517	−7,790	−7,986	−8,127	−8,228	−8,286
Lateral Flow	−806	−813	−815	−816	−817	−818	−818	−818
Net from other zones	4,549	4,443	4,331	4,248	4,182	4,126	4,080	4,749
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Burnet County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	48	9	6	4	4	3	2	3
Pumping	−197	−197	−197	−197	−197	−197	−197	−197
SW and GW Interactions	−42	−41	−41	−40	−40	−40	−39	−38
Recharge	678	678	678	678	678	678	678	374
Vertical Leakage Upper	5,811	6,535	6,921	7,192	7,388	7,529	7,628	7,989
Vertical Leakage Lower	−6,034	−6,706	−7,082	−7,349	−7,542	−7,680	−7,779	−7,838
Lateral Flow	−222	−237	−244	−248	−251	−253	−254	−255
Net from other zones	−445	−408	−405	−405	−405	−404	−405	−104
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Burnet County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−9	26	18	13	10	8	6	7
Pumping	−890	−890	−890	−890	−890	−890	−890	−890
SW and GW Interactions	−1,519	−1,536	−1,550	−1,558	−1,561	−1,559	−1,554	−1,536
Recharge	3,768	3,768	3,768	3,768	3,768	3,768	3,768	2,046
Vertical Leakage Upper	5,303	6,011	6,415	6,698	6,896	7,030	7,119	8,864
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−5,134	−5,843	−6,211	−6,473	−6,662	−6,798	−6,895	−6,955
Net from other zones	169	168	204	225	234	232	224	1,909
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Callahan County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2,277	2,269	2,269	2,268	2,267	2,266	2,264	2,256
Vertical Leakage Lower	−2,261	−2,254	−2,254	−2,253	−2,252	−2,251	−2,249	−2,241
Lateral Flow	−16	−15	−15	−15	−15	−15	−15	−15
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Callahan County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2,262	2,254	2,254	2,253	2,252	2,250	2,249	2,241
Vertical Leakage Lower	−2,246	−2,239	−2,239	−2,238	−2,237	−2,235	−2,234	−2,226
Lateral Flow	−16	−15	−15	−15	−15	−15	−15	−15
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Callahan County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2,246	2,239	2,238	2,238	2,237	2,235	2,233	2,226
Vertical Leakage Lower	−2,230	−2,224	−2,223	−2,223	−2,222	−2,220	−2,218	−2,211
Lateral Flow	−16	−15	−15	−15	−15	−15	−15	−15
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Callahan County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2,231	2,223	2,223	2,222	2,221	2,220	2,218	2,211
Vertical Leakage Lower	−2,215	−2,208	−2,208	−2,207	−2,206	−2,205	−2,203	−2,196
Lateral Flow	−16	−15	−15	−15	−15	−15	−15	−15
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Callahan County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	−1	−1	−1	−1	−1	−1	−1	−1
SW and GW Interactions	−14	−14	−14	−14	−14	−13	−13	−13
Recharge	29	29	29	29	29	29	29	17
Vertical Leakage Upper	2,214	2,207	2,207	2,207	2,206	2,202	2,200	2,206
Vertical Leakage Lower	−2,199	−2,192	−2,192	−2,192	−2,191	−2,189	−2,187	−2,181
Lateral Flow	−15	−15	−15	−15	−15	−15	−15	−15
Net from other zones	0	0	0	0	0	−2	−2	10
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Callahan County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	−23	−23	−23	−23	−23	−23	−23	−23
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	52	52	52	52	52	52	52	30
Vertical Leakage Upper	2,147	2,140	2,140	2,140	2,139	2,138	2,136	2,151
Vertical Leakage Lower	−2,162	−2,156	−2,156	−2,156	−2,155	−2,154	−2,152	−2,146
Lateral Flow	−14	−13	−13	−13	−13	−13	−13	−12
Net from other zones	−29	−29	−29	−29	−29	−29	−29	−7
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Callahan County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	1
Pumping	−1,702	−1,702	−1,702	−1,702	−1,702	−1,702	−1,702	−1,702
SW and GW Interactions	−3,792	−3,730	−3,681	−3,637	−3,594	−3,555	−3,517	−3,451
Recharge	4,371	4,371	4,371	4,371	4,371	4,371	4,371	2,602
Vertical Leakage Upper	5,375	5,245	5,147	5,059	4,972	4,892	4,815	6,445
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−460	−454	−454	−454	−453	−451	−450	−444
Net from other zones	4,915	4,791	4,693	4,605	4,519	4,441	4,365	6,001
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Collin County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1,571	859	476	284	181	121	84	60
Pumping	−2,521	−2,521	−2,521	−2,521	−2,521	−2,521	−2,521	−2,521
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	97	180	220	237	246	252	254	257
Vertical Leakage Lower	25	51	59	62	63	63	63	62
Lateral Flow	828	1,431	1,766	1,938	2,031	2,085	2,120	2,142
Net from other zones	950	1,662	2,045	2,237	2,340	2,400	2,437	2,461
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Collin County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	103	208	183	139	101	73	53	38
Pumping	−97	−97	−97	−97	−97	−97	−97	−97
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−25	−52	−59	−63	−63	−63	−64	−63
Vertical Leakage Lower	−19	−44	−47	−46	−45	−44	−43	−43
Lateral Flow	38	−15	20	67	104	131	151	165
Net from other zones	−6	−111	−86	−42	−4	24	44	59
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Collin County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1,015	201	92	56	38	27	19	14
Pumping	−1,786	−1,786	−1,786	−1,786	−1,786	−1,786	−1,786	−1,786
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	19	44	47	46	44	44	43	43
Vertical Leakage Lower	21	61	61	59	57	55	54	53
Lateral Flow	731	1,480	1,586	1,625	1,647	1,660	1,670	1,676
Net from other zones	771	1,585	1,694	1,730	1,748	1,759	1,767	1,772
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Collin County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	29	424	300	199	137	98	71	52
Pumping	−10	−10	−10	−10	−10	−10	−10	−10
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−21	−61	−61	−59	−57	−55	−54	−54
Vertical Leakage Lower	−70	−166	−161	−155	−152	−152	−151	−151
Lateral Flow	72	−187	−68	25	82	119	144	163
Net from other zones	−19	−414	−290	−189	−127	−88	−61	−42
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Collin County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1,886	691	387	266	193	141	104	77
Pumping	−1,381	−1,381	−1,381	−1,381	−1,381	−1,381	−1,381	−1,381
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	70	165	161	155	152	152	151	151
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−575	525	833	960	1,036	1,088	1,126	1,153
Net from other zones	−505	690	994	1,115	1,188	1,240	1,277	1,304
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Comanche County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	9,235	9,482	9,622	9,742	9,852	9,957	10,195	10,361
Vertical Leakage Lower	−9,270	−9,514	−9,651	−9,768	−9,876	−9,978	−10,210	−10,371
Lateral Flow	35	32	29	26	24	21	15	10
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Comanche County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	9,270	9,514	9,651	9,769	9,875	9,978	10,210	10,371
Vertical Leakage Lower	−9,305	−9,546	−9,680	−9,795	−9,899	−9,999	−10,225	−10,381
Lateral Flow	35	32	29	26	24	21	15	10
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Comanche County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	1
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	10,337	10,566	10,690	10,799	10,898	10,994	11,216	11,361
Vertical Leakage Lower	−10,352	−10,578	−10,700	−10,806	−10,903	−10,996	−11,212	−11,354
Lateral Flow	15	12	10	7	5	2	−4	−8
Net from other zones	0	0	0	0	0	0	0	−1
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Comanche County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	−41	−41	−41	−41	−41	−41	−41	−41
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	743	743	743	743	743	743	743	417
Vertical Leakage Upper	9,609	9,835	9,957	10,063	10,160	10,253	10,469	10,937
Vertical Leakage Lower	−10,512	−10,736	−10,855	−10,959	−11,054	−11,145	−11,355	−11,493
Lateral Flow	201	199	196	194	192	190	184	180
Net from other zones	−702	−702	−702	−702	−702	−702	−702	−376
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Comanche County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	2	1	1	1	1	1	2	4
Pumping	−437	−437	−437	−437	−437	−437	−437	−437
SW and GW Interactions	−3,332	−3,211	−3,153	−3,108	−3,068	−3,029	−2,992	−2,899
Recharge	6,058	6,058	6,058	6,058	6,058	6,058	6,058	3,430
Vertical Leakage Upper	11,118	11,100	11,103	11,116	11,131	11,145	11,280	13,861
Vertical Leakage Lower	−11,111	−11,297	−11,405	−11,501	−11,590	−11,676	−11,878	−12,012
Lateral Flow	1,034	997	986	979	973	967	959	952
Net from other zones	1,041	800	684	594	514	436	361	2,801
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Comanche County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	2	1	1	1	1	1	2	4
Pumping	−427	−427	−427	−427	−427	−427	−427	−427
SW and GW Interactions	−4,462	−4,339	−4,287	−4,251	−4,222	−4,195	−4,173	−4,085
Recharge	2,316	2,316	2,316	2,316	2,316	2,316	2,316	1,325
Vertical Leakage Upper	17,718	17,658	17,662	17,687	17,718	17,750	17,907	18,857
Vertical Leakage Lower	−10,922	−11,076	−11,174	−11,262	−11,342	−11,419	−11,606	−11,725
Lateral Flow	237	206	196	187	178	169	154	136
Net from other zones	7,033	6,788	6,684	6,612	6,554	6,500	6,455	7,268
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Comanche County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	4	3	4	5	6	7	8	31
Pumping	−11,142	−11,142	−11,142	−11,142	−11,142	−11,142	−11,142	−11,142
SW and GW Interactions	−13,905	−13,316	−12,964	−12,618	−12,254	−11,870	−11,492	−10,779
Recharge	10,181	10,181	10,181	10,181	10,181	10,181	10,181	5,827
Vertical Leakage Upper	28,551	27,528	26,922	26,317	25,669	24,977	24,410	27,457
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	216	62	−37	−125	−206	−283	−473	−615
Net from other zones	28,767	27,590	26,885	26,192	25,463	24,694	23,937	26,842
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Cooke County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−12,078	−11,685	−11,388	−11,154	−10,969	−10,819	−10,694	−10,058
Recharge	12,802	12,802	12,802	12,802	12,802	12,802	12,802	8,651
Vertical Leakage Upper	7,228	7,793	7,674	7,453	7,241	7,054	6,889	9,884
Vertical Leakage Lower	4,045	2,694	2,220	1,973	1,815	1,703	1,618	1,503
Lateral Flow	81	81	80	80	80	79	79	78
Net from other zones	11,354	10,568	9,974	9,506	9,136	8,836	8,586	11,465
Mass Balance	0	0	0	0	0	0	0	0

Cooke County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−42,140	−41,561	−41,176	−40,912	−40,724	−40,573	−40,458	−38,012
Recharge	47,478	47,478	47,478	47,478	47,478	47,478	47,478	31,911
Vertical Leakage Upper	32,757	32,951	32,654	32,374	32,155	31,965	31,821	42,610
Vertical Leakage Lower	3,961	2,610	2,137	1,890	1,733	1,621	1,536	1,422
Lateral Flow	84	83	83	82	82	82	81	81
Net from other zones	36,802	35,644	34,874	34,346	33,970	33,668	33,438	44,113
Mass Balance	0	0	0	0	0	0	0	0

Cooke County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	512	346	201	111	66	42	28	27
Pumping	−1,091	−1,091	−1,091	−1,091	−1,091	−1,091	−1,091	−1,091
SW and GW Interactions	−15,197	−14,726	−14,362	−14,091	−13,878	−13,704	−13,556	−12,787
Recharge	16,439	16,439	16,439	16,439	16,439	16,439	16,439	10,942
Vertical Leakage Upper	21,003	22,785	23,146	23,137	23,006	22,837	22,658	26,665
Vertical Leakage Lower	−5,404	−7,761	−8,608	−9,007	−9,233	−9,374	−9,467	−9,508
Lateral Flow	−1,065	−1,266	−1,363	−1,407	−1,431	−1,445	−1,455	−1,461
Net from other zones	14,534	13,758	13,175	12,723	12,342	12,018	11,736	15,696
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Cooke County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	480	583	326	191	120	80	55	48
Pumping	−743	−743	−743	−743	−743	−743	−743	−743
SW and GW Interactions	−10,560	−10,043	−9,690	−9,443	−9,258	−9,115	−8,999	−8,268
Recharge	8,960	8,960	8,960	8,960	8,960	8,960	8,960	6,043
Vertical Leakage Upper	17,564	18,888	19,029	18,934	18,789	18,643	18,505	20,002
Vertical Leakage Lower	−4,508	−6,896	−7,403	−7,598	−7,702	−7,768	−7,813	−7,832
Lateral Flow	−633	−706	−789	−858	−908	−942	−966	−982
Net from other zones	12,423	11,286	10,837	10,478	10,179	9,933	9,726	11,188
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Cooke County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	818	196	90	50	32	21	15	15
Pumping	−2,474	−2,474	−2,474	−2,474	−2,474	−2,474	−2,474	−2,474
SW and GW Interactions	−1,903	−1,727	−1,589	−1,490	−1,415	−1,357	−1,313	−1,092
Recharge	2,618	2,618	2,618	2,618	2,618	2,618	2,618	1,808
Vertical Leakage Upper	5,695	7,732	7,962	7,960	7,913	7,865	7,821	8,208
Vertical Leakage Lower	−1,607	−2,823	−3,163	−3,292	−3,361	−3,406	−3,437	−3,453
Lateral Flow	−1,244	−1,795	−1,855	−1,882	−1,898	−1,910	−1,917	−1,920
Net from other zones	2,844	3,114	2,944	2,786	2,654	2,549	2,467	2,835
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Cooke County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	638	458	183	98	61	42	30	24
Pumping	−364	−364	−364	−364	−364	−364	−364	−364
SW and GW Interactions	−2,280	−2,124	−2,027	−1,957	−1,905	−1,865	−1,833	−1,753
Recharge	524	524	524	524	524	524	524	360
Vertical Leakage Upper	5,644	6,547	6,693	6,682	6,647	6,612	6,578	6,599
Vertical Leakage Lower	−2,139	−3,578	−3,684	−3,727	−3,754	−3,774	−3,788	−3,796
Lateral Flow	257	661	702	701	696	690	686	683
Net from other zones	3,762	3,630	3,711	3,656	3,589	3,528	3,476	3,486
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Cooke County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	2,423	270	105	57	36	25	18	14
Pumping	−5,850	−5,850	−5,850	−5,850	−5,850	−5,850	−5,850	−5,850
SW and GW Interactions	−2,146	−2,107	−2,076	−2,053	−2,034	−2,021	−2,011	−1,918
Recharge	1,272	1,272	1,272	1,272	1,272	1,272	1,272	887
Vertical Leakage Upper	5,159	6,520	6,564	6,561	6,551	6,544	6,539	6,746
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	1,288	2,002	2,061	2,066	2,059	2,051	2,043	2,039
Net from other zones	6,447	8,522	8,625	8,627	8,610	8,595	8,582	8,785
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Coryell County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−7,935	−7,142	−6,667	−6,375	−6,177	−6,022	−5,897	−5,733
Vertical Leakage Lower	7,891	7,099	6,625	6,333	6,135	5,981	5,856	5,693
Lateral Flow	44	43	42	42	42	41	41	40
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Coryell County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−9,864	−9,349	−9,161	−9,040	−8,949	−8,875	−8,813	−8,358
Recharge	13,685	13,685	13,685	13,685	13,685	13,685	13,685	8,652
Vertical Leakage Upper	−1,847	−2,085	−1,988	−1,938	−1,921	−1,917	−1,914	2,371
Vertical Leakage Lower	7,846	7,055	6,582	6,290	6,092	5,940	5,814	5,652
Lateral Flow	44	43	43	43	42	42	41	41
Net from other zones	6,043	5,013	4,637	4,395	4,213	4,065	3,941	8,064
Mass Balance	0	0	0	0	0	0	0	0

Coryell County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−9	3	3	2	1	1	1	1
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−727	−679	−651	−632	−620	−611	−605	−567
Recharge	666	666	666	666	666	666	666	439
Vertical Leakage Upper	5,596	6,906	7,716	8,115	8,317	8,435	8,511	8,717
Vertical Leakage Lower	−4,578	−5,995	−6,858	−7,292	−7,516	−7,651	−7,738	−7,793
Lateral Flow	−221	−222	−225	−227	−228	−229	−230	−230
Net from other zones	797	689	633	596	573	555	543	694
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Coryell County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−2	11	11	6	4	3	2	4
Pumping	−120	−120	−120	−120	−120	−120	−120	−120
SW and GW Interactions	−24,370	−22,861	−22,098	−21,540	−21,110	−20,762	−20,465	−19,288
Recharge	19,196	19,196	19,196	19,196	19,196	19,196	19,196	11,956
Vertical Leakage Upper	34,122	32,521	31,858	31,176	30,539	29,979	29,473	34,413
Vertical Leakage Lower	−3,895	−5,231	−5,960	−6,301	−6,472	−6,574	−6,639	−6,679
Lateral Flow	−561	−655	−789	−877	−927	−960	−982	−998
Net from other zones	29,666	26,635	25,109	23,998	23,140	22,445	21,852	26,736
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Coryell County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	422	82	73	34	20	13	9	9
Pumping	−2,197	−2,197	−2,197	−2,197	−2,197	−2,197	−2,197	−2,197
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	3,779	5,144	5,889	6,238	6,414	6,519	6,586	6,626
Vertical Leakage Lower	−1,863	−2,659	−3,237	−3,474	−3,594	−3,666	−3,712	−3,741
Lateral Flow	−141	−370	−528	−601	−643	−669	−686	−697
Net from other zones	1,775	2,115	2,124	2,163	2,177	2,184	2,188	2,188
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Coryell County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	189	70	53	24	14	9	6	5
Pumping	−14	−14	−14	−14	−14	−14	−14	−14
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1,851	2,659	3,237	3,474	3,594	3,665	3,712	3,741
Vertical Leakage Lower	−1,931	−2,585	−3,090	−3,283	−3,384	−3,445	−3,485	−3,511
Lateral Flow	−95	−130	−186	−201	−210	−215	−219	−221
Net from other zones	−175	−56	−39	−10	0	5	8	9
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Coryell County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	505	191	136	62	36	23	16	12
Pumping	−2,163	−2,163	−2,163	−2,163	−2,163	−2,163	−2,163	−2,163
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1,901	2,585	3,090	3,283	3,384	3,446	3,485	3,511
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−243	−613	−1,063	−1,182	−1,257	−1,306	−1,338	−1,360
Net from other zones	1,658	1,972	2,027	2,101	2,127	2,140	2,147	2,151
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Dallas County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−773	−662	−613	−579	−551	−528	−509	−374
Recharge	392	392	392	392	392	392	392	200
Vertical Leakage Upper	1,154	932	834	766	710	664	626	548
Vertical Leakage Lower	NA	NA	NA	NA	NA	NA	NA	NA
Lateral Flow	NA	NA	NA	NA	NA	NA	NA	NA
Net from other zones	1,154	932	834	766	710	664	626	548
Mass Balance	0	0	0	0	0	0	0	0

Dallas County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	459	448	321	226	161	115	84	61
Pumping	−359	−359	−359	−359	−359	−359	−359	−359
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	224	296	338	362	376	386	391	395
Vertical Leakage Lower	38	52	54	54	54	53	53	53
Lateral Flow	−362	−437	−354	−283	−232	−195	−169	−150
Net from other zones	−100	−89	38	133	198	244	275	298
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Dallas County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	47	117	105	81	60	43	31	23
Pumping	−131	−131	−131	−131	−131	−131	−131	−131
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−38	−52	−55	−55	−55	−54	−53	−53
Vertical Leakage Lower	−2	−20	−25	−26	−26	−26	−26	−26
Lateral Flow	124	86	106	131	152	168	179	187
Net from other zones	84	14	26	50	71	88	100	108
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Dallas County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	153	190	110	71	48	34	24	18
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2	20	25	26	27	26	26	25
Vertical Leakage Lower	−42	−38	−44	−50	−54	−57	−59	−60
Lateral Flow	−113	−172	−91	−47	−21	−3	9	17
Net from other zones	−153	−190	−110	−71	−48	−34	−24	−18
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Dallas County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	203	437	310	209	143	100	71	52
Pumping	−1	−1	−1	−1	−1	−1	−1	−1
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	42	37	43	49	54	57	60	60
Vertical Leakage Lower	−300	−413	−397	−384	−377	−374	−373	−372
Lateral Flow	56	−60	45	127	181	218	243	261
Net from other zones	−202	−436	−309	−208	−142	−99	−70	−51
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Dallas County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1,566	617	372	264	191	139	102	75
Pumping	−3,200	−3,200	−3,200	−3,200	−3,200	−3,200	−3,200	−3,200
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	300	413	397	383	377	374	372	372
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	1,334	2,170	2,431	2,553	2,632	2,687	2,726	2,753
Net from other zones	1,634	2,583	2,828	2,936	3,009	3,061	3,098	3,125
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Delta County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	50	15	12	9	7	5	4	3
Pumping	−56	−56	−56	−56	−56	−56	−56	−56
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	2	1	2	2	2	2	2
Vertical Leakage Lower	1	2	2	2	2	2	2	2
Lateral Flow	5	37	41	43	45	47	48	49
Net from other zones	6	41	44	47	49	51	52	53
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Delta County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	6	12	13	11	9	7	5	4
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	−2	−2	−2	−2	−2	−1	−2
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−6	−10	−11	−9	−7	−5	−4	−2
Net from other zones	−6	−12	−13	−11	−9	−7	−5	−4
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Delta County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	2	4	4	3	2	2	1	1
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	0	0	0	0	−1	0	0
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−2	−4	−4	−3	−2	−1	−1	−1
Net from other zones	−2	−4	−4	−3	−2	−2	−1	−1
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Delta County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	7	15	15	12	10	7	6	4
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	0	0	0	0	0	0	0
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−7	−15	−15	−12	−10	−7	−6	−4
Net from other zones	−7	−15	−15	−12	−10	−7	−6	−4
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Delta County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	10	21	20	16	13	10	7	6
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	0	0	1	0	0	1	0
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−10	−21	−20	−17	−13	−10	−8	−6
Net from other zones	−10	−21	−20	−16	−13	−10	−7	−6
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Denton County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−14,159	−13,391	−12,844	−12,404	−12,042	−11,739	−11,484	−10,583
Recharge	18,721	18,721	18,721	18,721	18,721	18,721	18,721	10,594
Vertical Leakage Upper	9,461	7,953	6,875	6,004	5,286	4,685	4,179	10,509
Vertical Leakage Lower	134	106	90	81	75	70	66	61
Lateral Flow	2	2	2	2	2	2	2	2
Net from other zones	9,597	8,061	6,967	6,087	5,363	4,757	4,247	10,572
Mass Balance	0	0	0	0	0	0	0	0

Denton County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−44,469	−42,684	−41,855	−41,309	−40,918	−40,618	−40,383	−37,403
Recharge	41,220	41,220	41,220	41,220	41,220	41,220	41,220	23,255
Vertical Leakage Upper	47,584	44,041	42,399	41,316	40,542	39,947	39,480	51,491
Vertical Leakage Lower	131	104	88	79	72	67	64	58
Lateral Flow	3	3	3	3	2	2	2	2
Net from other zones	47,718	44,148	42,490	41,398	40,616	40,016	39,546	51,551
Mass Balance	0	0	0	0	0	0	0	0

Denton County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	4,082	1,216	551	295	177	115	80	67
Pumping	−10,522	−10,522	−10,522	−10,522	−10,522	−10,522	−10,522	−10,522
SW and GW Interactions	−2,680	−2,057	−1,751	−1,559	−1,426	−1,325	−1,246	−781
Recharge	2,050	2,050	2,050	2,050	2,050	2,050	2,050	1,214
Vertical Leakage Upper	6,686	7,391	7,533	7,513	7,451	7,377	7,304	7,272
Vertical Leakage Lower	−162	−286	−440	−533	−592	−632	−659	−678
Lateral Flow	3,226	4,265	4,330	4,315	4,288	4,262	4,239	4,209
Net from other zones	9,750	11,370	11,423	11,295	11,147	11,007	10,884	10,803
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Denton County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1,135	986	541	318	201	135	94	71
Pumping	−1,726	−1,726	−1,726	−1,726	−1,726	−1,726	−1,726	−1,726
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	162	286	440	533	592	631	659	677
Vertical Leakage Lower	−1,423	−2,292	−2,341	−2,344	−2,345	−2,347	−2,350	−2,352
Lateral Flow	1,852	2,746	3,086	3,219	3,278	3,307	3,323	3,330
Net from other zones	591	740	1,185	1,408	1,525	1,591	1,632	1,655
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Denton County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	2,527	404	178	100	63	43	30	23
Pumping	−7,187	−7,187	−7,187	−7,187	−7,187	−7,187	−7,187	−7,187
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1,423	2,292	2,341	2,343	2,345	2,347	2,350	2,353
Vertical Leakage Lower	−209	−410	−553	−617	−656	−683	−702	−716
Lateral Flow	3,446	4,901	5,221	5,361	5,435	5,480	5,509	5,527
Net from other zones	4,660	6,783	7,009	7,087	7,124	7,144	7,157	7,164
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Denton County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1,177	732	333	189	122	84	60	44
Pumping	−1,098	−1,098	−1,098	−1,098	−1,098	−1,098	−1,098	−1,098
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	210	409	552	616	655	683	702	716
Vertical Leakage Lower	−1,574	−2,376	−2,396	−2,404	−2,415	−2,427	−2,436	−2,444
Lateral Flow	1,285	2,333	2,609	2,697	2,736	2,758	2,772	2,782
Net from other zones	−79	366	765	909	976	1,014	1,038	1,054
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Denton County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	4,225	661	275	162	109	77	56	42
Pumping	−9,552	−9,552	−9,552	−9,552	−9,552	−9,552	−9,552	−9,552
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1,574	2,377	2,396	2,405	2,416	2,427	2,436	2,444
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	3,753	6,514	6,881	6,985	7,027	7,048	7,060	7,066
Net from other zones	5,327	8,891	9,277	9,390	9,443	9,475	9,496	9,510
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Eastland County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	6,321	6,292	6,280	6,272	6,265	6,260	6,252	6,233
Vertical Leakage Lower	−6,308	−6,279	−6,268	−6,260	−6,253	−6,248	−6,241	−6,222
Lateral Flow	−13	−13	−12	−12	−12	−12	−11	−11
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Eastland County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	6,307	6,279	6,268	6,260	6,253	6,248	6,240	6,222
Vertical Leakage Lower	−6,294	−6,266	−6,256	−6,248	−6,241	−6,236	−6,229	−6,211
Lateral Flow	−13	−13	−12	−12	−12	−12	−11	−11
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Eastland County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	6,322	6,293	6,282	6,275	6,267	6,262	6,256	6,237
Vertical Leakage Lower	−6,308	−6,280	−6,269	−6,262	−6,255	−6,250	−6,244	−6,226
Lateral Flow	−14	−13	−13	−13	−12	−12	−12	−11
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Eastland County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	6,308	6,279	6,269	6,262	6,255	6,250	6,244	6,225
Vertical Leakage Lower	−6,294	−6,266	−6,256	−6,249	−6,243	−6,238	−6,232	−6,214
Lateral Flow	−14	−13	−13	−13	−12	−12	−12	−11
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Eastland County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	1
Pumping	−125	−125	−125	−125	−125	−125	−125	−125
SW and GW Interactions	−374	−349	−334	−320	−308	−299	−293	−285
Recharge	794	794	794	794	794	794	794	450
Vertical Leakage Upper	6,248	6,171	6,130	6,095	6,065	6,042	6,024	6,333
Vertical Leakage Lower	−5,906	−5,886	−5,877	−5,871	−5,864	−5,859	−5,853	−5,836
Lateral Flow	−263	−256	−254	−253	−254	−254	−254	−253
Net from other zones	79	29	−1	−29	−53	−71	−83	244
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Eastland County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	1	1	1	1
Pumping	−266	−266	−266	−266	−266	−266	−266	−266
SW and GW Interactions	−69	−66	−64	−61	−59	−57	−54	−50
Recharge	308	308	308	308	308	308	308	176
Vertical Leakage Upper	5,736	5,710	5,698	5,685	5,674	5,664	5,653	5,761
Vertical Leakage Lower	−5,560	−5,545	−5,538	−5,531	−5,525	−5,519	−5,513	−5,497
Lateral Flow	−80	−75	−74	−74	−74	−74	−75	−75
Net from other zones	96	90	86	80	75	71	65	189
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Eastland County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	1	1	1	2	2	2	3
Pumping	−5,329	−5,329	−5,329	−5,329	−5,329	−5,329	−5,329	−5,329
SW and GW Interactions	−6,783	−6,532	−6,378	−6,249	−6,136	−6,034	−5,940	−5,766
Recharge	6,129	6,129	6,129	6,129	6,129	6,129	6,129	3,453
Vertical Leakage Upper	12,997	12,480	12,165	11,900	11,667	11,457	11,263	13,575
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−231	−217	−210	−203	−197	−191	−185	−170
Net from other zones	12,766	12,263	11,955	11,697	11,470	11,266	11,078	13,405
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Erath County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	21,402	22,347	22,425	22,394	22,332	22,258	22,080	21,990
Vertical Leakage Lower	−21,397	−22,341	−22,421	−22,394	−22,334	−22,262	−22,089	−22,001
Lateral Flow	−5	−6	−4	0	2	4	9	11
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Erath County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	28	28	28	28	28	28	28	14
Vertical Leakage Upper	21,369	22,314	22,394	22,366	22,306	22,235	22,061	21,988
Vertical Leakage Lower	−21,392	−22,336	−22,418	−22,394	−22,336	−22,267	−22,098	−22,013
Lateral Flow	−5	−6	−4	0	2	4	9	11
Net from other zones	−28	−28	−28	−28	−28	−28	−28	−14
Mass Balance	0	0	0	0	0	0	0	0

Erath County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1	1	1	1	1	1	1	2
Pumping	−61	−61	−61	−61	−61	−61	−61	−61
SW and GW Interactions	−587	−549	−533	−521	−512	−503	−495	−475
Recharge	1,876	1,876	1,876	1,876	1,876	1,876	1,876	968
Vertical Leakage Upper	25,873	26,624	26,604	26,512	26,405	26,289	26,078	26,789
Vertical Leakage Lower	−26,402	−27,230	−27,245	−27,181	−27,094	−26,999	−26,809	−26,655
Lateral Flow	−113	−112	−109	−105	−103	−100	−95	−93
Net from other zones	−642	−718	−750	−774	−792	−810	−826	41
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Erath County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	2	1	1	1	1	1	1	2
Pumping	−1,078	−1,078	−1,078	−1,078	−1,078	−1,078	−1,078	−1,078
SW and GW Interactions	−2,269	−1,740	−1,501	−1,311	−1,143	−993	−855	−463
Recharge	8,342	8,342	8,342	8,342	8,342	8,342	8,342	4,415
Vertical Leakage Upper	22,598	22,368	21,905	21,461	21,037	20,642	20,177	23,165
Vertical Leakage Lower	−24,911	−25,742	−25,761	−25,701	−25,617	−25,524	−25,340	−25,189
Lateral Flow	−415	−411	−407	−403	−399	−397	−392	−389
Net from other zones	−2,728	−3,785	−4,263	−4,643	−4,979	−5,279	−5,555	−2,413
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Erath County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	165	21	19	17	16	15	15	26
Pumping	−7,371	−7,371	−7,371	−7,371	−7,371	−7,371	−7,371	−7,371
SW and GW Interactions	−3,150	−2,840	−2,616	−2,440	−2,286	−2,157	−2,044	−1,886
Recharge	12,299	12,299	12,299	12,299	12,299	12,299	12,299	6,765
Vertical Leakage Upper	18,911	19,124	18,694	18,283	17,890	17,540	17,128	22,196
Vertical Leakage Lower	−14,332	−15,016	−15,021	−14,962	−14,887	−14,808	−14,642	−14,521
Lateral Flow	−3,372	−3,377	−3,388	−3,386	−3,375	−3,361	−3,341	−3,323
Net from other zones	1,207	731	285	−65	−372	−629	−855	4,352
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Erath County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	137	9	9	8	7	8	8	12
Pumping	−870	−870	−870	−870	−870	−870	−870	−870
SW and GW Interactions	−962	−929	−907	−889	−876	−863	−852	−829
Recharge	1,283	1,283	1,283	1,283	1,283	1,283	1,283	720
Vertical Leakage Upper	14,974	15,592	15,552	15,456	15,356	15,251	15,064	15,459
Vertical Leakage Lower	−13,290	−13,848	−13,854	−13,799	−13,733	−13,665	−13,515	−13,416
Lateral Flow	−310	−308	−306	−300	−291	−281	−266	−247
Net from other zones	1,374	1,436	1,392	1,357	1,332	1,305	1,283	1,796
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Erath County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	442	19	18	14	13	14	13	20
Pumping	−11,237	−11,237	−11,237	−11,237	−11,237	−11,237	−11,237	−11,237
SW and GW Interactions	−6,772	−6,570	−6,451	−6,362	−6,287	−6,222	−6,164	−6,033
Recharge	2,816	2,816	2,816	2,816	2,816	2,816	2,816	1,575
Vertical Leakage Upper	24,017	24,172	23,940	23,708	23,491	23,293	23,027	23,908
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−2,494	−2,630	−2,635	−2,577	−2,509	−2,442	−2,291	−2,200
Net from other zones	21,523	21,542	21,305	21,131	20,982	20,851	20,736	21,708
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Falls County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	2	7	12	8	5	3	2	2
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	10	8	9	14	18	19	20	20
Vertical Leakage Lower	−12	−15	−21	−23	−24	−24	−24	−24
Lateral Flow	0	0	0	1	1	2	2	2
Net from other zones	−2	−7	−12	−8	−5	−3	−2	−2
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Falls County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−23	27	34	19	12	8	5	4
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	11	15	21	23	23	24	24	24
Vertical Leakage Lower	−22	−26	−28	−30	−31	−32	−32	−32
Lateral Flow	34	−16	−27	−12	−4	0	3	4
Net from other zones	23	−27	−34	−19	−12	−8	−5	−4
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Falls County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	29	8	11	6	4	2	2	1
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	22	27	29	31	31	32	31	32
Vertical Leakage Lower	6	0	−9	−14	−17	−19	−20	−21
Lateral Flow	−57	−35	−31	−23	−18	−15	−13	−12
Net from other zones	−29	−8	−11	−6	−4	−2	−2	−1
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Falls County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	68	87	112	67	39	24	15	10
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−5	−1	9	14	17	18	20	21
Vertical Leakage Lower	−38	−46	−59	−54	−51	−49	−48	−48
Lateral Flow	−25	−40	−62	−27	−5	7	13	17
Net from other zones	−68	−87	−112	−67	−39	−24	−15	−10
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Falls County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	687	781	306	163	99	64	42	29
Pumping	−1,435	−1,435	−1,435	−1,435	−1,435	−1,435	−1,435	−1,435
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	38	47	59	54	51	49	49	48
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	710	607	1,070	1,218	1,285	1,322	1,344	1,358
Net from other zones	748	654	1,129	1,272	1,336	1,371	1,393	1,406
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Fannin County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−20,851	−20,574	−20,277	−20,019	−19,792	−19,587	−19,407	−18,465
Recharge	28,920	28,920	28,920	28,920	28,920	28,920	28,920	24,081
Vertical Leakage Upper	12,782	12,228	11,634	11,118	10,664	10,254	9,894	12,849
Vertical Leakage Lower	NA	NA	NA	NA	NA	NA	NA	NA
Lateral Flow	NA	NA	NA	NA	NA	NA	NA	NA
Net from other zones	12,782	12,228	11,634	11,118	10,664	10,254	9,894	12,849
Mass Balance	0	0	0	0	0	0	0	0

Fannin County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−502	−486	−470	−453	−436	−418	−401	−370
Recharge	752	752	752	752	752	752	752	592
Vertical Leakage Upper	252	220	188	154	120	84	50	148
Vertical Leakage Lower	NA	NA	NA	NA	NA	NA	NA	NA
Lateral Flow	NA	NA	NA	NA	NA	NA	NA	NA
Net from other zones	252	220	188	154	120	84	50	148
Mass Balance	0	0	0	0	0	0	0	0

Fannin County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1,182	642	404	267	183	128	91	66
Pumping	−2,088	−2,088	−2,088	−2,088	−2,088	−2,088	−2,088	−2,088
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	29	60	79	92	98	103	106	108
Vertical Leakage Lower	1	14	20	20	19	17	16	15
Lateral Flow	876	1,372	1,585	1,709	1,788	1,840	1,875	1,899
Net from other zones	906	1,446	1,684	1,821	1,905	1,960	1,997	2,022
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Fannin County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	149	231	258	235	193	151	115	86
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−1	−13	−21	−21	−19	−17	−16	−14
Vertical Leakage Lower	−8	−19	−21	−20	−18	−16	−14	−13
Lateral Flow	−140	−199	−216	−194	−156	−118	−85	−59
Net from other zones	−149	−231	−258	−235	−193	−151	−115	−86
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Fannin County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	57	99	65	47	34	25	19	14
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	9	19	21	20	19	16	15	13
Vertical Leakage Lower	1	13	13	10	8	7	5	5
Lateral Flow	−67	−131	−99	−77	−61	−48	−39	−32
Net from other zones	−57	−99	−65	−47	−34	−25	−19	−14
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Fannin County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	79	231	208	157	117	87	65	48
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−1	−13	−13	−10	−8	−6	−6	−4
Vertical Leakage Lower	−19	−37	−41	−42	−42	−43	−43	−44
Lateral Flow	−59	−181	−154	−105	−67	−38	−16	0
Net from other zones	−79	−231	−208	−157	−117	−87	−65	−48
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Fannin County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	86	281	213	160	121	90	68	50
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	19	37	42	42	42	43	43	44
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−105	−318	−255	−202	−163	−133	−111	−94
Net from other zones	−86	−281	−213	−160	−121	−90	−68	−50
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Grayson County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−31,253	−30,536	−29,848	−29,265	−28,766	−28,338	−27,972	−26,543
Recharge	34,736	34,736	34,736	34,736	34,736	34,736	34,736	24,848
Vertical Leakage Upper	27,847	26,450	25,085	23,925	22,931	22,078	21,347	28,379
Vertical Leakage Lower	−77	−114	−125	−131	−135	−138	−139	−141
Lateral Flow	0	0	0	0	0	0	0	0
Net from other zones	27,770	26,336	24,960	23,794	22,796	21,940	21,208	28,238
Mass Balance	0	0	0	0	0	0	0	0

Grayson County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−16,467	−16,512	−16,563	−16,632	−16,707	−16,786	−16,862	−16,486
Recharge	23,655	23,655	23,655	23,655	23,655	23,655	23,655	18,489
Vertical Leakage Upper	9,356	9,483	9,596	9,740	9,894	10,055	10,209	14,624
Vertical Leakage Lower	−77	−114	−125	−131	−135	−138	−140	−141
Lateral Flow	0	0	0	0	0	0	0	0
Net from other zones	9,279	9,369	9,471	9,609	9,759	9,917	10,069	14,483
Mass Balance	0	0	0	0	0	0	0	0

Grayson County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1,509	763	409	233	141	91	61	44
Pumping	−4,109	−4,109	−4,109	−4,109	−4,109	−4,109	−4,109	−4,109
SW and GW Interactions	−1,834	−1,793	−1,750	−1,720	−1,703	−1,694	−1,688	−1,655
Recharge	639	639	639	639	639	639	639	487
Vertical Leakage Upper	4,515	4,969	5,172	5,283	5,353	5,401	5,434	5,548
Vertical Leakage Lower	−58	−63	−109	−151	−184	−209	−228	−241
Lateral Flow	1,172	1,387	1,498	1,545	1,566	1,575	1,579	1,581
Net from other zones	5,629	6,293	6,561	6,677	6,735	6,767	6,785	6,888
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Grayson County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	430	647	526	382	269	190	135	98
Pumping	−1,053	−1,053	−1,053	−1,053	−1,053	−1,053	−1,053	−1,053
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	59	63	110	151	184	209	228	241
Vertical Leakage Lower	−369	−636	−674	−673	−667	−662	−659	−657
Lateral Flow	933	979	1,091	1,193	1,267	1,316	1,349	1,371
Net from other zones	623	406	527	671	784	863	918	955
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Grayson County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	983	249	121	74	49	34	25	18
Pumping	−3,123	−3,123	−3,123	−3,123	−3,123	−3,123	−3,123	−3,123
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	369	636	675	673	668	663	660	657
Vertical Leakage Lower	30	28	−21	−44	−59	−69	−77	−82
Lateral Flow	1,741	2,210	2,348	2,420	2,465	2,495	2,515	2,530
Net from other zones	2,140	2,874	3,002	3,049	3,074	3,089	3,098	3,105
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Grayson County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	487	395	222	137	92	65	47	34
Pumping	−1,184	−1,184	−1,184	−1,184	−1,184	−1,184	−1,184	−1,184
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−31	−28	21	45	60	70	77	83
Vertical Leakage Lower	−275	−551	−576	−582	−588	−594	−599	−603
Lateral Flow	1,003	1,368	1,517	1,584	1,620	1,643	1,659	1,670
Net from other zones	697	789	962	1,047	1,092	1,119	1,137	1,150
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Grayson County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	717	370	183	115	80	57	42	31
Pumping	−1,247	−1,247	−1,247	−1,247	−1,247	−1,247	−1,247	−1,247
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	275	550	575	581	587	594	598	602
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	255	327	489	551	580	596	607	614
Net from other zones	530	877	1,064	1,132	1,167	1,190	1,205	1,216
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hamilton County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−3,148	−2,589	−2,357	−2,207	−2,112	−2,039	−1,977	−1,897
Vertical Leakage Lower	3,115	2,556	2,324	2,175	2,080	2,007	1,945	1,866
Lateral Flow	33	33	33	32	32	32	32	31
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Hamilton County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−502	−404	−363	−338	−316	−298	−283	−240
Recharge	3,210	3,210	3,210	3,210	3,210	3,210	3,210	1,813
Vertical Leakage Upper	−5,321	−4,958	−4,808	−4,710	−4,658	−4,621	−4,589	−3,199
Vertical Leakage Lower	3,080	2,522	2,290	2,142	2,047	1,974	1,912	1,834
Lateral Flow	35	34	34	34	33	33	33	32
Net from other zones	−2,206	−2,402	−2,484	−2,534	−2,578	−2,614	−2,644	−1,333
Mass Balance	0	0	0	0	0	0	0	0

Hamilton County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1	0	0	0	0	0	0	1
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−156	−155	−155	−154	−154	−154	−154	−152
Recharge	386	386	386	386	386	386	386	214
Vertical Leakage Upper	8,053	8,984	9,339	9,536	9,635	9,693	9,730	9,913
Vertical Leakage Lower	−8,087	−9,018	−9,373	−9,572	−9,671	−9,729	−9,766	−9,782
Lateral Flow	−41	−42	−42	−42	−42	−42	−42	−42
Net from other zones	−75	−76	−76	−78	−78	−78	−78	89
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hamilton County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	9	3	3	2	2	2	2	3
Pumping	−218	−218	−218	−218	−218	−218	−218	−218
SW and GW Interactions	−13,681	−12,637	−12,257	−11,992	−11,787	−11,617	−11,469	−10,559
Recharge	17,218	17,218	17,218	17,218	17,218	17,218	17,218	9,819
Vertical Leakage Upper	18,231	17,074	16,669	16,338	16,026	15,745	15,486	21,081
Vertical Leakage Lower	−6,940	−7,813	−8,140	−8,324	−8,415	−8,469	−8,504	−8,521
Lateral Flow	−938	−990	−1,018	−1,032	−1,039	−1,044	−1,046	−1,046
Net from other zones	10,353	8,271	7,511	6,982	6,572	6,232	5,936	11,514
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hamilton County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	171	17	16	9	6	4	4	6
Pumping	−1,672	−1,672	−1,672	−1,672	−1,672	−1,672	−1,672	−1,672
SW and GW Interactions	−4,332	−4,098	−4,006	−3,939	−3,887	−3,843	−3,806	−3,660
Recharge	1,081	1,081	1,081	1,081	1,081	1,081	1,081	633
Vertical Leakage Upper	14,523	14,929	15,072	15,121	15,108	15,074	15,034	15,208
Vertical Leakage Lower	−2,628	−3,101	−3,287	−3,391	−3,442	−3,471	−3,490	−3,501
Lateral Flow	−2,811	−3,058	−3,198	−3,270	−3,307	−3,330	−3,345	−3,354
Net from other zones	9,084	8,770	8,587	8,460	8,359	8,273	8,199	8,353
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hamilton County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	104	20	17	8	5	3	3	3
Pumping	−151	−151	−151	−151	−151	−151	−151	−151
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2,628	3,100	3,287	3,391	3,442	3,471	3,490	3,502
Vertical Leakage Lower	−2,352	−2,708	−2,874	−2,961	−3,004	−3,029	−3,046	−3,056
Lateral Flow	−229	−261	−279	−287	−292	−294	−296	−298
Net from other zones	47	131	134	143	146	148	148	148
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hamilton County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	161	34	30	14	8	6	4	5
Pumping	−383	−383	−383	−383	−383	−383	−383	−383
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2,352	2,708	2,874	2,961	3,004	3,028	3,045	3,055
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−2,130	−2,359	−2,521	−2,592	−2,629	−2,651	−2,666	−2,677
Net from other zones	222	349	353	369	375	377	379	378
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hill County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−329	−282	−264	−249	−239	−230	−224	−176
Recharge	715	715	715	715	715	715	715	393
Vertical Leakage Upper	−57	−151	−187	−217	−237	−255	−267	−41
Vertical Leakage Lower	NA	NA	NA	NA	NA	NA	NA	NA
Lateral Flow	NA	NA	NA	NA	NA	NA	NA	NA
Net from other zones	−57	−151	−187	−217	−237	−255	−267	−41
Mass Balance	0	0	0	0	0	0	0	0

Hill County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−17,562	−16,165	−15,751	−15,483	−15,289	−15,141	−15,026	−14,149
Recharge	14,112	14,112	14,112	14,112	14,112	14,112	14,112	7,788
Vertical Leakage Upper	21,012	18,218	17,390	16,854	16,466	16,170	15,940	20,510
Vertical Leakage Lower	NA	NA	NA	NA	NA	NA	NA	NA
Lateral Flow	NA	NA	NA	NA	NA	NA	NA	NA
Net from other zones	21,012	18,218	17,390	16,854	16,466	16,170	15,940	20,510
Mass Balance	0	0	0	0	0	0	0	0

Hill County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	2	3	27	27	22	17	12	10
Pumping	−352	−352	−352	−352	−352	−352	−352	−352
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1,046	1,035	1,108	1,185	1,238	1,276	1,304	1,322
Vertical Leakage Lower	−392	−503	−601	−672	−713	−739	−756	−768
Lateral Flow	−304	−183	−182	−188	−195	−202	−208	−212
Net from other zones	350	349	325	325	330	335	340	342
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hill County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	65	51	75	49	32	21	15	11
Pumping	−115	−115	−115	−115	−115	−115	−115	−115
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	392	503	601	671	712	739	756	767
Vertical Leakage Lower	−405	−537	−633	−685	−712	−728	−738	−744
Lateral Flow	63	98	72	80	83	83	82	81
Net from other zones	50	64	40	66	83	94	100	104
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hill County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	75	110	123	74	45	29	20	14
Pumping	−25	−25	−25	−25	−25	−25	−25	−25
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	405	537	633	685	712	728	738	745
Vertical Leakage Lower	−807	−1,123	−1,293	−1,370	−1,412	−1,438	−1,456	−1,467
Lateral Flow	352	501	562	636	680	706	723	733
Net from other zones	−50	−85	−98	−49	−20	−4	5	11
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hill County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	838	231	227	137	85	55	37	26
Pumping	−1,050	−1,050	−1,050	−1,050	−1,050	−1,050	−1,050	−1,050
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	807	1,124	1,294	1,369	1,412	1,439	1,456	1,467
Vertical Leakage Lower	−934	−862	−1,022	−1,028	−1,029	−1,031	−1,033	−1,035
Lateral Flow	339	557	551	572	582	587	590	592
Net from other zones	212	819	823	913	965	995	1,013	1,024
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hill County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	960	821	458	251	157	104	72	51
Pumping	−3,610	−3,610	−3,610	−3,610	−3,610	−3,610	−3,610	−3,610
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	933	862	1,022	1,029	1,029	1,031	1,033	1,035
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	1,717	1,927	2,130	2,330	2,424	2,475	2,505	2,524
Net from other zones	2,650	2,789	3,152	3,359	3,453	3,506	3,538	3,559
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hood County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	13,938	15,294	15,642	15,883	16,047	16,170	16,266	16,356
Vertical Leakage Lower	−13,938	−15,294	−15,642	−15,883	−16,046	−16,169	−16,265	−16,355
Lateral Flow	0	0	0	0	−1	−1	−1	−1
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Hood County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	13,938	15,294	15,641	15,882	16,047	16,169	16,265	16,355
Vertical Leakage Lower	−13,938	−15,294	−15,641	−15,882	−16,046	−16,168	−16,264	−16,354
Lateral Flow	0	0	0	0	−1	−1	−1	−1
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Hood County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	1
Pumping	−159	−159	−159	−159	−159	−159	−159	−159
SW and GW Interactions	−419	−389	−371	−354	−339	−325	−311	−288
Recharge	875	875	875	875	875	875	875	457
Vertical Leakage Upper	16,630	17,948	18,262	18,446	18,547	18,590	18,608	19,000
Vertical Leakage Lower	−16,525	−17,929	−18,284	−18,505	−18,637	−18,710	−18,757	−18,779
Lateral Flow	17	43	48	51	52	54	55	56
Net from other zones	122	62	26	−8	−38	−66	−94	277
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hood County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	8	2	2	2	2	2	2	3
Pumping	−914	−914	−914	−914	−914	−914	−914	−914
SW and GW Interactions	−4,403	−3,616	−3,208	−2,879	−2,598	−2,356	−2,150	−1,675
Recharge	5,751	5,751	5,751	5,751	5,751	5,751	5,751	3,108
Vertical Leakage Upper	19,579	19,410	18,949	18,511	18,081	17,671	17,305	19,021
Vertical Leakage Lower	−14,863	−16,243	−16,554	−16,749	−16,863	−16,932	−16,976	−16,996
Lateral Flow	−755	−774	−818	−843	−861	−866	−868	−872
Net from other zones	3,961	2,393	1,577	919	357	−127	−539	1,153
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hood County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	320	22	17	13	10	9	8	10
Pumping	−8,123	−8,123	−8,123	−8,123	−8,123	−8,123	−8,123	−8,123
SW and GW Interactions	−1,781	−1,135	−716	−381	−107	130	337	659
Recharge	3,127	3,127	3,127	3,127	3,127	3,127	3,127	1,711
Vertical Leakage Upper	15,299	15,386	14,859	14,385	13,950	13,545	13,174	13,967
Vertical Leakage Lower	−6,958	−8,001	−8,173	−8,277	−8,334	−8,369	−8,390	−8,399
Lateral Flow	−103	−141	−275	−363	−416	−449	−470	−484
Net from other zones	8,238	7,244	6,411	5,745	5,200	4,727	4,314	5,084
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hood County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	348	20	13	8	6	5	4	4
Pumping	−397	−397	−397	−397	−397	−397	−397	−397
SW and GW Interactions	−1,327	−1,194	−1,126	−1,074	−1,026	−985	−946	−867
Recharge	552	552	552	552	552	552	552	302
Vertical Leakage Upper	9,060	9,838	9,872	9,873	9,835	9,786	9,730	9,832
Vertical Leakage Lower	−6,815	−7,540	−7,682	−7,768	−7,816	−7,843	−7,861	−7,868
Lateral Flow	−94	−85	−106	−120	−128	−133	−136	−139
Net from other zones	2,151	2,213	2,084	1,985	1,891	1,810	1,733	1,825
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hood County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	638	22	15	10	7	6	5	6
Pumping	−7,244	−7,244	−7,244	−7,244	−7,244	−7,244	−7,244	−7,244
SW and GW Interactions	−2,966	−2,875	−2,796	−2,725	−2,659	−2,599	−2,540	−2,451
Recharge	2,639	2,639	2,639	2,639	2,639	2,639	2,639	1,455
Vertical Leakage Upper	10,108	10,650	10,635	10,579	10,494	10,402	10,301	11,314
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−209	−317	−453	−534	−578	−605	−621	−629
Net from other zones	9,899	10,333	10,182	10,045	9,916	9,797	9,680	10,685
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hunt County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	165	51	31	21	15	10	8	5
Pumping	−3	−3	−3	−3	−3	−3	−3	−3
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	3	5	7	7	7	8	7	8
Vertical Leakage Lower	1	3	3	3	3	3	3	3
Lateral Flow	−166	−56	−38	−28	−22	−18	−15	−13
Net from other zones	−162	−48	−28	−18	−12	−7	−5	−2
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hunt County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	10	26	26	22	17	13	10	7
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−1	−3	−3	−4	−4	−4	−4	−3
Vertical Leakage Lower	0	−1	−2	−1	−1	−1	−1	−1
Lateral Flow	−9	−22	−21	−17	−12	−8	−5	−3
Net from other zones	−10	−26	−26	−22	−17	−13	−10	−7
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hunt County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	4	8	5	4	3	2	2	1
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1	1	2	2	1	1	1	1
Vertical Leakage Lower	1	4	4	3	3	3	3	3
Lateral Flow	−6	−13	−11	−9	−7	−6	−6	−5
Net from other zones	−4	−8	−5	−4	−3	−2	−2	−1
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hunt County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	9	28	24	18	13	10	7	5
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−1	−3	−3	−3	−3	−3	−2	−2
Vertical Leakage Lower	−1	−3	−3	−3	−3	−3	−3	−3
Lateral Flow	−7	−22	−18	−12	−7	−4	−2	0
Net from other zones	−9	−28	−24	−18	−13	−10	−7	−5
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Hunt County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	20	54	39	29	22	16	12	9
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2	2	3	3	3	3	3	3
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−22	−56	−42	−32	−25	−19	−15	−12
Net from other zones	−20	−54	−39	−29	−22	−16	−12	−9
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Johnson County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−4,406	−3,809	−3,593	−3,439	−3,318	−3,213	−3,127	−2,881
Recharge	4,712	4,712	4,712	4,712	4,712	4,712	4,712	2,486
Vertical Leakage Upper	4,186	3,087	2,751	2,517	2,326	2,153	2,009	3,777
Vertical Leakage Lower	−90	−185	−281	−355	−406	−443	−471	−505
Lateral Flow	4	4	4	4	4	4	4	4
Net from other zones	4,100	2,906	2,474	2,166	1,924	1,714	1,542	3,276
Mass Balance	0	0	0	0	0	0	0	0

Johnson County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−15,389	−14,367	−13,859	−13,488	−13,179	−12,915	−12,686	−12,140
Recharge	17,485	17,485	17,485	17,485	17,485	17,485	17,485	9,022
Vertical Leakage Upper	13,383	11,434	10,514	9,846	9,279	8,788	8,358	15,763
Vertical Leakage Lower	−96	−191	−287	−361	−412	−449	−477	−511
Lateral Flow	6	6	6	6	6	6	6	6
Net from other zones	13,293	11,249	10,233	9,491	8,873	8,345	7,887	15,258
Mass Balance	0	0	0	0	0	0	0	0

Johnson County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−1,491	−29	35	33	26	20	15	14
Pumping	−2,442	−2,442	−2,442	−2,442	−2,442	−2,442	−2,442	−2,442
SW and GW Interactions	−204	−164	−152	−144	−138	−135	−131	−107
Recharge	600	600	600	600	600	600	600	312
Vertical Leakage Upper	5,048	4,346	4,438	4,544	4,609	4,660	4,692	4,943
Vertical Leakage Lower	−1,459	−1,723	−1,864	−1,966	−2,024	−2,066	−2,095	−2,101
Lateral Flow	152	−424	−463	−481	−493	−502	−508	−512
Net from other zones	3,741	2,199	2,111	2,097	2,092	2,092	2,089	2,330
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Johnson County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−81	36	39	29	21	15	11	11
Pumping	−1,633	−1,633	−1,633	−1,633	−1,633	−1,633	−1,633	−1,633
SW and GW Interactions	722	938	1,040	1,118	1,175	1,218	1,252	1,369
Recharge	439	439	439	439	439	439	439	230
Vertical Leakage Upper	−424	−593	−654	−709	−765	−809	−848	−867
Vertical Leakage Lower	−511	−689	−805	−873	−912	−935	−951	−960
Lateral Flow	766	564	534	511	500	487	478	481
Net from other zones	−169	−718	−925	−1,071	−1,177	−1,257	−1,321	−1,346
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Johnson County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−487	151	114	73	48	33	24	20
Pumping	−138	−138	−138	−138	−138	−138	−138	−138
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	510	690	805	874	911	935	951	960
Vertical Leakage Lower	−1,519	−2,085	−2,243	−2,336	−2,391	−2,427	−2,451	−2,467
Lateral Flow	1,634	1,382	1,462	1,527	1,570	1,597	1,614	1,625
Net from other zones	625	−13	24	65	90	105	114	118
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Johnson County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	447	189	127	80	52	36	25	19
Pumping	−124	−124	−124	−124	−124	−124	−124	−124
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1,519	2,085	2,244	2,336	2,392	2,427	2,451	2,467
Vertical Leakage Lower	−2,271	−2,500	−2,583	−2,618	−2,637	−2,649	−2,658	−2,664
Lateral Flow	429	350	336	326	317	310	306	302
Net from other zones	−323	−65	−3	44	72	88	99	105
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Johnson County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	642	235	165	101	66	45	32	24
Pumping	−4,489	−4,489	−4,489	−4,489	−4,489	−4,489	−4,489	−4,489
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2,271	2,500	2,582	2,618	2,636	2,649	2,658	2,664
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	1,576	1,754	1,742	1,770	1,787	1,795	1,799	1,801
Net from other zones	3,847	4,254	4,324	4,388	4,423	4,444	4,457	4,465
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Kaufman County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	2	15	18	15	12	9	7	5
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2	2	2	3	2	3	2	3
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−4	−17	−20	−18	−14	−12	−9	−8
Net from other zones	−2	−15	−18	−15	−12	−9	−7	−5
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Kaufman County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	3	12	13	11	8	6	5	3
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	0	0	−1	0	0	−1	0
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−3	−12	−13	−10	−8	−6	−4	−3
Net from other zones	−3	−12	−13	−11	−8	−6	−5	−3
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Kaufman County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	2	8	6	4	3	2	2	1
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	0	0	1	0	0	0	0
Vertical Leakage Lower	−1	−1	−1	−1	−1	−1	−1	−1
Lateral Flow	−1	−7	−5	−4	−2	−1	−1	0
Net from other zones	−2	−8	−6	−4	−3	−2	−2	−1
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Kaufman County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	3	14	14	11	8	6	4	3
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1	1	1	1	1	0	1	1
Vertical Leakage Lower	−3	−5	−4	−3	−3	−2	−2	−2
Lateral Flow	−1	−10	−11	−9	−6	−4	−3	−2
Net from other zones	−3	−14	−14	−11	−8	−6	−4	−3
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Kaufman County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	33	53	45	35	26	20	14	11
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	3	5	3	3	3	2	3	2
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−36	−58	−48	−38	−29	−22	−17	−13
Net from other zones	−33	−53	−45	−35	−26	−20	−14	−11
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lamar County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−18,104	−18,139	−18,058	−17,995	−17,948	−17,912	−17,883	−16,989
Recharge	19,300	19,300	19,300	19,300	19,300	19,300	19,300	16,438
Vertical Leakage Upper	16,908	16,978	16,816	16,690	16,596	16,524	16,466	17,540
Vertical Leakage Lower	NA	NA	NA	NA	NA	NA	NA	NA
Lateral Flow	NA	NA	NA	NA	NA	NA	NA	NA
Net from other zones	16,908	16,978	16,816	16,690	16,596	16,524	16,466	17,540
Mass Balance	0	0	0	0	0	0	0	0

Lamar County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−272	−281	−276	−272	−269	−266	−264	−184
Recharge	370	370	370	370	370	370	370	318
Vertical Leakage Upper	174	192	182	174	168	162	158	50
Vertical Leakage Lower	NA	NA	NA	NA	NA	NA	NA	NA
Lateral Flow	NA	NA	NA	NA	NA	NA	NA	NA
Net from other zones	174	192	182	174	168	162	158	50
Mass Balance	0	0	0	0	0	0	0	0

Lamar County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	46	152	133	109	86	66	50	38
Pumping	−8	−8	−8	−8	−8	−8	−8	−8
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−3	−1	2	5	6	7	7	8
Vertical Leakage Lower	1	2	2	1	0	−1	−1	−2
Lateral Flow	−36	−145	−129	−107	−84	−64	−48	−36
Net from other zones	−38	−144	−125	−101	−78	−58	−42	−30
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lamar County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	22	37	44	42	35	28	22	17
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−1	−1	−1	−2	0	1	1	1
Vertical Leakage Lower	2	1	1	2	2	3	3	4
Lateral Flow	−23	−37	−44	−42	−37	−32	−26	−22
Net from other zones	−22	−37	−44	−42	−35	−28	−22	−17
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lamar County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	10	28	27	23	18	14	11	8
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−2	−1	−1	−1	−2	−2	−3	−4
Vertical Leakage Lower	−9	−10	−12	−14	−15	−17	−18	−18
Lateral Flow	1	−17	−14	−8	−1	5	10	14
Net from other zones	−10	−28	−27	−23	−18	−14	−11	−8
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lamar County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	30	77	85	72	58	45	34	26
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	9	9	11	14	15	17	18	18
Vertical Leakage Lower	−15	−19	−23	−24	−26	−27	−28	−28
Lateral Flow	−24	−67	−73	−62	−47	−35	−24	−16
Net from other zones	−30	−77	−85	−72	−58	−45	−34	−26
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lamar County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	35	98	99	84	67	52	40	30
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	15	20	23	25	26	27	28	29
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−50	−118	−122	−109	−93	−79	−68	−59
Net from other zones	−35	−98	−99	−84	−67	−52	−40	−30
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lampasas County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−961	−728	−628	−567	−532	−507	−489	−464
Vertical Leakage Lower	909	677	577	516	481	456	438	414
Lateral Flow	52	51	51	51	51	51	51	50
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Lampasas County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−909	−677	−577	−517	−481	−457	−438	−414
Vertical Leakage Lower	857	626	526	466	430	406	387	364
Lateral Flow	52	51	51	51	51	51	51	50
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Lampasas County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2,035	2,282	2,386	2,447	2,480	2,501	2,516	2,520
Vertical Leakage Lower	−2,048	−2,296	−2,400	−2,461	−2,494	−2,515	−2,530	−2,534
Lateral Flow	13	14	14	14	14	14	14	14
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lampasas County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	−68	−68	−68	−68	−68	−68	−68	−68
SW and GW Interactions	−2,346	−2,271	−2,240	−2,217	−2,200	−2,187	−2,176	−2,091
Recharge	3,822	3,822	3,822	3,822	3,822	3,822	3,822	2,236
Vertical Leakage Upper	2,919	3,017	3,058	3,073	3,072	3,067	3,060	4,480
Vertical Leakage Lower	−1,852	−2,100	−2,204	−2,265	−2,298	−2,319	−2,334	−2,338
Lateral Flow	−129	−129	−128	−128	−128	−128	−128	−128
Net from other zones	938	788	726	680	646	620	598	2,014
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lampasas County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	3	1	1	0	0	0	0	1
Pumping	−713	−713	−713	−713	−713	−713	−713	−713
SW and GW Interactions	−11,903	−11,556	−11,401	−11,284	−11,190	−11,111	−11,043	−10,664
Recharge	6,203	6,203	6,203	6,203	6,203	6,203	6,203	3,598
Vertical Leakage Upper	19,455	19,008	18,803	18,630	18,476	18,338	18,217	20,068
Vertical Leakage Lower	−1,167	−1,391	−1,486	−1,541	−1,571	−1,589	−1,602	−1,606
Lateral Flow	25	4	−6	−11	−15	−17	−19	−20
Net from other zones	18,313	17,621	17,311	17,078	16,890	16,732	16,596	18,442
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lampasas County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	11	5	4	2	1	1	1	1
Pumping	−30	−30	−30	−30	−30	−30	−30	−30
SW and GW Interactions	−1,623	−1,594	−1,575	−1,560	−1,547	−1,537	−1,529	−1,510
Recharge	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,003
Vertical Leakage Upper	2,661	2,827	2,884	2,909	2,913	2,911	2,908	3,624
Vertical Leakage Lower	−1,187	−1,393	−1,482	−1,532	−1,560	−1,577	−1,589	−1,594
Lateral Flow	39	27	22	19	18	17	16	16
Net from other zones	1,513	1,461	1,424	1,396	1,371	1,351	1,335	2,046
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lampasas County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	24	9	7	4	2	2	1	2
Pumping	−857	−857	−857	−857	−857	−857	−857	−857
SW and GW Interactions	−3,391	−3,350	−3,318	−3,292	−3,269	−3,249	−3,231	−3,185
Recharge	3,512	3,512	3,512	3,512	3,512	3,512	3,512	1,955
Vertical Leakage Upper	4,457	4,581	4,606	4,604	4,586	4,563	4,539	6,009
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−354	−545	−632	−679	−705	−722	−733	−739
Net from other zones	4,103	4,036	3,974	3,925	3,881	3,841	3,806	5,270
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lee County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	0	0	0	0	0	0	0
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	0	0	0	0	0	0	0	0
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lee County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	0	0	0	0	0	0	0
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	0	0	0	0	0	0	0	0
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lee County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	0	0	0	0	0	0	0
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	0	0	0	0	0	0	0	0
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lee County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	0	0	0	0	0	0	0
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	0	0	0	0	0	0	0	0
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Lee County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	3	7	5	4	3	2	1	1
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	0	1	0	0	0	1	0
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−3	−7	−6	−4	−3	−2	−2	−1
Net from other zones	−3	−7	−5	−4	−3	−2	−1	−1
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Limestone County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	4	4	6	5	4	3	2	1
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−1	−3	−3	−3	−3	−2	−2	−1
Vertical Leakage Lower	−2	−2	−3	−3	−3	−3	−3	−3
Lateral Flow	−1	1	0	1	2	2	3	3
Net from other zones	−4	−4	−6	−5	−4	−3	−2	−1
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Limestone County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	8	11	15	9	5	4	2	2
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2	2	4	3	4	3	4	3
Vertical Leakage Lower	−2	−1	−1	−1	−1	−1	−1	−1
Lateral Flow	−8	−12	−18	−11	−8	−6	−5	−4
Net from other zones	−8	−11	−15	−9	−5	−4	−2	−2
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Limestone County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−8	4	7	4	2	2	1	1
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	3	0	1	2	1	0	1	0
Vertical Leakage Lower	1	0	−1	−2	−2	−2	−2	−2
Lateral Flow	4	−4	−7	−4	−1	0	0	1
Net from other zones	8	−4	−7	−4	−2	−2	−1	−1
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Limestone County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	18	18	31	20	12	7	5	3
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−1	1	1	1	2	3	2	2
Vertical Leakage Lower	−6	−6	−9	−7	−6	−5	−5	−4
Lateral Flow	−11	−13	−23	−14	−8	−5	−2	−1
Net from other zones	−18	−18	−31	−20	−12	−7	−5	−3
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Limestone County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	109	203	83	45	27	18	12	8
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	5	5	9	7	6	5	5	5
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−114	−208	−92	−52	−33	−23	−17	−13
Net from other zones	−109	−203	−83	−45	−27	−18	−12	−8
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

McLennan County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−23,410	−21,477	−20,721	−20,173	−19,767	−19,454	−19,206	−17,872
Recharge	16,581	16,581	16,581	16,581	16,581	16,581	16,581	10,325
Vertical Leakage Upper	30,239	26,373	24,861	23,765	22,953	22,327	21,831	25,419
Vertical Leakage Lower	NA	NA	NA	NA	NA	NA	NA	NA
Lateral Flow	NA	NA	NA	NA	NA	NA	NA	NA
Net from other zones	30,239	26,373	24,861	23,765	22,953	22,327	21,831	25,419
Mass Balance	0	0	0	0	0	0	0	0

McLennan County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−203	17	32	21	14	9	6	5
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	552	493	601	683	730	761	780	792
Vertical Leakage Lower	−492	−635	−765	−840	−882	−908	−925	−936
Lateral Flow	143	125	132	136	138	138	139	139
Net from other zones	203	−17	−32	−21	−14	−9	−6	−5
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

McLennan County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−187	63	87	48	29	19	13	9
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	493	634	765	840	882	907	924	936
Vertical Leakage Lower	−1,251	−1,556	−1,744	−1,810	−1,841	−1,859	−1,870	−1,877
Lateral Flow	945	859	892	922	930	933	933	932
Net from other zones	187	−63	−87	−48	−29	−19	−13	−9
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

McLennan County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	498	119	120	61	35	22	14	10
Pumping	−4,701	−4,701	−4,701	−4,701	−4,701	−4,701	−4,701	−4,701
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1,251	1,557	1,744	1,809	1,841	1,859	1,870	1,877
Vertical Leakage Lower	−159	−303	−779	−883	−936	−967	−986	−999
Lateral Flow	3,111	3,328	3,616	3,714	3,761	3,787	3,803	3,813
Net from other zones	4,203	4,582	4,581	4,640	4,666	4,679	4,687	4,691
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

McLennan County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	528	534	303	153	88	54	35	24
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	159	302	779	883	935	966	987	998
Vertical Leakage Lower	−1,348	−1,556	−2,106	−2,104	−2,106	−2,110	−2,115	−2,118
Lateral Flow	661	720	1,024	1,068	1,083	1,090	1,093	1,096
Net from other zones	−528	−534	−303	−153	−88	−54	−35	−24
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

McLennan County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	2,232	5,021	557	269	159	101	68	47
Pumping	−11,809	−15,948	−15,948	−15,948	−15,948	−15,948	−15,948	−15,948
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1,348	1,557	2,106	2,105	2,106	2,111	2,115	2,118
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	8,229	9,370	13,285	13,574	13,683	13,736	13,765	13,783
Net from other zones	9,577	10,927	15,391	15,679	15,789	15,847	15,880	15,901
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Milam County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1	3	3	3	2	1	1	1
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−2	−3	−3	−3	−2	−1	−1	−1
Vertical Leakage Lower	1	0	0	0	0	0	0	0
Lateral Flow	0	0	0	0	0	0	0	0
Net from other zones	−1	−3	−3	−3	−2	−1	−1	−1
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Milam County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1	11	10	7	5	3	2	2
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−1	0	1	0	0	0	0	−1
Vertical Leakage Lower	0	0	0	0	−1	−1	−1	−1
Lateral Flow	0	−11	−11	−7	−4	−2	−1	0
Net from other zones	−1	−11	−10	−7	−5	−3	−2	−2
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Milam County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1	2	2	2	1	1	1	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	0	0	0	1	0	1	2
Vertical Leakage Lower	−3	−4	−5	−7	−8	−8	−9	−9
Lateral Flow	2	2	3	5	6	7	7	7
Net from other zones	−1	−2	−2	−2	−1	−1	−1	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Milam County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	6	20	19	15	10	7	5	3
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2	4	6	6	8	8	9	10
Vertical Leakage Lower	−5	−11	−12	−11	−11	−10	−10	−10
Lateral Flow	−3	−13	−13	−10	−7	−5	−4	−3
Net from other zones	−6	−20	−19	−15	−10	−7	−5	−3
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Milam County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	494	259	232	156	104	70	47	33
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	5	11	11	11	10	10	10	9
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−499	−270	−243	−167	−114	−80	−57	−42
Net from other zones	−494	−259	−232	−156	−104	−70	−47	−33
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Mills County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−122	45	58	64	67	68	69	74
Vertical Leakage Lower	96	−70	−83	−89	−92	−93	−94	−99
Lateral Flow	26	25	25	25	25	25	25	25
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Mills County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	937	951	959	965	970	973	978	1,016
Recharge	1,171	1,171	1,171	1,171	1,171	1,171	1,171	671
Vertical Leakage Upper	−3,142	−3,003	−3,006	−3,012	−3,019	−3,023	−3,033	−2,604
Vertical Leakage Lower	71	−95	−108	−114	−117	−119	−119	−124
Lateral Flow	26	25	25	25	25	25	25	25
Net from other zones	−3,045	−3,073	−3,089	−3,101	−3,111	−3,117	−3,127	−2,703
Mass Balance	0	0	0	0	0	0	0	0

Mills County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	−84	−84	−84	−84	−84	−84	−84	−84
SW and GW Interactions	256	257	257	257	258	258	258	260
Recharge	86	86	86	86	86	86	86	49
Vertical Leakage Upper	4,368	4,571	4,574	4,574	4,570	4,567	4,564	4,587
Vertical Leakage Lower	−4,850	−5,055	−5,058	−5,059	−5,057	−5,054	−5,051	−5,041
Lateral Flow	−32	−32	−32	−31	−31	−31	−31	−31
Net from other zones	−514	−516	−516	−516	−518	−518	−518	−485
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Mills County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1	0	0	0	0	0	0	0
Pumping	−189	−189	−189	−189	−189	−189	−189	−189
SW and GW Interactions	−1,845	−1,805	−1,775	−1,752	−1,733	−1,717	−1,700	−1,667
Recharge	4,746	4,746	4,746	4,746	4,746	4,746	4,746	2,691
Vertical Leakage Upper	3,794	3,921	3,863	3,817	3,778	3,743	3,706	5,685
Vertical Leakage Lower	−4,360	−4,566	−4,569	−4,569	−4,568	−4,566	−4,563	−4,554
Lateral Flow	−302	−302	−301	−301	−301	−300	−300	−299
Net from other zones	−868	−947	−1,007	−1,053	−1,091	−1,123	−1,157	832
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Mills County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	21	1	1	1	1	1	1	2
Pumping	−607	−607	−607	−607	−607	−607	−607	−607
SW and GW Interactions	−1,672	−1,639	−1,614	−1,594	−1,577	−1,561	−1,547	−1,523
Recharge	3,721	3,721	3,721	3,721	3,721	3,721	3,721	2,071
Vertical Leakage Upper	3,983	4,123	4,076	4,036	4,000	3,966	3,936	5,530
Vertical Leakage Lower	−2,413	−2,606	−2,610	−2,612	−2,611	−2,610	−2,609	−2,603
Lateral Flow	−1,361	−1,354	−1,353	−1,351	−1,350	−1,349	−1,348	−1,347
Net from other zones	209	163	113	73	39	7	−21	1,580
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Mills County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	87	2	1	1	1	1	1	1
Pumping	−202	−202	−202	−202	−202	−202	−202	−202
SW and GW Interactions	−879	−854	−837	−822	−809	−798	−787	−772
Recharge	499	499	499	499	499	499	499	277
Vertical Leakage Upper	3,672	3,815	3,786	3,756	3,730	3,707	3,683	3,870
Vertical Leakage Lower	−2,096	−2,217	−2,221	−2,222	−2,222	−2,221	−2,220	−2,215
Lateral Flow	−202	−189	−189	−188	−188	−188	−187	−187
Net from other zones	1,374	1,409	1,376	1,346	1,320	1,298	1,276	1,468
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Mills County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	182	3	2	1	1	1	1	2
Pumping	−1,471	−1,471	−1,471	−1,471	−1,471	−1,471	−1,471	−1,471
SW and GW Interactions	−4,236	−4,190	−4,148	−4,108	−4,069	−4,033	−4,000	−3,945
Recharge	1,405	1,405	1,405	1,405	1,405	1,405	1,405	778
Vertical Leakage Upper	9,163	9,192	9,112	9,034	8,955	8,882	8,815	9,327
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−807	−749	−752	−753	−752	−751	−750	−746
Net from other zones	8,356	8,443	8,360	8,281	8,203	8,131	8,065	8,581
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Montague County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	6,450	8,301	8,595	8,727	8,805	8,858	8,897	8,929
Vertical Leakage Lower	−6,434	−8,285	−8,578	−8,710	−8,788	−8,841	−8,880	−8,912
Lateral Flow	−16	−16	−17	−17	−17	−17	−17	−17
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Montague County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	6,434	8,285	8,578	8,710	8,788	8,841	8,880	8,912
Vertical Leakage Lower	−6,418	−8,269	−8,561	−8,693	−8,771	−8,824	−8,863	−8,895
Lateral Flow	−16	−16	−17	−17	−17	−17	−17	−17
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Montague County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	−19	−19	−19	−19	−19	−19	−19	−19
SW and GW Interactions	−181	−177	−173	−169	−165	−161	−158	−150
Recharge	1,350	1,350	1,350	1,350	1,350	1,350	1,350	818
Vertical Leakage Upper	8,314	10,203	10,491	10,613	10,679	10,720	10,747	11,268
Vertical Leakage Lower	−9,098	−10,997	−11,294	−11,424	−11,499	−11,548	−11,582	−11,587
Lateral Flow	−185	−183	−182	−182	−181	−181	−180	−180
Net from other zones	−969	−977	−985	−993	−1,001	−1,009	−1,015	−499
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Montague County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	3	2	1	1	1	1	1	3
Pumping	−33	−33	−33	−33	−33	−33	−33	−33
SW and GW Interactions	−7,044	−6,687	−6,485	−6,335	−6,214	−6,114	−6,028	−5,453
Recharge	11,378	11,378	11,378	11,378	11,378	11,378	11,378	7,272
Vertical Leakage Upper	11,808	12,992	12,886	12,716	12,549	12,398	12,260	15,221
Vertical Leakage Lower	−8,668	−10,562	−10,856	−10,984	−11,058	−11,106	−11,139	−11,146
Lateral Flow	−400	−403	−406	−408	−409	−410	−411	−411
Net from other zones	2,740	2,027	1,624	1,324	1,082	882	710	3,664
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Montague County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	133	7	4	2	2	2	1	4
Pumping	−1,266	−1,266	−1,266	−1,266	−1,266	−1,266	−1,266	−1,266
SW and GW Interactions	−5,454	−5,037	−4,768	−4,571	−4,418	−4,293	−4,198	−3,932
Recharge	6,537	6,537	6,537	6,537	6,537	6,537	6,537	4,191
Vertical Leakage Upper	13,039	14,099	13,855	13,589	13,356	13,154	12,998	14,820
Vertical Leakage Lower	−6,406	−8,108	−8,360	−8,467	−8,527	−8,566	−8,593	−8,599
Lateral Flow	−1,129	−1,195	−1,234	−1,253	−1,266	−1,275	−1,281	−1,286
Net from other zones	5,504	4,796	4,261	3,869	3,563	3,313	3,124	4,935
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Montague County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	472	36	14	7	5	4	3	4
Pumping	−573	−573	−573	−573	−573	−573	−573	−573
SW and GW Interactions	−4,021	−3,274	−2,890	−2,637	−2,455	−2,329	−2,233	−2,040
Recharge	4,132	4,132	4,132	4,132	4,132	4,132	4,132	2,694
Vertical Leakage Upper	10,316	10,524	10,008	9,610	9,306	9,093	8,927	9,985
Vertical Leakage Lower	−5,011	−6,079	−6,194	−6,243	−6,270	−6,288	−6,300	−6,297
Lateral Flow	−1,294	−1,492	−1,607	−1,659	−1,690	−1,710	−1,723	−1,733
Net from other zones	4,011	2,953	2,207	1,708	1,346	1,095	904	1,955
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Montague County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	891	25	10	6	4	3	2	4
Pumping	−4,223	−4,223	−4,223	−4,223	−4,223	−4,223	−4,223	−4,223
SW and GW Interactions	−9,581	−9,335	−9,150	−9,001	−8,876	−8,771	−8,681	−8,305
Recharge	9,402	9,402	9,402	9,402	9,402	9,402	9,402	6,154
Vertical Leakage Upper	14,771	15,347	15,092	14,842	14,620	14,427	14,259	16,753
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−1,679	−1,881	−1,981	−2,025	−2,051	−2,067	−2,078	−2,078
Net from other zones	13,092	13,466	13,111	12,817	12,569	12,360	12,181	14,675
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Navarro County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	19	14	20	24	22	18	14	10
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−1	−2	−2	−4	−4	−4	−3	−2
Vertical Leakage Lower	−4	−4	−6	−7	−7	−7	−7	−7
Lateral Flow	−14	−8	−12	−13	−11	−7	−4	−1
Net from other zones	−19	−14	−20	−24	−22	−18	−14	−10
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Navarro County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	24	29	45	33	23	16	12	9
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	4	4	6	7	8	8	7	7
Vertical Leakage Lower	−2	−2	−3	−3	−4	−4	−4	−4
Lateral Flow	−26	−31	−48	−37	−27	−20	−15	−12
Net from other zones	−24	−29	−45	−33	−23	−16	−12	−9
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Navarro County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	11	9	14	10	7	5	3	2
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1	3	2	4	4	3	4	4
Vertical Leakage Lower	−9	−14	−16	−19	−21	−22	−23	−24
Lateral Flow	−3	2	0	5	10	14	16	18
Net from other zones	−11	−9	−14	−10	−7	−5	−3	−2
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Navarro County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	38	52	66	53	37	25	17	12
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	10	13	16	18	20	22	23	24
Vertical Leakage Lower	−19	−18	−21	−17	−14	−12	−11	−10
Lateral Flow	−29	−47	−61	−54	−43	−35	−29	−26
Net from other zones	−38	−52	−66	−53	−37	−25	−17	−12
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Navarro County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	142	186	224	154	107	75	53	39
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	19	18	21	18	14	12	12	10
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−161	−204	−245	−172	−121	−87	−65	−49
Net from other zones	−142	−186	−224	−154	−107	−75	−53	−39
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Parker County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	12,869	13,671	14,375	14,800	15,149	15,430	15,646	15,851
Vertical Leakage Lower	−12,882	−13,683	−14,385	−14,809	−15,156	−15,436	−15,651	−15,854
Lateral Flow	13	12	10	9	7	6	5	3
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Parker County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−40	−38	−36	−34	−32	−30	−28	−24
Recharge	551	551	551	551	551	551	551	275
Vertical Leakage Upper	12,411	13,208	13,906	14,326	14,669	14,945	15,156	15,627
Vertical Leakage Lower	−12,895	−13,695	−14,395	−14,818	−15,163	−15,442	−15,656	−15,857
Lateral Flow	13	12	10	9	7	6	5	3
Net from other zones	−471	−475	−479	−483	−487	−491	−495	−227
Mass Balance	0	0	0	0	0	0	0	0

Parker County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−16	4	4	4	4	4	4	8
Pumping	−3,190	−3,190	−3,190	−3,190	−3,190	−3,190	−3,190	−3,190
SW and GW Interactions	−6,771	−6,294	−5,969	−5,685	−5,443	−5,220	−5,011	−4,533
Recharge	10,973	10,973	10,973	10,973	10,973	10,973	10,973	5,605
Vertical Leakage Upper	26,245	25,975	25,888	25,629	25,336	25,014	24,675	29,091
Vertical Leakage Lower	−18,875	−19,624	−20,176	−20,476	−20,660	−20,779	−20,855	−20,860
Lateral Flow	−1,595	−1,550	−1,561	−1,570	−1,577	−1,582	−1,585	−1,588
Net from other zones	5,775	4,801	4,151	3,583	3,099	2,653	2,235	6,643
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Parker County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	62	17	12	9	8	7	7	12
Pumping	−5,973	−5,973	−5,973	−5,973	−5,973	−5,973	−5,973	−5,973
SW and GW Interactions	−3,839	−2,521	−1,597	−951	−487	−126	187	941
Recharge	9,699	9,699	9,699	9,699	9,699	9,699	9,699	5,003
Vertical Leakage Upper	16,853	14,966	13,671	12,678	11,935	11,332	10,782	13,976
Vertical Leakage Lower	−11,831	−12,464	−12,942	−13,195	−13,350	−13,448	−13,510	−13,511
Lateral Flow	−1,132	−1,203	−1,273	−1,316	−1,345	−1,365	−1,379	−1,389
Net from other zones	3,890	1,299	−544	−1,833	−2,760	−3,481	−4,107	−924
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Parker County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−17	37	22	15	12	10	9	15
Pumping	−1,075	−1,075	−1,075	−1,075	−1,075	−1,075	−1,075	−1,075
SW and GW Interactions	−1,440	−1,352	−1,288	−1,237	−1,193	−1,156	−1,124	−1,067
Recharge	2,504	2,504	2,504	2,504	2,504	2,504	2,504	1,290
Vertical Leakage Upper	12,208	12,665	13,014	13,165	13,231	13,256	13,254	14,354
Vertical Leakage Lower	−8,352	−8,849	−9,189	−9,365	−9,472	−9,540	−9,583	−9,585
Lateral Flow	−2,388	−2,578	−2,700	−2,770	−2,814	−2,843	−2,861	−2,865
Net from other zones	1,468	1,238	1,125	1,030	945	873	810	1,904
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Parker County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−138	53	27	18	13	10	9	14
Pumping	−348	−348	−348	−348	−348	−348	−348	−348
SW and GW Interactions	−1,765	−1,559	−1,474	−1,415	−1,370	−1,332	−1,299	−1,178
Recharge	1,499	1,499	1,499	1,499	1,499	1,499	1,499	782
Vertical Leakage Upper	10,382	10,468	10,638	10,696	10,713	10,705	10,682	11,159
Vertical Leakage Lower	−6,815	−7,275	−7,503	−7,624	−7,698	−7,745	−7,775	−7,778
Lateral Flow	−1,050	−1,279	−1,365	−1,411	−1,439	−1,457	−1,469	−1,473
Net from other zones	2,517	1,914	1,770	1,661	1,576	1,503	1,438	1,908
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Parker County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−135	53	27	17	12	10	8	14
Pumping	−3,866	−3,866	−3,866	−3,866	−3,866	−3,866	−3,866	−3,866
SW and GW Interactions	−8,352	−8,157	−8,060	−7,982	−7,913	−7,851	−7,793	−7,541
Recharge	4,929	4,929	4,929	4,929	4,929	4,929	4,929	2,590
Vertical Leakage Upper	18,591	18,660	18,695	18,660	18,595	18,518	18,432	20,270
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−2,815	−3,462	−3,665	−3,776	−3,844	−3,889	−3,917	−3,926
Net from other zones	15,776	15,198	15,030	14,884	14,751	14,629	14,515	16,344
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Red River County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−18,592	−18,289	−18,127	−18,034	−17,978	−17,942	−17,917	−17,297
Recharge	19,886	19,886	19,886	19,886	19,886	19,886	19,886	17,154
Vertical Leakage Upper	17,298	16,692	16,368	16,182	16,070	15,998	15,948	17,440
Vertical Leakage Lower	NA	NA	NA	NA	NA	NA	NA	NA
Lateral Flow	NA	NA	NA	NA	NA	NA	NA	NA
Net from other zones	17,298	16,692	16,368	16,182	16,070	15,998	15,948	17,440
Mass Balance	0	0	0	0	0	0	0	0

Red River County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−5,752	−5,660	−5,626	−5,607	−5,596	−5,590	−5,585	−5,369
Recharge	3,687	3,687	3,687	3,687	3,687	3,687	3,687	3,257
Vertical Leakage Upper	7,817	7,633	7,565	7,527	7,505	7,493	7,483	7,481
Vertical Leakage Lower	NA	NA	NA	NA	NA	NA	NA	NA
Lateral Flow	NA	NA	NA	NA	NA	NA	NA	NA
Net from other zones	7,817	7,633	7,565	7,527	7,505	7,493	7,483	7,481
Mass Balance	0	0	0	0	0	0	0	0

Red River County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−18	11	26	29	26	22	18	15
Pumping	−177	−177	−177	−177	−177	−177	−177	−177
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−15	−16	−17	−16	−15	−15	−15	−15
Vertical Leakage Lower	−2	−3	−3	−4	−5	−5	−6	−6
Lateral Flow	212	185	171	168	171	175	180	183
Net from other zones	195	166	151	148	151	155	159	162
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Red River County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1	2	3	3	2	2	2	1
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1	3	3	4	6	5	5	7
Vertical Leakage Lower	0	−1	−1	−2	−3	−3	−3	−4
Lateral Flow	−2	−4	−5	−5	−5	−4	−4	−4
Net from other zones	−1	−2	−3	−3	−2	−2	−2	−1
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Red River County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	3	5	7	7	6	5	4	3
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	1	1	2	3	3	4	4
Vertical Leakage Lower	−15	−16	−18	−20	−22	−23	−25	−26
Lateral Flow	12	10	10	11	13	15	17	19
Net from other zones	−3	−5	−7	−7	−6	−5	−4	−3
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Red River County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	8	15	21	21	18	15	12	9
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	15	17	18	20	22	23	24	26
Vertical Leakage Lower	−7	−8	−9	−10	−10	−10	−10	−11
Lateral Flow	−16	−24	−30	−31	−30	−28	−26	−24
Net from other zones	−8	−15	−21	−21	−18	−15	−12	−9
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Red River County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	7	16	20	19	16	13	11	8
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	6	8	9	10	10	11	10	11
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−13	−24	−29	−29	−26	−24	−21	−19
Net from other zones	−7	−16	−20	−19	−16	−13	−11	−8
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Rockwall County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	2	19	17	12	9	6	4	3
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1	2	3	2	2	3	3	3
Vertical Leakage Lower	0	0	0	1	1	1	1	1
Lateral Flow	−3	−21	−20	−15	−12	−10	−8	−7
Net from other zones	−2	−19	−17	−12	−9	−6	−4	−3
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Rockwall County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1	7	7	6	4	3	2	2
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	0	0	0	0	0	0	0
Vertical Leakage Lower	0	0	−1	−1	−1	−1	−1	−1
Lateral Flow	−1	−7	−6	−5	−3	−2	−1	−1
Net from other zones	−1	−7	−7	−6	−4	−3	−2	−2
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Rockwall County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	3	7	4	3	2	2	1	1
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	1	1	1	1	0	1	0
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−3	−8	−5	−4	−3	−2	−2	−1
Net from other zones	−3	−7	−4	−3	−2	−2	−1	−1
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Rockwall County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	3	14	11	8	6	4	3	2
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	0	−1	1	0	0	0	0	1
Vertical Leakage Lower	−3	−5	−5	−4	−4	−4	−4	−4
Lateral Flow	0	−8	−7	−4	−2	0	1	1
Net from other zones	−3	−14	−11	−8	−6	−4	−3	−2
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Rockwall County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	31	33	22	17	12	9	7	5
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	3	5	5	4	4	4	3	4
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−34	−38	−27	−21	−16	−13	−10	−9
Net from other zones	−31	−33	−22	−17	−12	−9	−7	−5
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Somervell County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−1,083	−545	−277	−94	21	101	161	217
Vertical Leakage Lower	1,068	531	263	80	−35	−115	−175	−231
Lateral Flow	15	14	14	14	14	14	14	14
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Somervell County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	30	30	30	30	30	30	30	16
Vertical Leakage Upper	−1,098	−561	−293	−110	5	85	145	216
Vertical Leakage Lower	1,053	517	249	66	−49	−129	−189	−246
Lateral Flow	15	14	14	14	14	14	14	14
Net from other zones	−30	−30	−30	−30	−30	−30	−30	−16
Mass Balance	0	0	0	0	0	0	0	0

Somervell County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	−13	−13	−13	−13	−13	−13	−13	−13
SW and GW Interactions	−137	−124	−120	−116	−113	−110	−108	−100
Recharge	1,094	1,094	1,094	1,094	1,094	1,094	1,094	572
Vertical Leakage Upper	−53	436	703	882	989	1,059	1,111	1,659
Vertical Leakage Lower	−697	−1,229	−1,503	−1,689	−1,802	−1,878	−1,934	−1,976
Lateral Flow	−57	−40	−41	−42	−42	−42	−42	−42
Net from other zones	−807	−833	−841	−849	−855	−861	−865	−359
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Somervell County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1	1	1	1	1	0	0	1
Pumping	−146	−146	−146	−146	−146	−146	−146	−146
SW and GW Interactions	−8,835	−7,603	−7,105	−6,747	−6,479	−6,269	−6,097	−5,453
Recharge	4,563	4,563	4,563	4,563	4,563	4,563	4,563	2,442
Vertical Leakage Upper	13,804	11,872	11,150	10,619	10,197	9,854	9,566	10,440
Vertical Leakage Lower	−687	−1,206	−1,461	−1,632	−1,735	−1,804	−1,854	−1,891
Lateral Flow	135	122	103	89	78	71	65	60
Net from other zones	13,252	10,788	9,792	9,076	8,540	8,121	7,777	8,609
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Somervell County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−198	13	11	7	5	3	3	4
Pumping	−234	−234	−234	−234	−234	−234	−234	−234
SW and GW Interactions	−1,926	−1,678	−1,559	−1,474	−1,413	−1,365	−1,329	−1,243
Recharge	319	319	319	319	319	319	319	171
Vertical Leakage Upper	4,164	4,236	4,260	4,261	4,241	4,215	4,193	4,206
Vertical Leakage Lower	−1,081	−1,623	−1,756	−1,839	−1,886	−1,916	−1,937	−1,951
Lateral Flow	882	645	518	434	381	343	314	290
Net from other zones	3,965	3,258	3,022	2,856	2,736	2,642	2,570	2,545
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Somervell County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	199	13	10	5	3	2	2	2
Pumping	−642	−642	−642	−642	−642	−642	−642	−642
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1,081	1,623	1,756	1,839	1,886	1,916	1,937	1,951
Vertical Leakage Lower	−717	−1,056	−1,171	−1,241	−1,281	−1,307	−1,325	−1,338
Lateral Flow	79	62	47	39	34	31	28	27
Net from other zones	443	629	632	637	639	640	640	640
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Somervell County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	296	26	20	11	7	5	4	3
Pumping	−952	−952	−952	−952	−952	−952	−952	−952
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	717	1,056	1,172	1,242	1,282	1,307	1,325	1,338
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−61	−130	−240	−301	−337	−360	−377	−389
Net from other zones	656	926	932	941	945	947	948	949
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Tarrant County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−7,893	−7,399	−7,125	−6,928	−6,767	−6,632	−6,518	−6,007
Recharge	7,889	7,889	7,889	7,889	7,889	7,889	7,889	3,896
Vertical Leakage Upper	8,139	7,294	6,870	6,575	6,335	6,133	5,965	9,015
Vertical Leakage Lower	−257	−399	−522	−620	−701	−769	−828	−906
Lateral Flow	15	14	13	12	11	11	10	9
Net from other zones	7,897	6,909	6,361	5,967	5,645	5,375	5,147	8,118
Mass Balance	0	0	0	0	0	0	0	0

Tarrant County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−26,613	−25,359	−24,706	−24,227	−23,841	−23,513	−23,232	−21,644
Recharge	25,161	25,161	25,161	25,161	25,161	25,161	25,161	12,485
Vertical Leakage Upper	28,322	25,956	24,773	23,913	23,222	22,634	22,131	31,710
Vertical Leakage Lower	−272	−413	−535	−632	−712	−780	−838	−916
Lateral Flow	15	14	13	12	11	11	10	9
Net from other zones	28,065	25,557	24,251	23,293	22,521	21,865	21,303	30,803
Mass Balance	0	0	0	0	0	0	0	0

Tarrant County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	653	365	205	132	92	67	50	53
Pumping	−9,694	−9,694	−9,694	−9,694	−9,694	−9,694	−9,694	−9,694
SW and GW Interactions	−4,050	−3,623	−3,284	−2,983	−2,701	−2,443	−2,209	−1,823
Recharge	5,038	5,038	5,038	5,038	5,038	5,038	5,038	2,557
Vertical Leakage Upper	11,306	11,022	10,735	10,367	9,957	9,551	9,165	10,932
Vertical Leakage Lower	−262	−420	−543	−620	−671	−706	−732	−752
Lateral Flow	1,059	935	827	743	680	630	591	550
Net from other zones	12,103	11,537	11,019	10,490	9,966	9,475	9,024	10,730
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Tarrant County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	91	127	80	53	36	26	19	18
Pumping	−916	−916	−916	−916	−916	−916	−916	−916
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	262	420	543	621	672	707	732	752
Vertical Leakage Lower	−595	−945	−1,094	−1,165	−1,205	−1,231	−1,248	−1,261
Lateral Flow	1,158	1,314	1,387	1,407	1,413	1,414	1,413	1,407
Net from other zones	825	789	836	863	880	890	897	898
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Tarrant County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	382	317	167	102	68	47	34	29
Pumping	−628	−628	−628	−628	−628	−628	−628	−628
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	594	945	1,095	1,165	1,204	1,231	1,249	1,260
Vertical Leakage Lower	−1,732	−2,253	−2,441	−2,539	−2,601	−2,643	−2,673	−2,692
Lateral Flow	1,384	1,619	1,807	1,900	1,957	1,993	2,018	2,031
Net from other zones	246	311	461	526	560	581	594	599
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Tarrant County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	549	430	227	140	93	65	47	37
Pumping	−101	−101	−101	−101	−101	−101	−101	−101
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	1,732	2,253	2,441	2,539	2,602	2,643	2,672	2,693
Vertical Leakage Lower	−3,121	−3,749	−3,788	−3,801	−3,813	−3,823	−3,831	−3,838
Lateral Flow	941	1,167	1,221	1,223	1,219	1,216	1,213	1,209
Net from other zones	−448	−329	−126	−39	8	36	54	64
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Tarrant County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1,310	444	217	135	91	64	46	37
Pumping	−6,601	−6,601	−6,601	−6,601	−6,601	−6,601	−6,601	−6,601
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	3,121	3,749	3,788	3,801	3,812	3,822	3,831	3,837
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	2,170	2,408	2,596	2,665	2,698	2,715	2,724	2,727
Net from other zones	5,291	6,157	6,384	6,466	6,510	6,537	6,555	6,564
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Taylor County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	149	148	148	148	148	148	148	147
Vertical Leakage Lower	−145	−144	−144	−144	−144	−144	−144	−143
Lateral Flow	−4	−4	−4	−4	−4	−4	−4	−4
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Taylor County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	145	145	144	144	144	144	144	144
Vertical Leakage Lower	−141	−141	−140	−140	−140	−140	−140	−140
Lateral Flow	−4	−4	−4	−4	−4	−4	−4	−4
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Taylor County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	141	141	141	141	141	141	140	140
Vertical Leakage Lower	−137	−137	−137	−137	−137	−137	−136	−136
Lateral Flow	−4	−4	−4	−4	−4	−4	−4	−4
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Taylor County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	138	137	137	137	137	137	137	136
Vertical Leakage Lower	−134	−133	−133	−133	−133	−133	−133	−132
Lateral Flow	−4	−4	−4	−4	−4	−4	−4	−4
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Taylor County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	134	133	133	133	133	133	133	133
Vertical Leakage Lower	−130	−129	−129	−129	−129	−129	−129	−129
Lateral Flow	−4	−4	−4	−4	−4	−4	−4	−4
Net from other zones	0	0	0	0	0	0	0	0
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Taylor County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	−2	−2	−2	−2	−2	−2	−2	−2
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	9	9	9	9	9	9	9	5
Vertical Leakage Upper	121	121	121	121	121	121	121	124
Vertical Leakage Lower	−124	−124	−124	−124	−124	−124	−124	−123
Lateral Flow	−4	−4	−4	−4	−4	−4	−4	−4
Net from other zones	−7	−7	−7	−7	−7	−7	−7	−3
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Taylor County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	−12	−12	−12	−12	−12	−12	−12	−12
SW and GW Interactions	−335	−333	−332	−332	−331	−331	−330	−327
Recharge	660	660	660	660	660	660	660	408
Vertical Leakage Upper	135	130	128	128	126	126	124	370
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−113	−112	−112	−112	−112	−112	−112	−112
Net from other zones	22	18	16	16	14	14	12	258
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Travis County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−2	−2	−1	−1	−1	0	0	0
Recharge	2	2	2	2	2	2	2	1
Vertical Leakage Upper	64	647	940	1,151	1,300	1,400	1,469	1,540
Vertical Leakage Lower	−96	−679	−973	−1,183	−1,331	−1,432	−1,500	−1,568
Lateral Flow	34	34	33	32	31	30	29	27
Net from other zones	2	2	0	0	0	−2	−2	−1
Mass Balance	0	0	0	0	0	0	0	0

Travis County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−170	104	813	1,496	1,874	2,133	2,332	2,789
Recharge	2,130	2,130	2,130	2,130	2,130	2,130	2,130	1,119
Vertical Leakage Upper	−1,695	−1,659	−2,783	−3,939	−4,548	−4,964	−5,294	−5,129
Vertical Leakage Lower	−158	−739	−1,030	−1,237	−1,381	−1,480	−1,545	−1,608
Lateral Flow	63	60	57	54	51	48	45	40
Net from other zones	−1,790	−2,338	−3,756	−5,122	−5,878	−6,396	−6,794	−6,697
Mass Balance	0	0	0	0	0	0	0	0

Travis County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	75	15	9	6	4	3	2	4
Pumping	−13	−13	−13	−13	−13	−13	−13	−13
SW and GW Interactions	−8	−8	−8	−8	−9	−9	−9	−9
Recharge	18	18	18	18	18	18	18	10
Vertical Leakage Upper	1,925	2,506	2,772	2,965	3,104	3,195	3,253	3,287
Vertical Leakage Lower	−2,021	−2,554	−2,818	−3,007	−3,141	−3,230	−3,286	−3,314
Lateral Flow	32	44	48	47	46	45	44	44
Net from other zones	−64	−4	2	5	9	10	11	17
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Travis County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−9	25	22	17	12	9	6	7
Pumping	−100	−100	−100	−100	−100	−100	−100	−100
SW and GW Interactions	−2,594	−2,519	−2,475	−2,426	−2,384	−2,352	−2,318	−2,253
Recharge	3,687	3,687	3,687	3,687	3,687	3,687	3,687	1,917
Vertical Leakage Upper	3,522	3,905	4,081	4,172	4,222	4,246	4,236	5,902
Vertical Leakage Lower	−2,237	−2,796	−3,033	−3,196	−3,311	−3,387	−3,436	−3,461
Lateral Flow	325	317	293	272	258	249	243	241
Net from other zones	1,610	1,426	1,341	1,248	1,169	1,108	1,043	2,682
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Travis County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	144	4	5	4	4	3	3	3
Pumping	−2,300	−2,300	−2,300	−2,300	−2,300	−2,300	−2,300	−2,300
SW and GW Interactions	−804	−869	−931	−987	−1,039	−1,089	−1,136	−1,171
Recharge	1,021	1,021	1,021	1,021	1,021	1,021	1,021	530
Vertical Leakage Upper	2,808	3,499	3,862	4,139	4,358	4,537	4,681	5,269
Vertical Leakage Lower	−730	−1,150	−1,383	−1,542	−1,654	−1,729	−1,777	−1,803
Lateral Flow	665	664	657	652	649	646	644	643
Net from other zones	2,743	3,013	3,136	3,249	3,353	3,454	3,548	4,109
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Travis County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	86	77	76	72	66	57	49	41
Pumping	−189	−189	−189	−189	−189	−189	−189	−189
SW and GW Interactions	−77	−77	−73	−70	−65	−61	−55	−50
Recharge	200	200	200	200	200	200	200	105
Vertical Leakage Upper	684	1,104	1,329	1,483	1,584	1,651	1,687	1,798
Vertical Leakage Lower	−694	−1,104	−1,334	−1,488	−1,591	−1,657	−1,696	−1,714
Lateral Flow	67	66	64	62	60	60	59	59
Net from other zones	57	66	59	57	53	54	50	143
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Travis County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	1,514	839	643	503	370	264	187	138
Pumping	−4,200	−4,200	−4,200	−4,200	−4,200	−4,200	−4,200	−4,200
SW and GW Interactions	−99	−96	−90	−84	−77	−69	−63	−56
Recharge	149	149	149	149	149	149	149	77
Vertical Leakage Upper	744	1,148	1,365	1,507	1,597	1,647	1,673	1,750
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	1,991	2,256	2,223	2,209	2,238	2,278	2,317	2,347
Net from other zones	2,735	3,404	3,588	3,716	3,835	3,925	3,990	4,097
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Williamson County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	−1,302	−1,188	−1,140	−1,097	−1,059	−1,024	−992	−947
Vertical Leakage Lower	1,294	1,181	1,133	1,090	1,052	1,017	985	940
Lateral Flow	8	7	7	7	7	7	7	7
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Williamson County

Washita and Fredericksburg Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	−2,250	926	3,156	4,994	6,365	7,428	8,157	9,474
Recharge	11,620	11,620	11,620	11,620	11,620	11,620	11,620	6,480
Vertical Leakage Upper	−8,414	−14,652	−19,064	−22,698	−25,402	−27,493	−28,919	−26,368
Vertical Leakage Lower	1,286	1,173	1,125	1,083	1,045	1,010	978	933
Lateral Flow	8	7	7	7	7	7	7	7
Net from other zones	−7,120	−13,472	−17,932	−21,608	−24,350	−26,476	−27,934	−25,428
Mass Balance	0	0	0	0	0	0	0	0

Williamson County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	38	17	13	9	7	5	4	6
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	16	29	40	52	59	67	86
Recharge	181	181	181	181	181	181	181	97
Vertical Leakage Upper	3,929	4,246	4,399	4,511	4,580	4,634	4,664	4,733
Vertical Leakage Lower	−4,115	−4,431	−4,602	−4,733	−4,826	−4,892	−4,938	−4,964
Lateral Flow	−33	−45	−49	−48	−46	−46	−45	−44
Net from other zones	−219	−230	−252	−270	−292	−304	−319	−275
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Williamson County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	−121	42	37	27	19	14	10	11
Pumping	−150	−150	−150	−150	−150	−150	−150	−150
SW and GW Interactions	−6,857	−6,476	−6,288	−6,139	−6,012	−5,900	−5,800	−5,335
Recharge	7,296	7,296	7,296	7,296	7,296	7,296	7,296	3,930
Vertical Leakage Upper	10,533	10,086	9,882	9,715	9,554	9,396	9,242	11,704
Vertical Leakage Lower	−2,502	−2,845	−2,920	−2,973	−3,014	−3,044	−3,066	−3,079
Lateral Flow	−1,342	−1,477	−1,569	−1,637	−1,681	−1,712	−1,732	−1,746
Net from other zones	6,689	5,764	5,393	5,105	4,859	4,640	4,444	6,879
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Williamson County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	196	14	13	12	10	8	6	6
Pumping	−1,594	−1,594	−1,594	−1,594	−1,594	−1,594	−1,594	−1,594
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	2,478	2,830	2,911	2,968	3,010	3,042	3,065	3,078
Vertical Leakage Lower	−819	−988	−1,073	−1,134	−1,179	−1,212	−1,236	−1,252
Lateral Flow	−261	−262	−257	−252	−247	−244	−241	−238
Net from other zones	1,398	1,580	1,581	1,582	1,584	1,586	1,588	1,588
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Williamson County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	111	102	95	85	73	59	47	38
Pumping	−199	−199	−199	−199	−199	−199	−199	−199
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	819	989	1,074	1,135	1,179	1,212	1,236	1,252
Vertical Leakage Lower	−731	−893	−973	−1,027	−1,062	−1,084	−1,098	−1,107
Lateral Flow	0	1	3	6	9	12	14	16
Net from other zones	88	97	104	114	126	140	152	161
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Williamson County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	920	959	741	552	393	275	193	141
Pumping	−1,747	−1,747	−1,747	−1,747	−1,747	−1,747	−1,747	−1,747
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	731	892	972	1,026	1,061	1,084	1,097	1,107
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	96	−104	34	169	293	388	457	499
Net from other zones	827	788	1,006	1,195	1,354	1,472	1,554	1,606
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Wise County

Woodbine Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	0	0	0	0	0	0	0	0
Pumping	0	0	0	0	0	0	0	0
SW and GW Interactions	0	0	0	0	0	0	0	0
Recharge	0	0	0	0	0	0	0	0
Vertical Leakage Upper	9,630	13,027	14,275	14,905	15,311	15,607	15,840	16,062
Vertical Leakage Lower	−9,661	−13,058	−14,305	−14,935	−15,340	−15,635	−15,867	−16,088
Lateral Flow	31	31	30	30	29	28	27	26
Net from other zones	0	0	0	0	0	0	0	0
Mass Balance	0	0	0	0	0	0	0	0

Wise County

Paluxy Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	63	32	19	15	13	12	12	24
Pumping	−2,143	−2,143	−2,143	−2,143	−2,143	−2,143	−2,143	−2,143
SW and GW Interactions	−6,817	−6,267	−5,920	−5,686	−5,494	−5,330	−5,190	−4,726
Recharge	11,073	11,073	11,073	11,073	11,073	11,073	11,073	6,160
Vertical Leakage Upper	20,447	23,434	24,146	24,304	24,266	24,149	24,002	28,006
Vertical Leakage Lower	−13,947	−17,664	−18,982	−19,586	−19,932	−20,154	−20,303	−20,371
Lateral Flow	−1,859	−2,198	−2,273	−2,291	−2,289	−2,277	−2,261	−2,224
Net from other zones	4,641	3,572	2,891	2,427	2,045	1,718	1,438	5,411
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Wise County

Glen Rose Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	39	84	42	27	20	16	13	22
Pumping	−1,062	−1,062	−1,062	−1,062	−1,062	−1,062	−1,062	−1,062
SW and GW Interactions	−11,926	−10,691	−9,917	−9,355	−8,911	−8,538	−8,219	−7,188
Recharge	11,703	11,703	11,703	11,703	11,703	11,703	11,703	6,548
Vertical Leakage Upper	26,096	27,343	27,113	26,593	26,050	25,526	25,038	28,200
Vertical Leakage Lower	−11,506	−14,738	−15,764	−16,230	−16,499	−16,674	−16,794	−16,857
Lateral Flow	−1,418	−1,948	−2,198	−2,321	−2,390	−2,433	−2,460	−2,475
Net from other zones	13,172	10,657	9,151	8,042	7,161	6,419	5,784	8,868
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Wise County

Hensell Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	168	81	36	22	15	11	9	13
Pumping	−1,617	−1,617	−1,617	−1,617	−1,617	−1,617	−1,617	−1,617
SW and GW Interactions	−9,067	−8,303	−7,798	−7,423	−7,138	−6,912	−6,730	−6,253
Recharge	7,576	7,576	7,576	7,576	7,576	7,576	7,576	4,101
Vertical Leakage Upper	22,063	23,768	23,785	23,499	23,199	22,922	22,678	25,262
Vertical Leakage Lower	−8,606	−10,809	−11,465	−11,753	−11,920	−12,031	−12,108	−12,148
Lateral Flow	−1,450	−2,393	−2,719	−2,881	−2,977	−3,037	−3,078	−3,105
Net from other zones	12,007	10,566	9,601	8,865	8,302	7,854	7,492	10,009
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Wise County

Pearsall Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	373	167	64	35	23	16	12	12
Pumping	−943	−943	−943	−943	−943	−943	−943	−943
SW and GW Interactions	−6,193	−5,403	−4,928	−4,597	−4,353	−4,159	−4,002	−3,647
Recharge	3,855	3,855	3,855	3,855	3,855	3,855	3,855	2,111
Vertical Leakage Upper	17,138	17,760	17,466	17,091	16,771	16,494	16,257	17,332
Vertical Leakage Lower	−7,364	−8,878	−9,253	−9,423	−9,526	−9,594	−9,643	−9,666
Lateral Flow	−673	−1,155	−1,333	−1,421	−1,474	−1,510	−1,534	−1,552
Net from other zones	9,101	7,727	6,880	6,247	5,771	5,390	5,080	6,114
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Wise County

Hosston Layer

	2010	2020	2030	2040	2050	2060	2070	2080
Storage	564	132	51	29	19	13	10	10
Pumping	−5,757	−5,757	−5,757	−5,757	−5,757	−5,757	−5,757	−5,757
SW and GW Interactions	−9,861	−9,368	−8,969	−8,643	−8,380	−8,166	−7,987	−7,582
Recharge	8,279	8,279	8,279	8,279	8,279	8,279	8,279	4,675
Vertical Leakage Upper	18,807	19,335	18,912	18,430	18,006	17,647	17,337	20,154
Vertical Leakage Lower	0	0	0	0	0	0	0	0
Lateral Flow	−2,171	−3,253	−3,547	−3,695	−3,787	−3,850	−3,895	−3,918
Net from other zones	16,636	16,082	15,365	14,735	14,219	13,797	13,442	16,236
Net Water Budget	0	0	0	0	0	0	0	0
Net leakage	0	0	0	0	0	0	0	0

Appendix F
Central Texas GCD Modeling Results for the Llano Uplift DFCs

Appendix F contains the modeling results of work completed by WSP (USA) in 2020 under contract with the Central Texas Groundwater Conservation District to assess the impact of various pumping scenarios on the average drawdowns predicted by the Llano Uplift groundwater availability model (GAM) in groundwater management area (GMA) 8. The main purpose for this analysis was to assess the long-term regional drawdowns predicted by the Llano Uplift GAM based on various pumping scenarios in GMA 8 and to provide insight for selecting proposed Desired Future Conditions (DFC) for the Llano Uplift aquifers in GMA 8 for the 2021 DFC joint planning cycle.

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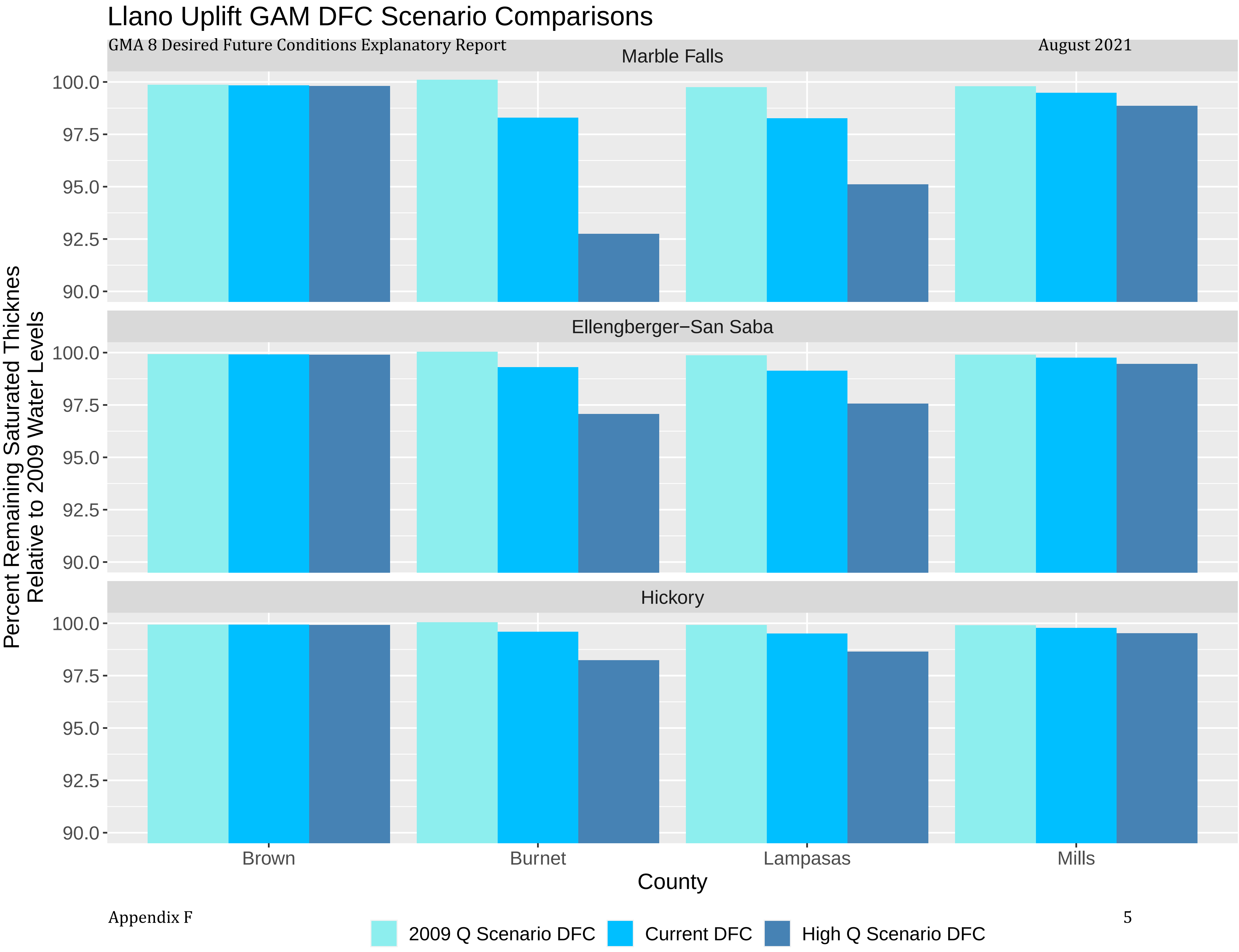
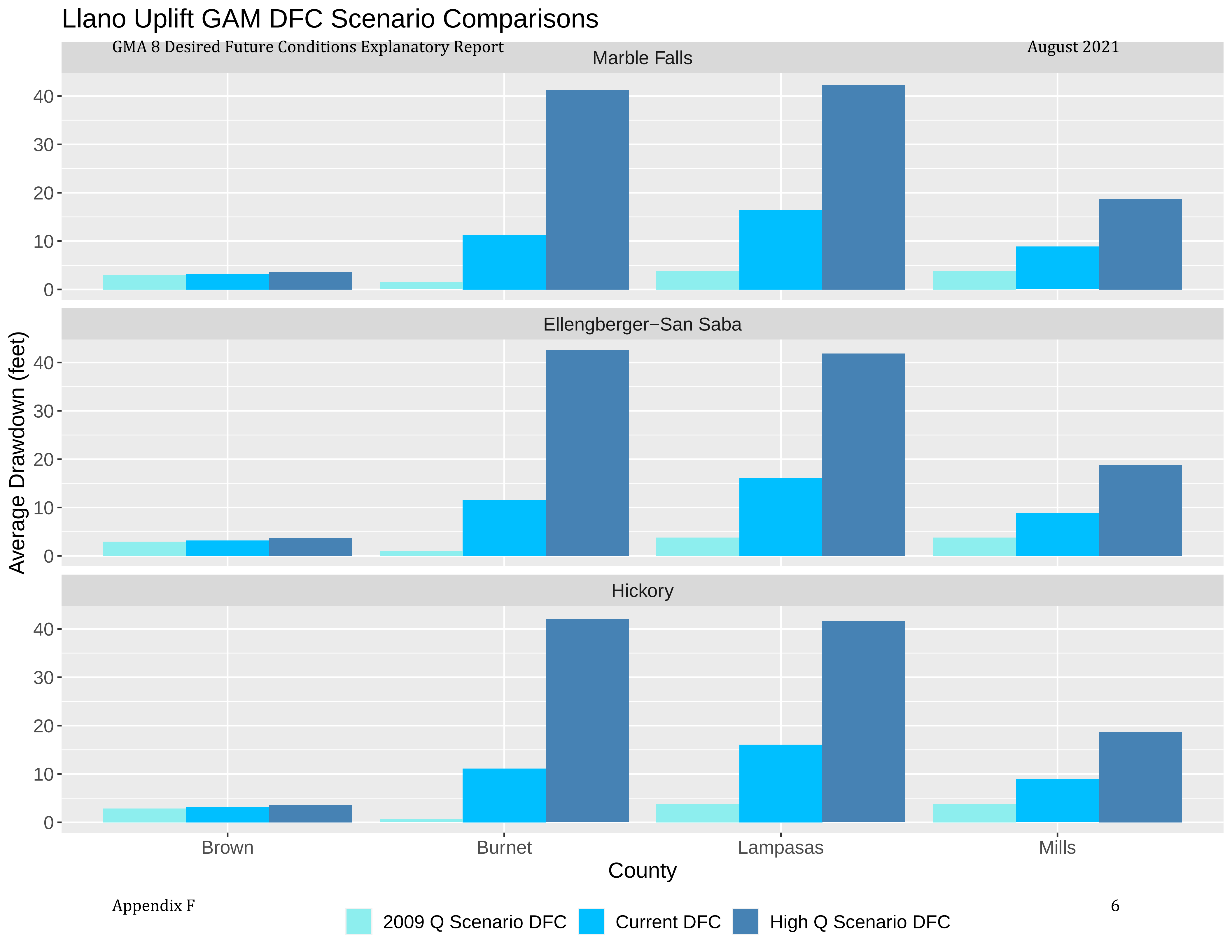
Current MAG Results									
County	**Aquifer**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Brown	Marble Falls	25	25	25	25	25	25	25	-
Brown	Ellenburger-San Saba	131	131	131	131	131	131	131	-
Brown	Hickory	12	12	12	12	12	12	12	-
Burnet	Marble Falls	2,738	2,738	2,738	2,738	2,738	2,738	2,738	-
Burnet	Ellenburger-San Saba	10,834	10,834	10,834	10,834	10,834	10,834	10,834	-
Burnet	Hickory	3,415	3,415	3,415	3,415	3,415	3,415	3,415	-
Lampasas	Marble Falls	2,839	2,839	2,839	2,839	2,839	2,839	2,839	-
Lampasas	Ellenburger-San Saba	2,595	2,595	2,595	2,595	2,595	2,595	2,595	-
Lampasas	Hickory	113	113	113	113	113	113	113	-
Mills	Marble Falls	25	25	25	25	25	25	25	-
Mills	Ellenburger-San Saba	499	499	499	499	499	499	499	-
Mills	Hickory	36	36	36	36	36	36	36	-

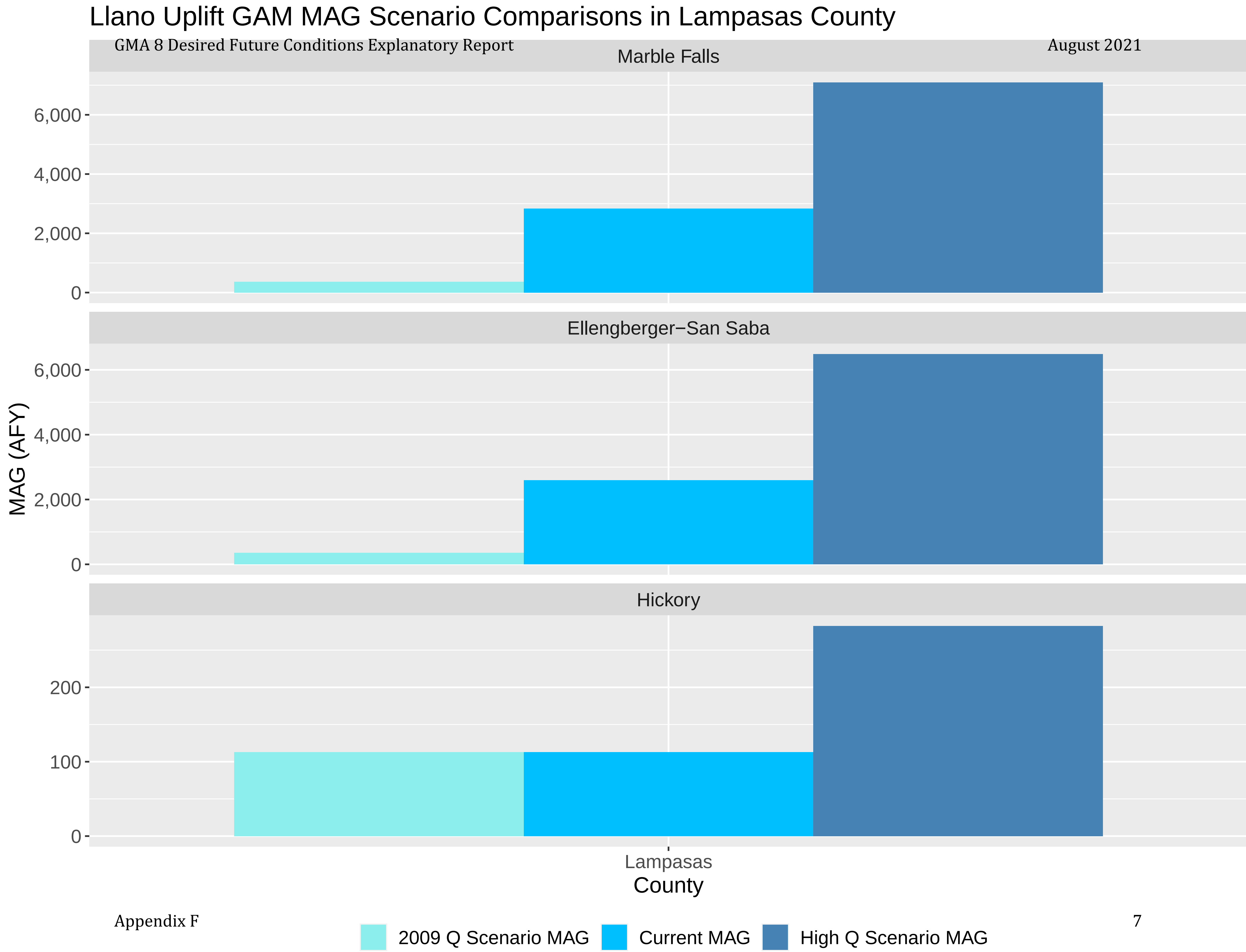
High Q MAG Results									
County	**Aquifer**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Brown	Marble Falls	25	25	25	25	25	25	25	25
Brown	Ellenburger-San Saba	131	131	131	131	131	131	131	131
Brown	Hickory	12	12	12	12	12	12	12	12
Burnet	Marble Falls	6,845	6,845	6,845	6,845	6,845	6,845	6,845	6,845
Burnet	Ellenburger-San Saba	27,086	27,086	27,086	27,086	27,086	27,086	27,086	27,086
Burnet	Hickory	8,538	8,538	8,538	8,538	8,538	8,538	8,538	8,538
Lampasas	Marble Falls	7,097	7,097	7,097	7,097	7,097	7,097	7,097	7,097
Lampasas	Ellenburger-San Saba	6,487	6,487	6,487	6,487	6,487	6,487	6,487	6,487
Lampasas	Hickory	283	283	283	283	283	283	283	283
Mills	Marble Falls	63	63	63	63	63	63	63	63
Mills	Ellenburger-San Saba	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248
Mills	Hickory	90	90	90	90	90	90	90	90

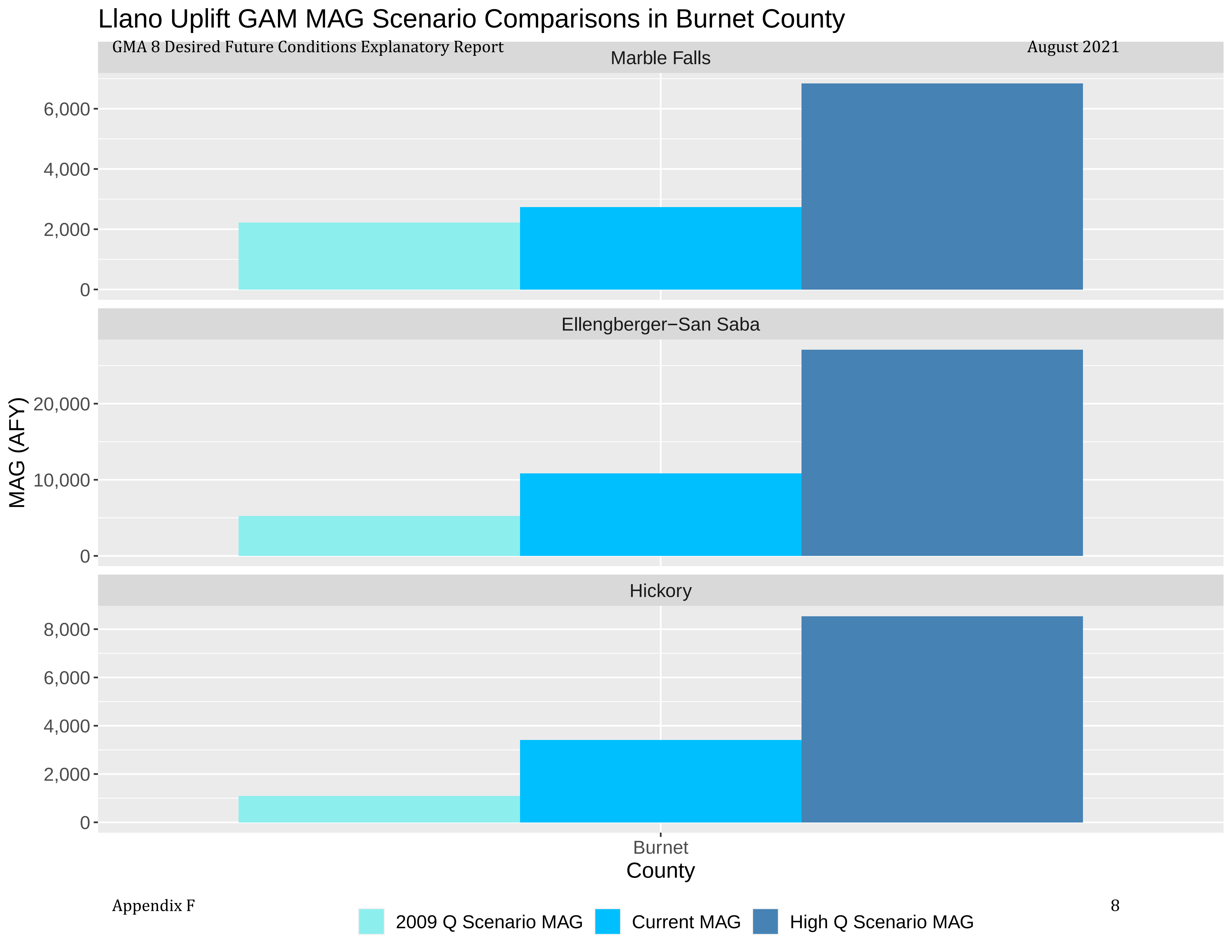
High Q MAG Results									
County	**Aquifer**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Brown	Marble Falls	25	25	25	25	25	25	25	25
Brown	Ellenburger-San Saba	131	131	131	131	131	131	131	131
Brown	Hickory	12	12	12	12	12	12	12	12
Burnet	Marble Falls	6,845	6,845	6,845	6,845	6,845	6,845	6,845	6,845
Burnet	Ellenburger-San Saba	27,086	27,086	27,086	27,086	27,086	27,086	27,086	27,086
Burnet	Hickory	8,538	8,538	8,538	8,538	8,538	8,538	8,538	8,538
Lampasas	Marble Falls	7,097	7,097	7,097	7,097	7,097	7,097	7,097	7,097
Lampasas	Ellenburger-San Saba	6,487	6,487	6,487	6,487	6,487	6,487	6,487	6,487
Lampasas	Hickory	283	283	283	283	283	283	283	283
Mills	Marble Falls	63	63	63	63	63	63	63	63
Mills	Ellenburger-San Saba	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248
Mills	Hickory	90	90	90	90	90	90	90	90

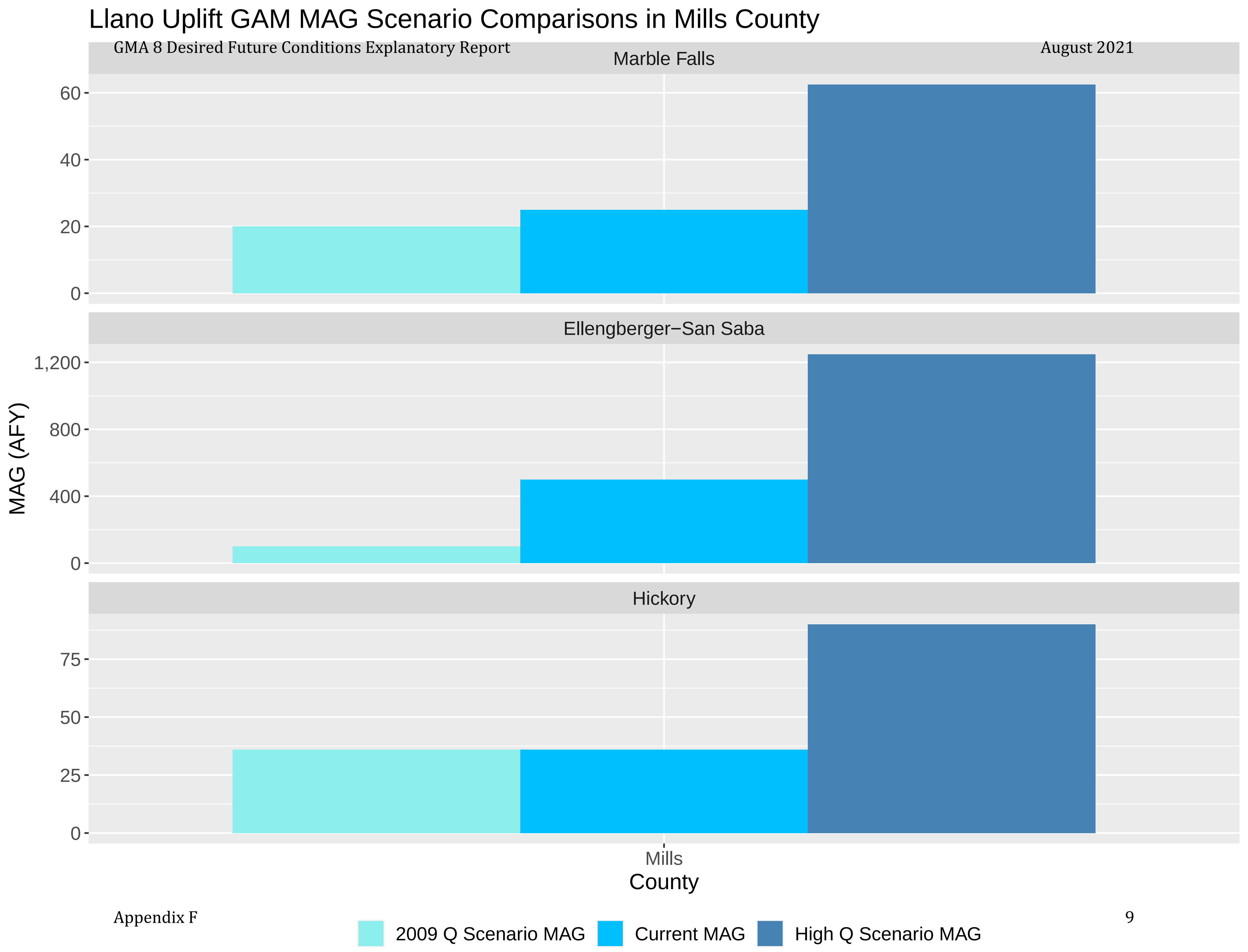
Llano Uplift DFC Results (Average Drawdown)				
County	**Scenario**	**Marble Falls**	**Ellenburger-San Saba**	**Hickory**
Brown	2009 Q	2.9	2.9	2.9
Brown	Current Q	3.2	3.2	3.1
Brown	High Q	3.6	3.6	3.6
Burnet	2009 Q	1.4	1.1	0.7
Burnet	Current Q	11.3	11.5	11.1
Burnet	High Q	41.3	42.6	42.0
Lampasas	2009 Q	3.8	3.8	3.8
Lampasas	Current Q	16.4	16.2	16.1
Lampasas	High Q	42.3	41.8	41.7
Mills	2009 Q	3.8	3.8	3.8
Mills	Current Q	8.9	8.9	8.9
Mills	High Q	18.7	18.7	18.7

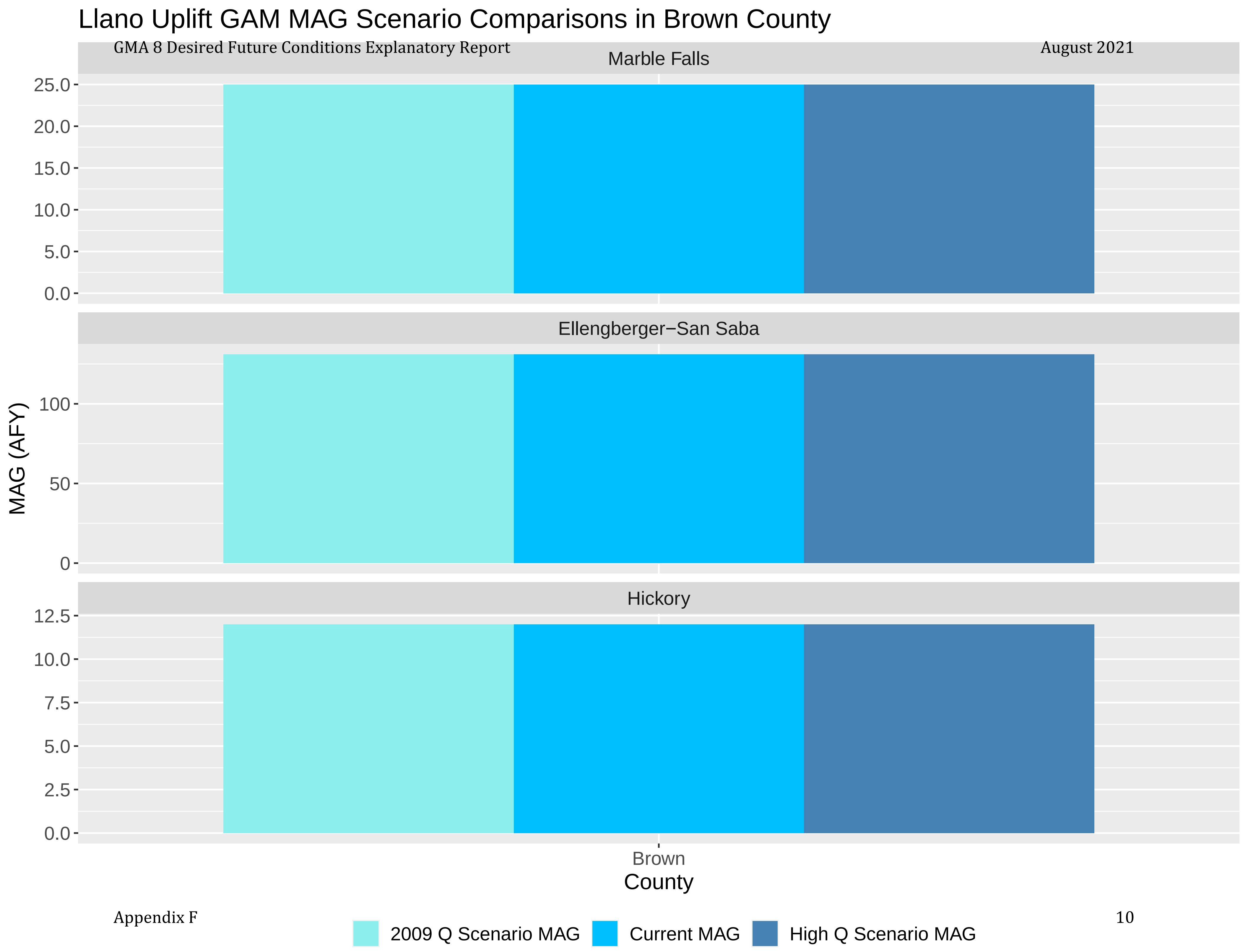

Llano Uplift GAM DFC Scenario Comparisons
Marble Falls
Ellengberger−San Saba
Hickory
100.0
97.5
95.0
92.5
90.0
Percent Remaining Saturated Thicknes
Relative to 2009 Water Levels
Brown
Burnet
Lampasas
Mills
County
2009 Q Scenario DFC
Current DFC
High Q Scenario DFC


Llano Uplift GAM DFC Scenario Comparisons
Marble Falls
Ellengberger−San Saba
Hickory
Average Drawdown (feet)
0
10
20
30
40
Brown
Burnet
Lampasas
Mills
County
2009 Q Scenario DFC
Current DFC
High Q Scenario DFC


Llano Uplift GAM MAG Scenario Comparisons in Lampasas County
Marble Falls
Ellengberger−San Saba
Hickory
MAG (AFY)
6,000
4,000
2,000
0
200
100
Lampasas
County
2009 Q Scenario MAG
Current MAG
High Q Scenario MAG


Llano Uplift GAM MAG Scenario Comparisons in Burnet County
Marble Falls
Ellengberger−San Saba
Hickory
MAG (AFY)
6,000
4,000
2,000
0
20,000
10,000
0
8,000
6,000
4,000
2,000
0
Burnet
County
2009 Q Scenario MAG
Current MAG
High Q Scenario MAG


Llano Uplift GAM MAG Scenario Comparisons in Mills County
Marble Falls
Ellengberger−San Saba
Hickory
MAG (AFY)
0
20
40
60
400
800
1,200
25
50
75
Mills
County
2009 Q Scenario MAG
Current MAG
High Q Scenario MAG


Llano Uplift GAM MAG Scenario Comparisons in Brown County
Marble Falls
Ellengberger−San Saba
Hickory
MAG (AFY)
25.0
20.0
15.0
10.0
5.0
0.0
100
50
0
12.5
10.0
7.5
5.0
2.5
0.0
Brown
County
2009 Q Scenario MAG
Current MAG
High Q Scenario MAG

Llano Uplift DFC Results (Perc. Sat Thickness Remaining)				
County	**Scenario**	**Marble Falls**	**Ellenburger-San Saba**	**Hickory**
Brown	2009 Q	99.9	99.9	99.9
Brown	Current Q	99.8	99.9	99.9
Brown	High Q	99.8	99.9	99.9
Burnet	2009 Q	100.1	100.0	100.0
Burnet	Current Q	98.3	99.3	99.6
Burnet	High Q	92.8	97.1	98.3
Lampasas	2009 Q	99.8	99.9	99.9
Lampasas	Current Q	98.3	99.1	99.5
Lampasas	High Q	95.2	97.6	98.7
Mills	2009 Q	99.8	99.9	99.9
Mills	Current Q	99.5	99.8	99.8
Mills	High Q	98.9	99.5	99.5

		Current MAG Results							
County	**Aquifer**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Brown	Marble Falls	25	25	25	25	25	25	25	-
Brown	Ellenburger-San Saba	131	131	131	131	131	131	131	-
Brown	Hickory	12	12	12	12	12	12	12	-
Burnet	Marble Falls	2,738	2,738	2,738	2,738	2,738	2,738	2,738	-
Burnet	Ellenburger-San Saba	10,834	10,834	10,834	10,834	10,834	10,834	10,834	-
Burnet	Hickory	3,415	3,415	3,415	3,415	3,415	3,415	3,415	-
Lampasas	Marble Falls	2,839	2,839	2,839	2,839	2,839	2,839	2,839	-
Lampasas	Ellenburger-San Saba	2,595	2,595	2,595	2,595	2,595	2,595	2,595	-
Lampasas	Hickory	113	113	113	113	113	113	113	-
Mills	Marble Falls	25	25	25	25	25	25	25	-
Mills	Ellenburger-San Saba	499	499	499	499	499	499	499	-
Mills	Hickory	36	36	36	36	36	36	36	-

		2009 Q MAG Results							
County	**Aquifer**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Brown	Marble Falls	25	25	25	25	25	25	25	25
Brown	Ellenburger-San Saba	131	131	131	131	131	131	131	131
Brown	Hickory	12	12	12	12	12	12	12	12
Burnet	Marble Falls	2,220	2,220	2,220	2,220	2,220	2,220	2,220	2,220
Burnet	Ellenburger-San Saba	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244
Burnet	Hickory	1,088	1,088	1,088	1,088	1,088	1,088	1,088	1,088
Lampasas	Marble Falls	363	363	363	363	363	363	363	363
Lampasas	Ellenburger-San Saba	351	351	351	351	351	351	351	351
Lampasas	Hickory	113	113	113	113	113	113	113	113
Mills	Marble Falls	20	20	20	20	20	20	20	20
Mills	Ellenburger-San Saba	100	100	100	100	100	100	100	100
Mills	Hickory	36	36	36	36	36	36	36	36

High Q MAG Results									
County	**Aquifer**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Brown	Marble Falls	25	25	25	25	25	25	25	25
Brown	Ellenburger-San Saba	131	131	131	131	131	131	131	131
Brown	Hickory	12	12	12	12	12	12	12	12
Burnet	Marble Falls	6,845	6,845	6,845	6,845	6,845	6,845	6,845	6,845
Burnet	Ellenburger-San Saba	27,086	27,086	27,086	27,086	27,086	27,086	27,086	27,086
Burnet	Hickory	8,538	8,538	8,538	8,538	8,538	8,538	8,538	8,538
Lampasas	Marble Falls	7,097	7,097	7,097	7,097	7,097	7,097	7,097	7,097
Lampasas	Ellenburger-San Saba	6,487	6,487	6,487	6,487	6,487	6,487	6,487	6,487
Lampasas	Hickory	283	283	283	283	283	283	283	283
Mills	Marble Falls	63	63	63	63	63	63	63	63
Mills	Ellenburger-San Saba	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248
Mills	Hickory	90	90	90	90	90	90	90	90

Appendix G
Consultant Presentations at GMA 8 Groundwater Planning Meetings:
July 26, 2019
November 22, 2019
February 26, 2020
May 15, 2020
August 7, 2020

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GMA 8
Joint Groundwater Planning

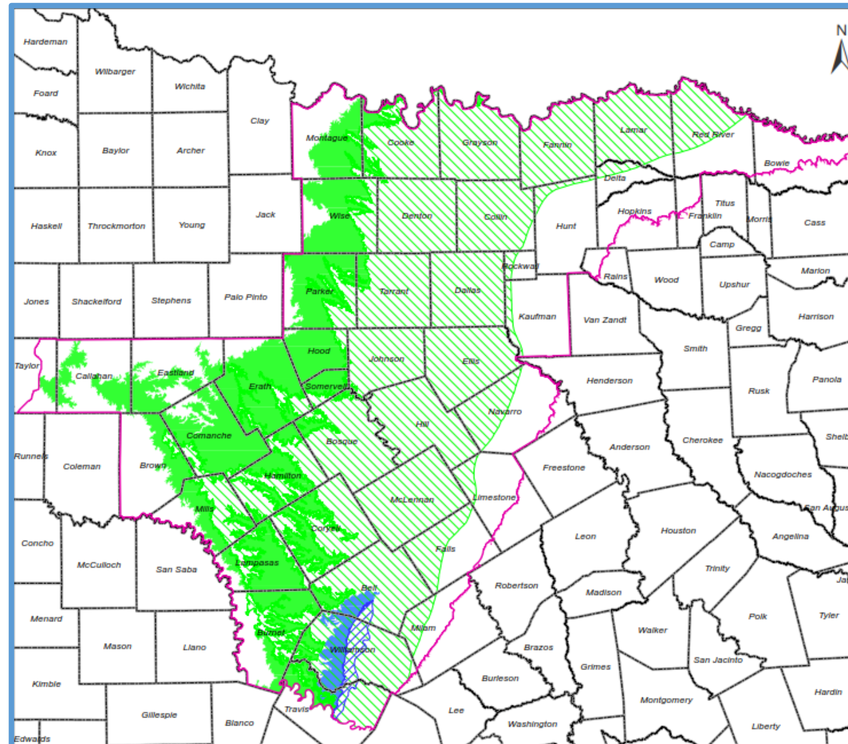
July 26, 2019

Agenda Item 7

- Discussion and possible action on potential model runs for this planning cycle
- Meeting scheduled with TWDB staff to discuss GMA 8 issues
  - WSP consultant team
  - Joe, Dirk, Drew, and Mitchell
- Modeling Issues

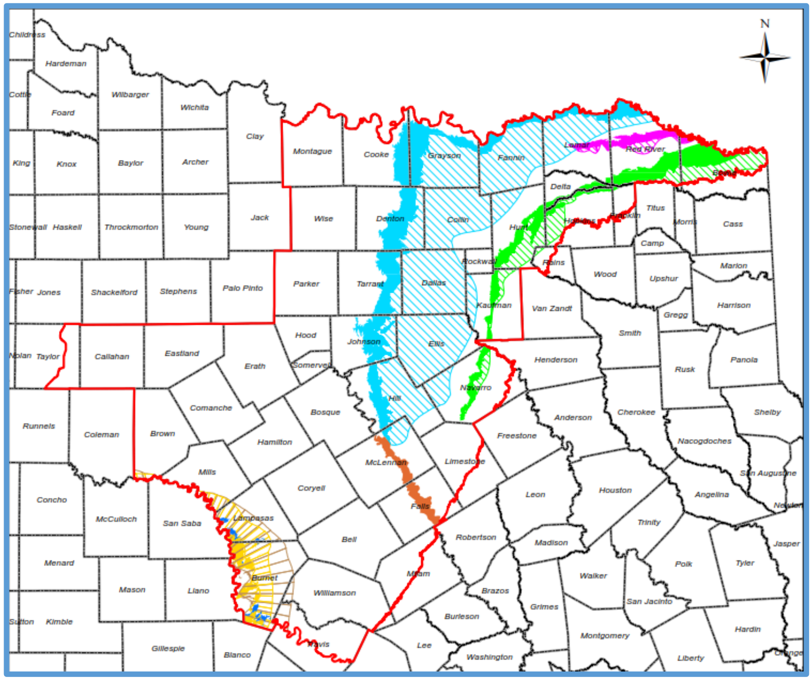
Major Aquifers

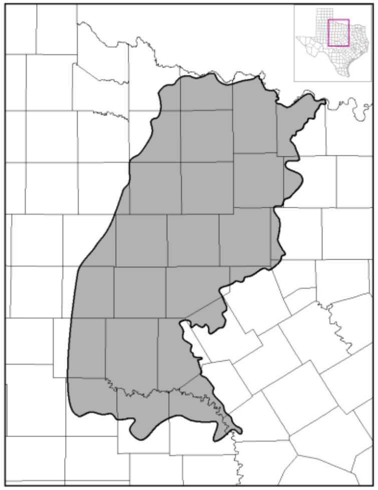
- Northern Trinity Woodbine GAM
  - Trinity
  - Woodbine
  - Current budget allows one updated simulation
- Northern Edwards (BFZ) GAM
  - Edwards BFZ
  - Clearwater UWCD funding



Minor Aquifers

- Llano Uplift Aquifer System GAM
  - Ellenburger-San Saba
  - Hickory
  - Marble Falls
  - No funding in current budget
- Nacatoch Aquifer GAM
  - Non-relevant last round
- Brazos River Alluvium Aquifer GAM
  - Non-relevant last round
- Blossom Aquifer GAM
  - Non-relevant last round
- Cross Timbers Aquifer GAM
  - Cross Timbers
  - GAM likely not ready in this round
  - Relevant or NOT?

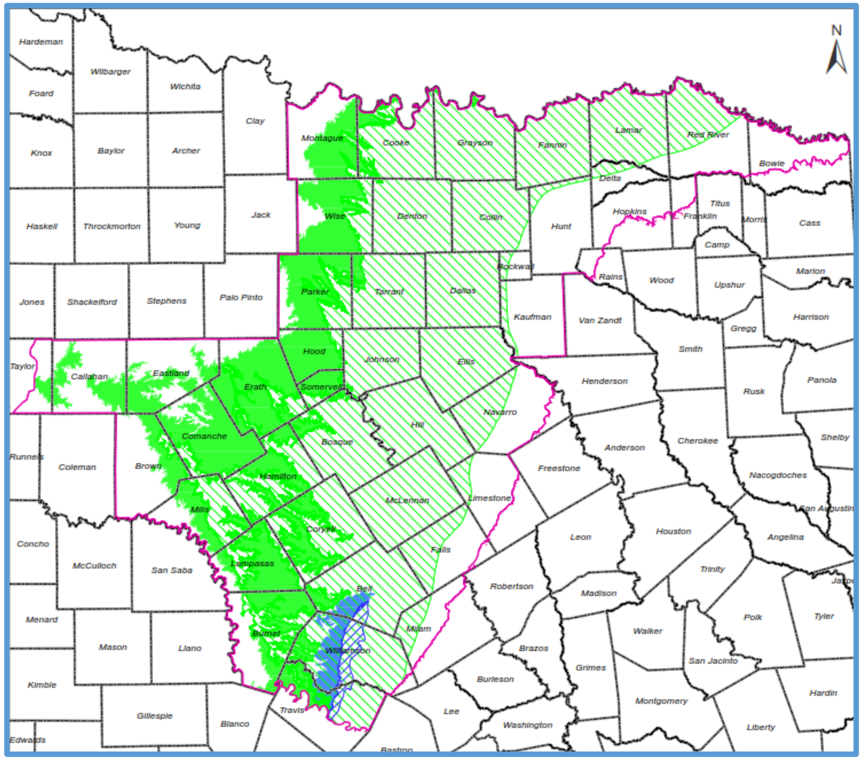




4

Modeling Runs

- Northern Trinity Woodbine GAM
  - Run 10



Run 10 Description

- Used TWDB accepted version of the GAM
- Initial conditions set as simulated water levels on January 1, 2010 from transient calibration run
- Adjusted pumping amounts based on GCD input
- No changes to areal distribution of pumping from baseline
- No changes in aquifer assignment of pumping from baseline
- Set pumping so that model code would not automatically reduce pumping amounts

Run 11 – Update of NTWGAM

- Adjusted pumping amounts based on GCD input
  - Things to consider:
    - Rule changes
    - New permits
    - Anticipated pumping changes
    - Balancing highest practicable and conservation
    - Comments from last round of planning
    - Other
  - We propose that each GCD review the TWDB MAG spreadsheet and adjust pumping estimates
- Vertical adjustment of pumping
  - Run 10 - Set pumping so that model code would not automatically reduce pumping amounts
  - Tell us if you want to adjust

Questions

8

Agenda Item 8

- Discuss plan and schedule for GMA 8 consideration of nine factors required by Texas Water Code Subsections 36.108(d)(1 – 9) in the third round of DFC joint planning

WSP Team Approach to Presenting Information on Nine Factors

(Texas Water Code Subsections 36.108(d)(1-9))

- Factor presentations – Three GMA 8 Meetings (November 2019, February 2020, and May 2020)
- Focused discussion on factors during each meeting
- WSP Team presentations to guide discussions – GCDs make presentations available during 90-day public comment period
- Factor presentation content to be reflective of explanatory report content
- Re-visit factor discussions as needed when various GAM runs, or DFC statements considered

Proposed Schedule for Factors

November 2019

- Environmental Impacts
- Subsidence Impacts
- Hydrological Conditions

February 2020

- Aquifer Uses or Conditions
- Supply Needs & Management Strategies
- Private Property Rights

May 2020

- Socioeconomic Impacts
- DFC Feasibility
- Other Relevant Information

Questions

Agenda Item 9

- Discuss plan for updating and preparing the GMA 8 explanatory report for the third round of DFC joint planning

13

WSP Team Approach to Preparing the Explanatory Report

(Texas Water Code Section 36.108(d-3))

- Use GMA 8 second round of DFC joint planning ER as starting point
- Update ER discussion and appendices as needed
- WSP Team presents and reviews 1st ER draft – August 2020
- GMA 8 considers ER approval – November 2020

14

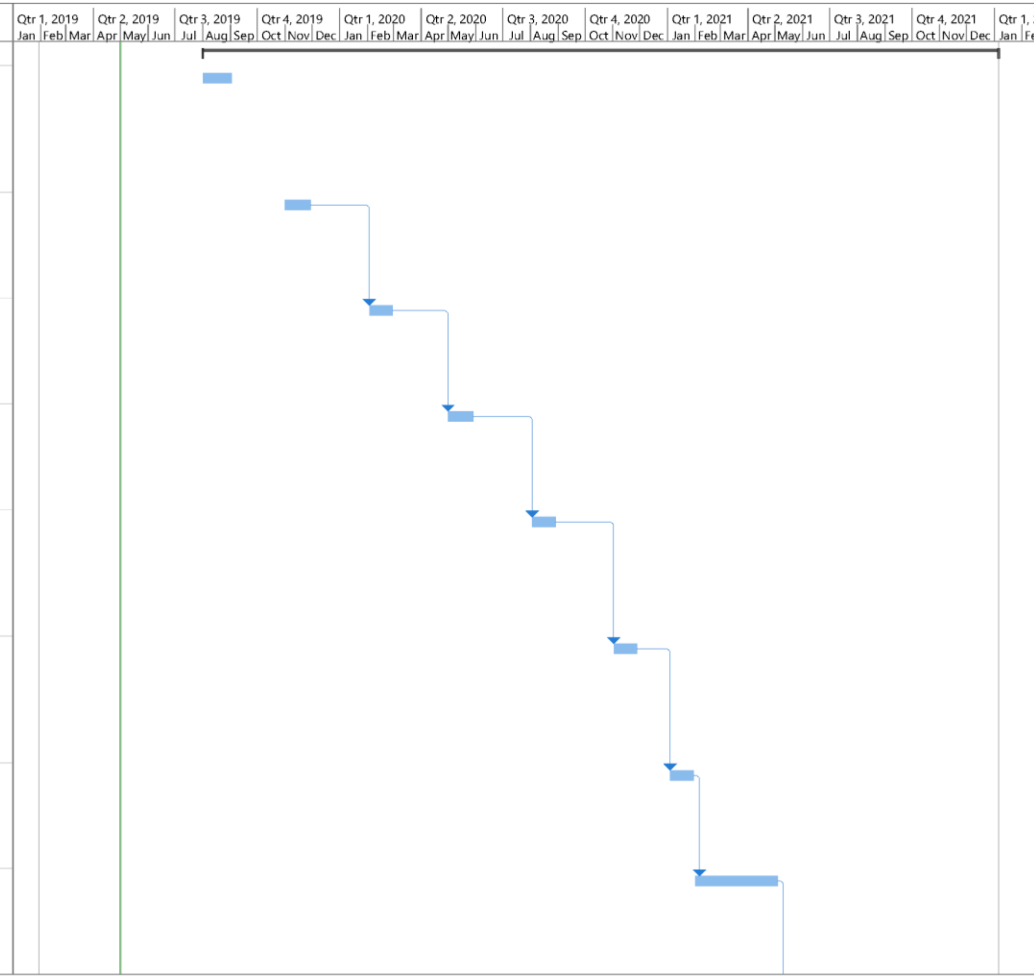
Questions

Agenda Item 10

- Discussion and possible action of joint planning schedule

Planning Schedule

ID	Task Name	Duration	Start	Finish
1	**GMA 8 Joint Planning Process**	**635 days**	**Thu 8/1/19**	**Wed 1/5/22**
2	GMA 8 meeting – Review project approach and timeline; present report on requirements of Texas Water Code 36.108; discuss aquifers designated as non-relevant; discuss GAMs to be used for modeling and possible runs; and discuss possible DFCs.	4.5 wks	Thu 8/1/19	Mon 9/2/19
3	GMA 8 meeting – Provide project update; present baseline GAM runs; present GAM runs on possible GMA 8 DFCs and discuss additional GAM runs needed; present report regarding Texas Water Code Subsections 36.108(d)(1-3).	4.1 wks	Fri 11/1/19	Fri 11/29/19
4	GMA 8 meeting – Provide project update; present GAM runs on possible GMA 8 DFCs and discuss additional GAM runs needed; present report regarding Texas Water Code Subsections 36.108(d)(4-6).	4 wks	Mon 2/3/20	Fri 2/28/20
5	GMA 8 meeting – Provide project update; present GAM runs on possible GMA 8 DFCs and discuss additional GAM runs needed; present report regarding Texas Water Code Subsetions 36.108 (d)(7-9).	4 wks	Fri 5/1/20	Thu 5/28/20
6	GMA 8 meeting – Provide project update; present GAM runs on possible GMA 8 DFCs and discuss additional GAM runs needed; present report regarding proposed non-relevant classifications; and continue discussions of nine factors as needed.	4 wks	Mon 8/3/20	Fri 8/28/20
7	GMA 8 meeting – Provide project update; present GAM runs on possible GMA 8 DFCs and discuss additional GAM runs needed; begin to identify DFCs to be proposed by GMA 8; and continue discussions of nine factors as needed.	4 wks	Mon 11/2/20	Fri 11/27/20
8	GMA 8 meeting – Consider action to adopt proposed DFCs and non-relevant aquifer classifications for GMA 8. Action to approve proposed DFCs must be approved by 2/3 vote of GMA 8.	4 wks	Mon 1/4/21	Fri 1/29/21
9	90-day public comment period on proposed DFCs/non-relevant aquifers – As applicable, hold public hearings and make available information used to develop the proposed DFCs, including how the nine factors were considered.	66 days	Mon 2/1/21	Mon 5/3/21



Project: Schedule_GMA8meetin
Date: Wed 5/1/19

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	

Page 1

Planning Schedule

ID	Task Name	Duration	Start	Finish
10	Texas Water Code Section 36.108 (d), deadline for adoption of proposed DFCs	0 days	Sat 5/1/21	Sat 5/1/21
11	GCDs compile public comments received during the public comment period; and prepare GCD summary reports and discussion of proposed revisions to DFCs, if applicable.	4 wks	Tue 5/4/21	Mon 5/31/21
12	GMA 8 meeting – Review GCD public comment summaries and proposed revisions to DFCs, if applicable; and consider GCD suggestions to modify proposed DFCs based on public comments, if applicable.	4 wks	Tue 6/1/21	Mon 6/28/21
13	GMA 8 Meeting - Review and discuss complete draft explanatory report	4.5 wks	Fri 7/30/21	Tue 8/31/21
14	GMA 8 meeting – Consider action to adopt final DFCs, non-relevant aquifer classification proposals and the explanatory report for GMA 8.	4 wks	Wed 11/3/21	Tue 11/30/21
15	Prepare and submit DFCs and explanatory report to TWDB and to each GCD. Submission packet due to the TWDB within 60 days of action to adopt the DFCs.	20 days	Wed 12/1/21	Tue 12/28/21
16	Texas Water Code Section 36.108(d-3), deadline for final adoption of DFCs	1 day	Wed 1/5/22	Wed 1/5/22

Project: Schedule_GMA8meetin
Date: Wed 5/1/19

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	

Page 2

Questions

GMA 8
Joint Groundwater Planning

November 22, 2019

Agenda Item 6

Discussion and possible action of upcoming model run inputs.

- Run 11 – Update of NTWGAM DFC/MAG Run
- GMA 8 representatives met with TWDB
- WSP has received Pumping Updates from:
  - *Upper Trinity GCD*
  - *Southern Trinity GCD (still working)*
- Path forward
  - *Complete updated run and present results at February meeting*

Summary of August 8, 2019 meeting with TWDB

- MAGs from this round of planning will be used in 2027 State Water Plan (2030-2080)
  - New run will begin in 2010 (no change)
  - WSP will extend DFC Model run to 2080
  - 2070 input will be used for 2071-2080
  - "Leap year" causes confusion in MAGs (WSP will make each year 365.25 days)
  - WSP will update pumping as provided by GCDs
  - WSP will provide files to TWDB as early as possible
- Subsidence vulnerability report should be used when considering the subsidence factor in setting DFCs in this round of joint planning
- For non-relevant aquifers, RWPGs provide groundwater availability estimates (reviewed by TWDB staff)

Agenda Item 6

Discussion and possible action of upcoming model run inputs.

- Upper Trinity GCD updated pumping

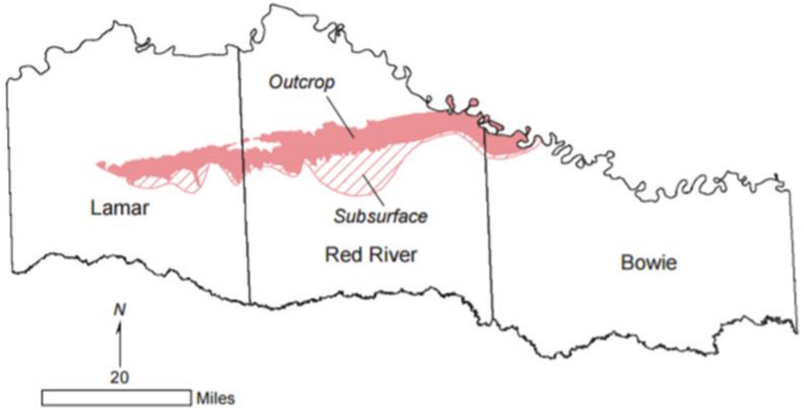
Aquifer	O/D*	County	acft
Glen Rose	Outcrop	Hood	792
Glen Rose	Downdip	Hood	125
Paluxy	Outcrop	Hood	159
Twin Mountains	Outcrop	Hood	5,025
Twin Mountains	Downdip	Hood	10,768
Antlers	Outcrop	Montague	6,114
Antlers	Downdip	Montague	
Antlers	Outcrop	Parker	2,905
Antlers	Downdip	Parker	
Glen Rose	Outcrop	Parker	3,684
Glen Rose	Downdip	Parker	1,406
Paluxy	Outcrop	Parker	2,614
Paluxy	Downdip	Parker	50
Twin Mountains	Outcrop	Parker	1,294
Twin Mountains	Downdip	Parker	2,527
Antlers	Outcrop	Wise	9,106
Antlers	Downdip	Wise	2,439
TOTAL			**49,009**

*O/D refers to the "outcrop" or "downdip" portion of each aquifer

wsp

Review of NON-RELEVANT Aquifers

- The Nacatoch, Blossom and Brazos River Alluvium aquifers were classified as non-relevant for the purposes of joint planning
- DFCs were not adopted for these aquifers



Questions ?

Agenda Item 7

- Presentations and discussions regarding Environmental Impacts, Subsidence Impacts, and Hydrological Conditions factors as they relate to Desired Future Conditions pursuant to Texas Water Code Section 36.108(d).

GMA 8 Schedule to Discuss Nine Factors

November 2019		
Environmental Impacts	Subsidence Impacts	Hydrological Conditions

February 2020		
Aquifer Uses or Conditions	Supply Needs & Management Strategies	Private Property Rights

May 2020		
Socioeconomic Impacts	DFC Feasibility	Other Relevant Information

8

Hydrological Conditions

Hydrological Conditions Summary: Water Level Data

- TWDB GWDB water level data
- Define relevant **TWDB** aquifer codes
- Count measurements and throw out null values.
  - *Wells with less than 3 measurements; and*
  - *Wells that do not have a measurement since 2000*
- Selection criteria reduced well locations with water levels from 8,461 to 677 wells used for mapping/hydrographs
- WSP will provide PDFs for GMA 8 posting and review

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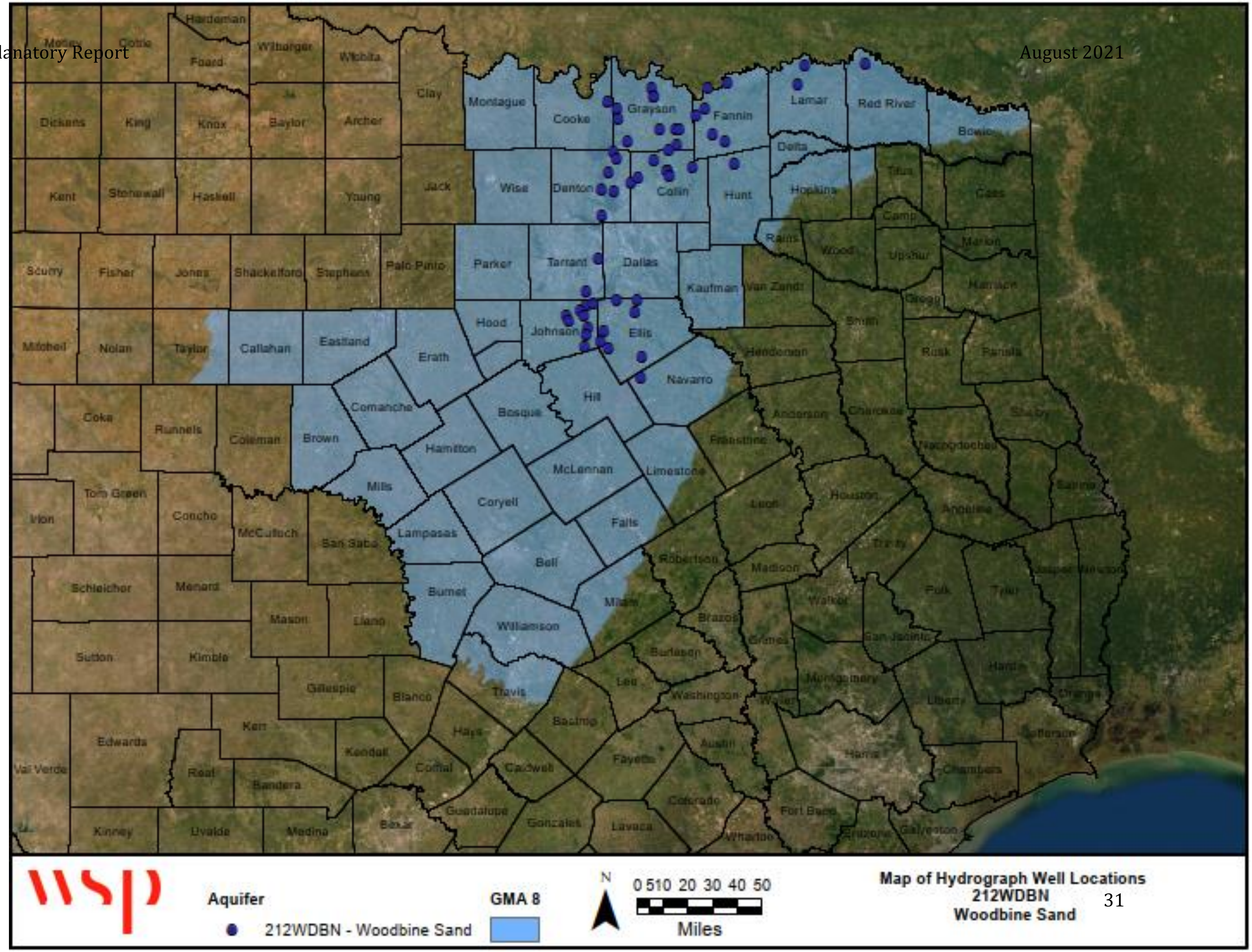
Graph of the Number of Wells per GCD and Aquifer
212WDBN - Woodbine Sand
217HSTN - Hosston Formation
218ALRS - Antlers Sand
218CCRK - Cow Creek Limestone
A - Edwards and Associated Limestones - (Balcones Fault Zone Aquifer)
218EDRD - Edwards Limestone
218EDRDA - Edwards and Associated Limestones
218GLRS - Glen Rose Limestone
218GLRSL - Glen Rose Limestone, Lower Member
218GLRSU - Glen Rose Limestone, Upper Member
218HNSL - Hensell Sand Member of Travis Peak Formation
218PLXY - Paluxy Sand
218PRSL - Pearsall Formation
218TVPK - Travis Peak Formation
218TWMT - Twin Mountains Formation
318WCHT - Wichita Formation or Group
Number of Wells
0
10
20
30
40
Central Texas GCD
Clearwater UWCD
Middle Trinity GCD
North Texas GCD
Northern Trinity GCD
Prairielands GCD
Red River GCD
Saratoga UWCD
Southern Trinity GCD
Upper Trinity GCD
GCD

11

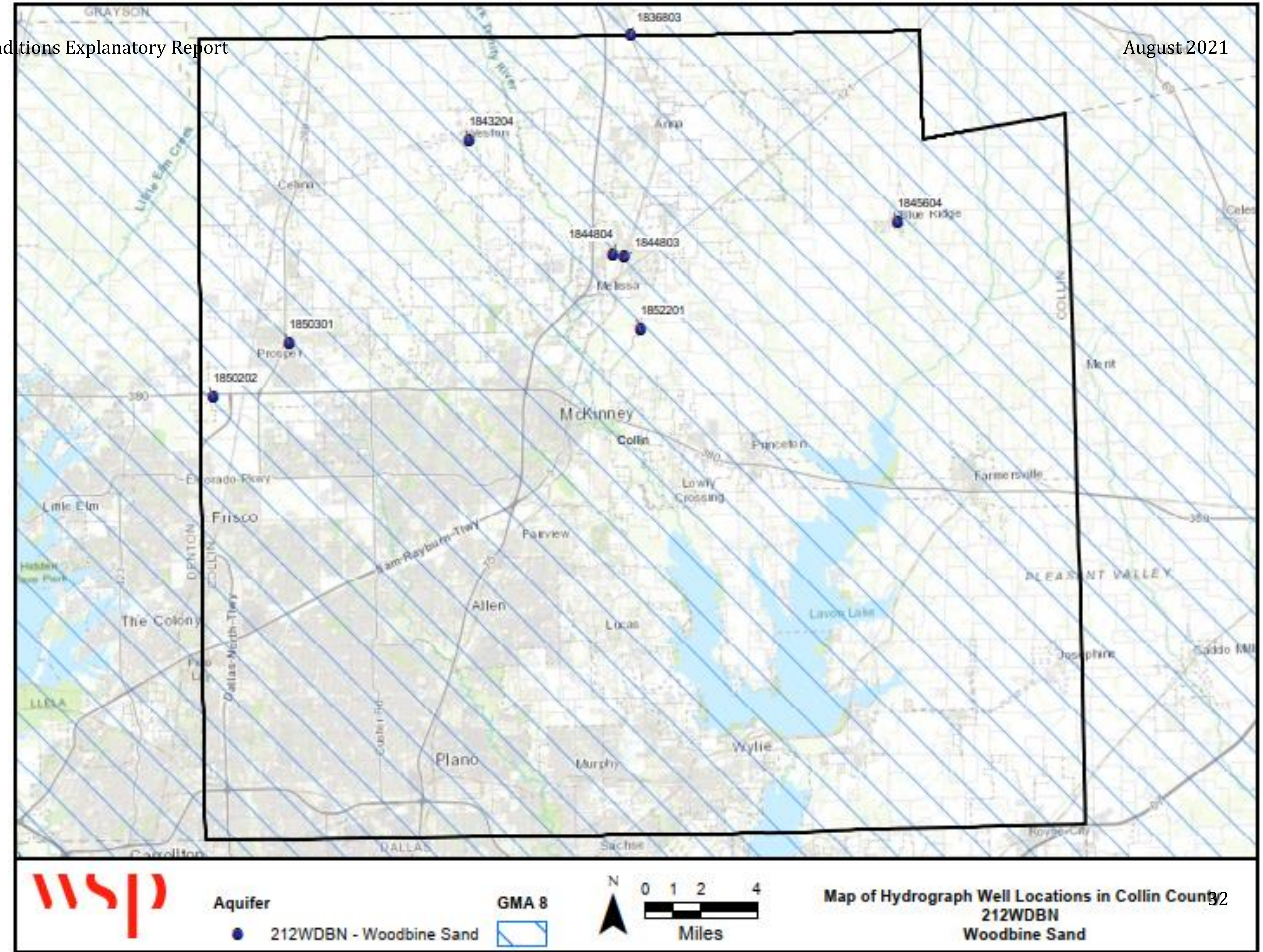
WOODBINE AQUIFER WELLS WITH HYDROGRAPHS

12



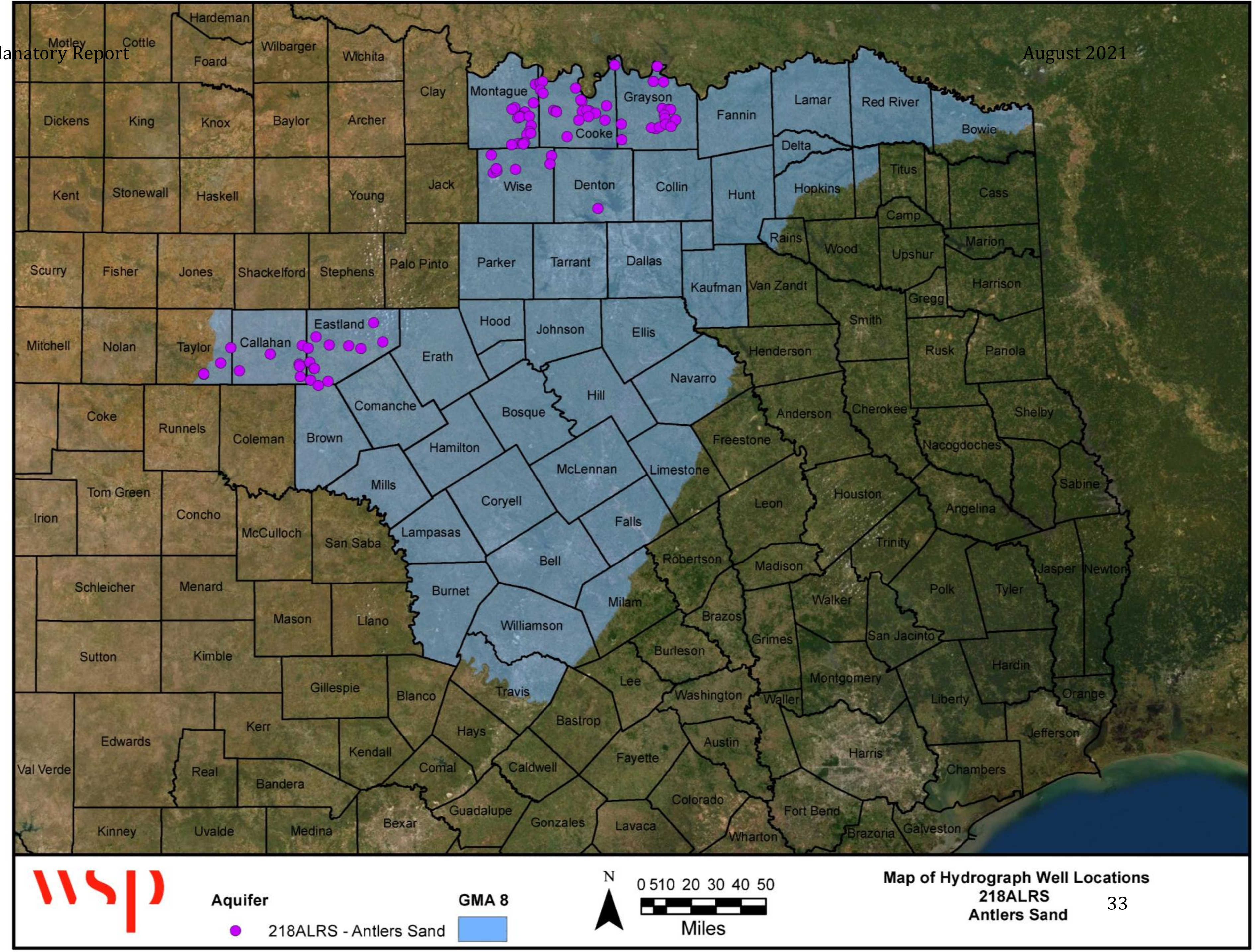
WOODBINE AQUIFER WELLS WITH HYDROGRAPHS IN COLLIN COUNTY

13



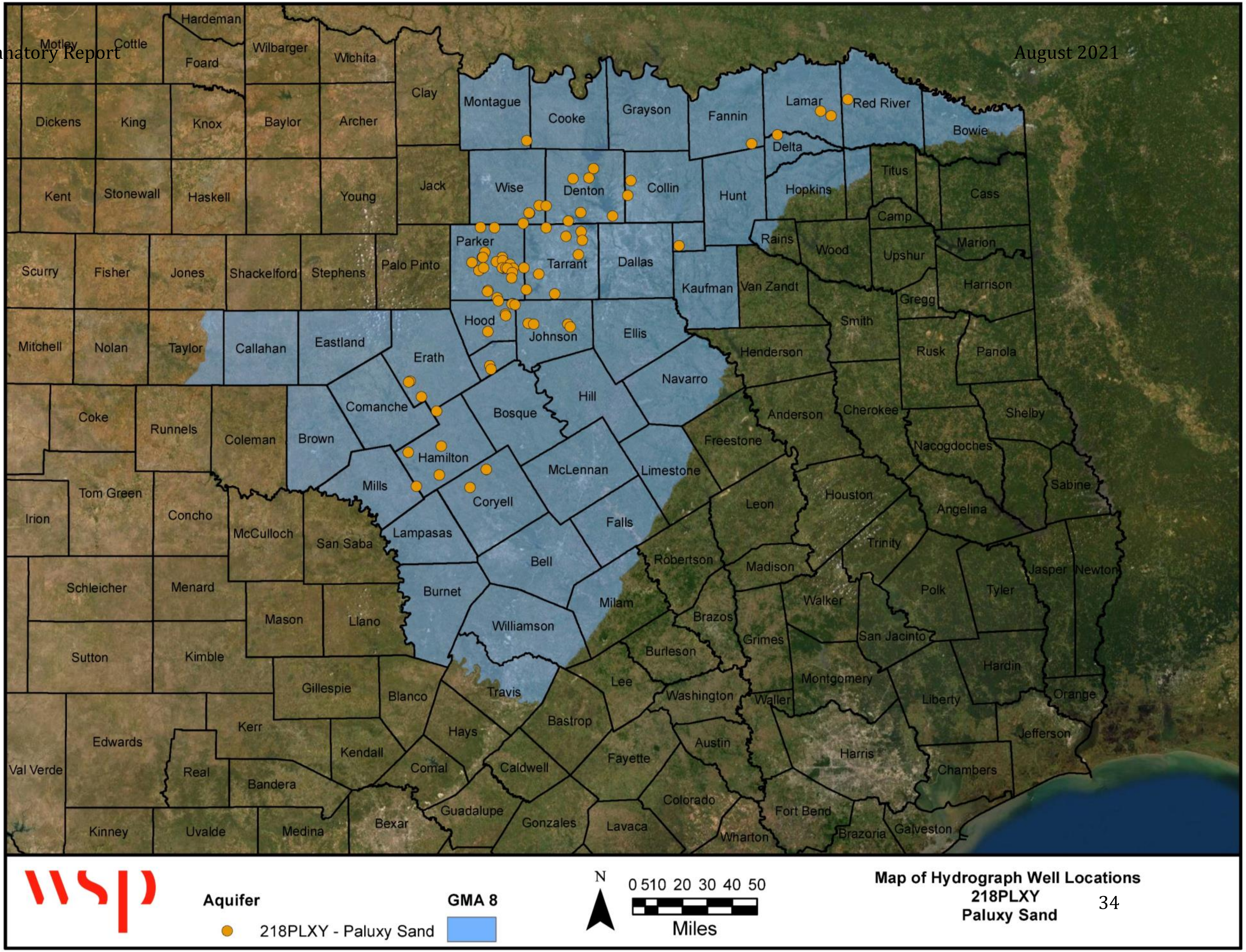
ANTLERS AQUIFER WELLS WITH HYDROGRAPHS

14



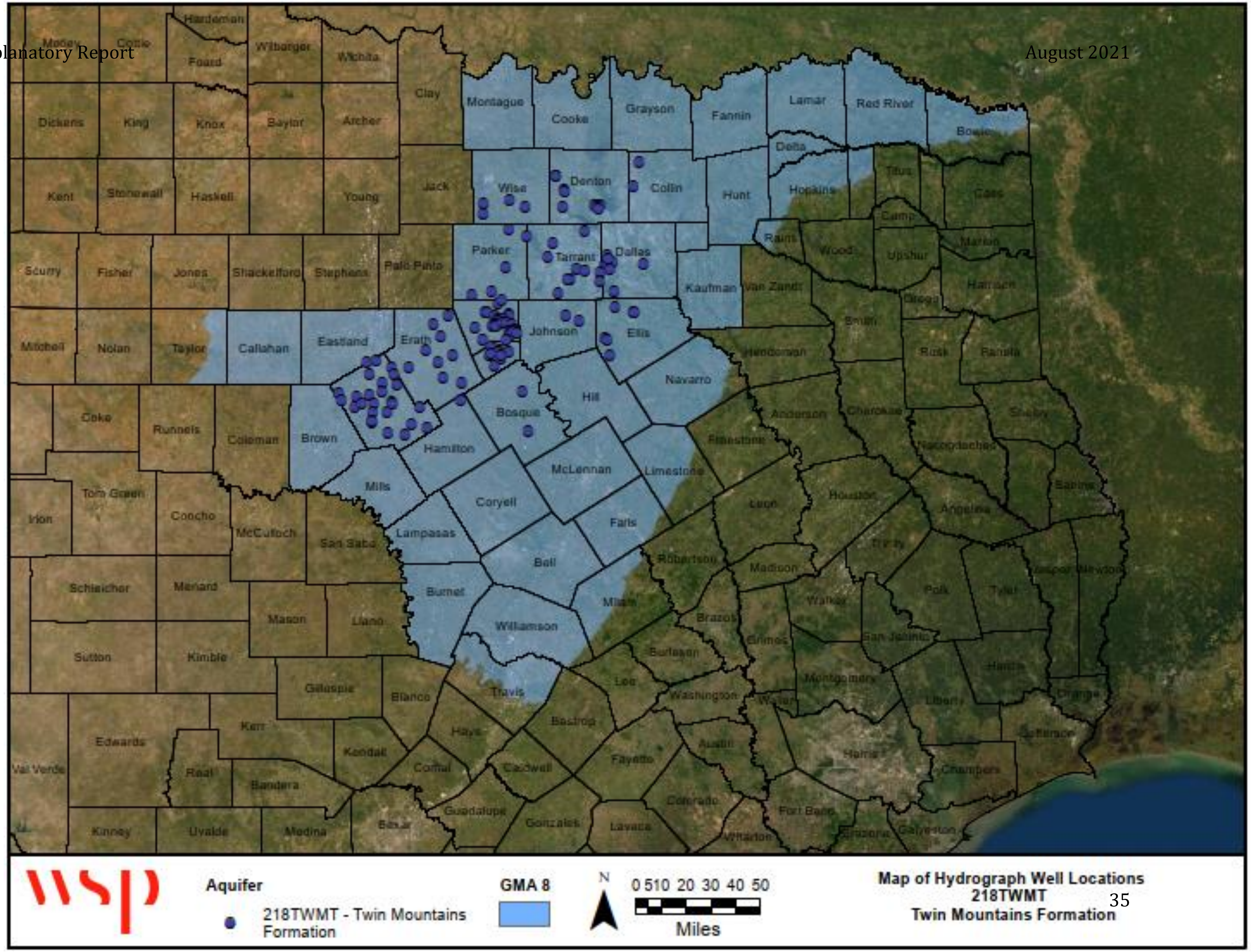
PALUXY AQUIFER WELLS WITH HYDROGRAPHS

15



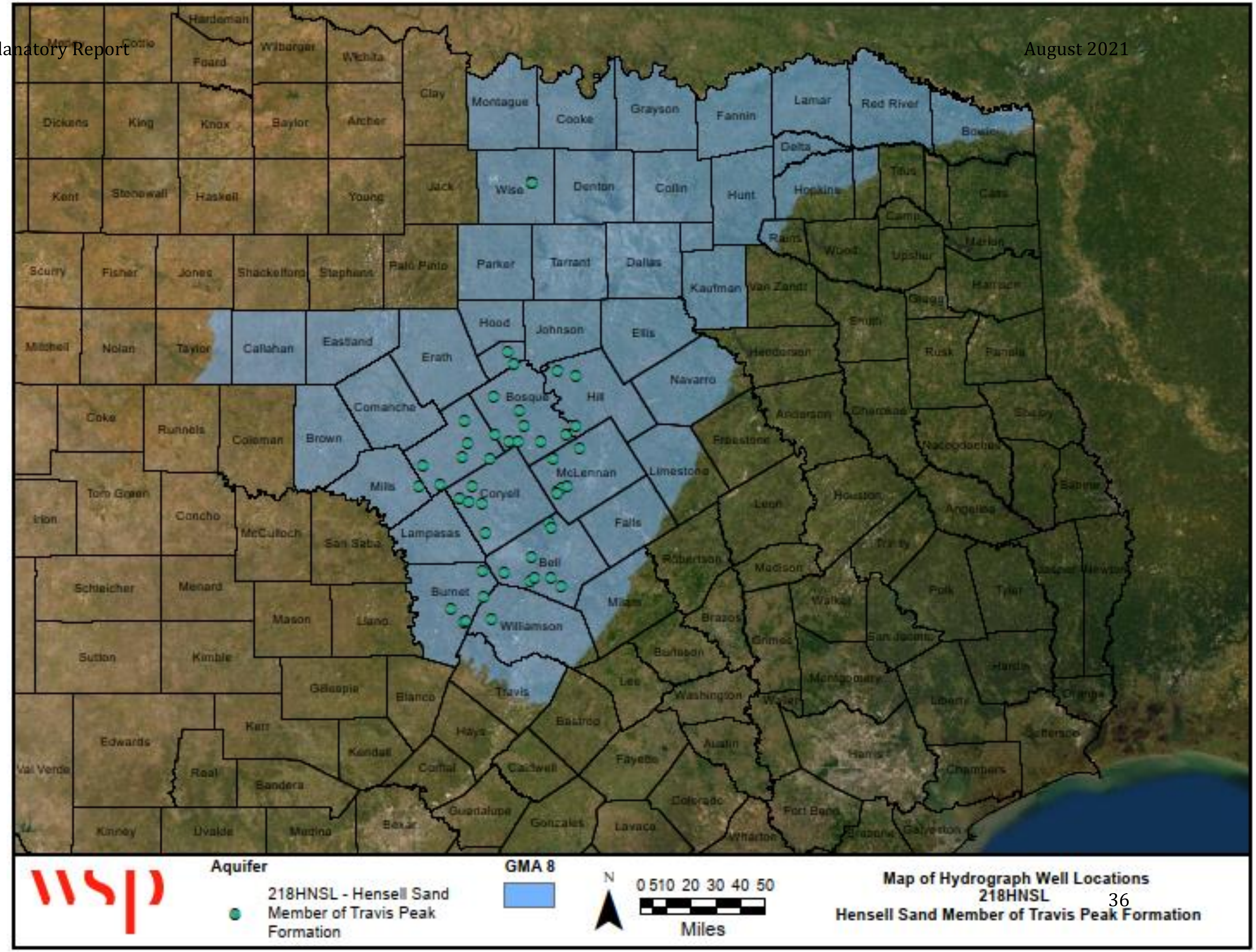
TWIN MOUNTAIN AQUIFER WELLS WITH HYDROGRAPHS

16



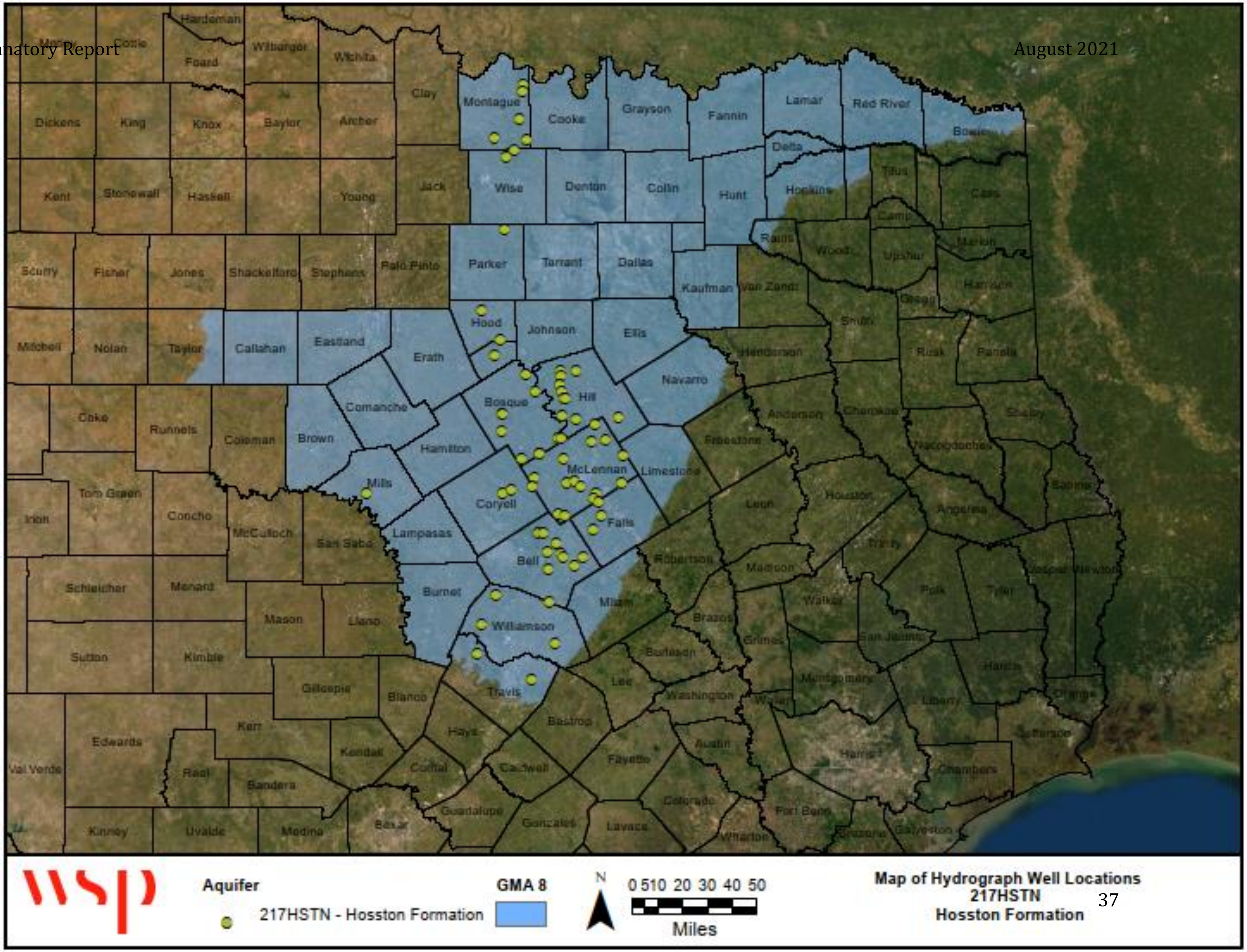
HENSELL AQUIFER WELLS WITH HYDROGRAPHS

17



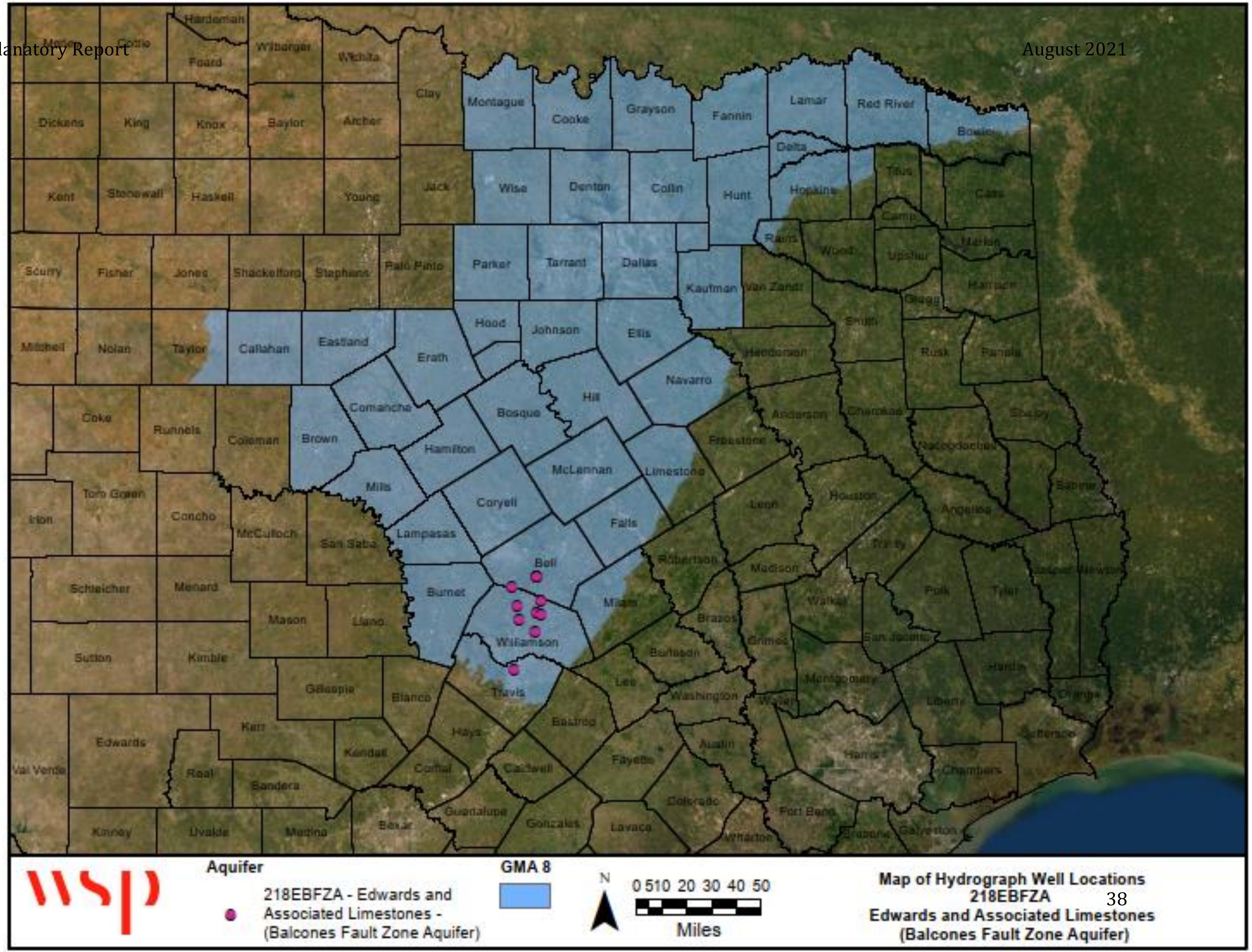
HOSSTON AQUIFER WELLS WITH HYDROGRAPHS

18



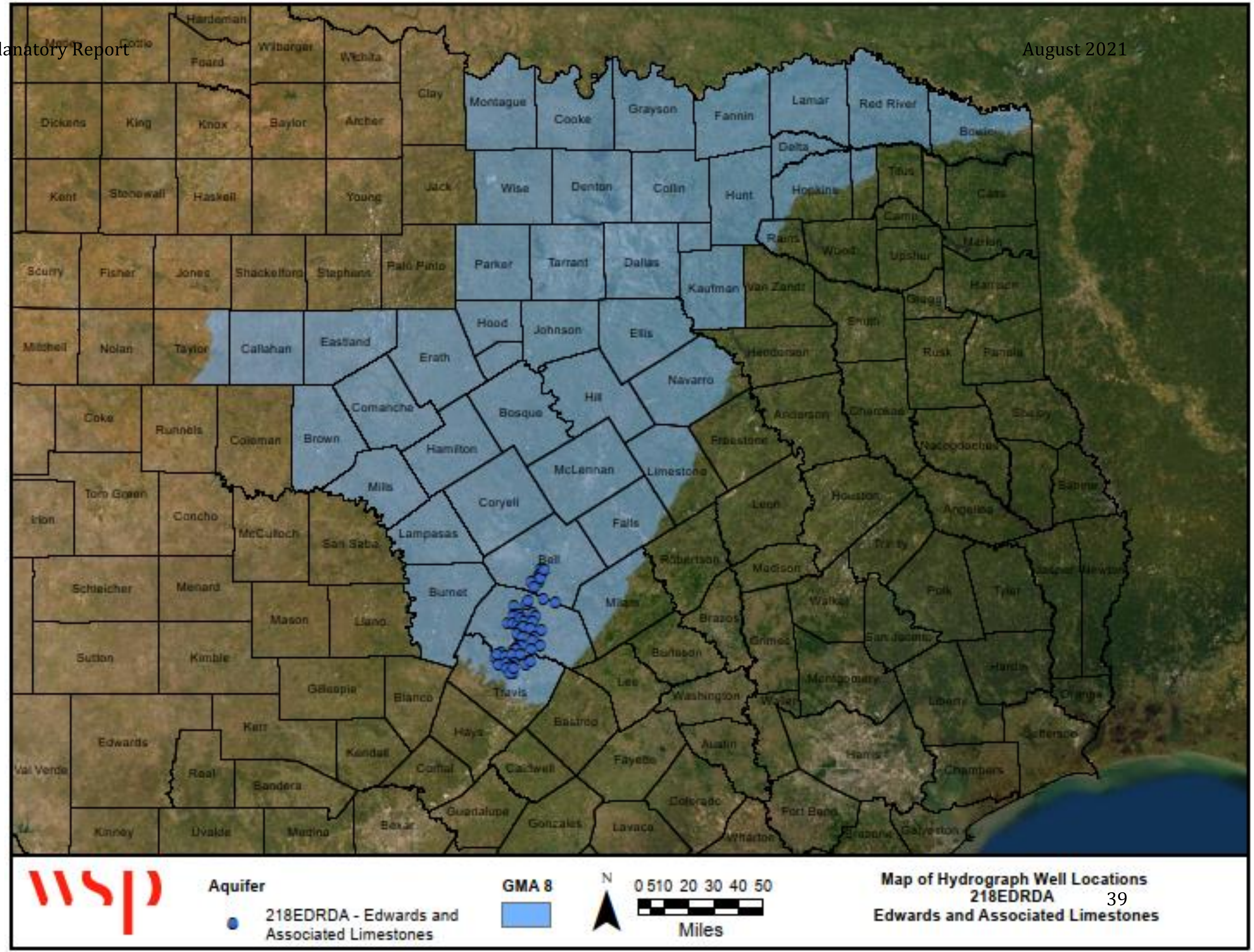
EDWARDS BFZ AQUIFER WELLS WITH HYDROGRAPHS

19

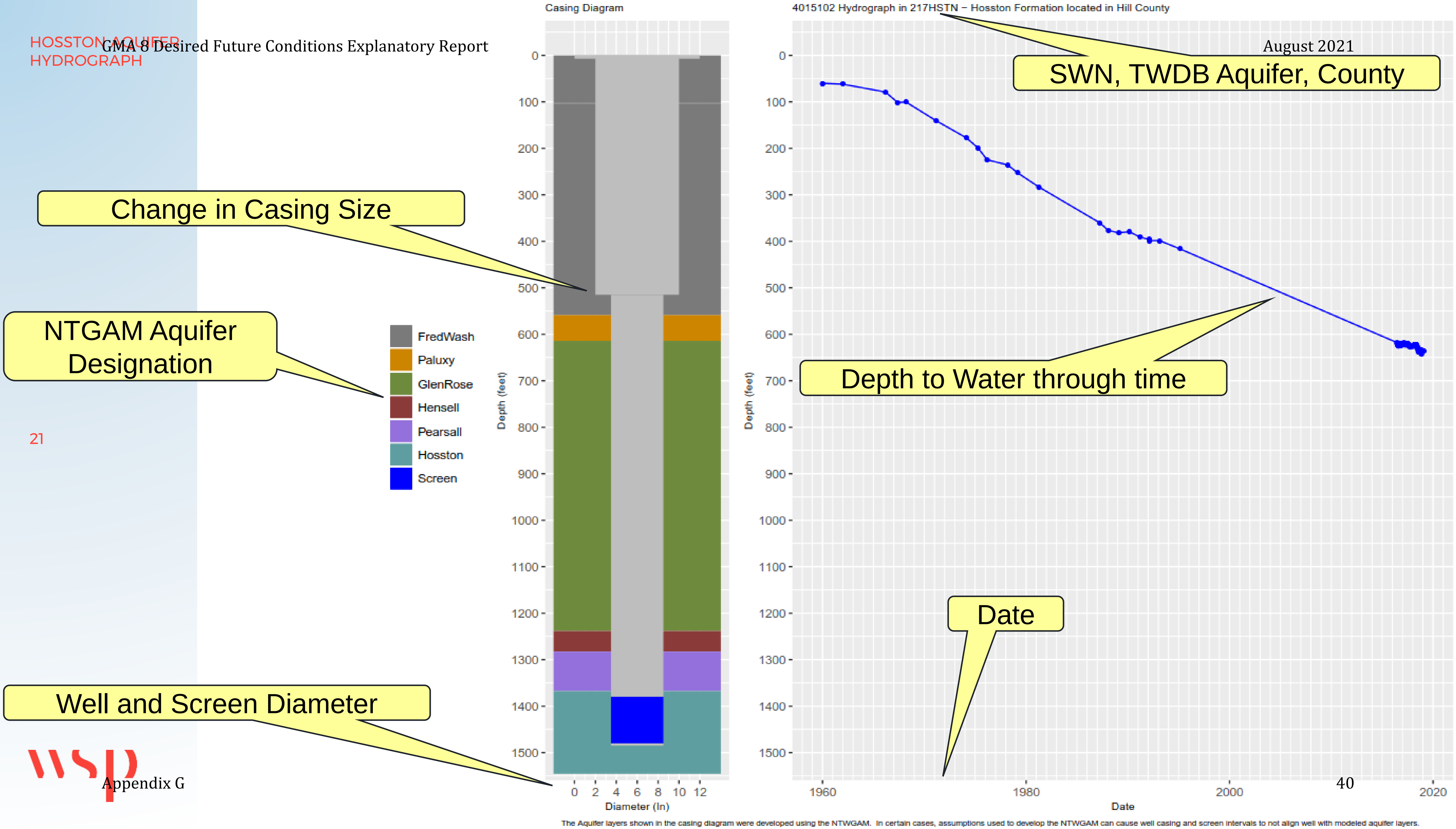


EDWARDS AND ASSOCIATED LIMESTONES AQUIFER WELLS WITH HYDROGRAPHS

20



HOSSTON AQUIFER HYDROGRAPH



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HENSELL AQUIFER HYDROGRAPH IN BELL COUNTY

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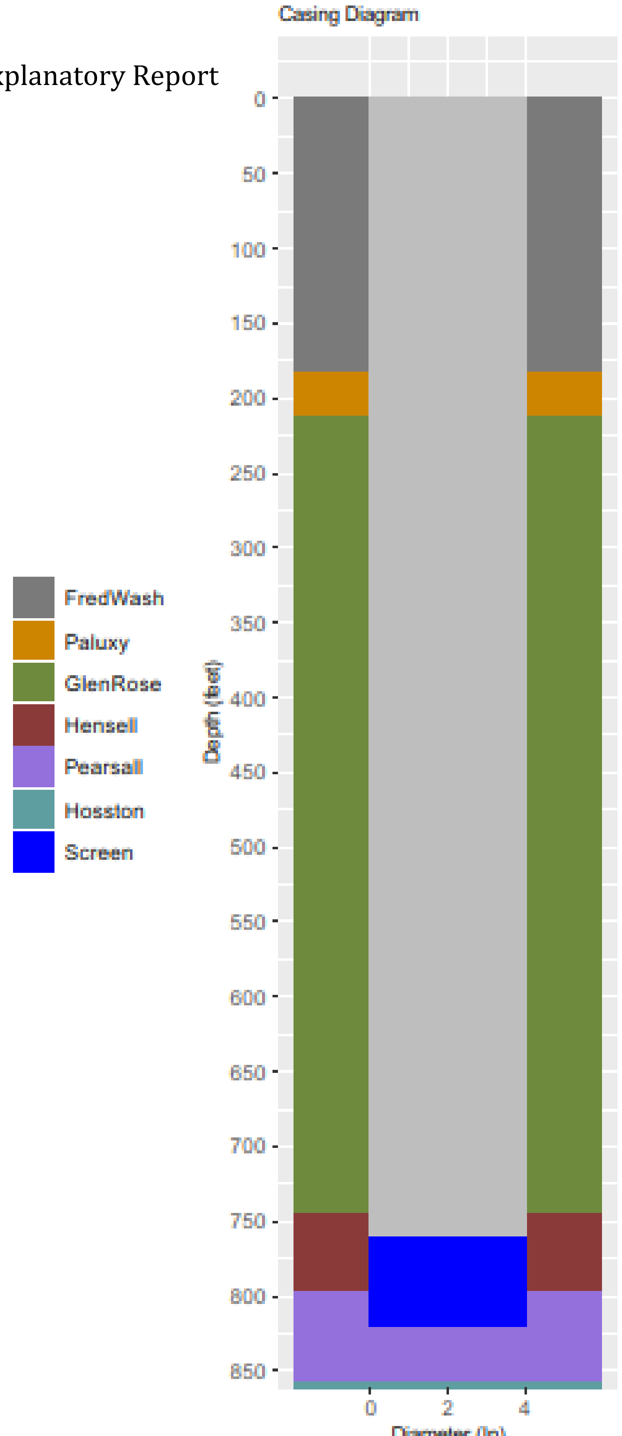

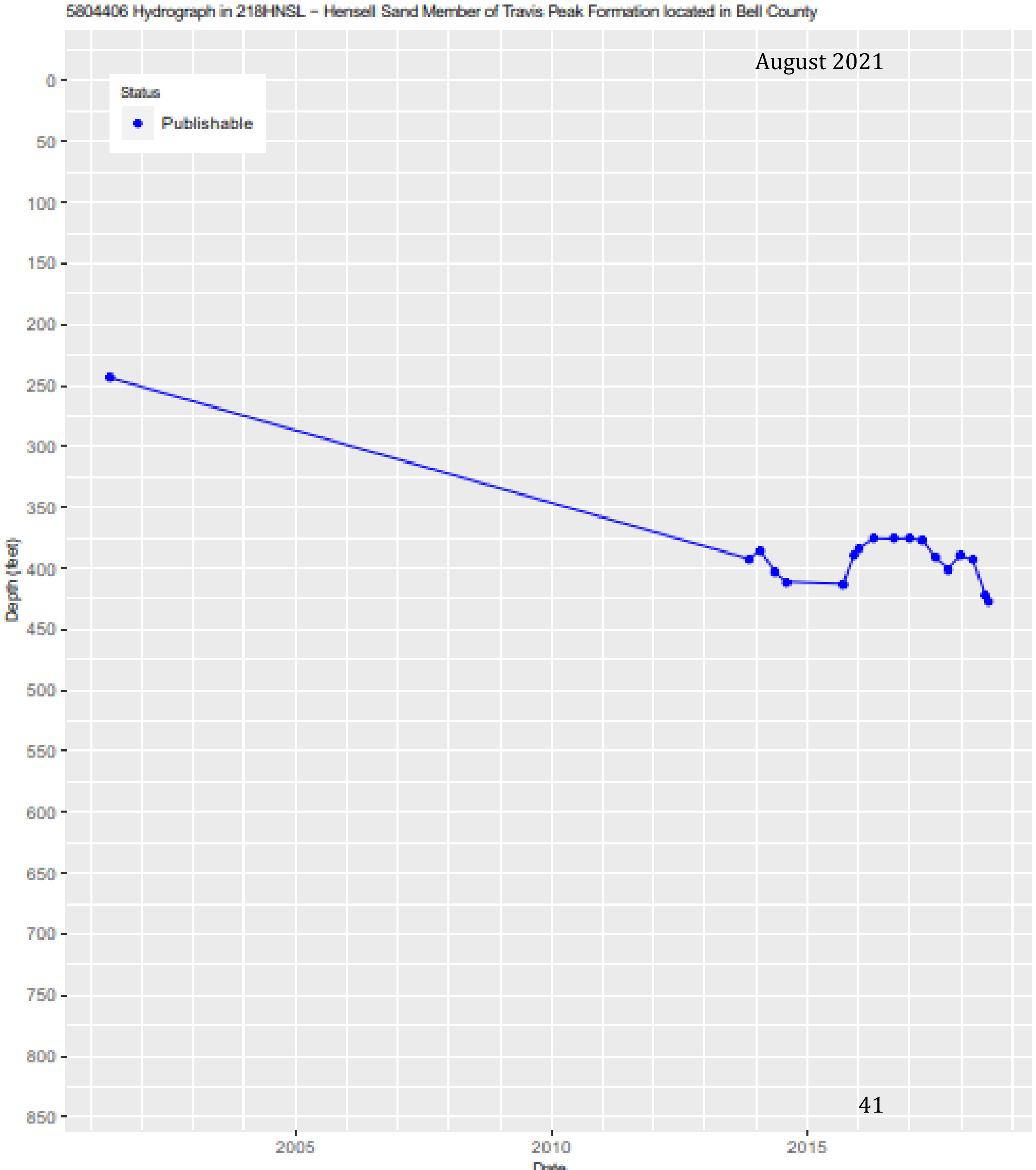

Subsidence Impacts

Key Factors Impacting Subsidence

1. Clay layer distribution, thickness, & compressibility
2. Amount and timing of water level changes
3. Lowest historical water level

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TWDB Subsidence Tool- What Is It?

— Developed in 2017

— Helps GCDs identify risk subsidence due to groundwater pumping

— Capable in identifying risk subsidence in all major/minor aquifers in Texas

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Subsidence: Using the Tool

— Tool requires a geophysical log, adequate water level data, water quality data, and the DFC

— The log is used to determine aquifer top, bottom, thickness, and clay thickness in the *aquifer*

— Ideally, a predevelopment water level, a 2010 water level, and a current water level is available

— Current GCD or TWDB observation wells are the best candidates.

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Subsidence

— How Is Subsidence Estimated?
- *Saturated thickness and extent of clay*
- *Clay compressibility*
- *Aquifer lithology*
- *Pre-consolidation characterization*
- *Predicted DFC water level decline*

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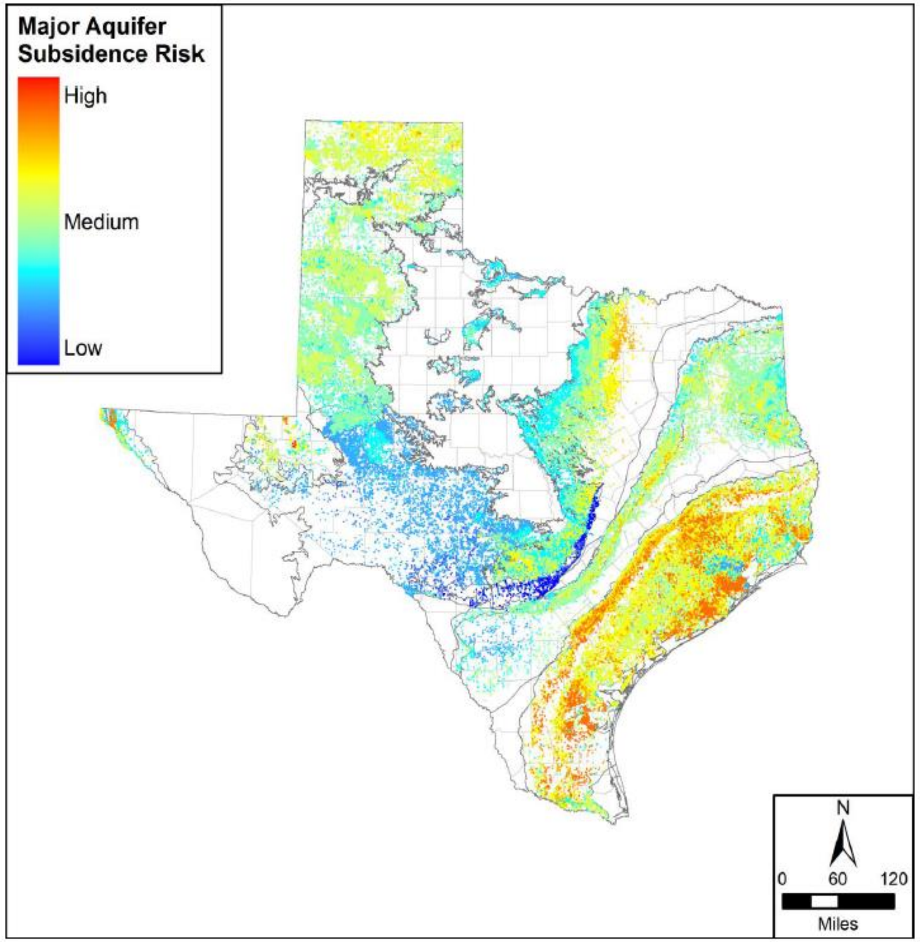
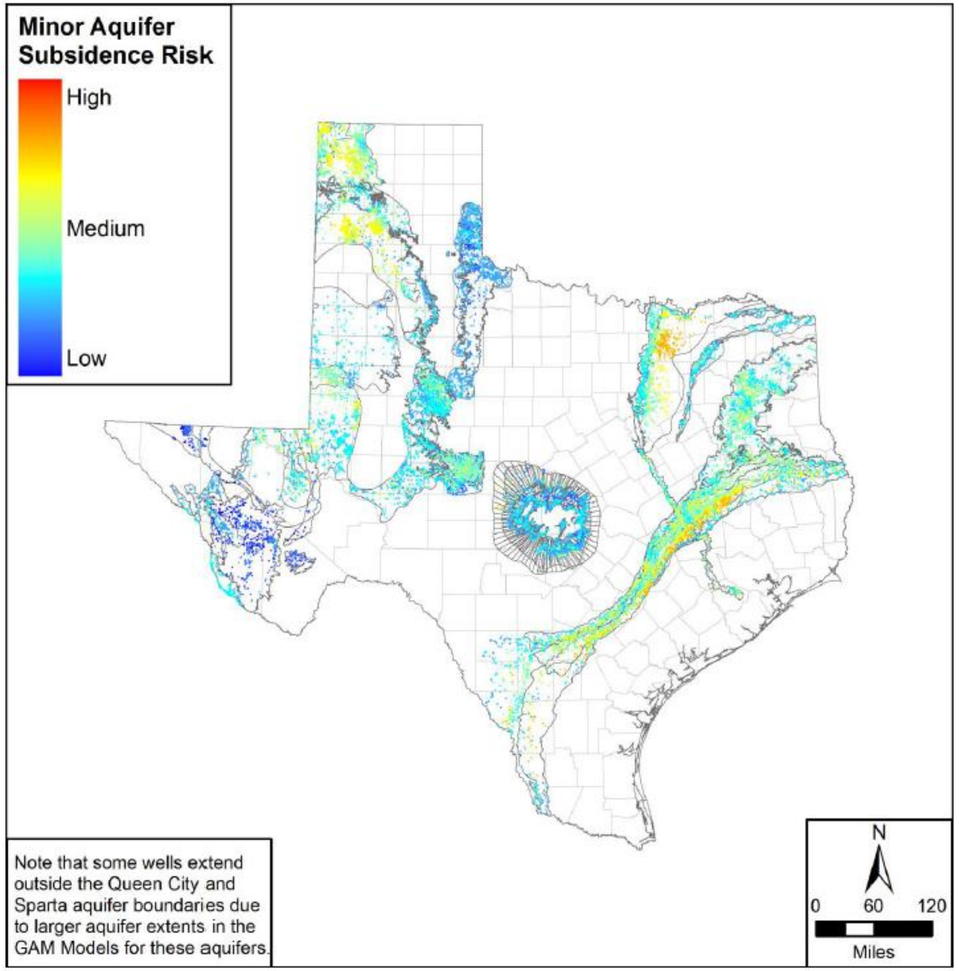
Visualizing the Subsidence Risk

- 340,000 wells statewide
- "High Risk" include Yegua Jackson and Gulf Coast
- "Low Risk" include igneous and Edwards aquifers
- *The only common characteristic shared by all "High Risk" aquifers is that they all have unconsolidated clastic aquifers*





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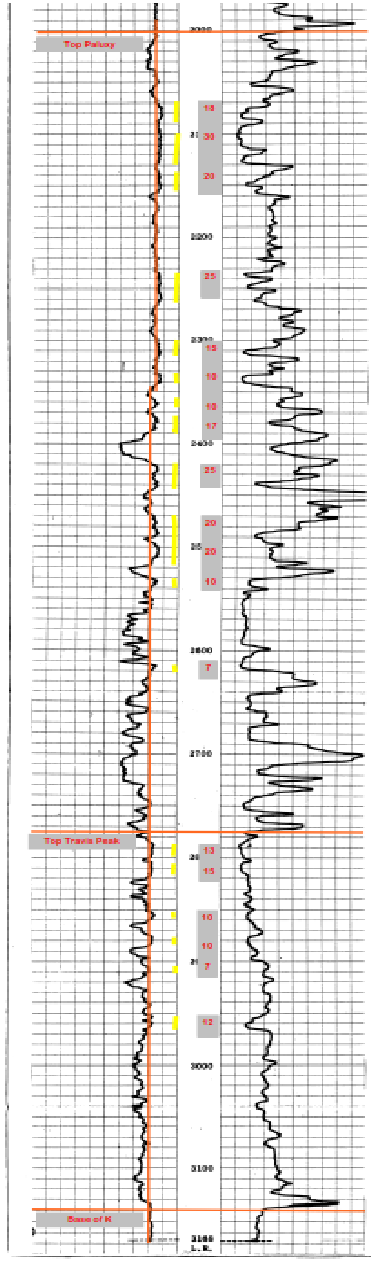
The Localized Evaluation Process

1. Identify the downdip area
2. Find TWBD or GCD wells that meet available data criteria
3. Analyze logs to determine aquifer thickness and clay thickness
4. Calculate the risk using the tool

Rockett SUD 33-26-902
Clay thickness = 294 feet



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Subsidence Calculations

Aquifer	**Trinity**
Report Generated by	K. Laughlin
Report Date	3/13/2019
Well Name	33-26-902 Rockett SUD
Water Levels to Use for Predictions	Base and Future

Location and Water Level Based User Input	User Input Values	Units
Land Surface (feet MSL)	592	feet
Aquifer Top (feet MSL)	-1,408	feet
Aquifer Thickness	1,140	feet
Clay Thickness within Aquifer	294	feet
Groundwater Temperature	44	Degrees Celsius
Groundwater Total Dissolved Solids (TDS)	1,295	mg/l
Predevelopment Water Level (feet MSL)	32	feet
Current Water Level (feet MSL)	-709	feet
Unsaturated Thickness	1,301	feet
Preconsolidation (deepest) Water Level (feet MSL)	-603	feet
Base Water Level (feet MSL)	-579	feet
Future Water Level (feet MSL)	-880	feet
Beginning Year for Subsidence Evaluation	2010	year
Ending Year for Subsidence Evaluation	2070	year

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Subsidence Risk Results

Aquifer Subsidence Calculations based on overall aquifer information and user supplied input values		Units
Water Level Trend	-5.01	ft/year; negative for decline
Predominant Aquifer Lithology	Consolidated Clastic	Description
Aquifer Storage Coefficient	0.0001	Dimensionless
Aquifer Porosity	25	Percent
Predominant Aquifer Clay Type	Stiff Clay	Type
Aquifer Clay Porosity	50	Percent
Minimum Aquifer Compressibility	8.96E-05	psi^{-1}
Maximum Aquifer Compressibility	1.38E-04	psi^{-1}
Minimum Clay Compressibility	8.96E-04	psi^{-1}
Maximum Clay Compressibility	1.79E-03	psi^{-1}
Minimum Elastic Specific Storage (S_{ske})	2.41E-07	ft^{-1}
Maximum Elastic Specific Storage (S_{ske})	4.57E-07	ft^{-1}
Minimum Inelastic Specific Storage (S_{skv})	2.41E-05	ft^{-1}
Maximum Inelastic Specific Storage (S_{skv})	4.57E-05	ft^{-1}
Total Weighted Risk for Well 0 (low risk) to 10 (high risk)	**7.66**	

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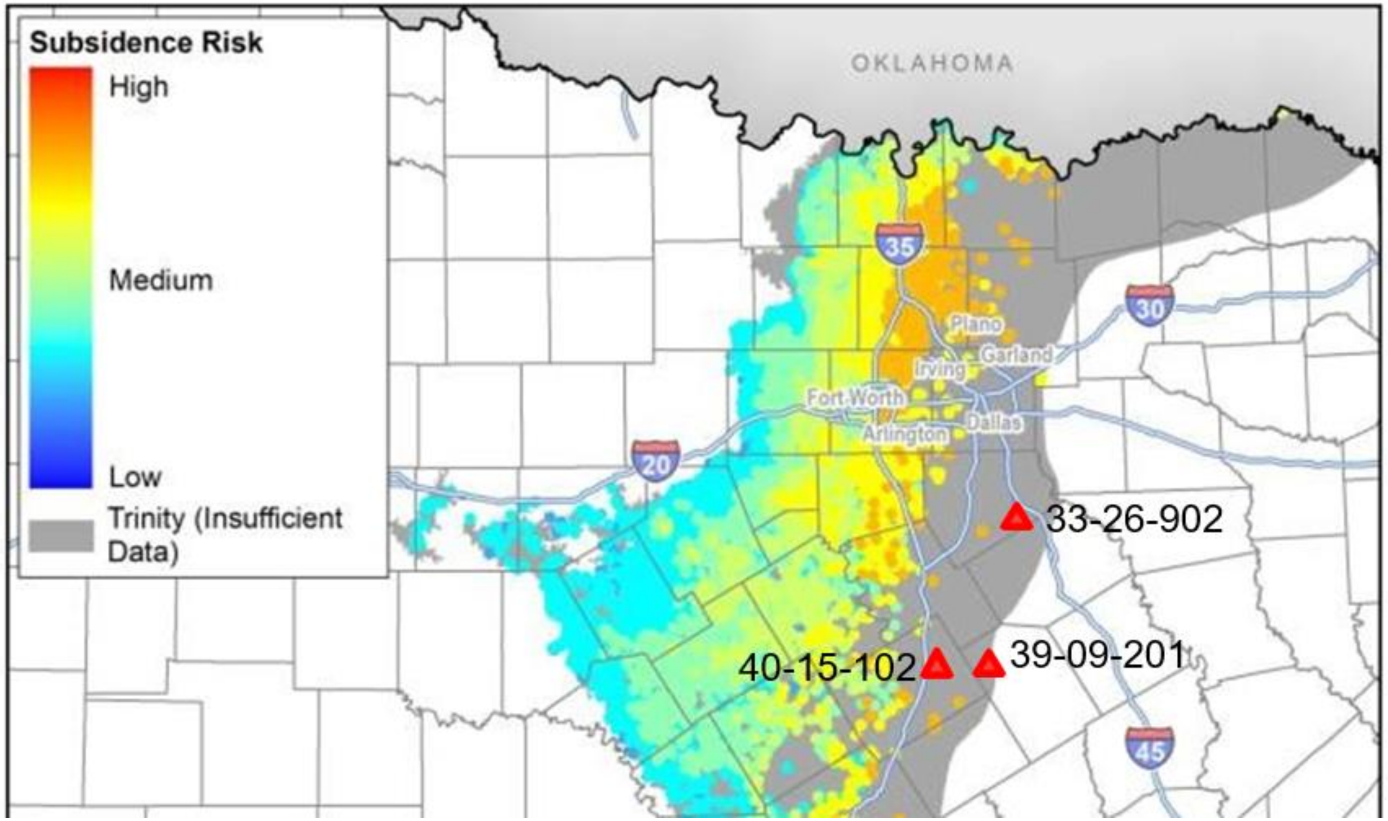
Prairielands GCD (and nearby)

Well Owner	State Well ID	Aquifer Thickness (feet)	Clay Thickness (feet)	**Subsidence Risk Score**	Minimum Subsidence (feet)	Maximum Subsidence (feet)
Rockett SUD	33-26-902	1,140	668	**7.66**	0.6	1.2
Penelope WSC	39-09-201	1,440	299	**8.59**	3.0	6.0
Aquilla	40-15-102	835	294	**7.66**	2.5	4.5



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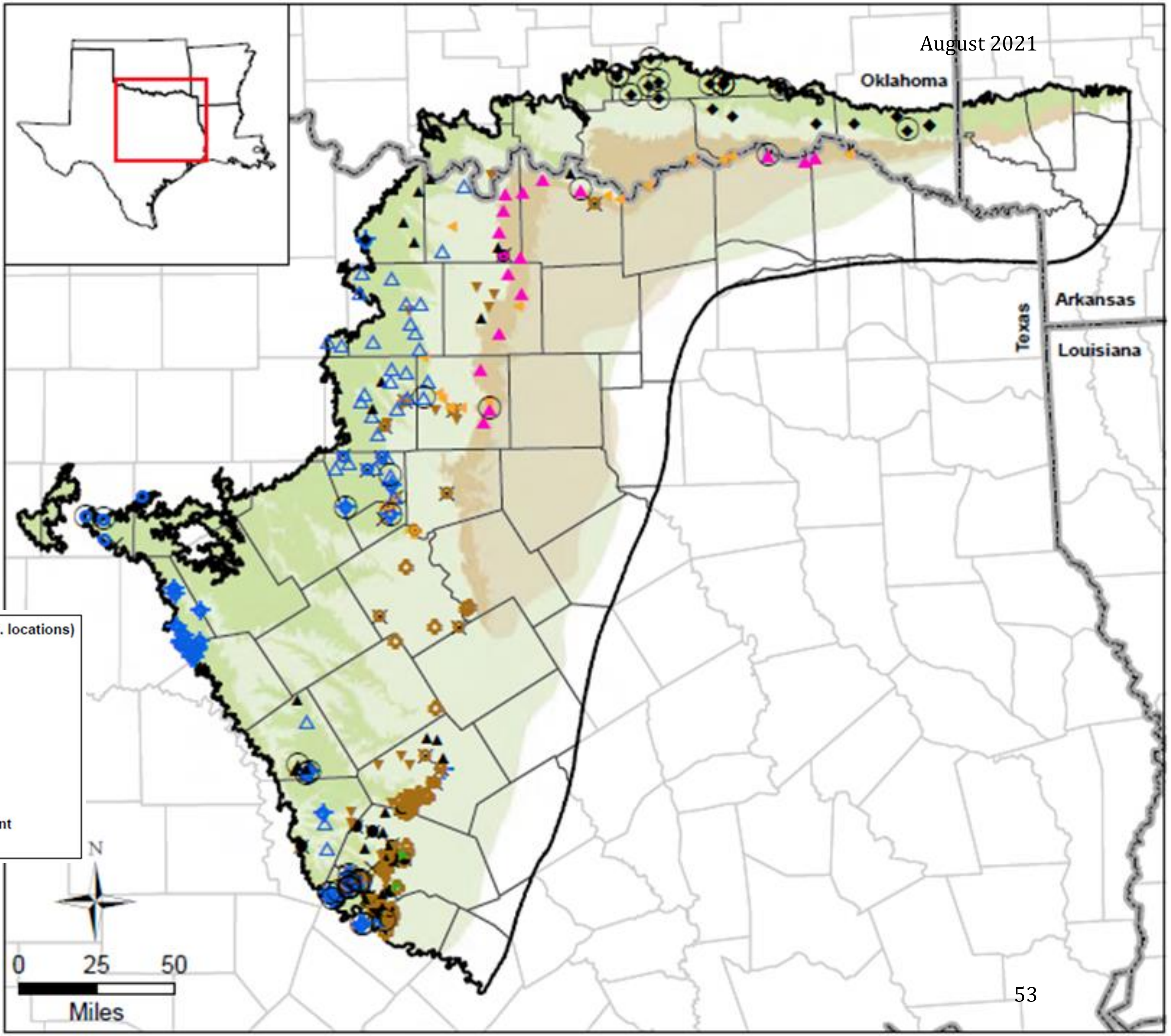
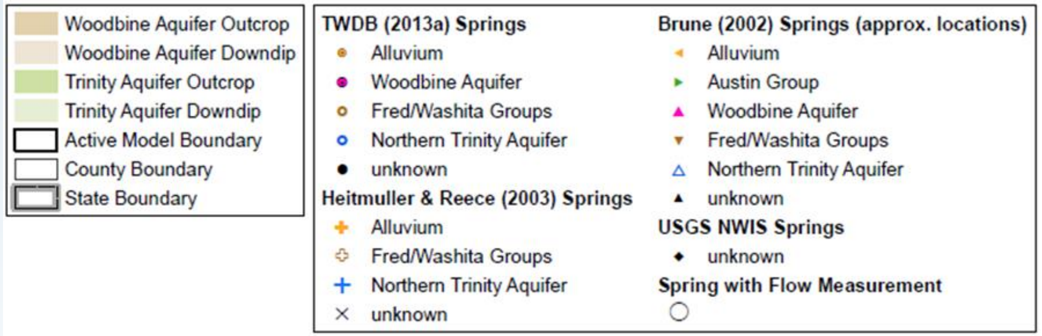
Environmental Impacts

Environmental Impacts: Spring Locations





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Environmental Impacts: Spring Discharge and Streamflow

— Southern portion of GMA 8 has the greatest density of springs.

— Most are in the Washita/Fredericksburg, which includes Edwards BFZ.

— Many located in far western extent of GMA 8.

— Springs flow when the water level elevation of the aquifer is higher than the spring elevation.

— Water level declines reduce spring flow in the model

Environmental Impacts Summary

- NTGAM includes boundary conditions to represent :
  - *Springs*
  - *Ephemeral streams*
  - *Perennial streams*

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- Water budgets from Run 10 in existing ER indicate reduced spring flows and baseflows where DFCs include water level decline in aquifer outcrop areas.

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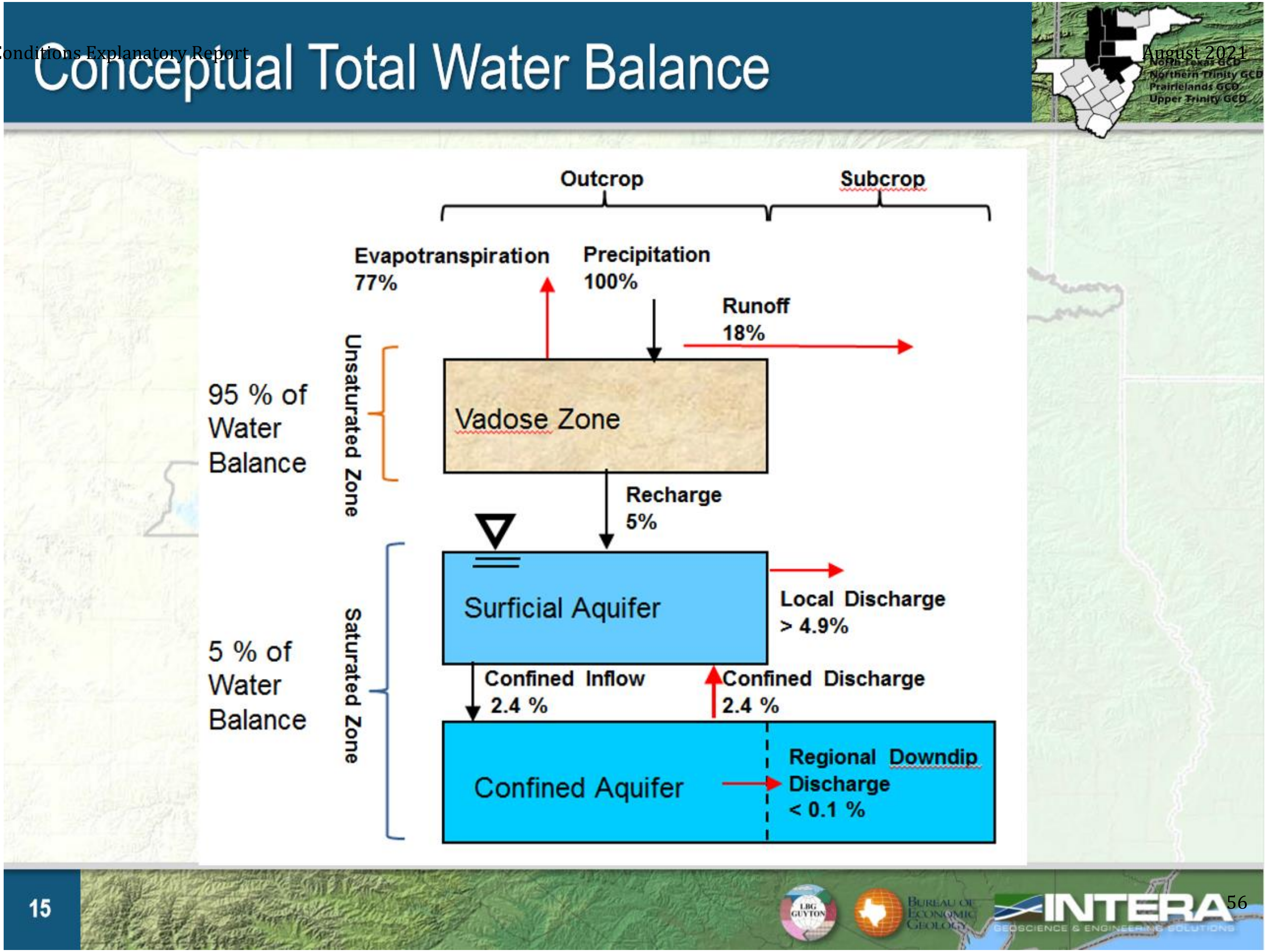
Conceptual Total Water Balance
North Texas GCD
Northern Trinity GCD
Prairielands GCD
Upper Trinity GCD
Outcrop
Subcrop
Evapotranspiration
77%
Precipitation
100%
Runoff
18%
95 % of
Water
Balance
Unsaturated Zone
Vadose Zone
Recharge
5%
Surficial Aquifer
Local Discharge
> 4.9%
5 % of
Water
Balance
Saturated Zone
Confined Inflow
2.4 %
Confined Discharge
2.4 %
Confined Aquifer
Regional Downdip
Discharge
< 0.1 %
15
Bureau of Economic Geology
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

Environmental Impacts:
ER Run 10 Water Budget Examples

NTGCD Run 10 - Johnson County - Wash/Fred Aquifer							
Component	2010	2020	2030	2040	2050	2060	2070
Lateral Flow	-2,882	-2,920	-2,927	-2,944	-2,960	-2,969	-2,977
Leakage (Above)	1,105	1,022	1,039	1,068	1,096	1,122	1,140
Leakage (Below)	-4,767	-4,214	-4,234	-4,279	-4,313	-4,336	-4,354
Recharge	17,488	17,488	17,488	17,488	17,488	9,023	17,488
Perennial	-145	-125	-122	-120	-119	-104	-117
Ephemeral	-15,345	-14,345	-13,842	-13,474	-13,168	-12,558	-12,499
Evapotransipration	0	0	0	0	0	0	0
Springs	-22	-20	-20	-19	-19	-18	-18
Reservoir	122	124	125	127	128	129	130
Wells	-2,554	-2,554	-2,554	-2,554	-2,554	-2,554	-2,554
Flowing	0	0	0	0	0	0	0
Storage	7,093	5,636	5,140	4,800	4,514	12,356	3,854
Total	92	92	92	92	93	92	93

18% decline

30% decline

NTGCD Run 10 - Somervell County - Hensell Aquifer							
Component	2010	2020	2030	2040	2050	2060	2070
Lateral Flow	2,051	1,909	1,834	1,791	1,761	1,740	1,722
Leakage (Above)	1,984	2,335	2,480	2,557	2,602	2,624	2,646
Leakage (Below)	-720	-1,035	-1,139	-1,194	-1,227	-1,249	-1,266
Recharge	308	308	308	308	308	164	308
Perennial	-1,935	-1,681	-1,564	-1,488	-1,435	-1,343	-1,353
Ephemeral	0	0	0	0	0	0	0
Evapotranspiration	0	0	0	0	0	0	0
Springs	0	0	0	0	0	0	0
Reservoir	0	0	0	0	0	0	0
Wells	-2,127	-2,127	-2,127	-2,127	-2,127	-2,127	-2,127
Flowing	0	0	0	0	0	0	0
Storage	440	292	208	154	118	191	70
Total	0	0	0	0	0	0	0

Summary of Impacts to Springs and Perennial/Ephemeral Streams

GCD or County	Percent Difference from 2010 to 2070 Perennial	Percent Difference from 2010 to 2070 Ephemeral	Percent Difference from 2010 to 2070 Springs
Clearwater UWCD	18	34	79
Middle Trinity GCD	19	16	100
ND Brown	0	9	11
Central Texas GCD	35	14	0
ND Callahan	0	8	0
North Texas GCD	11	14	18
ND Dallas	31	0	0
ND Eastland	0	14	0
Prairielands GCD	29	19	20
Red River GCD	7	11	0
ND Hamilton	16	21	0
Upper Trinity GCD	36	21	24
ND Jack	0	38	0
ND Lamar	2	5	16
Saratoga UWCD	7	7	3
Southern Trinity GCD	17	26	0
ND Mills	-3	7	0
ND Palo Pinto	0	12	0
ND Red River	4	5	0
Northern Trinity GCD	15	19	28
ND Taylor	0	2	0
ND Travis	NA	22	0
ND Williamson	NA	31	0

*Positive values indicate decline, and negative values indicate increase

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Agenda Item 10

- Discussion of possible agenda items and dates for next GMA 8 meeting

GMA 8 Schedule to Discuss Nine Factors

November 2019

Environmental Impacts	Subsidence Impacts	Hydrological Conditions

February 2020

Aquifer Uses or Conditions	Supply Needs & Management Strategies	Private Property Rights

May 2020

Socioeconomic Impacts	DFC Feasibility	Other Relevant Information

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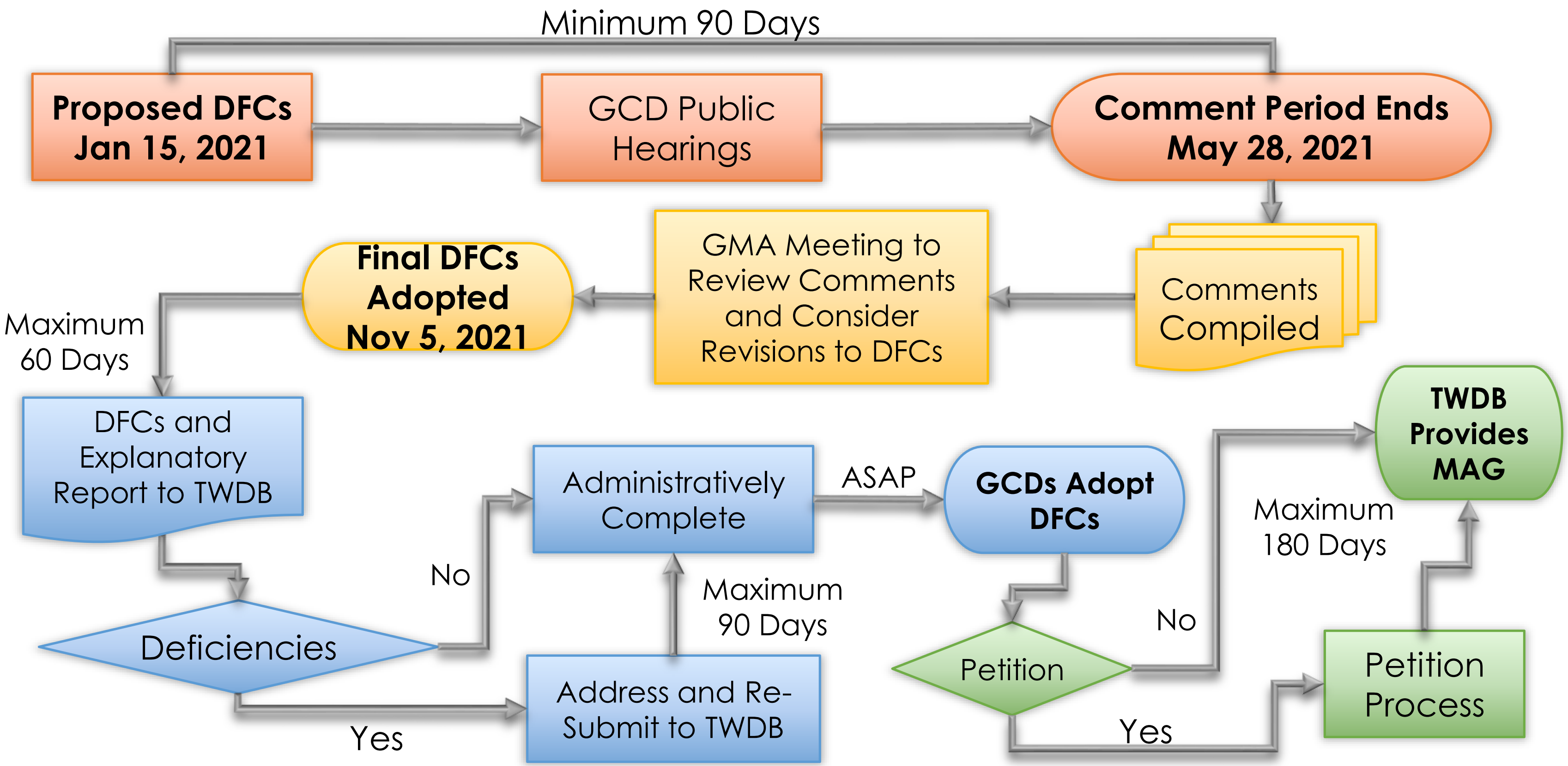
WSP Team Approach to Preparing the Explanatory Report
(Texas Water Code Section 36.108(d-3))

- Use GMA 8 second round of DFC joint planning ER as starting point
- Update ER discussion and appendices as needed
- WSP Team presents and reviews 1st ER draft – August 2020
- GMA 8 considers ER approval – November 2020

Anticipated Timeline for GMA 8 DFC Process



Thank you!

wsp.com

GMA 8
Joint Groundwater Planning Meeting

February 26, 2020

Blanton & Associates, Inc.
Environmental Consulting • Planning • Project Management

Agenda Item 6
Discussion and possible action on results from updated NTWGAM run related to Joint Planning in GMA 8

- Run 11 – Update of NTWGAM DFC/MAG Run
- WSP has received pumping updates from:
  - *Upper Trinity GCD*
  - *Southern Trinity GCD*
  - *Prairielands GCD*

- WSP is working with Central Texas GCD to complete simulations related to impacts in the Llano Uplift aquifers using the Llano Uplift GAM
  - *Central Texas GCD is funding this effort separately*

wsp

2

Upper Trinity GCD pumping

Aquifer	O/D*	County	acft
Glen Rose	Outcrop	Hood	792
Glen Rose	Downdip	Hood	125
Paluxy	Outcrop	Hood	159
Twin Mountains	Outcrop	Hood	5,025
Twin Mountains	Downdip	Hood	10,768
Antlers	Outcrop	Montague	6,114
Antlers	Downdip	Montague	
Antlers	Outcrop	Parker	2,905
Antlers	Downdip	Parker	
Glen Rose	Outcrop	Parker	3,684
Glen Rose	Downdip	Parker	1,406
Paluxy	Outcrop	Parker	2,614
Paluxy	Downdip	Parker	50
Twin Mountains	Outcrop	Parker	1,294
Twin Mountains	Downdip	Parker	2,527
Antlers	Outcrop	Wise	9,106
Antlers	Downdip	Wise	2,439
TOTAL			**49,009**

*O/D refers to the "outcrop" or "downdip" portion of each aquifer

3

Upper Trinity GCD pumping

Aquifer	O/D	County	Run 10 AFY	Adjustment	Run 11 AFY
Glen Rose	Outcrop	Hood	654	138	792
Glen Rose	Downdip	Hood	103	22	125
Paluxy	Outcrop	Hood	159	0	159
Twin Mountains	Outcrop	Hood	3,674	1,351	5,025
Twin Mountains	Downdip	Hood	7,854	2,914	10,768
Antlers	Outcrop	Montague	3,878	2,236	6,114
Antlers	Downdip	Montague			
Antlers	Outcrop	Parker	2,899	6	2,905
Antlers	Downdip	Parker			
Glen Rose	Outcrop	Parker	2,290	1,394	3,684
Glen Rose	Downdip	Parker	874	532	1,406
Paluxy	Outcrop	Parker	2,609	5	2,614
Paluxy	Downdip	Parker	50	0	50
Twin Mountains	Outcrop	Parker	1,074	220	1,294
Twin Mountains	Downdip	Parker	2,083	444	2,527
Antlers	Outcrop	Wise	7,702	1,404	9,106
Antlers	Downdip	Wise	2,058	381	2,439
-	-	Total	37,961	11,048	49,009

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Southern Trinity GCD pumping

Year	Hosston Run 10 AFY	Adjustement for Hosston	Hosston Run 11 AFY
2010	15,937	-4,135	11,802
2011	15,937	-4,635	11,302
2012	15,937	-5,361	10,576
2013	15,937	-6,978	8,959
2014	15,937	-8,424	7,513
2015	15,937	-7,565	8,372
2016	15,937	-7,074	8,863
2017	15,937	-7,929	8,008
2018	15,937	-8,130	7,807
2019	15,937	-8,135	7,802
2020-2070	15,937	0	15,937

5

Prairielands GCD pumping

Aquifer	Run 10 AFY	Adjustment	Run 11 AFY
Woodbine	4,642	-2,475	2,168
Fred/Wash	3,112	-2,822	290
Paluxy	3,250	-1,460	1,790
Glen Rose	1,944	-1,615	329
Hensell	3,603	-3,011	593
Pearsall	98	2,810	2,908
Hosston	13,237	8,572	21,810
Total	29,887	0	29,887

6

Run 11 Results - DFC

- DFC differences between Run 10 and Run 11
- Blue negative values indicate higher water levels
- Red positive values indicate greater drawdowns

7

Run 11 – Change in Drawdown in 2070

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Bell	-	1	4	-	10	6	11	-
Bosque	-	1	11	-	70	38	97	-
Brown	-	0	0	-	0	0	0	0
Burnet	-	-	0	-	2	0	0	-
Callahan	-	-	-	-	-	-	-	0
Collin	4	15	23	59	-	-	-	36
Comanche	-	0	0	-	1	0	0	0
Cooke	0	-	-	-	-	-	-	13
Coryell	-	0	2	-	11	7	14	-
Dallas	-16	-3	20	144	206	71	230	-
Delta	-	10	11	-	13	-	-	-
Denton	0	1	14	71	-	-	-	26
Eastland	-	-	-	-	-	-	-	0

8

Run 11 – Change in Drawdown in 2070

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Ellis	-65	-30	20	297	251	87	288	-
Erath	-	0	0	2	7	0	7	1
Falls	-	14	22	-	34	31	34	-
Fannin	3	14	17	37	23	-	-	16
Grayson	1	10	16	38	-	-	-	16
Hamilton	-	0	0	-	5	2	9	-
Hill	-15	-14	16	-	201	82	245	-
Hunt	14	19	22	40	32	-	-	-
Johnson	-13	-60	-50	61	148	45	219	-
Kaufman	13	44	61	111	125	89	132	-
Lamar	1	3	5	-	8	-	-	7
Lampasas	-	0	0	-	0	0	1	-
Limestone	-	22	52	-	83	69	83	-

9

Run 11 – Change in Drawdown in 2070

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
McLennan	1	8	24	-	69	48	78	-
Milam	-	-	8	-	10	7	10	-
Mills	-	0	0	-	2	0	0	-
Navarro	-30	-9	68	-	145	101	145	-
Red River	0	1	2	-	3	-	-	1
Rockwall	11	33	40	84	-	-	-	-
Somervell	-	0	0	40	46	3	95	-
Tarrant	-2	-15	4	79	-	-	-	33
Taylor	-	-	-	-	-	-	-	0
Travis	-	-	1	-	3	0	2	-
Williamson	-	-	1	-	3	1	3	-

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Run 11 – Change in Drawdown in 2070

County	O/D	Paluxy	Glen Rose	Twin Mnts	Antlers
Hood	Downdip	-	4	36	-
Hood	Outcrop	0	1	9	-
Montague	Downdip	-	-	-	-
Montague	Outcrop	-	-	-	21
Parker	Downdip	0	20	34	-
Parker	Outcrop	0	7	5	33
Wise	Downdip	-	-	-	14
Wise	Outcrop	-	-	-	25

11

Run 11 Results

- Drawdown (feet) from 2010 to the end of 2080

12

Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Bell	-	20	91	0	311	147	348	0
Bosque	-	7	61	0	241	169	302	0
Bowie	-	-	-	0	-	0	0	-
Brown	-	2	1	0	2	1	1	2
Burnet	0	0	2	0	19	6	21	0
Callahan	-	0	0	0	0	0	0	1
Collin	486	740	383	605	-	0	0	623
Comanche	-	2	2	0	4	2	3	12
Cooke	2	0	0	0	0	0	0	195
Coryell	-	5	17	0	113	74	147	0
Dallas	120	339	300	627	577	422	603	0
Delta	-	288	207	0	213	0	0	0
Denton	20	558	376	803	0	0	0	432
Eastland	-	0	0	0	0	0	0	4

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Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Ellis	8	93	229	646	575	365	617	0
Erath	-	6	6	8	27	13	40	13
Falls	-	165	246	0	506	311	512	0
Fannin	262	721	320	429	310	0	0	282
Franklin	-	-	-	0	-	0	0	0
Grayson	163	952	377	475	0	0	0	376
Hamilton	-	2	4	0	30	16	44	0
Hill	4	28	156	0	512	277	595	0
Hopkins	-	-	-	0	-	0	0	0
Hunt	643	626	344	430	375	0	0	0
Johnson	-10	-118	13	220	337	177	456	0
Kaufman	248	345	351	515	471	420	449	0
Lamar	43	103	112	0	131	0	0	139
Lampasas	-	1	1	0	6	1	12	0
Limestone	-	214	335	0	489	263	501	0

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Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
McLennan	7	46	163	0	547	276	630	0
Milam	0	0	230	0	367	247	368	0
Mills	-	1	1	0	9	2	13	0
Navarro	76	126	315	0	454	373	455	0
Red River	2	25	41	0	60	0	0	15
Rockwall	282	458	374	533	-	0	0	0
Somervell	-	4	4	73	99	30	180	0
Tarrant	4	89	159	401	0	0	0	185
Taylor	-	0	0	0	0	0	0	0
Travis	0	0	84	0	153	55	158	0
Williamson	0	0	82	0	183	79	187	0

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Run 11 Results – Drawdown (2010-2080)

County	O/D	Paluxy	Glen Rose	Twin Mnts	Antlers
Hood	Downdip	-	35	83	0
Hood	Outcrop	5	9	14	0
Montague	Downdip	0	0	0	-
Montague	Outcrop	0	0	0	40
Parker	Downdip	1	52	85	-
Parker	Outcrop	6	21	7	44
Wise	Downdip	0	0	0	159
Wise	Outcrop	0	0	0	61

Questions ?

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Agenda Item 7

- Presentations and discussions regarding Aquifer Uses or Conditions, Supply Needs & Management Strategies, and Private Property Rights factors as they relate to Desired Future Conditions pursuant to Texas Water Code Section 36.108(d).

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GMA 8 Schedule to Discuss Nine Factors

November 2019

- Environmental Impacts
- Subsidence Impacts
- Hydrological Conditions

February 2020

- Aquifer Uses or Conditions
- Supply Needs & Management Strategies
- Private Property Rights

May 2020

- Socioeconomic Impacts
- DFC Feasibility
- Other Relevant Information

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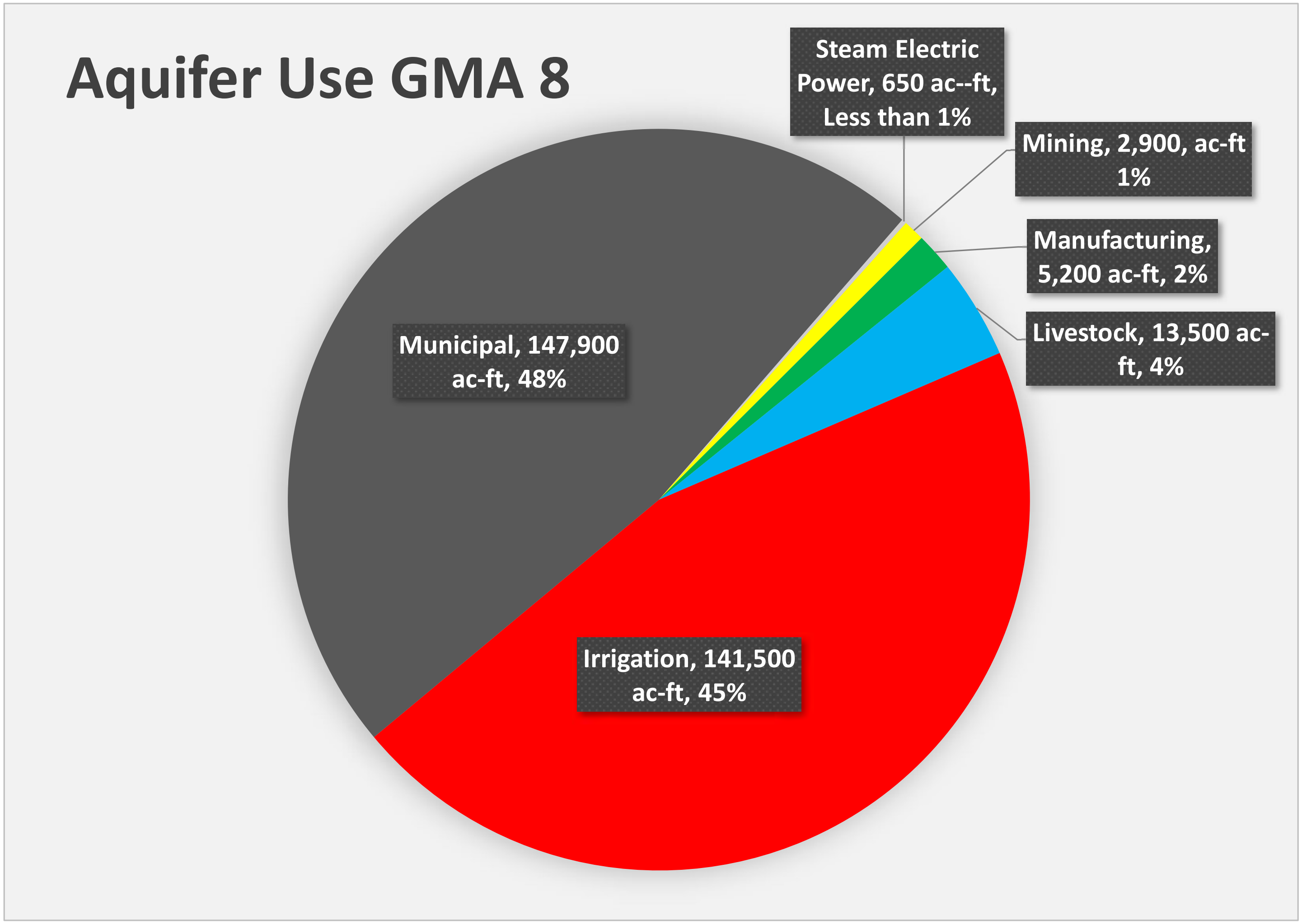
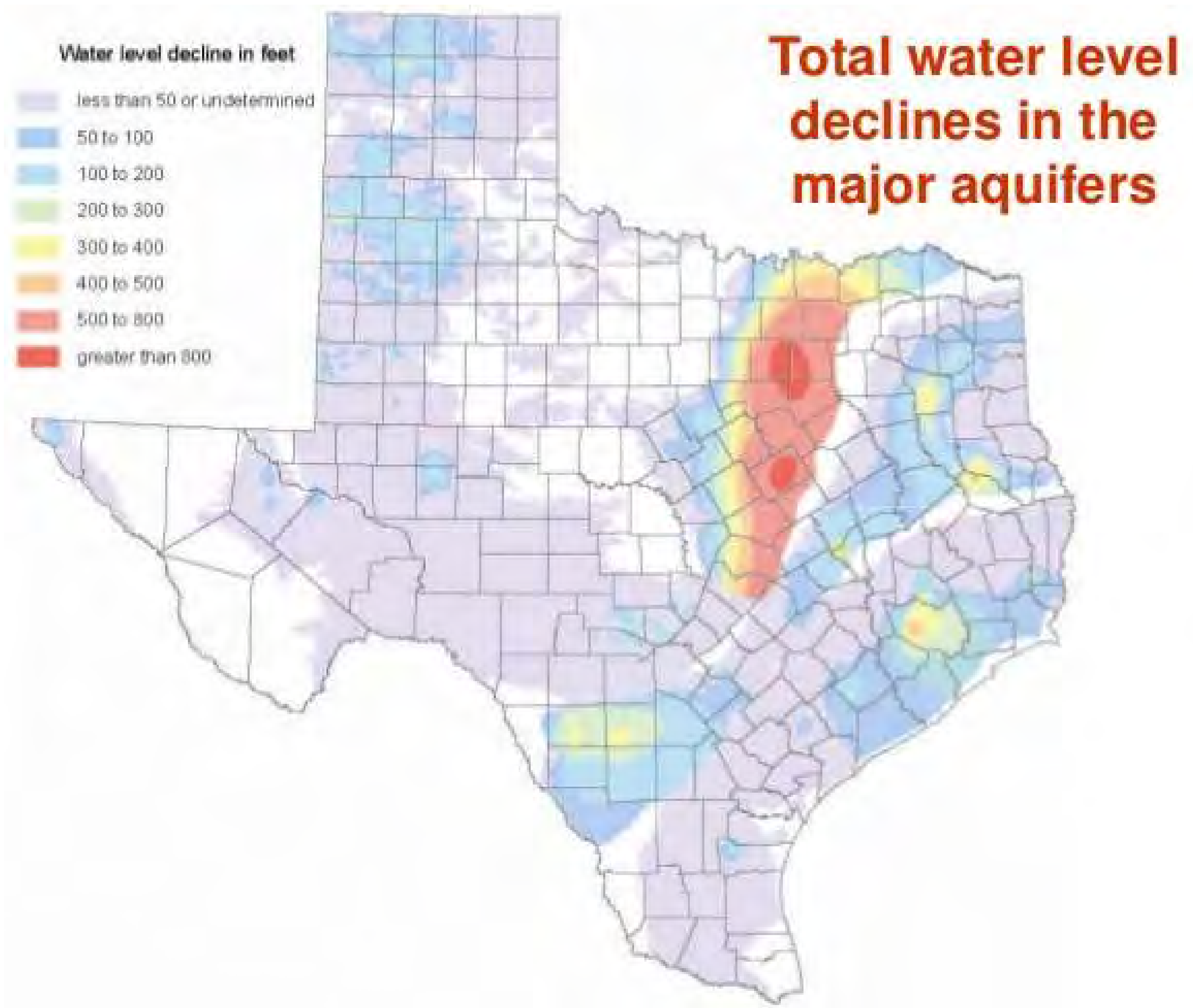
Aquifer Uses or Conditions

- Aquifer Uses
  - TWDB historic use data

- Aquifer Conditions
  - Water level hydrographs
  - Presented at last meeting and made available

20


Aquifer Use GMA 8
Steam Electric Power, 650 ac--ft, Less than 1%
Mining, 2,900, ac-ft 1%
Manufacturing, 5,200 ac-ft, 2%
Livestock, 13,500 ac-ft, 4%
Municipal, 147,900 ac-ft, 48%
Irrigation, 141,500 ac-ft, 45%


Water level decline in feet
less than 50 or undetermined
50 to 100
100 to 200
200 to 300
300 to 400
400 to 500
500 to 800
greater than 800
Total water level declines in the major aquifers

Supply Needs & Management Strategies

- Taken from 2017 State Water Plan
- Supply Needs
  - Need = Supply is less than Future Demand
  - Need = Current Supply - Future Demands
- Management Strategies
  - Infrastructure strategies to meet needs
  - 2020 and 2050 strategies

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At a glance

Water Sources for New Strategies in GMA 8

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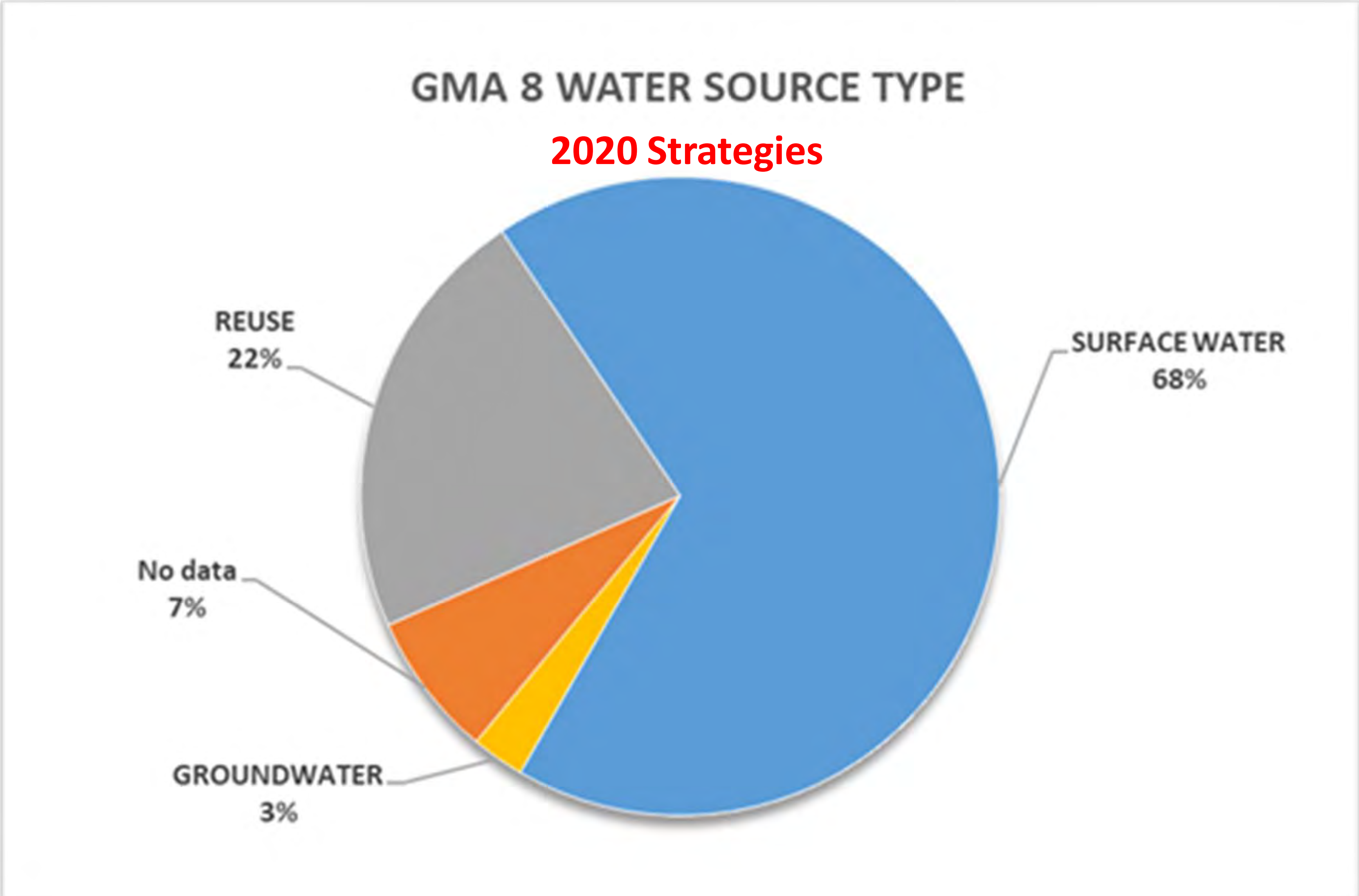
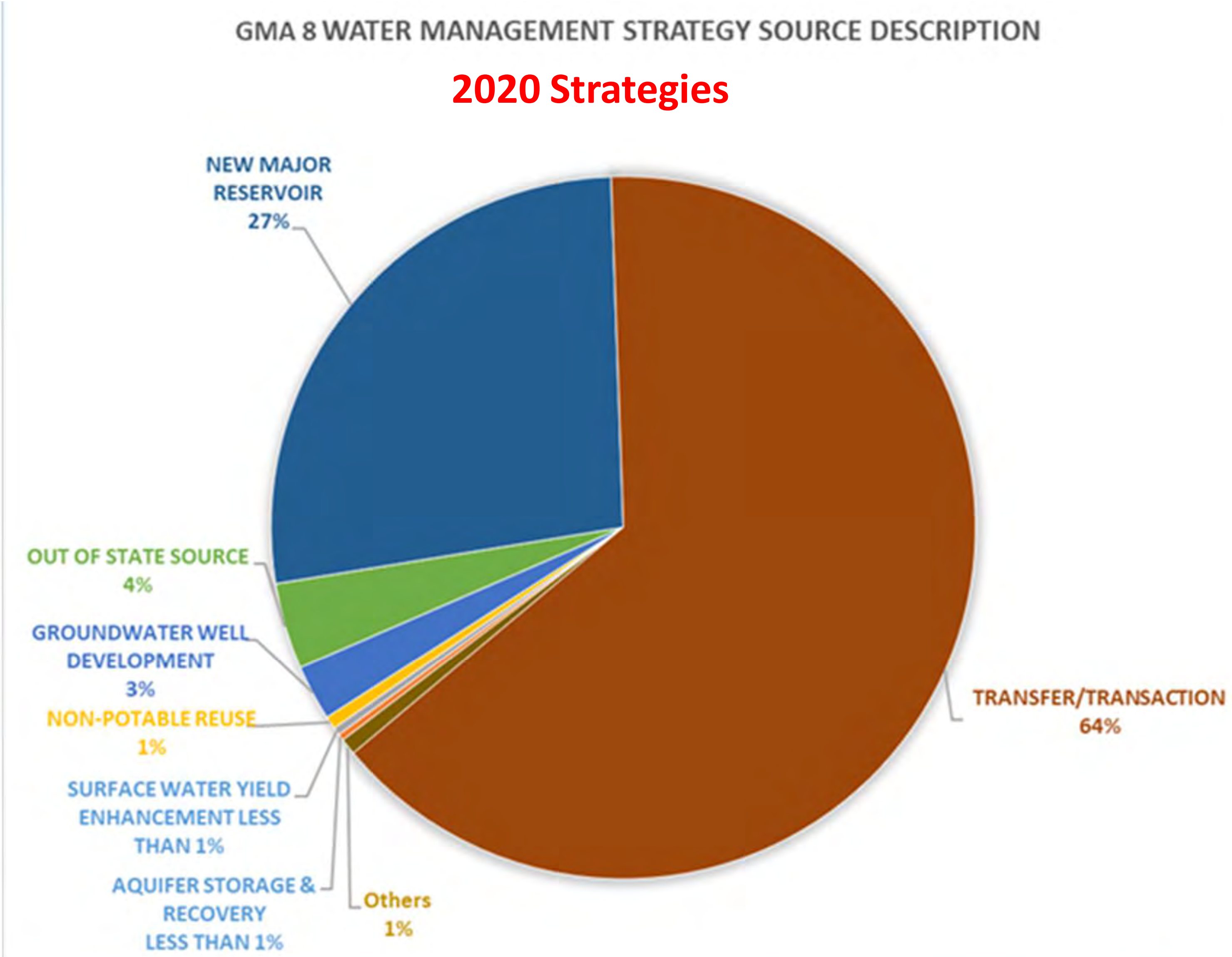
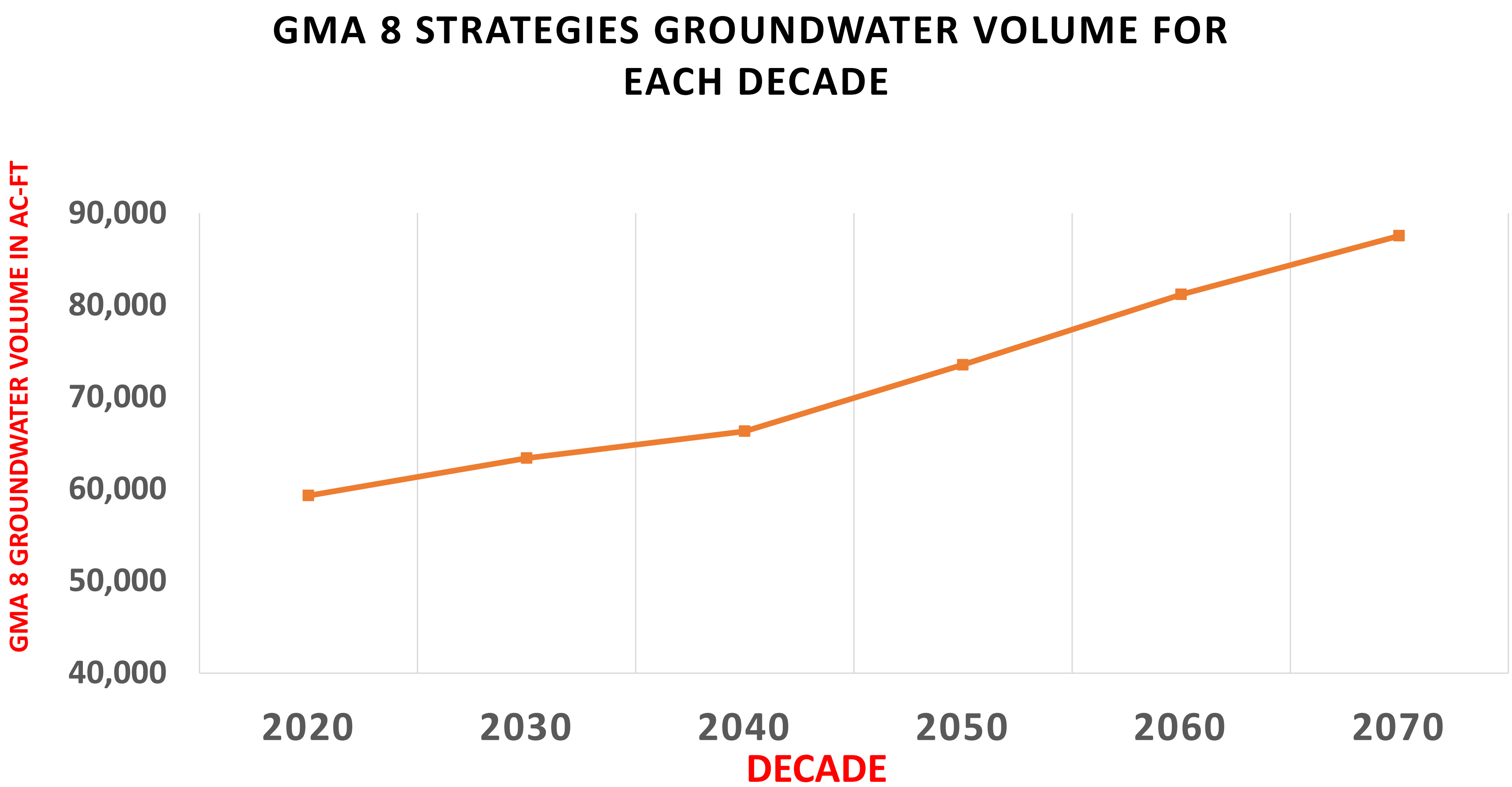


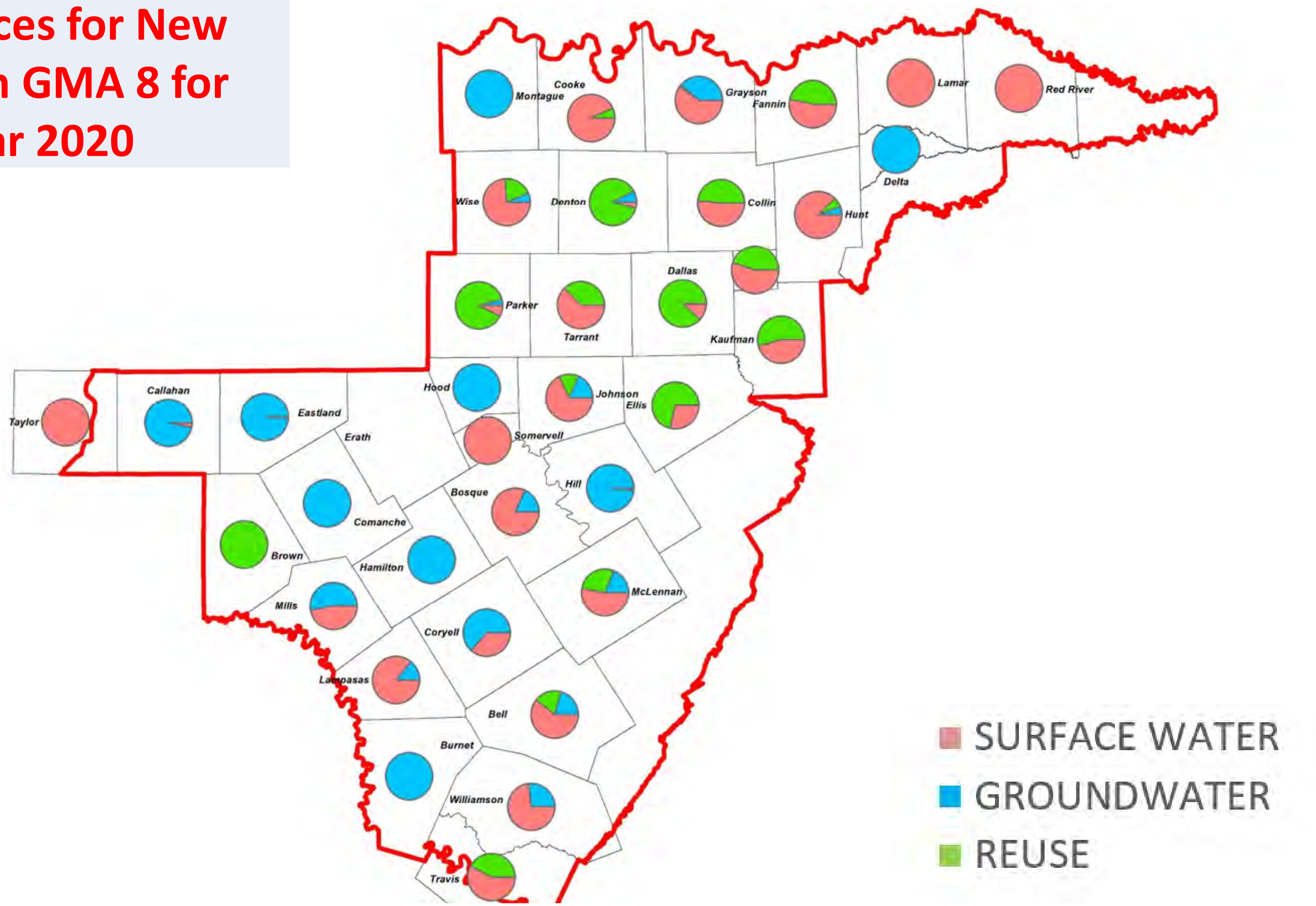
At a glance

Sources for New Strategies in GMA 8

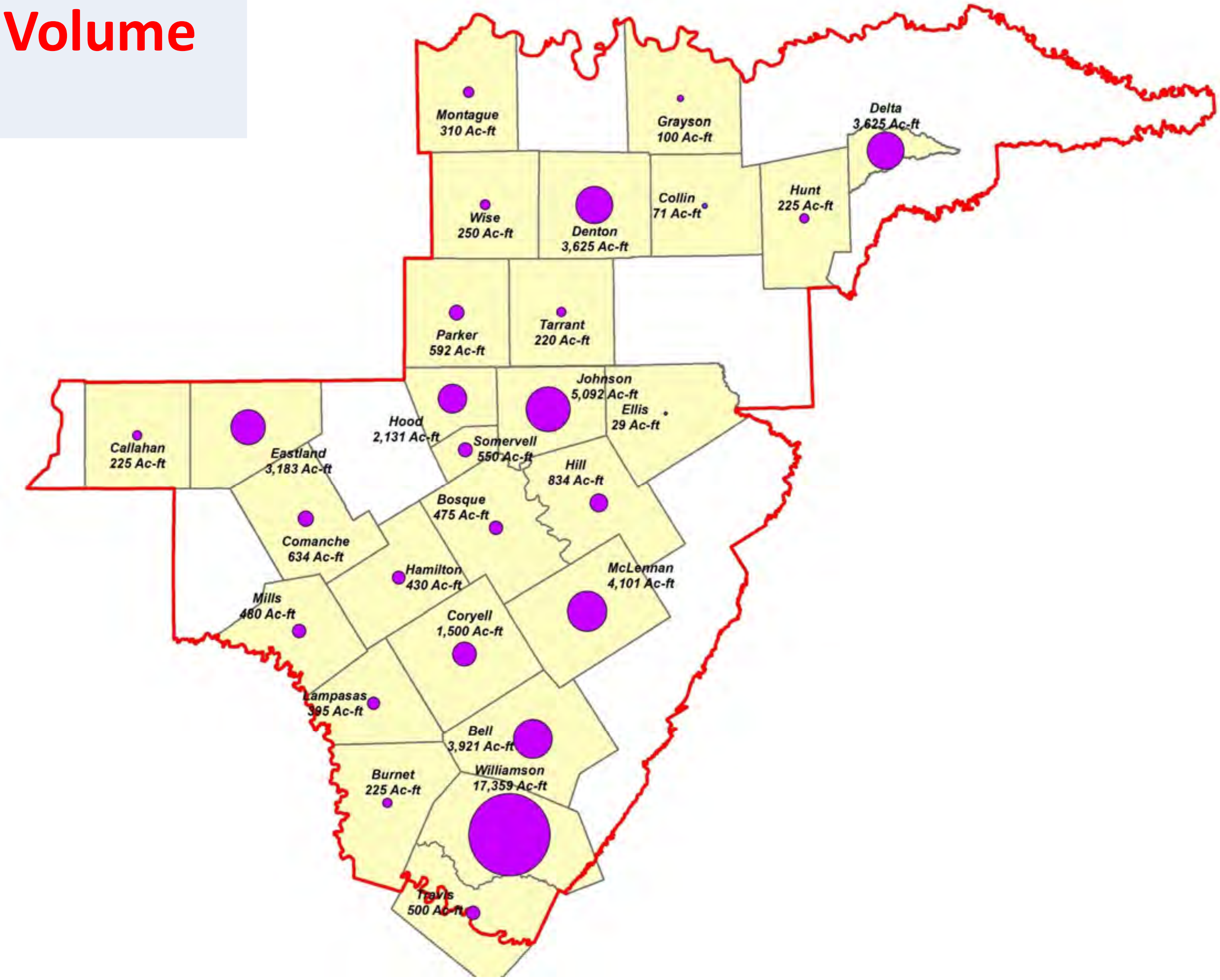



GMA 8 STRATEGIES GROUNDWATER VOLUME FOR EACH DECADE
GMA 8 GROUNDWATER VOLUME IN AC-FT
90,000
80,000
70,000
60,000
50,000
40,000
2020
2030
2040
2050
2060
2070
DECADE

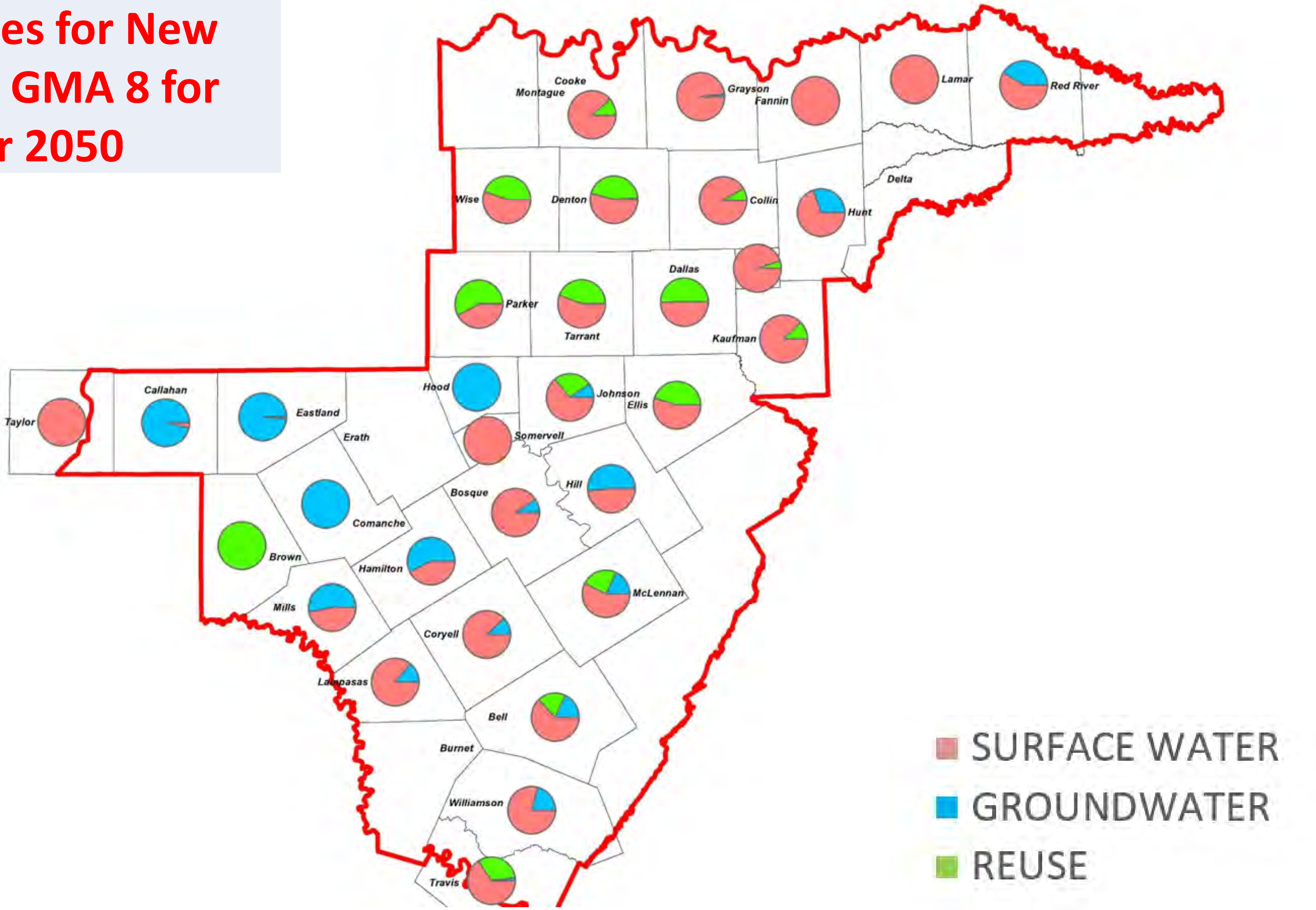
Water Sources for New Strategies in GMA 8 for the year 2020



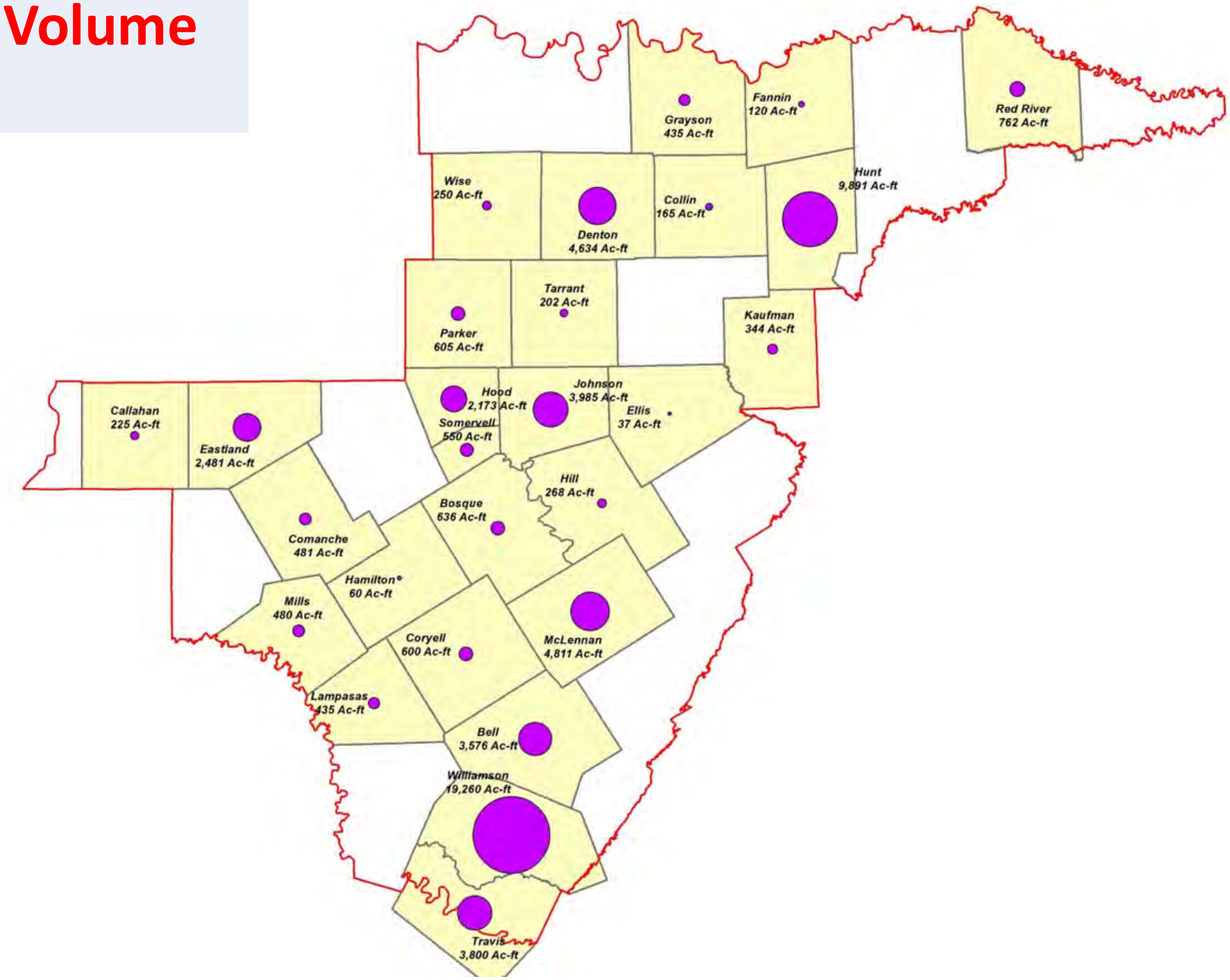
Groundwater Volume 2020

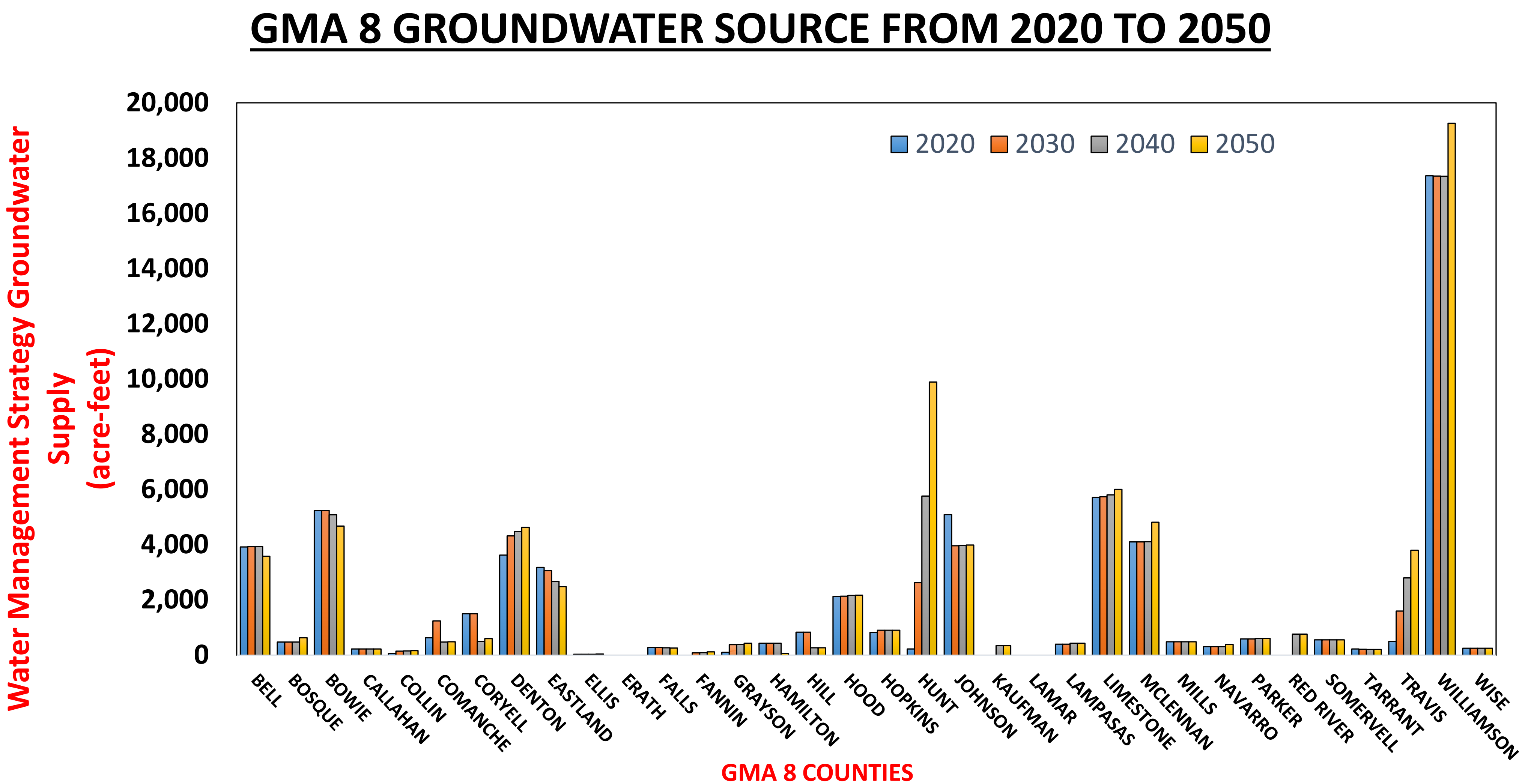


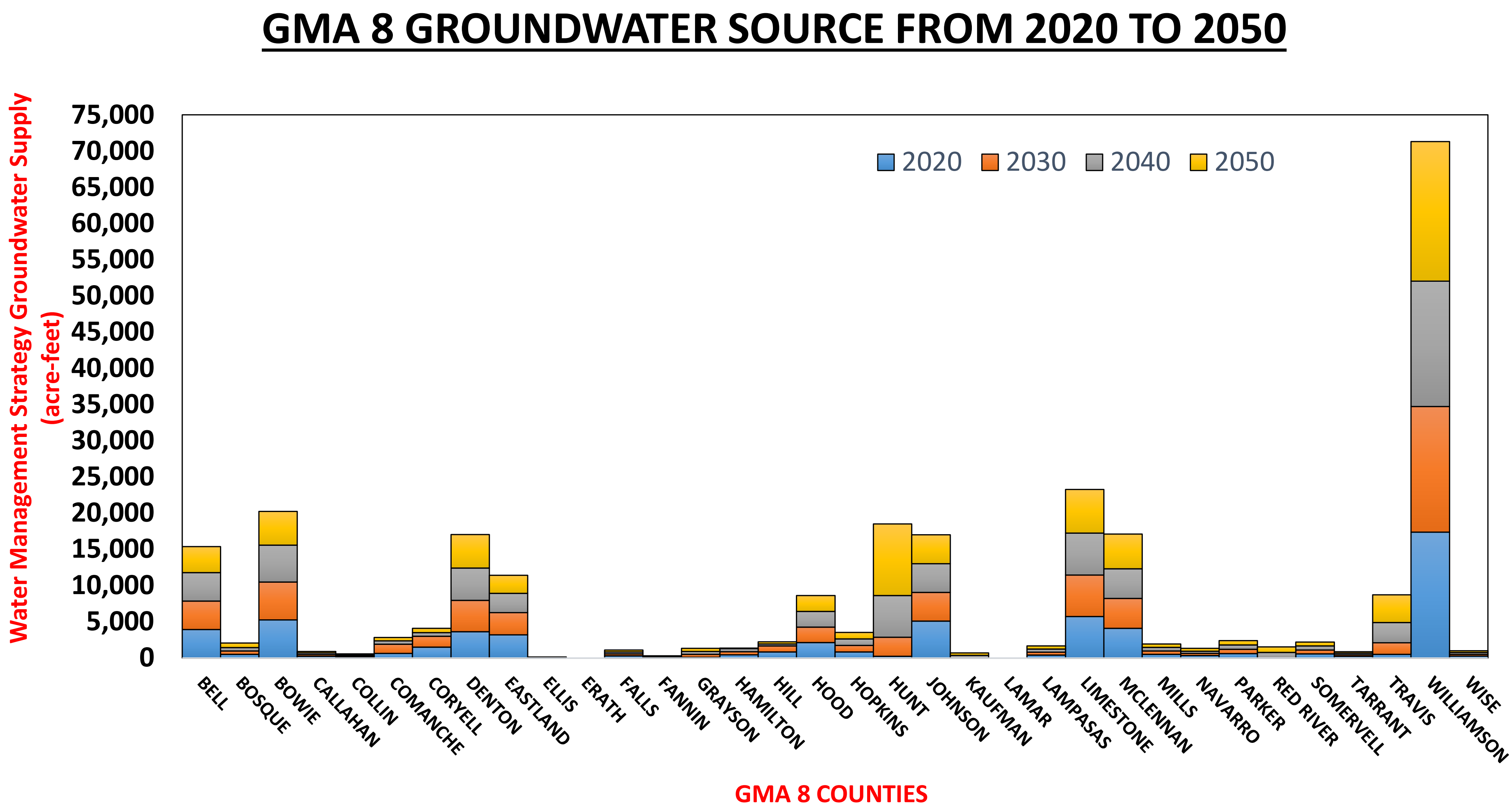
Water Sources for New Strategies in GMA 8 for the year 2050



Groundwater Volume 2050




GMA 8 GROUNDWATER SOURCE FROM 2020 TO 2050
Water Management Strategy Groundwater Supply (acre-feet)
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2020
2030
2040
2050
BELL
BOSQUE
BOWIE
CALLAHAN
COLLIN
COMANCHE
CORYELL
DENTON
EASTLAND
ELLIS
ERATH
FALLS
FANNIN
GRAYSON
HAMILTON
HILL
HOOD
HOPKINS
HUNT
JOHNSON
KAUFMAN
LAMAR
LAMPASAS
LIMESTONE
MCLENNAN
MILLS
NAVARRO
PARKER
RED RIVER
SOMERVELL
TARRANT
TRAVIS
WILLIAMSON
WISE
GMA 8 COUNTIES


GMA 8 GROUNDWATER SOURCE FROM 2020 TO 2050
Water Management Strategy Groundwater Supply (acre-feet)
75,000
70,000
65,000
60,000
55,000
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
2020
2030
2040
2050
BELL
BOSQUE
BOWIE
CALLAHAN
COLLIN
COMANCHE
CORYELL
DENTON
EASTLAND
ELLIS
ERATH
FALLS
FANNIN
GRAYSON
HAMILTON
HILL
HOOD
HOPKINS
HUNT
JOHNSON
KAUFMAN
LAMAR
LAMPASAS
LIMESTONE
MCLENNAN
MILLS
NAVARRO
PARKER
RED RIVER
SOMERVELL
TARRANT
TRAVIS
WILLIAMSON
WISE
GMA 8 COUNTIES

Standard for Desired Future Conditions

Highest Practicable Level of Groundwater Production

Conservation, Preservation, Protection, Recharging, and Prevention of Waste of Groundwater, and Control of Subsidence

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Impact on Interests/Rights in Private Property

Today's Meeting:

Presentations and discussions regarding Aquifer Uses or Conditions, Supply Needs & Management Strategies, and ***Private Property Rights*** factors as they relate to Desired Future Conditions (DFCs) pursuant to Texas Water Code (TWC) § 36.108(d)

- *Discussion of regulatory compliance and technical/policy summary of factor only; no legal analysis, advice or opinions, and no discussion today should be construed as such*
- *Questions regarding legal implications should be directed to GCD legal counsel for appropriate consultation*

Impact on Interests/Rights in Private Property

Private Property Rights Factor Discussion:

1. Review TWC § 36.108(d) requirements for private property rights factor consideration
2. Review other TWC considerations
3. Review GMA 8 discussions of private property rights factor during second round of DFC joint planning
4. Other considerations regarding private property rights
5. Next steps in GMA 8 private property rights factor consideration
6. GMA 8 discussion of private property rights factor
7. Questions

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Impact on Interests/Rights in Private Property

Private Property Rights Factor - TWC § 38.108(d) requirements

Before GMA Can Vote on Proposed DFCs, TWC § 36.108(d) requires that:

"(d) Not later than May 1, 2021, and every five years thereafter, the districts shall consider groundwater availability models and other data or information for the management area and shall propose for adoption desired future conditions for the relevant aquifers within the management area. **Before voting on the proposed desired future conditions of the aquifers under Subsection (d-2), the districts shall consider:**

. . .

(7) the impact on the interests and rights in private property, including ownership and the rights of management area landowners and their lessees and assigns in groundwater as recognized under Section 36.002; . . ."

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Impact on Interests/Rights in Private Property

Private Property Rights Factor - TWC § 38.108(d) requirements

- TWC § 36.002 establishes property owner has vested ownership interest in and right to produce groundwater beneath property.
- TWC § 36.002 does not:
  1) Prohibit GCD from limiting or prohibiting landowner from drilling well due to landowner's failure or inability to comply with GCD's well spacing or tract size requirements
  2) Affect GCD's ability to regulate groundwater production under TWC sections on permits, well spacing or transfers, or special laws governing GCDs
  3) Require GCD rule to allocate to each landowner proportionate share of groundwater available from aquifer based on number of surface acres owned

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Impact on Interests/Rights in Private Property

Other TWC Considerations

- TWC § 36.0015(b) establishes purpose of GCDs to manage groundwater resources and affirms as State's preferred method of groundwater management to protect property rights, balance groundwater conservation and development, and use best available science to conserve and develop groundwater through rules.
- TWC § 36.116 gives GCDs authority to regulate well spacing/production.
- GCDs empowered to issue permits and carry out responsibilities consistent with management plans and rules, TWC Chapter 36, and Texas Constitution.
- GCDs continually strike balance between groundwater production to meet current and future needs, while also conserving, preserving and managing resources.
- "Balance Test" is not new to GCDs.

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Impact on Interests/Rights in Private Property

Private Property Rights Factor - GMA 8 DFC Joint Planning Second Round Discussions

- GMA 8 GCDS thoroughly discussed and considered impacts on private property throughout second round.
- Formal discussions of private property rights factor and related issues held during GMA 8 meetings –
  - July 29, 2014
  - May 27, 2015
  - March 23, 2016
  - April 1, 2016
- Each GCD also held discussions to consider impacts of proposed DFCs on private property rights.

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Impact on Interests/Rights in Private Property

Private Property Rights Factor - GMA 8 DFC Joint Planning Second Round Discussions

- From the GMA 8 *Desired Future Conditions Explanatory Report* (February 2017), GMA 8 representatives identified topics/issues to considered by each GCD as DFCs developed –
  - Existing uses of groundwater within GCD
  - Projected future uses of groundwater within GCD
  - Investment-backed expectations of existing users and property owners within GCD
  - Long-term viability of groundwater resources in GMA
  - Availability of water to all properties and ability to allocate the modeled available groundwater (MAG) amounts through rules after DFC adoption
  - Whether immediate cutbacks would be required in setting a particular DFC or whether cutbacks, if any, would need to occur over a certain timeframe

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Impact on Interests/Rights in Private Property

Private Property Rights Factor - GMA 8 DFC Joint Planning Second Round Discussions

- GMA 8 representative identified topics/issues to be considered by each GCD as DFCs developed (continued) –
  - For outcrop areas, how outcrop depletes rapidly in dry times, and whether drought rules or triggers based on the DFC/MAG for outcrop could be beneficial to ensure viability of the resource during dry times
  - Economic consequences to existing users (e.g., cost to drop pumps, reconfigure or drill new wells upon water table dropping, etc.). Also, consider economic consequences of less water available to protect existing users from economic consequences relevant to existing users – reaching a balance between these two dynamics

Impact on Interests/Rights in Private Property

Private Property Rights Factor - GMA 8 DFC Joint Planning Second Round Discussions

- GMA 8 representative identified topics/issues to be considered by each GCD as DFCs developed (continued) –
  - Review sustainability GAM run versus additional GAM runs that provide for more pumping from an aquifer, and how those two differ with respect to private property rights
  - Focus on finding a balance, as defined by each GCD, between all of these considerations

All of these topics/issues considered by GMA 8 GCDs during the second round of joint planning continue to be relevant considerations in this third round.

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Impact on Interests/Rights in Private Property

Private Property Rights Factor - GMA 8 DFC Joint Planning Second Round Discussions

- GMA 8 survey tool developed and used by each GMA 8 GCD to initiate and document this factor's (and socioeconomic factor's) consideration.
- Ten GMA 8 GCDs discussed proposed DFCs impacts on private property.
- Post-Oak Savannah GCD – Proposed DFCs not applicable to GCD.
- Northern Trinity GCD – Did not discuss how proposed DFCs may impact ability of existing well owners and property owners who have yet to drill a well.
- All completed surveys provided documentation of multiple meeting dates where this factor was discussed at length by each GCD's board of directors.
- Some completed surveys included supporting documentation/reports.
- All remaining GCD responses to the survey were affirmative as summarized in Table 24 of the GMA 8 *Desired Future Conditions Explanatory Report* (February 2017).

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Impact on Interests/Rights in Private Property

Private Property Rights Factor - GMA 8 DFC Joint Planning Second Round Discussions

Table 24. Summary of GMA 8 Survey regarding impacts of proposed DFCs on private property rights.

GMA 8 Survey questions regarding impacts of proposed DFCs on private property rights	GMA 8 GCD Survey Responses										
	CTGCD	CUWCD	MTGCD	NTGCD	Ntrinty GCD	POSGCD	PGCD	RRGCD	SUWCD	STGCD	UTGCD
Did your GCD discuss and consider the impacts of proposed DFC options on interests and rights in private property, including ownership and the rights of management area landowners and their lessees and assigns in groundwater?	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y
Did your GCD discuss how proposed DFCs may impact the ability of both: (1) existing well owners, and (2) property owners who have not yet drilled a well but may have an expectation of being able to do so in the future, to recover their investment-backed expectations from their investments in their water wells and their investments in their properties?	Y	Y	Y	Y	N	NA	Y	Y	Y	Y	Y
Did your GCD discuss how proposed DFCs may impact the availability of water to all properties overlying the aquifer in your district, and whether property owners of various economic means will be able to complete affordable water wells with sufficient well yields for projected uses, or whether affordable water from alternative water supplies would be available to those properties?	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y

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Impact on Interests/Rights in Private Property

Other Considerations Regarding Private Property Rights

GMA and GCD Continuing DFC and Annual Joint Planning Efforts

- DFC process is "iterative."
- Through annual joint planning, GCDs can discuss new or emerging issues that may involve reevaluating, revising, and/or reconsidering DFCs.
- GCDs propose DFCs no later than every five years; meet to consider DFCs at least annually to collectively respond to changed circumstances, consider potential impacts to factors, and make adaptive management adjustments to either DFCs or MAGs.
- Process can be costly and time-consuming for GCDs.
- GCDs actively engaged in management activities and programs to carry out statutory mission and manage aquifers.

Impact on Interests/Rights in Private Property

Other Considerations Regarding Private Property Rights

GMA and GCD Continuing DFC and Annual Joint Planning Efforts (continued)

- GCDs implement various management strategies to address aquifer management issues to identify ways to improve and share resources.
- Statutes are flexible to develop locally-responsive management programs and management strategies and incentives - management zones, water conservation, reuse and rainwater harvesting - further reduce demand, help achieve DFCs, and consider potential impacts.

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Impact on Interests/Rights in Private Property

Next Steps in GMA 8 Private Property Rights Factor Consideration

- Are GMA 8 Survey results regarding impacts of proposed DFCs on private property rights still reflective of today's issues?
- Once actual DFCs are being considered and reviewed relative to the nine factors, WSP Team to develop presentation of impacts of proposed DFCs on nine factors.
- Information from presentations to be incorporated into the GMA 8 Desired Future Conditions Explanatory Report.

Impact on Interests/Rights in Private Property

Questions?

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Agenda Item 12

- Discussion of possible agenda items and dates for next GMA 8 meeting
  - *Presentation of Central Texas GCD run results for Llano Uplift aquifers*
  - *Discussion of final 3 of 9 factors (Socioeconomic, Feasibility, and other)*
  - *Discussion and possible action on DFCs for:*
    - Trinity
    - Woodbine
    - Edwards
    - Llano Uplift Aquifer (Hickory, Ellenburger, and Marble Falls)
  - *Discussion and possible action on designation of Non-Relevant Aquifers*

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GMA 8 Schedule to Discuss Nine Factors

November 2019

- Environmental Impacts
- Subsidence Impacts
- Hydrological Conditions

February 2020

- Aquifer Uses or Conditions
- Supply Needs & Management Strategies
- Private Property Rights

May 2020

- Socioeconomic Impacts
- DFC Feasibility
- Other Relevant Information

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Thank you!

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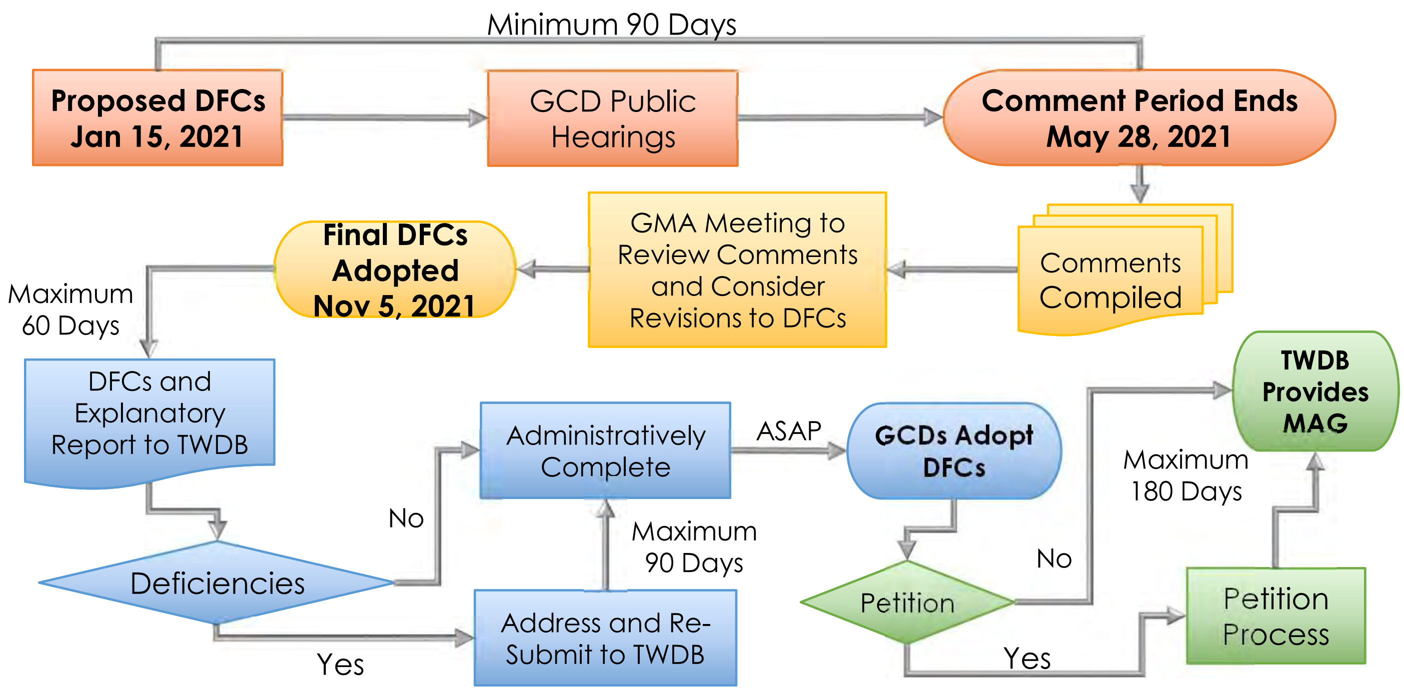
Anticipated Timeline for GMA 8 DFC Process



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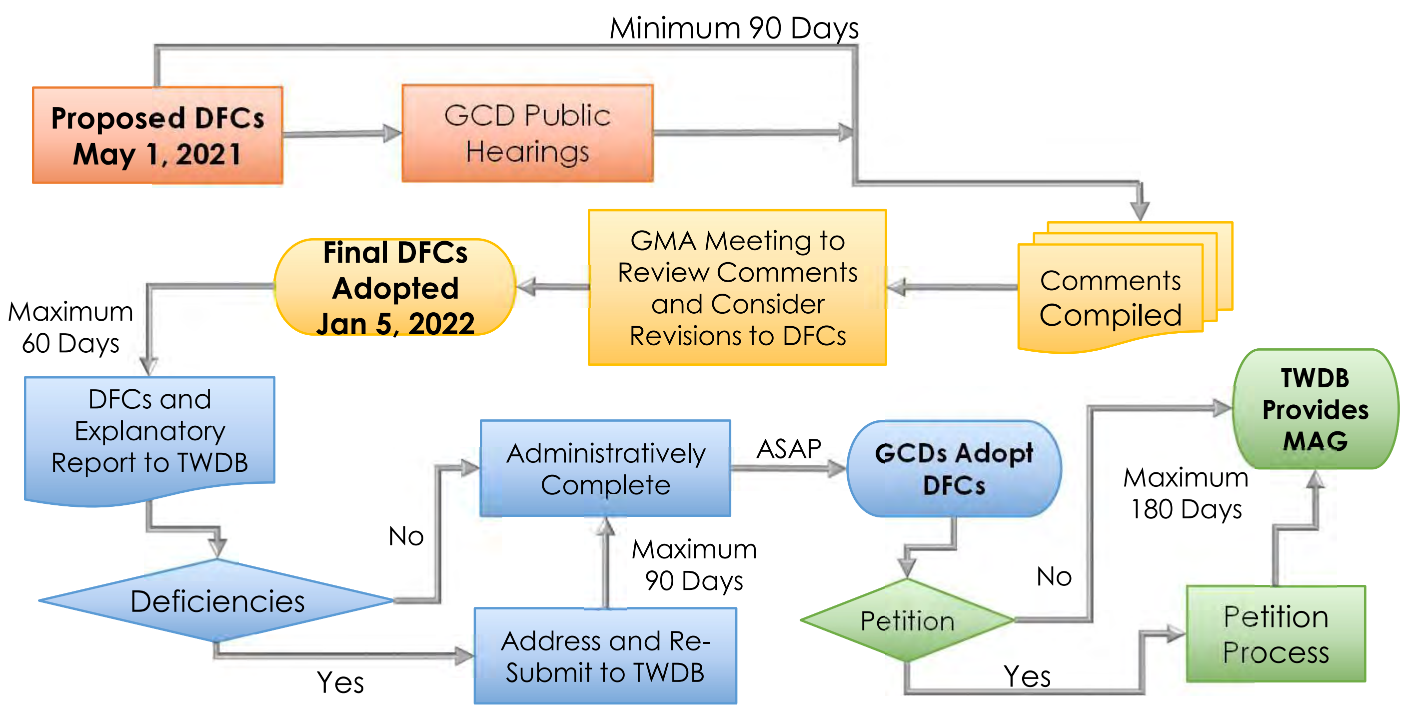
DFC Process (TWC Sec. 36.108 & 31 TAC Ch. 356)



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GMA 8
Joint Groundwater Planning Meeting

May 15, 2020

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Agenda Item 6
Discussion and possible action on results from updated NTWGAM run related to Joint Planning in GMA 8. Discussion will include changes made in Upper Trinity GCD, Prairielands GCD, Southern Trinity GCD, Clearwater UWCD, Central Texas GCD, and Williamson and Travis County

- Run 11 – Update of NTWGAM DFC/MAG Run
- WSP has received pumping updates from:
  - *Upper Trinity GCD, Southern Trinity GCD, Prairielands GCD, Central Texas GCD (funded thru GMA 8 contract)*
  - *Clearwater UWCD, Travis and Williamson County (funded separately by Clearwater UWCD)*
- WSP has completed simulations for Central Texas GCD related to impacts in the Llano Uplift aquifers using the Llano Uplift GAM
  - *Central Texas GCD is funding this effort separately*

Summary of Run 11

- MAGs from this round of planning will be used in 2027 State Water Plan (2030-2080)

- Run 11
  - Begins in 2010 (no change)
  - Model extended to 2080
  - 2070 input will be used for 2071-2080
  - Each year is 365.25 days to remove leap year change in MAG
  - Pumping has been updated as provided by GCDs
  - One drought of record included from 2078-2080
  - WSP will provide files to TWDB as early as possible

Upper Trinity GCD Pumping

Aquifer	O/D	County	Run 10 AFY	Adjustment	Run 11 AFY
Glen Rose	Outcrop	Hood	654	138	792
Glen Rose	Downdip	Hood	103	22	125
Paluxy	Outcrop	Hood	159	0	159
Twin Mountains	Outcrop	Hood	3,674	1,351	5,025
Twin Mountains	Downdip	Hood	7,854	2,914	10,768
Antlers	Outcrop	Montague	3,878	2,236	6,114
Antlers	Outcrop	Parker	2,899	6	2,905
Glen Rose	Outcrop	Parker	2,290	1,394	3,684
Glen Rose	Downdip	Parker	874	532	1,406
Paluxy	Outcrop	Parker	2,609	5	2,614
Paluxy	Downdip	Parker	50	0	50
Twin Mountains	Outcrop	Parker	1,074	220	1,294
Twin Mountains	Downdip	Parker	2,083	444	2,527
Antlers	Outcrop	Wise	7,702	1,404	9,106
Antlers	Downdip	Wise	2,058	381	2,439
		Total	37,961	11,048	49,009

Southern Trinity GCD pumping

Year	Hosston Run 10 AFY	Adjustement for Hosston	Hosston Run 11 AFY
2010	15,937	-4,135	11,802
2011	15,937	-4,635	11,302
2012	15,937	-5,361	10,576
2013	15,937	-6,978	8,959
2014	15,937	-8,424	7,513
2015	15,937	-7,565	8,372
2016	15,937	-7,074	8,863
2017	15,937	-7,929	8,008
2018	15,937	-8,130	7,807
2019	15,937	-8,135	7,802
2020-2080	15,937	0	15,937

Prairielands GCD Pumping

Aquifer	Run 10 AFY	Adjustment	Run 11 AFY
Hensell	3,603	-3,206	397
Pearsall	98	1,848	1,946
Hosston	13,237	1,358	14,595
Total	16,938	0	16,938

Clearwater UWCD Pumping

Aquifer	Run 10 AFY	Adjustment	Run 11 AFY
Glen Rose	972	-697	275
Hensell	1,097	3	1,100
Hosston	7,179	721	7,900
Total	9,248	27	9,275

Central Texas GCD Pumping

Aquifer	Run 10 AFY	Adjustment	Run 11 AFY
Glen Rose	424	-276	148
Hensell	1,891	773	2,664
Hosston	1,381	-493	888
Total	3,696	4	3,700

Travis County Pumping

Aquifer	Run 10 AFY	Adjustment	Run 11 AFY
Glen Rose	973	-873	100
Hensell	1,144	1,156	2,300
Hosston	2,799	1,401	4,200
Total	4,916	1,684	6,600

Williamson County Pumping

Aquifer	Run 10 AFY	Adjustment	Run 11 AFY
Glen Rose	689	-539	150
Hensell	752	848	1,600
Hosston	1,934	-184	1,750
Total	3,375	125	3,500

Run 11 Results - DFC

- DFC differences between Run 10 and Run 11 (compare 2070 results)
- Blue negative values indicate higher water levels
- Red positive values indicate greater drawdowns

Change in Drawdown in 2070
(Difference between Run 10 and Run 11)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Bell	-	-1	-4	-	32	4	37	-
Bosque	-	0	3	-	18	8	27	-
Brown	-	0	0	-	0	0	0	0
Burnet	-	-	0	-	2	1	-1	-
Callahan	-	-	-	-	-	-	-	0
Collin	1	4	7	16	-	-	-	11
Comanche	-	0	0	-	1	0	0	0
Cooke	0	-	-	-	-	-	-	9
Coryell	-	0	0	-	6	3	8	-
Dallas	2	5	10	34	45	12	48	-
Delta	-	2	3	-	3	-	-	-
Denton	0	1	6	22	-	-	-	11
Eastland	-	-	-	-	-	-	-	0

Blue negative values indicate higher water levels

Red positive values indicate greater drawdowns

Change in Drawdown in 2070
(Difference between Run 10 and Run 11)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Ellis	3	6	13	66	57	13	63	-
Erath	-	0	0	1	4	-1	2	1
Falls	-	8	15	-	33	16	34	-
Fannin	0	3	4	9	6	-	-	4
Grayson	0	3	4	10	-	-	-	5
Hamilton	-	0	0	-	1	0	2	-
Hill	1	2	9	-	55	17	64	-
Hunt	3	4	5	10	8	-	-	-
Johnson	0	1	3	23	43	-11	86	-
Kaufman	9	13	16	25	28	20	30	-
Lamar	0	1	1	-	2	-	-	2
Lampasas	-	0	0	-	0	0	0	-
Limestone	-	7	19	-	27	20	28	-

Blue negative values indicate higher water levels

Red positive values indicate greater drawdowns

Change in Drawdown in 2070
(Difference between Run 10 and Run 11)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
McLennan	0	3	9	-	26	15	30	-
Milam	-	-	18	-	54	20	54	-
Mills	-	0	0	-	2	0	0	-
Navarro	6	6	20	-	36	26	35	-
Red River	0	0	0	-	1	-	-	0
Rockwall	5	9	11	20	-	-	-	-
Somervell	-	-1	-1	18	11	-10	35	-
Tarrant	0	1	9	26	-	-	-	26
Taylor	-	-	-	-	-	-	-	0
Travis	-	-	0	-	68	12	69	-
Williamson	-	-	-3	-	39	10	40	-

Blue negative values indicate higher water levels

Red positive values indicate greater drawdowns

Run 11 Results – DFC Values for Run 11

- DFC values are calculated the same as Run 10
- DFC is taken as the average drawdown from the start of the model run (2010) until the end of the model run (2080)
- The DFC values are averaged over each county and GCD

Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Bell	-	17	83	0	333	145	375	0
Bosque	-	6	53	0	189	139	232	0
Brown	-	2	1	0	2	1	1	2
Burnet	0	0	2	0	19	7	21	0
Callahan	-	0	0	0	0	0	0	1
Collin	482	729	366	560	-	0	0	596
Comanche	-	2	2	0	4	2	3	12
Cooke	2	0	0	0	0	0	0	191
Coryell	-	5	15	0	107	70	141	0
Dallas	137	346	288	515	415	362	419	0
Delta	-	279	198	0	202	0	0	0
Denton	20	558	367	752	0	0	0	416
Eastland	-	0	0	0	0	0	0	4

Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Ellis	76	128	220	413	380	290	390	0
Erath	-	6	6	8	25	12	35	14
Falls	-	159	238	0	505	296	511	0
Fannin	259	709	305	400	291	0	0	269
Grayson	163	943	364	445	0	0	0	364
Hamilton	-	2	4	0	26	14	38	0
Hill	20	45	149	0	365	211	413	0
Hunt	631	610	326	399	350	0	0	0
Johnson	4	-57	66	184	235	120	329	0
Kaufman	242	311	305	427	372	349	345	0
Lamar	42	100	107	0	125	0	0	132
Lampasas	-	1	1	0	6	1	11	0
Limestone	-	199	301	0	433	214	445	0

Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
McLennan	6	41	148	0	504	242	582	0
Milam	0	0	241	0	412	261	412	0
Mills	-	1	1	0	9	2	13	0
Navarro	110	139	266	0	343	295	343	0
Red River	2	24	40	0	57	0	0	15
Rockwall	275	433	343	466	-	0	0	0
Somervell	-	4	4	50	64	17	120	0
Tarrant	6	105	163	348	0	0	0	177
Taylor	-	0	0	0	0	0	0	0
Travis	0	0	83	0	219	68	226	0
Williamson	0	0	78	0	220	89	225	0
McLennan	6	41	148	0	504	242	582	0

Run 11 Results – Drawdown (2010-2080)

County	O/D	Paluxy	Glen Rose	Twin Mnts	Antlers
Hood	Downdip	-	39	72	0
Hood	Outcrop	6	9	13	0
Montague	Downdip	0	0	0	-
Montague	Outcrop	0	0	0	40
Parker	Downdip	2	50	68	-
Parker	Outcrop	6	20	7	42
Wise	Downdip	0	0	0	154
Wise	Outcrop	0	0	0	59

Questions ?

Agenda Item 7

- Presentation and discussion regarding Socioeconomic Impacts, Feasibility of Desired Future Conditions (DFCs), and Other Relevant Information factors as they relate to Desired Future Conditions (DFCs) adoption pursuant to Texas Water Code Section 36.108(d)

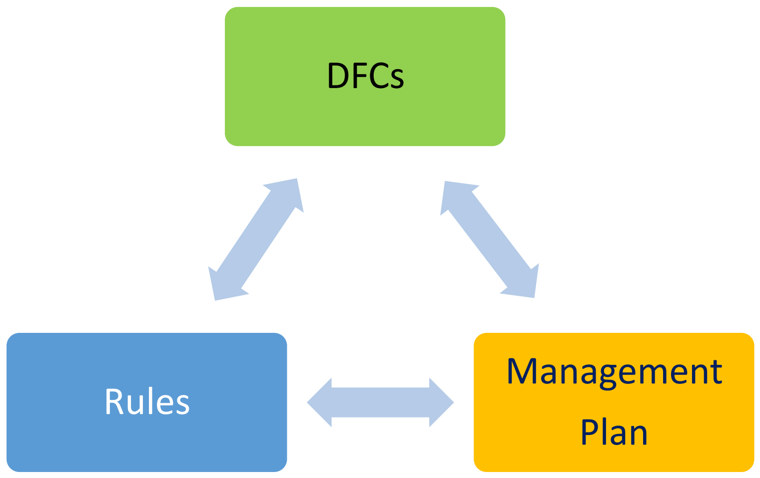
GMA 8 Schedule to Discuss Nine Factors

November 2019		
Environmental Impacts	Subsidence Impacts	Hydrological Conditions
February 2020		
Aquifer Uses or Conditions	Supply Needs & Management Strategies	Private Property Rights
May 2020		
Socioeconomic Impacts	DFC Feasibility	Other Relevant Information

Feasibility of Achieving the DFC

- Physical Achievability
  - Is the DFC physically possible within the aquifer?
  - ➢ Groundwater Availability Models help ensure that DFCs are generally physically achievable in the aquifer

- Regulatory Achievability
  - Can the DFC be achieved via GCD management plan and rules?
  - Does the regulated community and stakeholders agree with the management approach required to achieve the DFC?
  - ➢ Have GCDs implemented Rules and have an approved Management Plan?

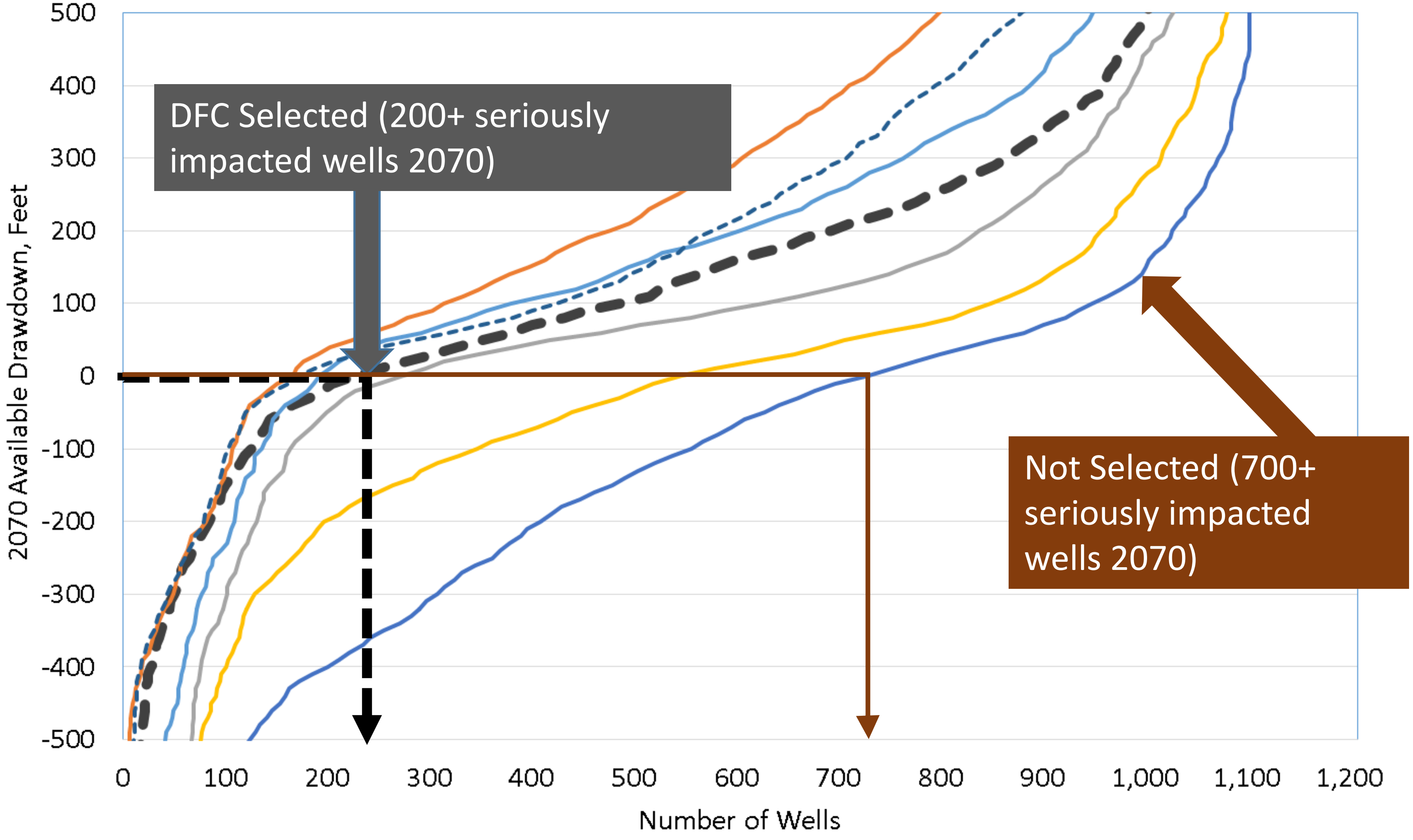


Standard for Desired Future Conditions

Highest Practicable Level of Groundwater Production

Conservation, Preservation, Protection, Recharging, and Prevention of Waste of Groundwater, and Control of Subsidence

Public Water Supply Well Impacts



Socioeconomic Impacts

Today's Meeting:

Socioeconomic Impacts factor as it relates to Desired Future Conditions (DFCs) pursuant to Texas Water Code (TWC) § 36.108(d) -

1. Review TWC § 36.108(d) requirements for socioeconomic impacts factor considerations
2. Review 31 Texas Administrative Code (TAC), Chapter 357, regional and state water plan socioeconomic considerations
3. Review GMA 8 socioeconomic impacts factor discussion during second round of DFC joint planning
4. Discuss next steps in GMA 8 socioeconomic impacts factor consideration

Socioeconomic Impacts

Socioeconomic Impacts Factor - TWC § 38.108(d) requirements

Before GMA votes on proposed DFCs, TWC § 36.108(d) requires that:

"(d) Not later than May 1, 2021, and every five years thereafter, the districts shall consider groundwater availability models and other data or information for the management area and shall propose for adoption desired future conditions for the relevant aquifers within the management area. **Before voting on the proposed desired future conditions of the aquifers under Subsection (d-2), the districts shall consider:**

. . .

(6) socioeconomic impacts reasonably expected to occur. . ."

Socioeconomic Impacts

Socioeconomic Impacts Factor – Title 31, TAC, Chapter 357

Regional and state water planning in Texas considers socioeconomic impacts in accordance with statutory guidance:

- 31 TAC § 357.11(j) states that "Upon request, the EA will provide technical assistance to RWPGs, including on water supply and demand analysis, methods to evaluate the social and economic impacts of not meeting needs, and regarding Drought Management Measures and water conservation practices."
- 31 TAC § 357.33(c) states that "The social and economic impacts of not meeting Water Needs shall be evaluated by RWPGs and reported for each RWPA."

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Socioeconomic Impacts

Socioeconomic Impacts Factor – Title 31, TAC, Chapter 357

- The regional water planning analysis is based on water supply needs from the regional water plans and consists of a series of point estimates of 1-year droughts at 10-year intervals.
- The socioeconomic impacts analysis attempts to measure impacts that may be anticipated if water user groups do not meet their identified water supply needs associated with a drought-of-record for one year.
- For the socioeconomic impact analysis, multiple impacts are examined, including (1) sales, income, and tax revenue, (2) jobs, (3) population, and (4) school enrollment.
- Results from the analysis are incorporated into the final regional water plans, and comprehensively presented in the subsequent state water plan.

Socioeconomic Impacts

Socioeconomic Impacts Factor – Title 31, TAC, Chapter 357

- TWDB prepared information for use by RWPGs for the 2016 regional water plans – Regions B, C, D, F, G, and H.
- TWDB prepared information for use by RWPGs for the 2021 RWPG initially prepared regional water plans.
- New to 2021 planning cycle, TWDB developed an interactive dashboard to view region and county level socioeconomic impacts.
- While TWDB assessments are useful to understand importance of meeting projected water needs, analyses **do not** evaluate socioeconomic impacts of proposed DFCs at the GMA level and a similar analysis does not exist.
- DFCs result in groundwater availability amounts for potential water management strategies that can meet some of the water supply needs and, therefore, are indirectly tied to this discussion for regional and state water planning.

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Socioeconomic Impacts

Socioeconomic Impacts Factor - GMA 8 DFC Joint Planning Second Round Discussions

- GMA 8 GCDS thoroughly discussed and considered socioeconomic impacts throughout second round.
- Formal discussions of socioeconomic impacts factor were held during GMA 8 meetings –
  - May 27, 2015
  - April 1, 2016
- Each GCD also held discussions to consider socioeconomic impacts of proposed DFCs.

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Socioeconomic Impacts

Socioeconomic Impacts Factor - GMA 8 DFC Joint Planning Second Round Discussions

- Information regarding socioeconomic impacts reasonably expected to occur as a result of the proposed DFCs was developed by District Representatives utilizing a survey tool developed specifically for use by GMA 8.
- The survey tool was used by individual District Representatives to discuss and consider socioeconomic impacts of DFCs under consideration with each GMA 8 GCD board of directors.
- The GMA 8 survey asked individual GCDs for "yes or no" responses to a set of questions and, for certain questions, requested any additional information that the GCD considered during discussions of potential socioeconomic impacts.
- Survey results were summarized in Table 23 of the GMA 8 Desired Future Conditions Explanatory Report (February 2017).

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Socioeconomic Impacts

Socioeconomic Impacts Factor – GMA 8 DFC Joint Planning Second Round Discussions

Table 23. Summary of GMA 8 survey regarding socioeconomic impacts of proposed DFCs.

Survey questions regarding socioeconomic impacts of proposed DFCs	GMA 8 GCD Survey Responses										
	CTGCD	CUWCD	MTGCD	NTGCD	Ntrinty GCD	POSGCD	PGCD	RRGCD	SUWCD	STGCD	UTGCD
Has your GCD identified any socioeconomic studies that relate directly or indirectly to the Section 36.108 (d)(6) planning criterion that should be considered by GMA 8 as part of the joint planning process?	Y	Y	N	N	N	Y	N	N	N	Y	Y
Did your GCD discuss and consider the information provided by the Texas Water Development Board on socioeconomic impacts of not meeting needs included in the applicable 2011 regional water plans and the 2012 state water plan?	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y
From a qualitative perspective, both positive and negative socioeconomic impacts may potentially result from implementation of proposed DFCs. Did your GCD discuss the potential socioeconomic impacts that may result from proposed DFCs due to a need for conversion to an alternative supply, including increased costs associated to infrastructure, operation, and maintenance?	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y
Did your GCD discuss how proposed DFCs may reduce/eliminate the costs of lowering pumps and either deepening existing wells or drilling new wells?	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y
Did your GCD discuss the potential that proposed DFCs may serve to sustain/enhance economic growth due to assurances provided by a diversified water portfolio?	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y
Did your GCD discuss how proposed DFCs may result in short-term reduction in utility rates due to reduction in cost of alternative water management strategy implementation?	N	Y	Y	Y	N	NA	Y	Y	Y	Y	Y
Did your GCD discuss how proposed DFCs may result in significant but unquantified production costs due to lowering of artesian water levels in local aquifers?	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y

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Socioeconomic Impacts

Socioeconomic Impacts Factor - GMA 8 DFC Joint Planning Second Round Discussions

- Survey responses illustrated that the GCDs in GMA 8 held focused discussions during multiple properly noticed board of directors' meetings on the socioeconomic impacts of proposed DFCs within their individual GCDs.
- Survey responses clearly indicated that GMA 8 GCDs recognized that in their deliberation and adoption of DFCs, management plans, and rules, it is critical to evaluate all policy decisions based, in part, on the potential socioeconomic impacts of the policy question under consideration.

Socioeconomic Impacts

Socioeconomic Impacts Factor - GMA 8 DFC Joint Planning Second Round Discussions

- Potential socioeconomic impacts considered included: impacts of lowering water levels on costs of production including increased pumping lifts, decreasing well yields and potential need for additional wells, potential for and additional costs of developing alternative supplies, and the need to meet water supply needs in order to avoid socioeconomic impacts of water shortages.
- Overall, almost all the questions regarding whether a GCD's board of directors considered a specific aspect of socioeconomic impacts potentially resulting from proposed DFCs were answered in the affirmative (61 – yes; 4 – no).

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Socioeconomic Impacts

Socioeconomic Impacts Factor - GMA 8 DFC Joint Planning Second Round Discussions

- Due to the absence of non-exempt pumping in the Northern Trinity and Woodbine aquifers in Post Oak Savannah GCD, the District's responses to questions pertaining to socioeconomic impacts of proposed DFCs were determined to be "not applicable."
- Five GCDs provided specific information regarding additional socioeconomic impact studies deemed to be relevant to the individual GCD. GCDs submitting district-specific information on socioeconomic impacts included Central Texas GD, Clearwater UWCD, Post Oak Savannah GCD, Southern Trinity GCD, and Upper Trinity GCD.

All the topics/issues considered by GMA 8 GCDs during the second round of joint planning continue to be relevant considerations in this third round.

Socioeconomic Impacts

Next Steps in GMA 8 Socioeconomic Impacts Factor Consideration

- Are there additional socioeconomic impacts for proposed DFCs identified by GMA 8 GCDs, or are those considered during second round still reflective of today's issues?
- Once actual DFCs are being considered and reviewed relative to the nine factors, WSP Team to develop presentation of impacts of proposed DFCs on nine factors.
- Information from presentations to be incorporated into the GMA 8 Desired Future Conditions Explanatory Report.

Socioeconomic Impacts

Questions?

Agenda Item 10

- Discussion of possible agenda items and dates for next GMA 8 meeting
  - *Presentation of Central Texas GCD run results for Llano Uplift aquifers*
  - *Discussion of slivers as per TWDB*
  - *Discussion and possible action on DFCs for:*
    - Trinity
    - Woodbine
    - Edwards
    - Llano Uplift Aquifer (Hickory, Ellenburger, and Marble Falls)
  - *Discussion and possible action on designation of Non-Relevant Aquifers*

Thank you!

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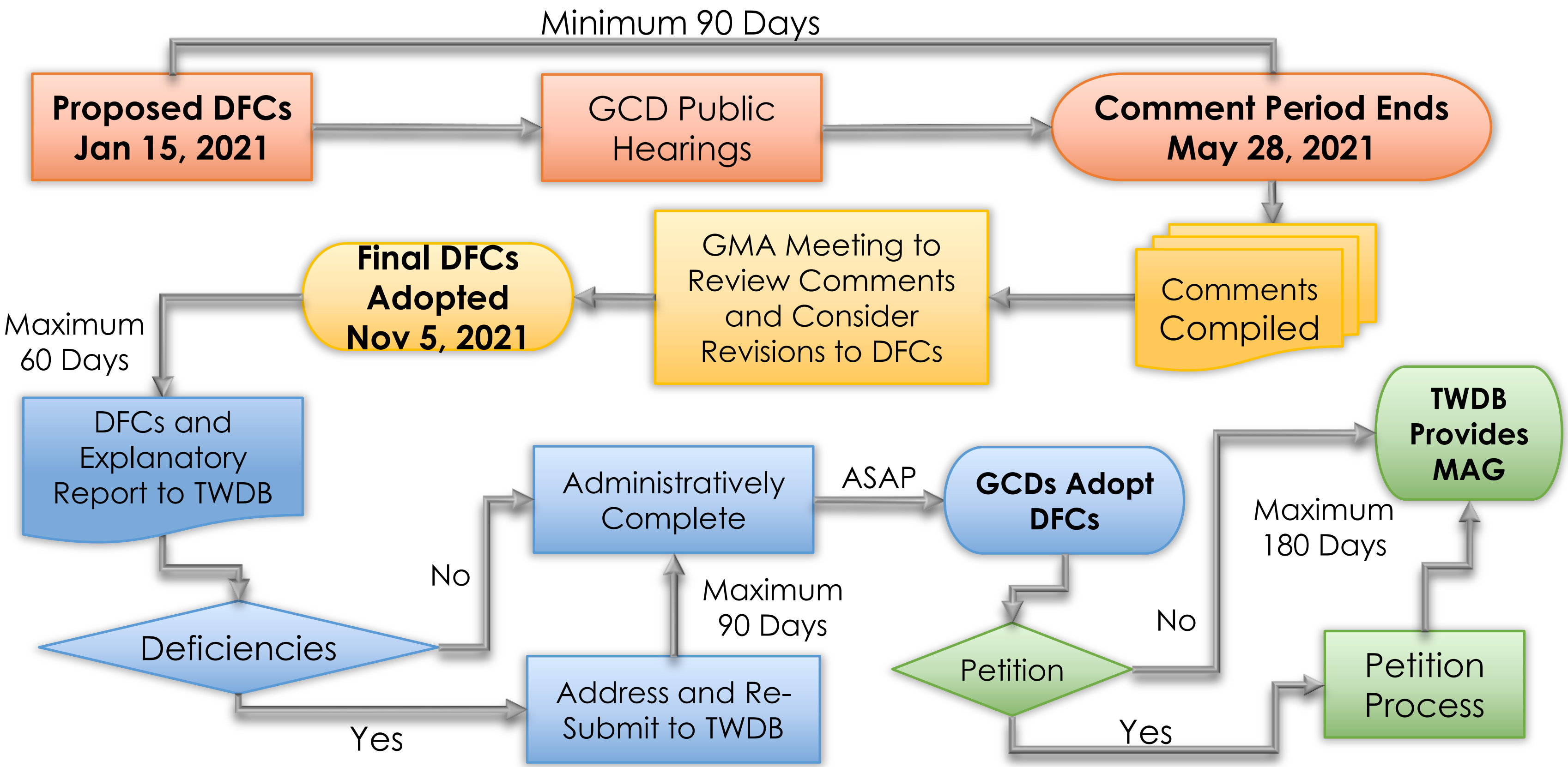
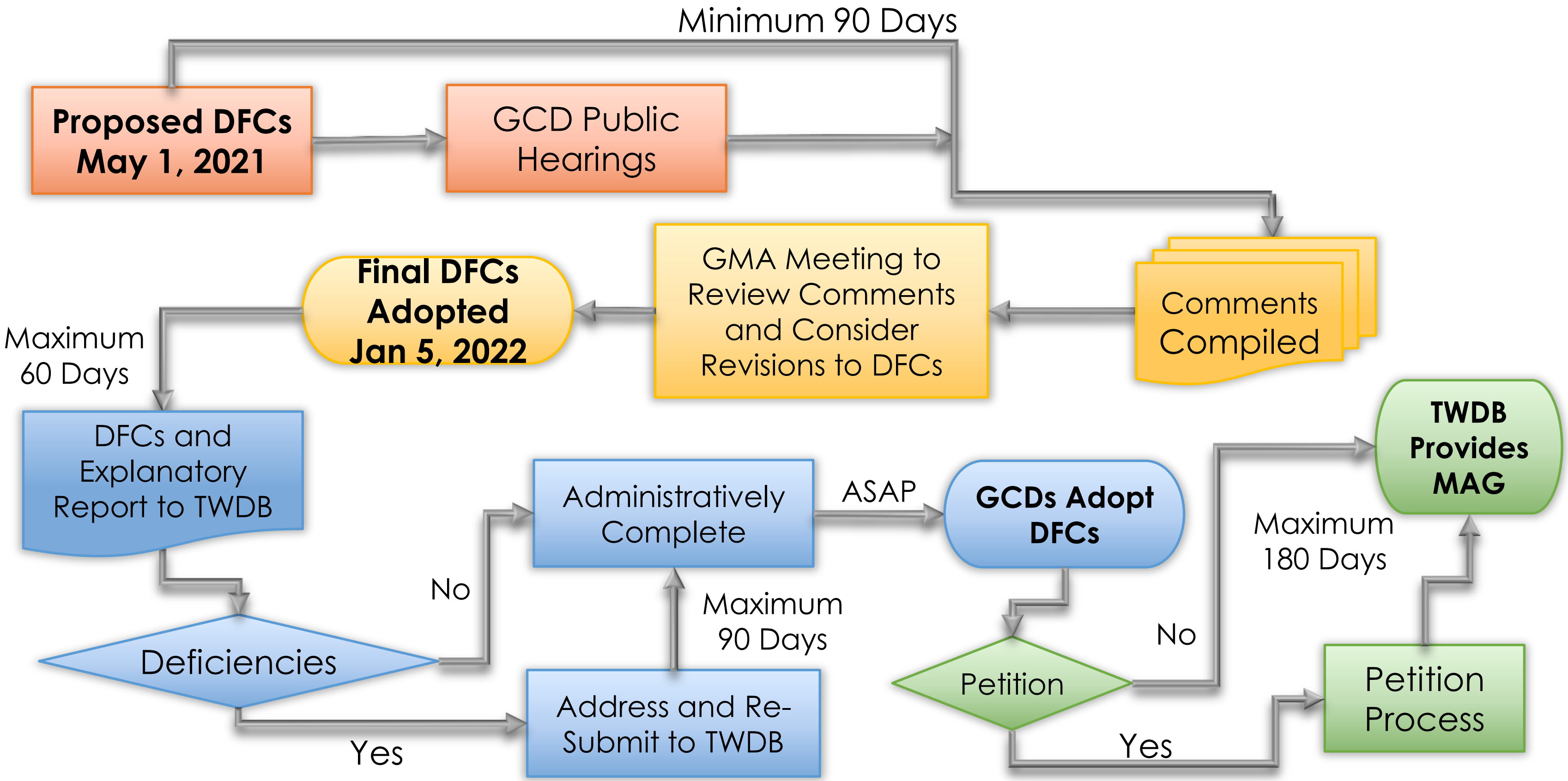
Anticipated Timeline for GMA 8 DFC Process



DFC Process (TWC Sec. 36.108 & 31 TAC Ch. 356)



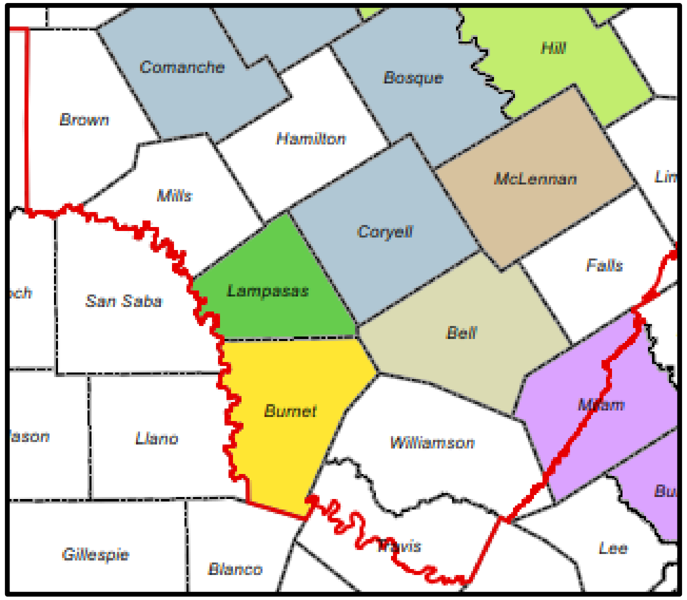
GMA 8 Joint Groundwater Planning Meeting

August 7, 2020

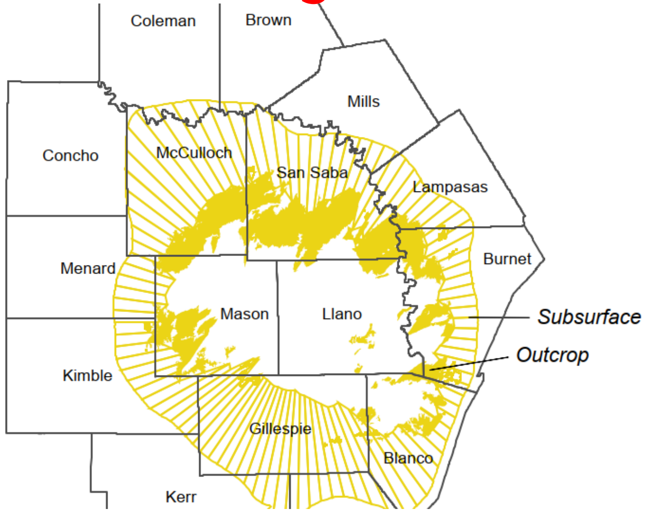
Agenda Item 6
Discussion and possible action on results from the Central Texas Llano Uplift model run

- WSP completed simulations for Central Texas GCD related to impacts from various pumping in the aquifers using the Llano Uplift GAM
- Central Texas GCD funded this effort separately from the GMA 8 budget

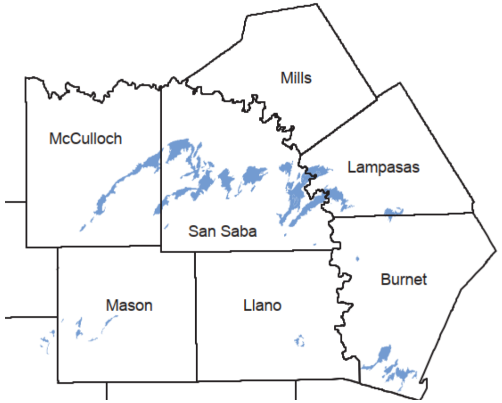
Southern portion of GMA 8



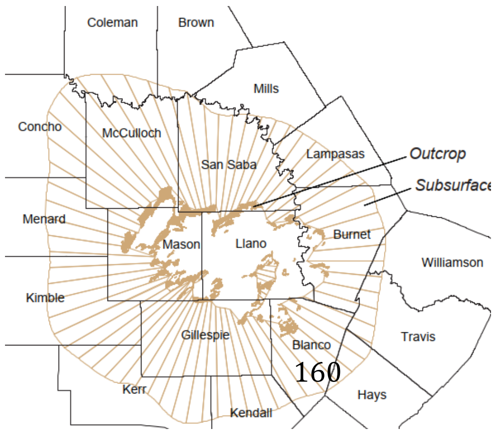
Ellenburger



Marble Falls



Hickory



Central Texas Llano Uplift model runs

- **History:** Previous DFC statements based on percent remaining saturated thickness

- **Objective:** Assess impact of various levels of pumping and develop a DFC statement for Llano Uplift aquifers based on average drawdown

- **Approach:** develop 3 scenarios of various pumping to assess impacts in the each aquifer
  - *Scenario A = 2009 pumping*
  - *Scenario B = Current MAG*
  - *Scenario C = 2.5 x Current MAG*

Scenario A - Llano Uplift model runs 2009 pumping

		2009 Q MAG Results							
County	Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Brown	Marble Falls	25	25	25	25	25	25	25	25
Brown	Ellenburger-San Saba	131	131	131	131	131	131	131	131
Brown	Hickory	12	12	12	12	12	12	12	12
Burnet	Marble Falls	2,220	2,220	2,220	2,220	2,220	2,220	2,220	2,220
Burnet	Ellenburger-San Saba	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244
Burnet	Hickory	1,088	1,088	1,088	1,088	1,088	1,088	1,088	1,088
Lampasas	Marble Falls	363	363	363	363	363	363	363	363
Lampasas	Ellenburger-San Saba	351	351	351	351	351	351	351	351
Lampasas	Hickory	113	113	113	113	113	113	113	113
Mills	Marble Falls	20	20	20	20	20	20	20	20
Mills	Ellenburger-San Saba	100	100	100	100	100	100	100	100
Mills	Hickory	36	36	36	36	36	36	36	36

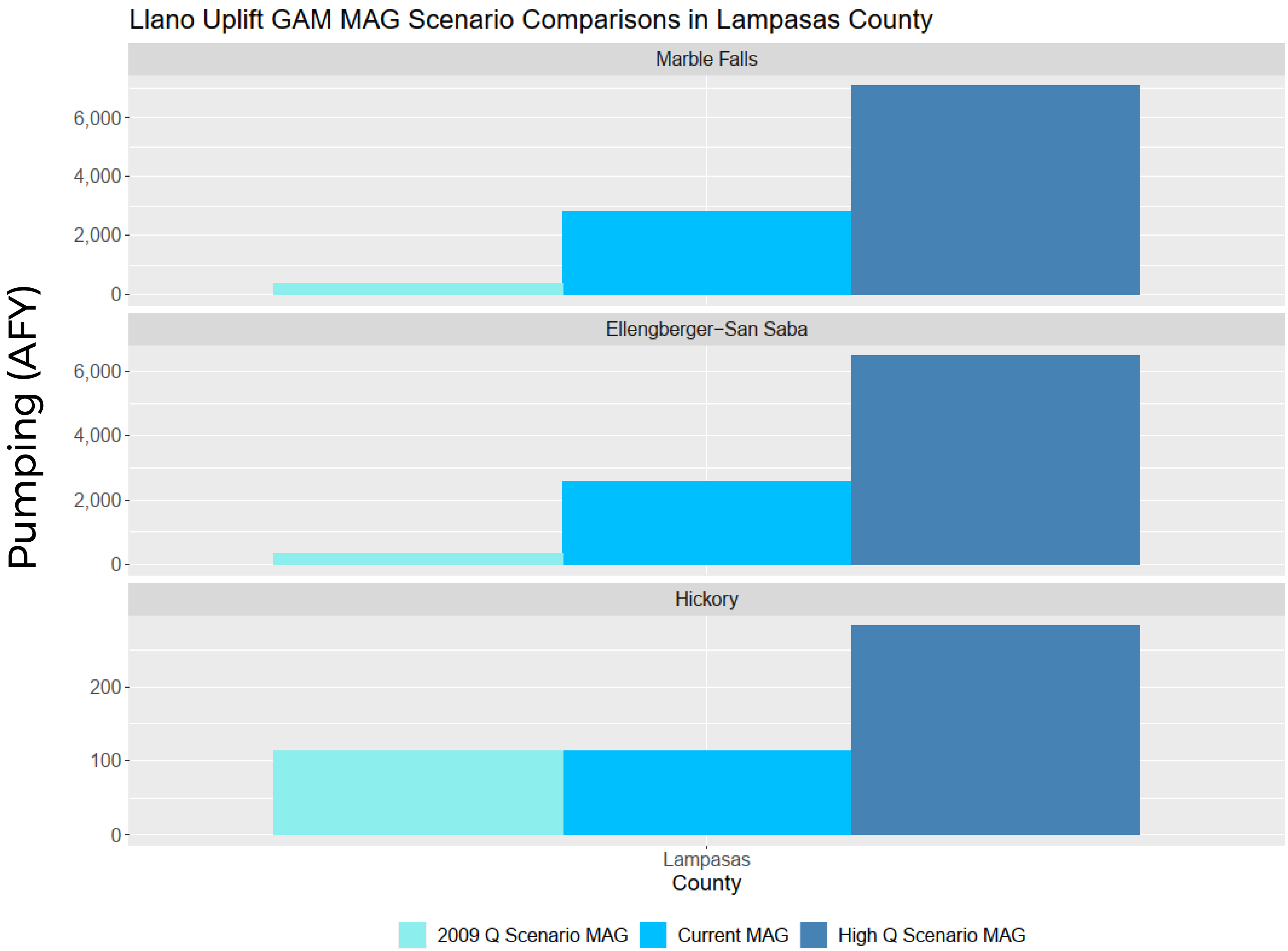
Scenario B - Llano Uplift model runs Current MAG pumping

		Current MAG Results							
County	Aquifer	2010	2020	2030	2040	2050	2060	2070	2080
Brown	Marble Falls	25	25	25	25	25	25	25	-
Brown	Ellenburger-San Saba	131	131	131	131	131	131	131	-
Brown	Hickory	12	12	12	12	12	12	12	-
Burnet	Marble Falls	2,738	2,738	2,738	2,738	2,738	2,738	2,738	-
Burnet	Ellenburger-San Saba	10,834	10,834	10,834	10,834	10,834	10,834	10,834	-
Burnet	Hickory	3,415	3,415	3,415	3,415	3,415	3,415	3,415	-
Lampasas	Marble Falls	2,839	2,839	2,839	2,839	2,839	2,839	2,839	-
Lampasas	Ellenburger-San Saba	2,595	2,595	2,595	2,595	2,595	2,595	2,595	-
Lampasas	Hickory	113	113	113	113	113	113	113	-
Mills	Marble Falls	25	25	25	25	25	25	25	-
Mills	Ellenburger-San Saba	499	499	499	499	499	499	499	-
Mills	Hickory	36	36	36	36	36	36	36	-

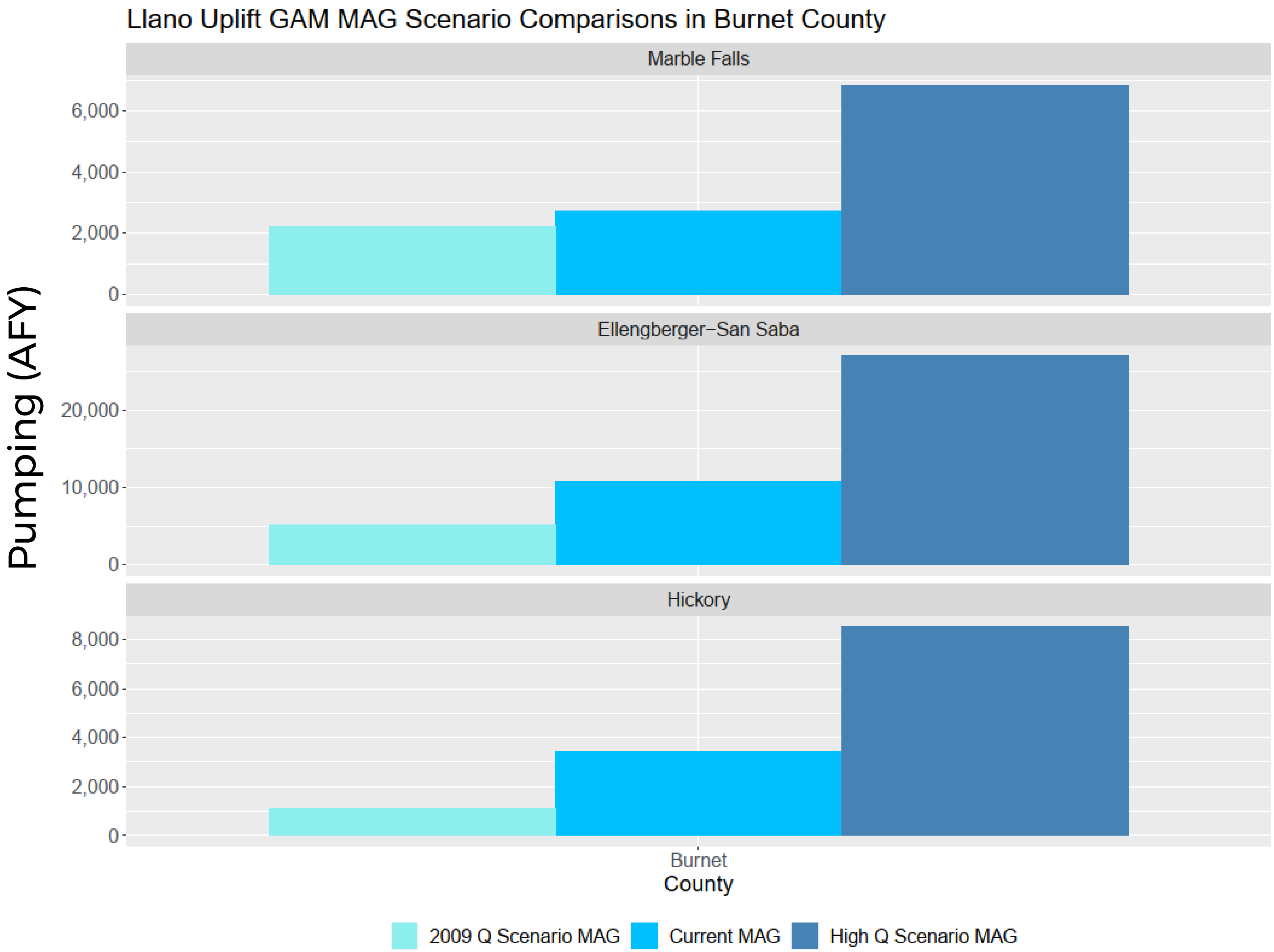
Scenario C - Llano Uplift model runs 2.5 x Current MAG pumping

County	Aquifer	High Q MAG Results 2010	2020	2030	2040	2050	2060	2070	2080
Brown	Marble Falls	25	25	25	25	25	25	25	25
Brown	Ellenburger-San Saba	131	131	131	131	131	131	131	131
Brown	Hickory	12	12	12	12	12	12	12	12
Burnet	Marble Falls	6,845	6,845	6,845	6,845	6,845	6,845	6,845	6,845
Burnet	Ellenburger-San Saba	27,086	27,086	27,086	27,086	27,086	27,086	27,086	27,086
Burnet	Hickory	8,538	8,538	8,538	8,538	8,538	8,538	8,538	8,538
Lampasas	Marble Falls	7,097	7,097	7,097	7,097	7,097	7,097	7,097	7,097
Lampasas	Ellenburger-San Saba	6,487	6,487	6,487	6,487	6,487	6,487	6,487	6,487
Lampasas	Hickory	283	283	283	283	283	283	283	283
Mills	Marble Falls	63	63	63	63	63	63	63	63
Mills	Ellenburger-San Saba	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248
Mills	Hickory	90	90	90	90	90	90	90	90

Lampasas County - Llano Uplift model runs Pumping Scenarios by aquifer



Burnet County - Llano Uplift model runs Pumping Scenarios by aquifer



Llano Uplift model run results from 3 scenarios

Q = Pumping
Current = current MAG

Llano Uplift DFC Results (Average Drawdown)				
County	Scenario	Marble Falls	Ellenburger-San Saba	Hickory
Brown	2009 Q	2.9	2.9	2.9
Brown	Current Q	3.2	3.2	3.1
Brown	High Q	3.6	3.6	3.6
Burnet	2009 Q	1.4	1.1	0.7
Burnet	Current Q	11.3	11.5	11.1
Burnet	High Q	41.3	42.6	42.0
Lampasas	2009 Q	3.8	3.8	3.8
Lampasas	Current Q	16.4	16.2	16.1
Lampasas	High Q	42.3	41.8	41.7
Mills	2009 Q	3.8	3.8	3.8
Mills	Current Q	8.9	8.9	8.9
Mills	High Q	18.7	18.7	18.7

Central Texas GCD Proposal for Llano Uplift Aquifer DFCs based on results of Scenario B

Proposed Llano Uplift DFCs (Average feet of Drawdown in 2080)			
County	Marble Falls	Ellenburger-San Saba	Hickory
Brown	3	3	3
Burnet	11	12	11
Lampasas	16	16	16
Mills	9	9	9

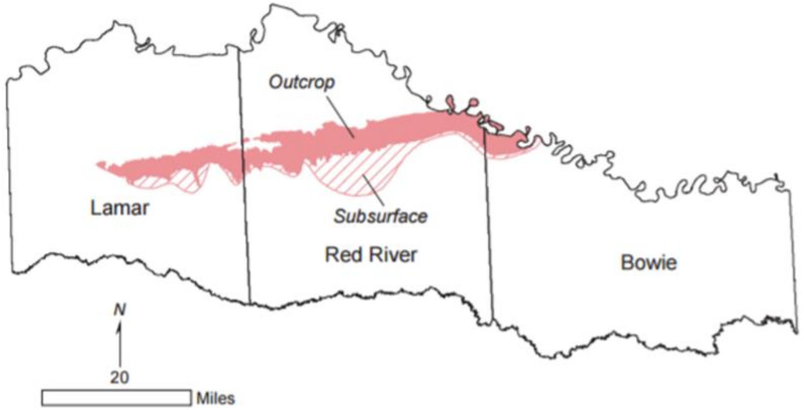
Proposed Action for Agenda Item 6

In the current round of planning, GMA 8 adopts the results from Scenario B using the Llano Uplift Aquifer GAM as the DFCs for the Llano Uplift Aquifers

Agenda Item 7
Discuss and possible action regarding GMA 8 declaration of non-relevant aquifers

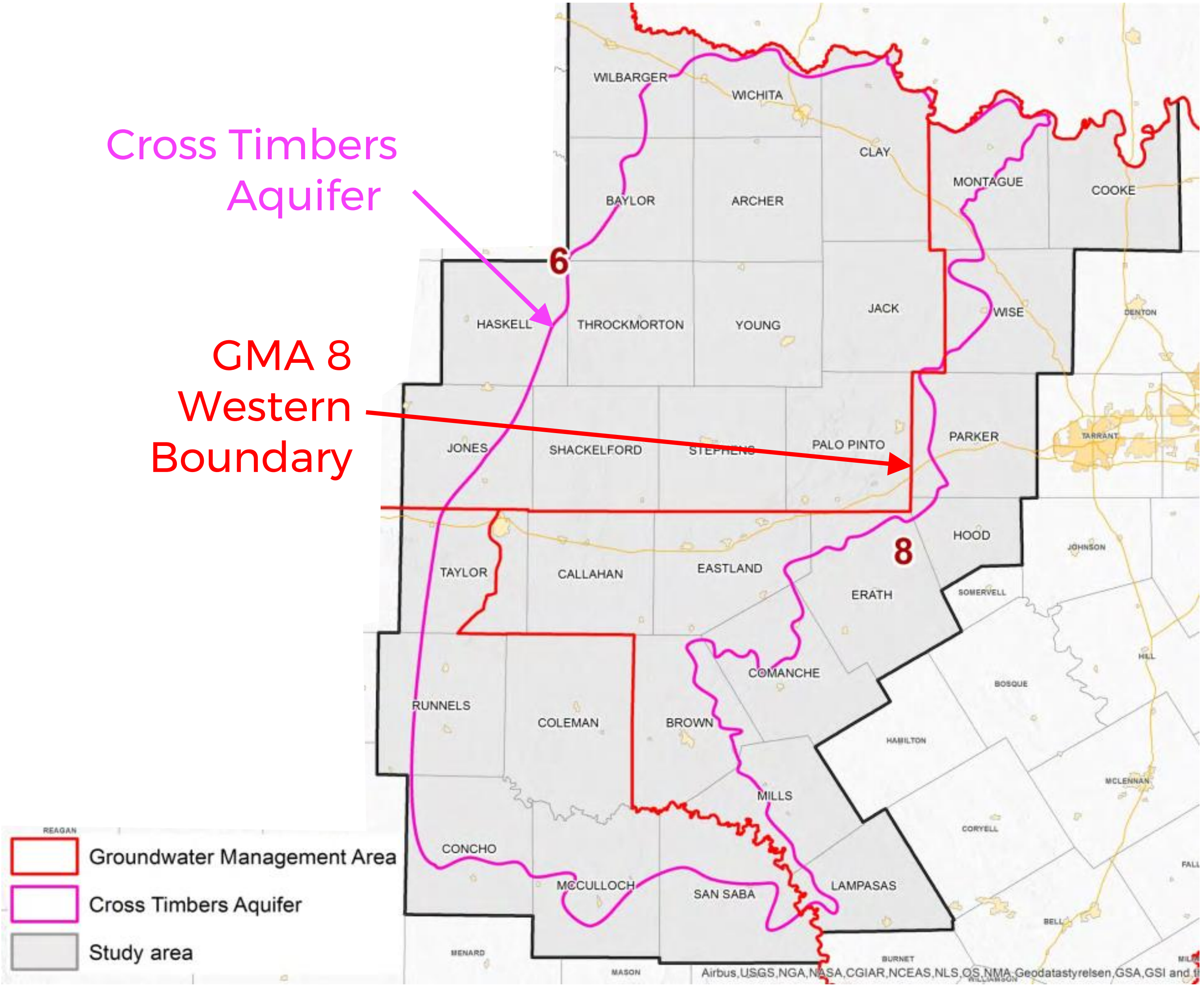
Review of NON-RELEVANT Aquifers (last round)

- The Nacatoch, Blossom and Brazos River Alluvium aquifers were classified as non-relevant for the purposes of joint planning
- DFCs were not adopted for these aquifers



New NON-RELEVANT Aquifer

- Cross Timbers Aquifer
  - *GAM Conceptual Model under development*
  - *Non-relevant*
  - *Will be added to Explanatory Report*



Proposed Action for Agenda Item 7

- In the current round of planning, GMA 8 determines that Nacatoch, Blossom, Brazos River Alluvium, and Cross Timbers Aquifers be declared non-relevant for purposes of Joint Groundwater Planning

Agenda Item 8
Presentation, discussion and possible action on options for Desired Future Conditions statements and next steps to establish proposed Desired Future Conditions.

Northern Trinity and Woodbine Aquifers

- *Run 11 – Update of NTWGAM DFC/MAG Run*
- *WSP has received pumping updates from Upper Trinity GCD, Southern Trinity GCD, Prairielands GCD, Central Texas GCD (funded thru GMA 8 contract)*
- *Pumping projections also updated for Clearwater UWCD, Central Texas GCD, Travis and Williamson County (funded separately by Clearwater UWCD)*

Edwards Balcones Fault Zone Aquifer

- *Clearwater UWCD recommends re-adopting current DFCs*

Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnt	Travis Peak	Hensell	Hosston	Antlers
Bell	-	17	83	0	333	145	375	0
Bosque	-	6	53	0	189	139	232	0
Brown	-	2	1	0	2	1	1	2
Burnet	0	0	2	0	19	7	21	0
Callahan	-	0	0	0	0	0	0	1
Collin	482	729	366	560	-	0	0	596
Comanche	-	2	2	0	4	2	3	12
Cooke	2	0	0	0	0	0	0	191
Coryell	-	5	15	0	107	70	141	0
Dallas	137	346	288	515	415	362	419	0
Delta	-	279	198	0	202	0	0	0
Denton	20	558	367	752	0	0	0	416
Eastland	-	0	0	0	0	0	0	4

Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnt	Travis Peak	Hensell	Hosston	Antlers
Ellis	76	128	220	413	380	290	390	0
Erath	-	6	6	8	25	12	35	14
Falls	-	159	238	0	505	296	511	0
Fannin	259	709	305	400	291	0	0	269
Grayson	163	943	364	445	0	0	0	364
Hamilton	-	2	4	0	26	14	38	0
Hill	20	45	149	0	365	211	413	0
Hunt	631	610	326	399	350	0	0	0
Johnson	4	-57	66	184	235	120	329	0
Kaufman	242	311	305	427	372	349	345	0
Lamar	42	100	107	0	125	0	0	132
Lampasas	-	1	1	0	6	1	11	0
Limestone	-	199	301	0	433	214	445	0

Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnt	Travis Peak	Hensell	Hosston	Antlers
McLennan	6	41	148	0	504	242	582	0
Milam	0	0	241	0	412	261	412	0
Mills	-	1	1	0	9	2	13	0
Navarro	110	139	266	0	343	295	343	0
Red River	2	24	40	0	57	0	0	15
Rockwall	275	433	343	466	-	0	0	0
Somervell	-	4	4	50	64	17	120	0
Tarrant	6	105	163	348	0	0	0	177
Taylor	-	0	0	0	0	0	0	0
Travis	0	0	83	0	219	68	226	0
Williamson	0	0	78	0	220	89	225	0
McLennan	6	41	148	0	504	242	582	0

Run 11 Results – Drawdown (2010-2080)

County	O/D	Paluxy	Glen Rose	Twin Mnt	Antlers
Hood	Downdip	-	39	72	0
Hood	Outcrop	6	9	13	0
Montague	Downdip	0	0	0	-
Montague	Outcrop	0	0	0	40
Parker	Downdip	2	50	68	-
Parker	Outcrop	6	20	7	42
Wise	Downdip	0	0	0	154
Wise	Outcrop	0	0	0	59

Presentation of DFCs from NTWGAM Run 11

DFC Tables in previous Explanatory Report

- Aquifer-Wide scale
- GCD scale
- County scale
- Outcrop and Downdip for UTGCD

Proposed Action for Agenda Item 8

Northern Trinity and Woodbine Aquifers

— *For the current round of planning, GMA 8 adopts the results of Run 11 as proposed DFCs for the Northern Trinity and Woodbine Aquifers*

Edwards (BFZ) Aquifer

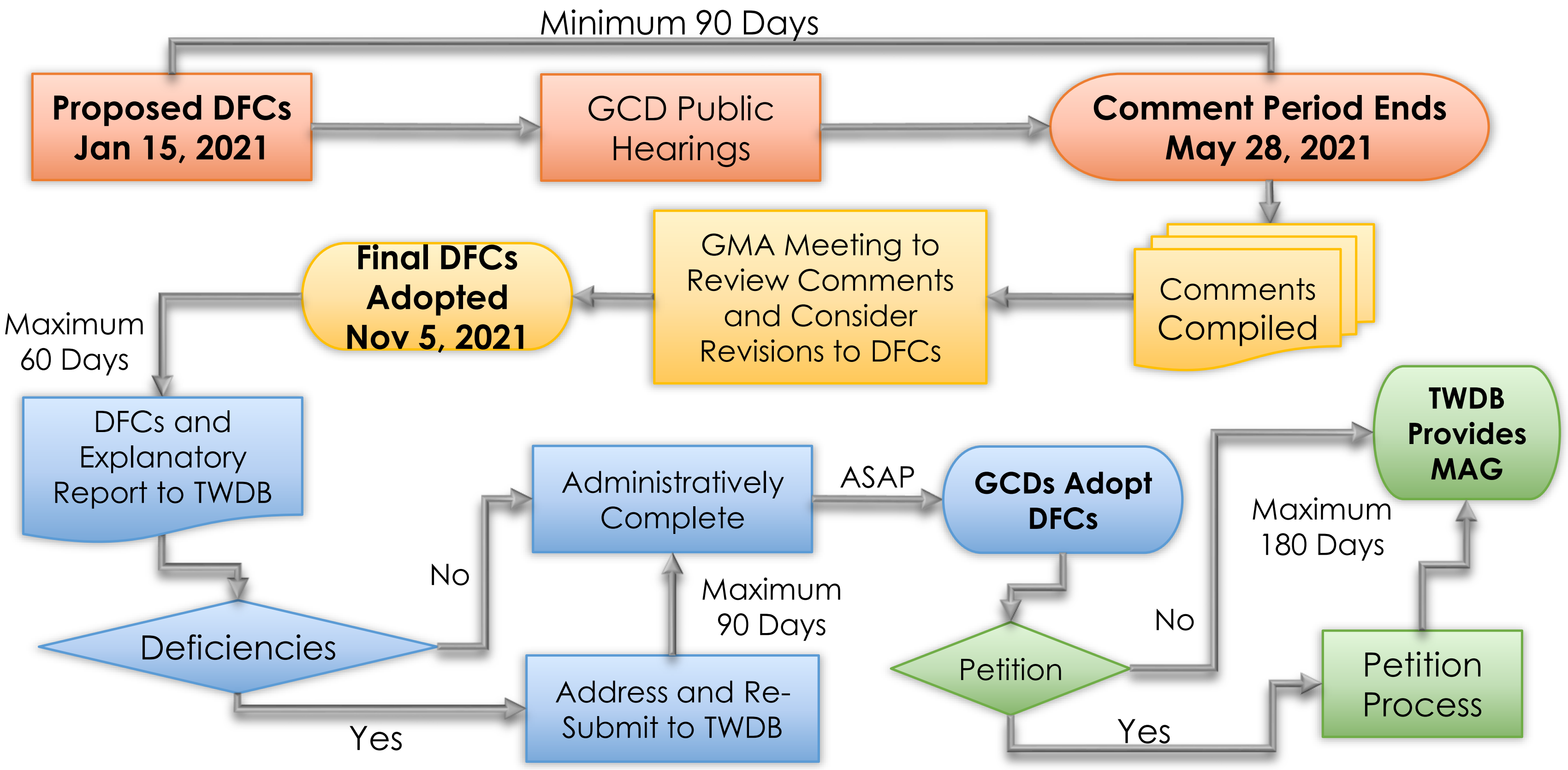
— *For the current round of planning, GMA 8 proposes the current DFCs for the Edwards BFZ Aquifer as defined in Resolution 2017-01 as the proposed DFCs*

County	Edwards (BFZ) DFC
Bell	Maintain at least 100 acre-feet per month of stream/spring flow in Salado Creek during a repeat of the drought of record
Travis	Maintain at least 42 acre-feet per month of aggregated stream/spring flow during a repeat of the drought of record
Williamson	Maintain at least 60 acre-feet per month of aggregated stream/spring flow during a repeat of the drought of record

Agenda Item 9
Discussion and possible action on margin of error language for the Desired Future Conditions Statement.

- Due to the nature of the drawdown calculations, TWDB suggests that the GMA provide “variance assumptions”
- For example, if the variation of averaged drawdowns calculated by the TWDB is within 5 percent of the proposed DFCs values, then the TWDB assumes the model results are consistent with the proposed DFCs.

Anticipated Timeline for GMA 8 DFC Process



Agenda Item 13
Discussion of possible agenda items and dates for next GMA 8 meeting

- Review 9 factors

- Approve DFC resolutions for each Aquifer
  - —Draft resolutions will be sent to GCDs at least 2 weeks prior to meeting

Thank you!

wsp.com

Appendix H
Consultant Presentation at GMA 8 Joint Groundwater Planning Meeting:
October 27, 2020

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GMA 8
Joint Groundwater Planning Meeting

October 27, 2020

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Blanton & Associates, Inc.

Agenda Item 7
Presentation and discussion of the 9 factors pursuant to Texas Water Code Section 36.108(d).

- WSP Team has discussed 9 factors in three previous meetings
- Minor DFC changes have occurred due to minor changes in GAM runs
- Briefly review 9 factors before considering adoption of proposed DFCs

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Standard for Desired Future Conditions

Highest Practicable Level of Groundwater Production

Conservation, Preservation, Protection, Recharging, and Prevention of Waste of Groundwater, and Control of Subsidence

3

Previous GMA 8 Meetings Discussing Nine Factors

November 2019		
Environmental Impacts	Subsidence Impacts	Hydrological Conditions
February 2020		
Aquifer Uses or Conditions	Supply Needs & Management Strategies	Private Property Rights
May 2020		
Socioeconomic Impacts	DFC Feasibility	Other Relevant Information

4

Environmental Impacts

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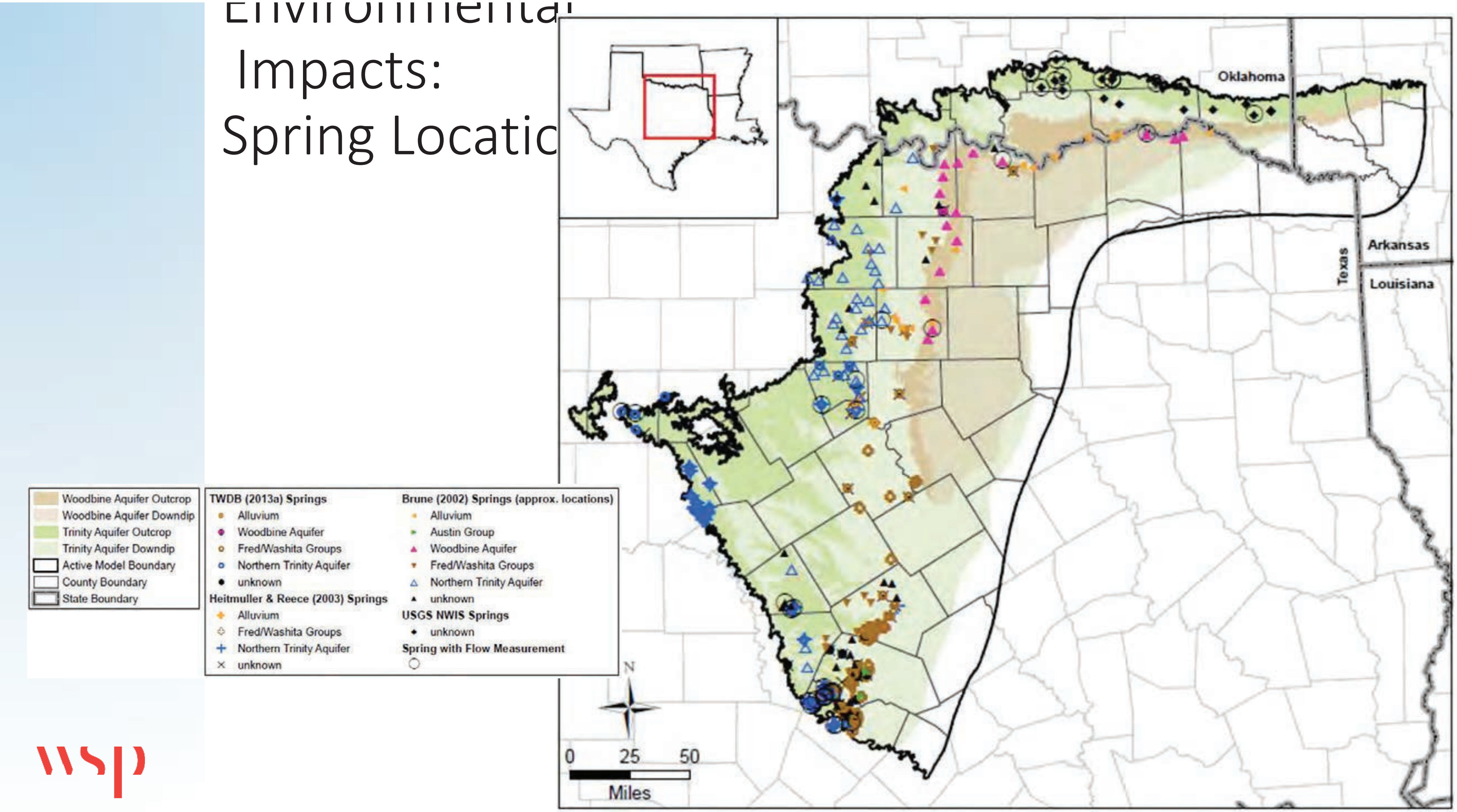
Impacts:
Oklahoma
Arkansas
Texas
Louisiana
Woodbine Aquifer Outcrop
Woodbine Aquifer Downdip
Trinity Aquifer Outcrop
Trinity Aquifer Downdip
Active Model Boundary
County Boundary
State Boundary
TWDB (2013a) Springs
Alluvium
Woodbine Aquifer
Fred/Washita Groups
Northern Trinity Aquifer
unknown
Heitmuller & Reece (2003) Springs
Alluvium
Fred/Washita Groups
Northern Trinity Aquifer
unknown
Brune (2002) Springs (approx. locations)
Alluvium
Austin Group
Woodbine Aquifer
Fred/Washita Groups
Northern Trinity Aquifer
unknown
USGS NWIS Springs
unknown
Spring with Flow Measurement
N
0 25 50
Miles
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Environmental Impacts: Spring Discharge and Streamflow

- Southern portion of GMA 8 has the greatest density of springs.
- Most are in the Washita/Fredericksburg, which includes Edwards BFZ.
- Many located in far western extent of GMA 8.
- Springs flow when the water level elevation of the aquifer is higher than the spring elevation.
- Run 11 impacts to springs and streams is very similar to Run 10 in previous round of planning

Subsidence Impacts

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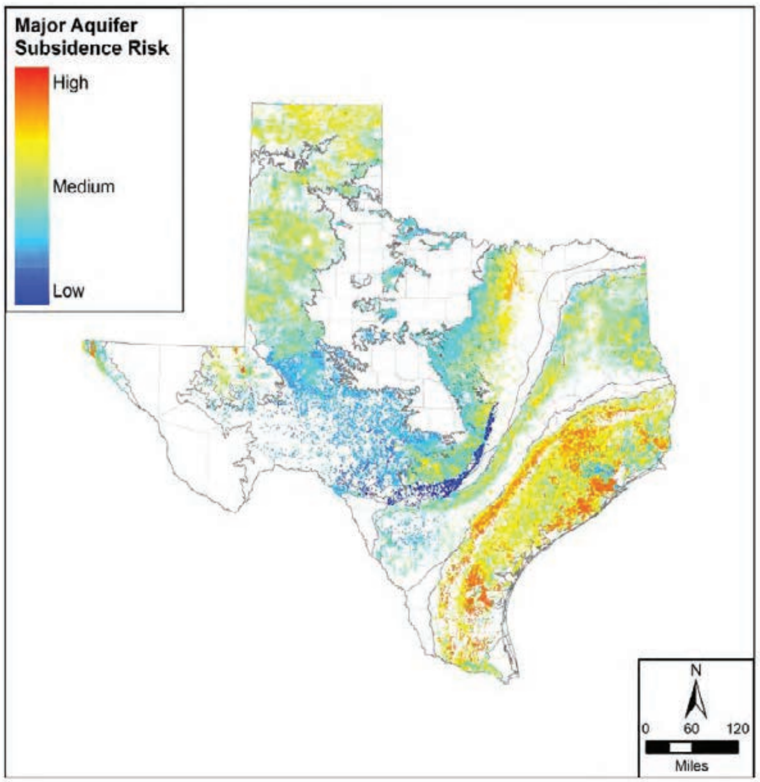
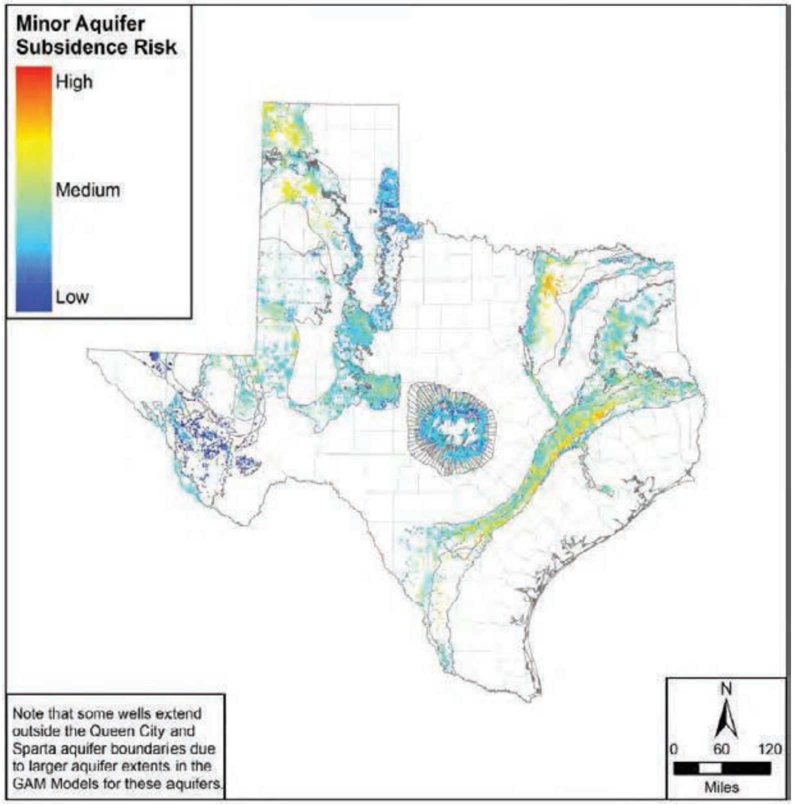
Visualizing the Subsidence Risk





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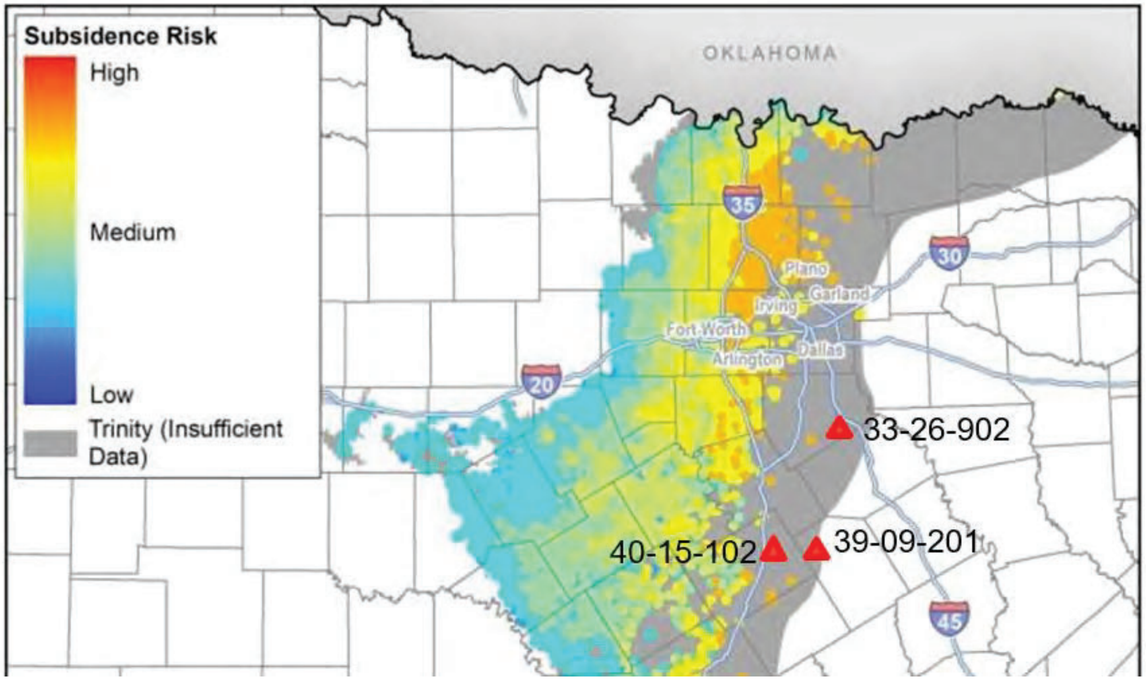
Examples of Subsidence Estimates

Well Owner	State Well ID	Aquifer Thickness (feet)	Clay Thickness (feet)	**Subsidence Risk Score**	Minimum Subsidence (feet)	Maximum Subsidence (feet)
Rockett SUD	33-26-902	1,140	668	**7.66**	0.6	1.2
Penelope WSC	39-09-201	1,440	299	**8.59**	3.0	6.0
Aquilla	40-15-102	835	294	**7.66**	2.5	4.5



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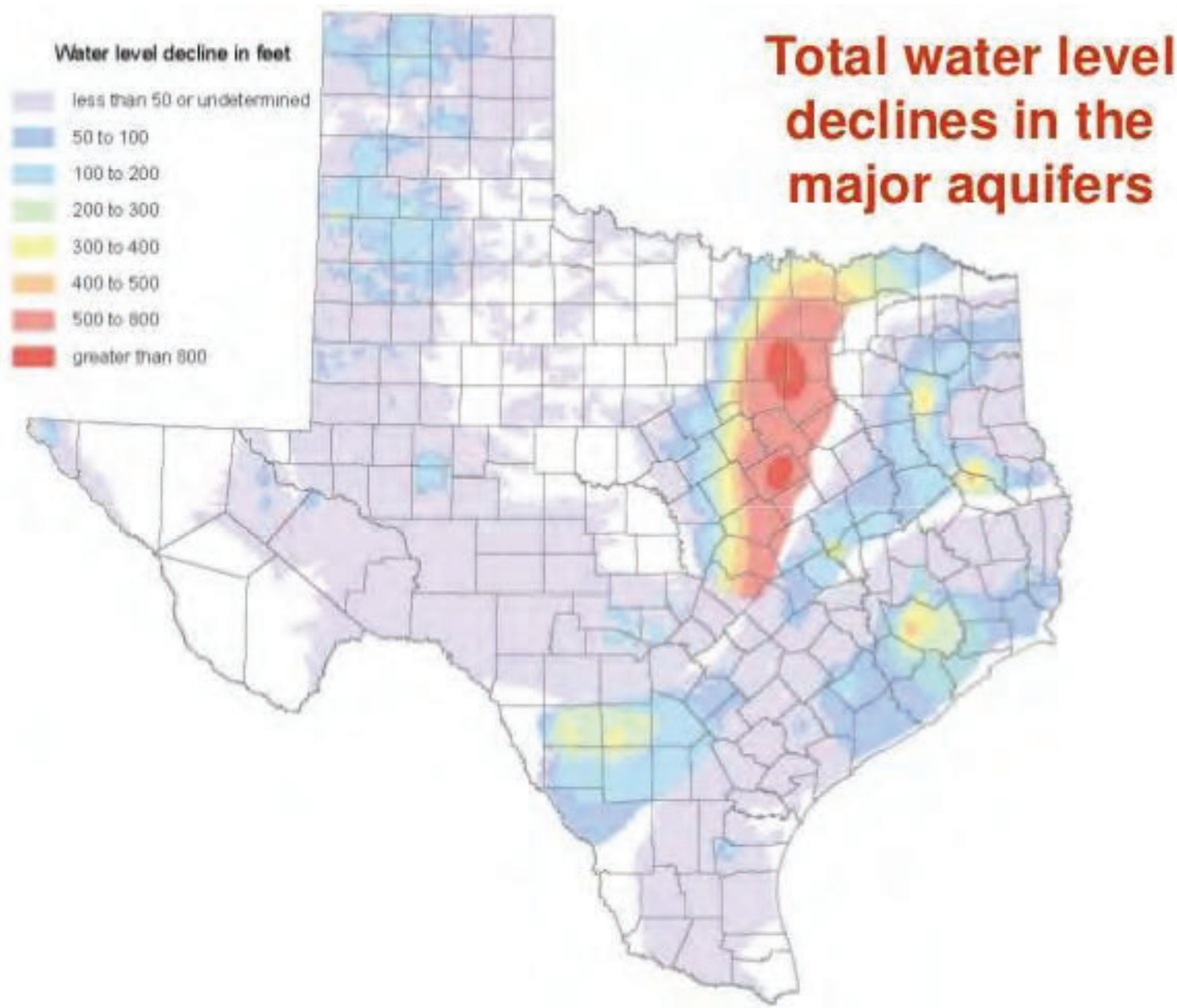
Hydrological Conditions

11


Water level decline in feet
less than 50 or undetermined
50 to 100
100 to 200
200 to 300
300 to 400
400 to 500
500 to 800
greater than 800
Total water level declines in the major aquifers

Hydrological Conditions

- TWDB GWDB water level data
- Define relevant **TWDB** aquifer codes
- Count measurements and throw out null values.
  - Wells with less than 3 measurements; and
  - Wells that do not have a measurement since 2000
- Selection criteria reduced well locations with water levels from 8,461 to 677 wells used for mapping/hydrographs

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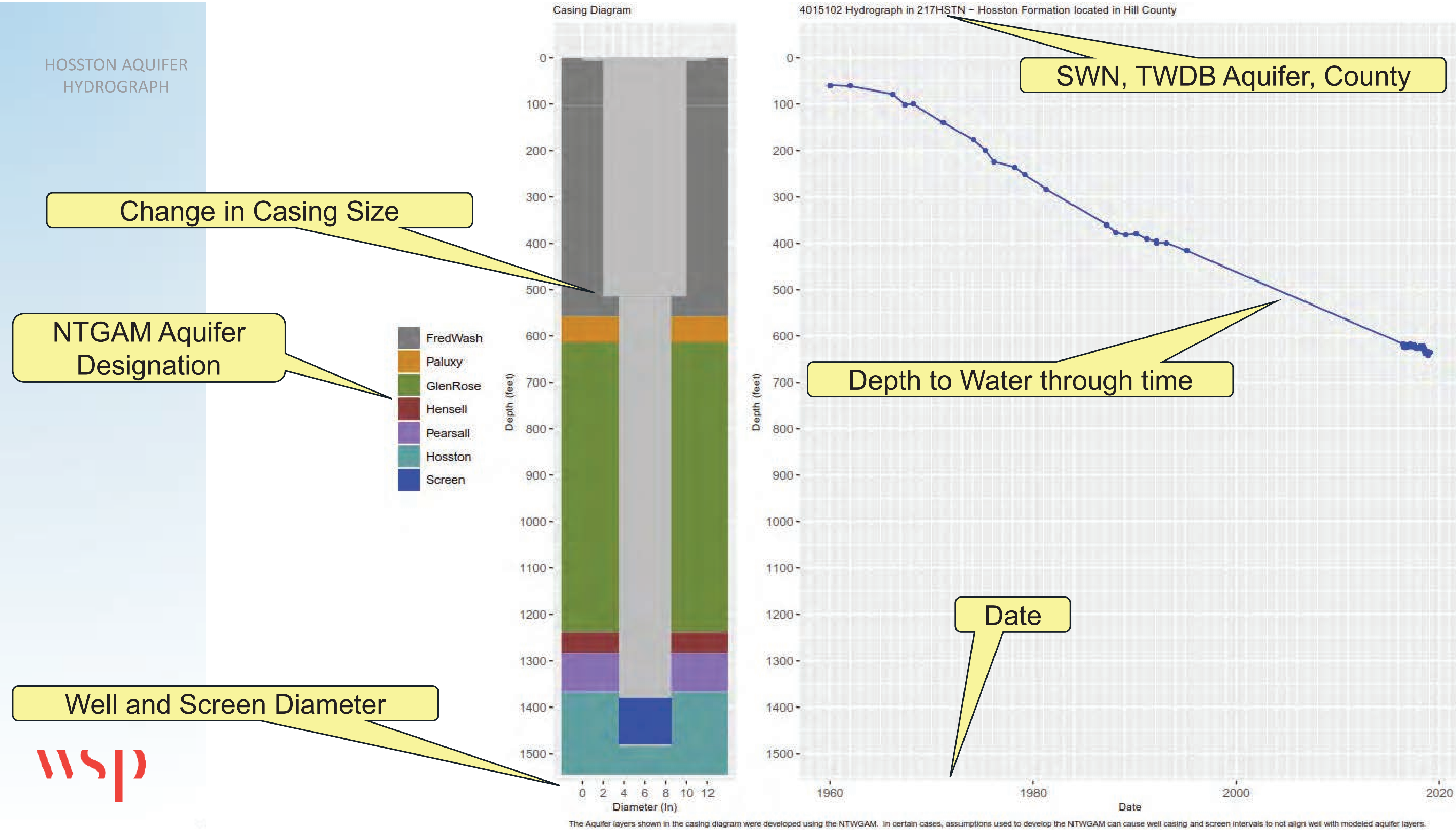
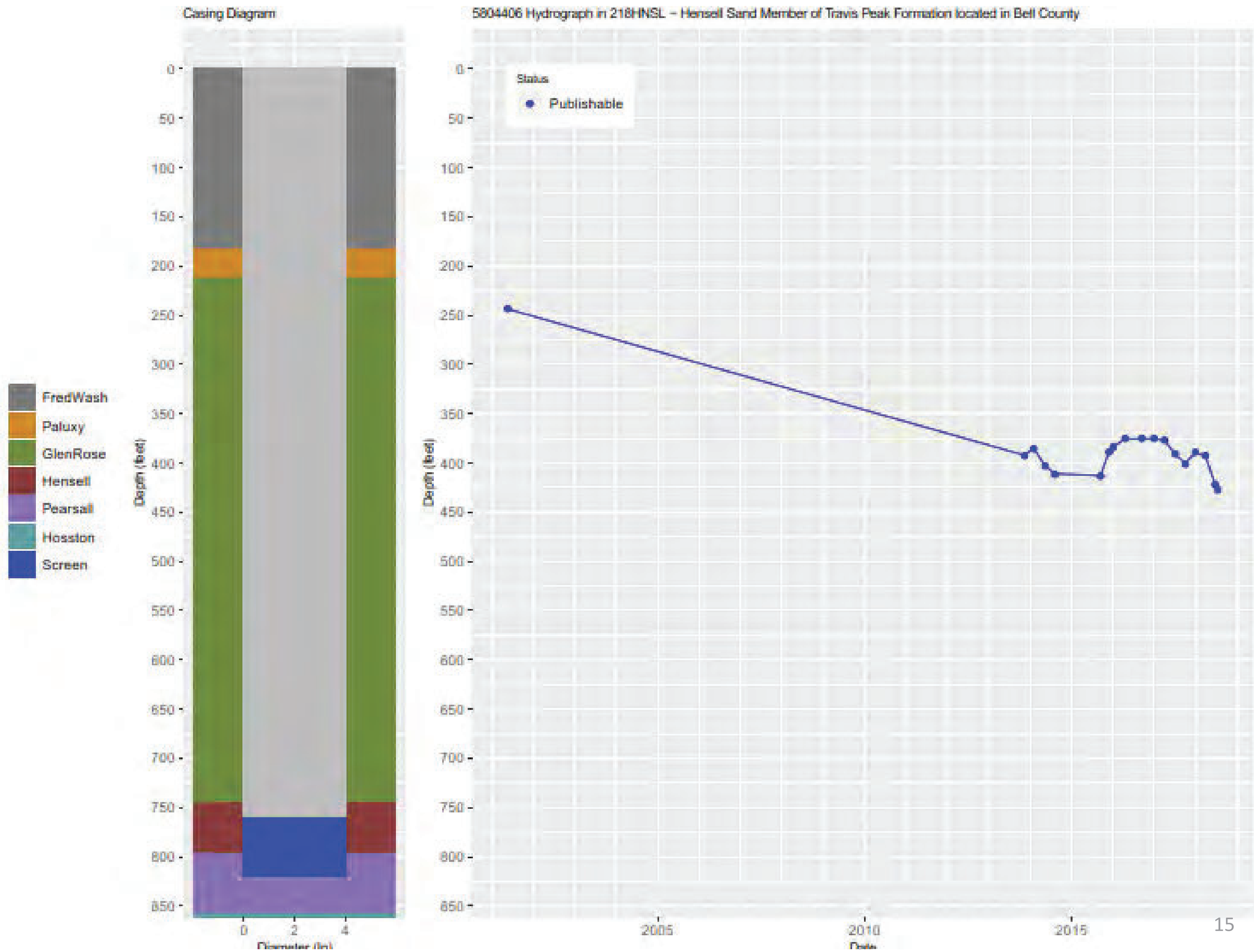
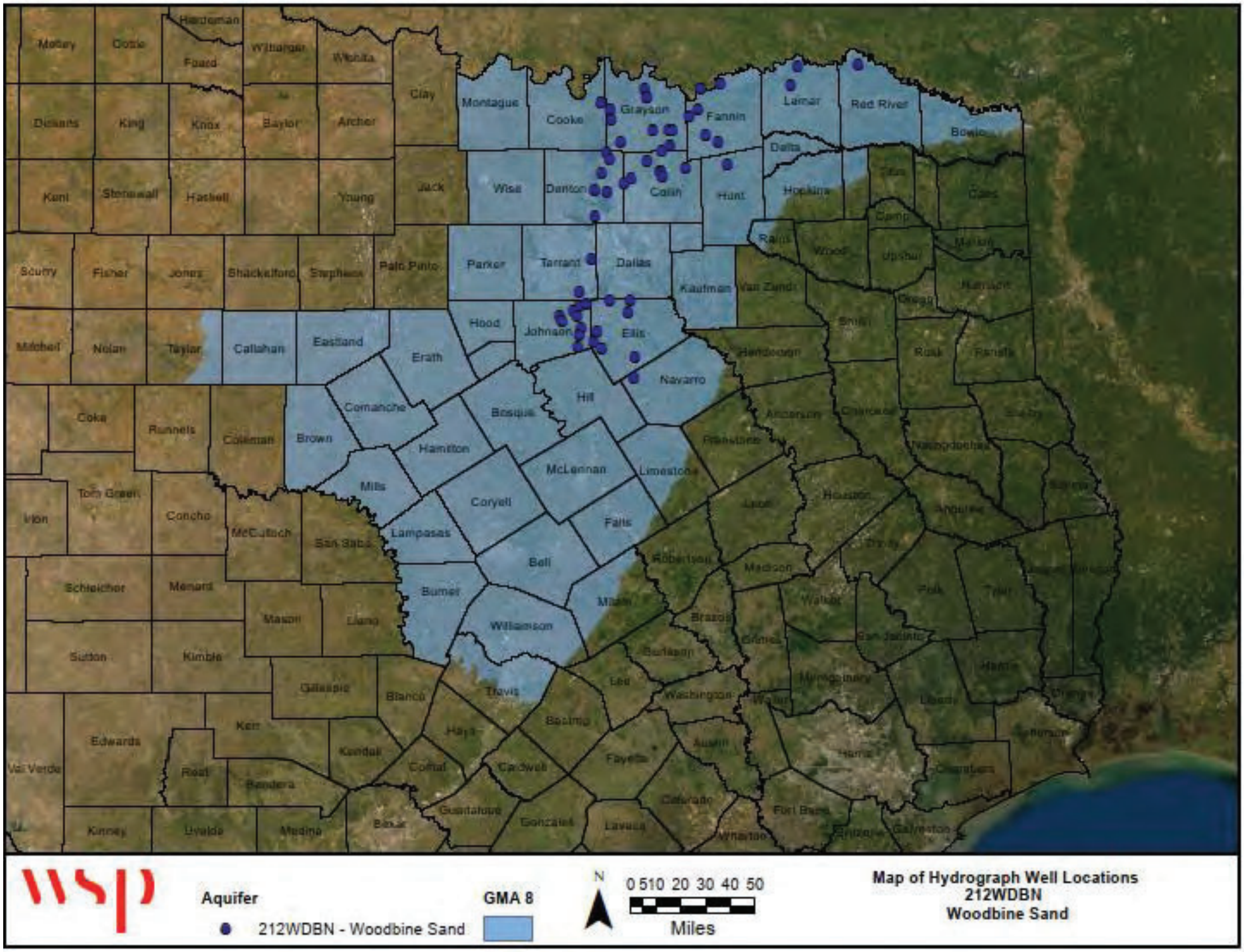

HOSSTON AQUIFER HYDROGRAPH
Casing Diagram
4015102 Hydrograph in 217HSTN – Hosston Formation located in Hill County
SWN, TWDB Aquifer, County
Change in Casing Size
NTGAM Aquifer Designation
FredWash
Paluxy
GlenRose
Hensell
Pearsall
Hosston
Screen
Depth to Water through time
Date
Well and Screen Diameter
Depth (feet)
Diameter (In)
Date
The Aquifer layers shown in the casing diagram were developed using the NTWGAM. In certain cases, assumptions used to develop the NTWGAM can cause well casing and screen intervals to not align well with modeled aquifer layers.

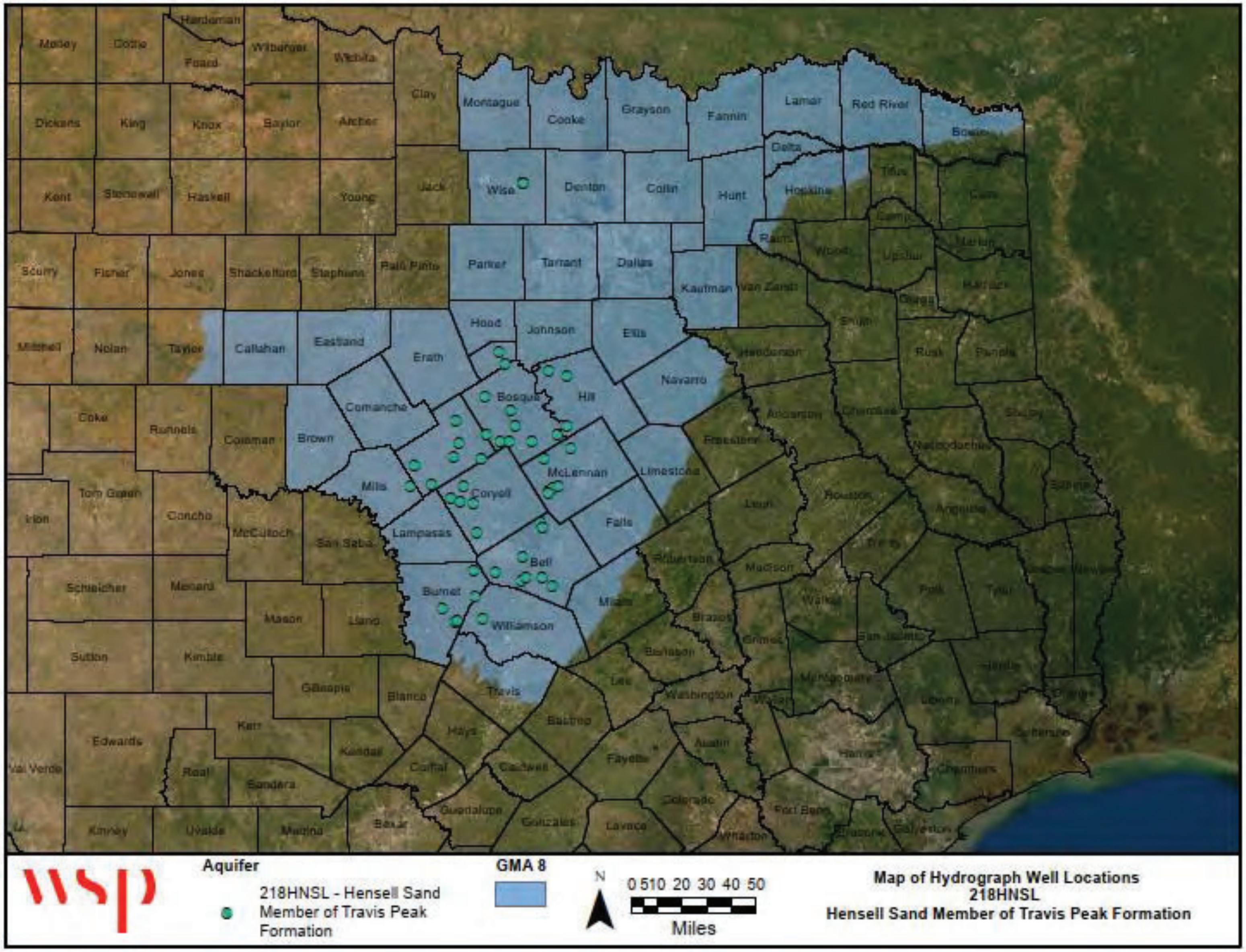
HENSELL AQUIFER HYDROGRAPH IN BELL COUNTY



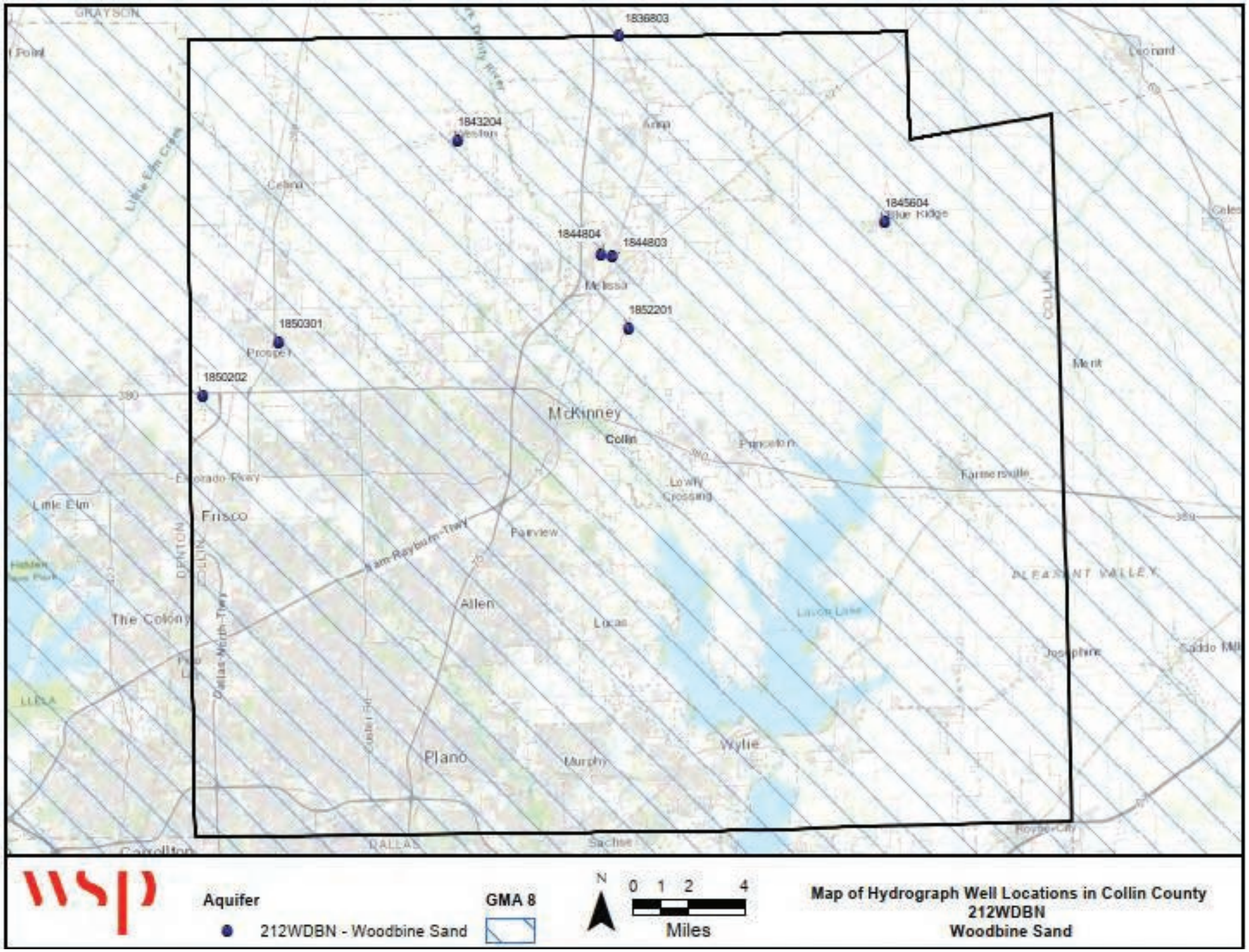
WOODBINE AQUIFER WELLS WITH HYDROGRAPHS



HENSELL AQUIFER WELLS WITH HYDROGRAPHS



WOODBINE AQUIFER WELLS WITH HYDROGRAPHS IN COLLIN COUNTY



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Total Estimated Recoverable Storage (TERS)

Hickory Aquifer in GMA 8

County	25 percent of Total Storage (acre-feet)	75 percent of Total Storage (acre-feet)
Brown	55,000	165,000
Burnet	1,650,000	4,950,000
Lampasas	700,000	2,100,000
Mills	157,500	472,500
Travis	8,250	24,750
Williamson	4,250	12,750
Total	2,575,000	7,725,000

Ellenburger – San Saba Aquifer in GMA 8

County	25 percent of Total Storage (acre-feet)	75 percent of Total Storage (acre-feet)
Brown	55,000	165,000
Burnet	1,650,000	4,950,000
Lampasas	700,000	2,100,000
Mills	157,500	472,500
Travis	8,250	24,750
Williamson	4,250	12,750
Total	2,575,000	7,725,000

Marble Falls Aquifer in GMA 8

County	25 percent of Total Storage (acre-feet)	75 percent of Total Storage (acre-feet)
Burnet	9,500	28,500
Lampasas	9,750	29,250
Total	19,250	57,750

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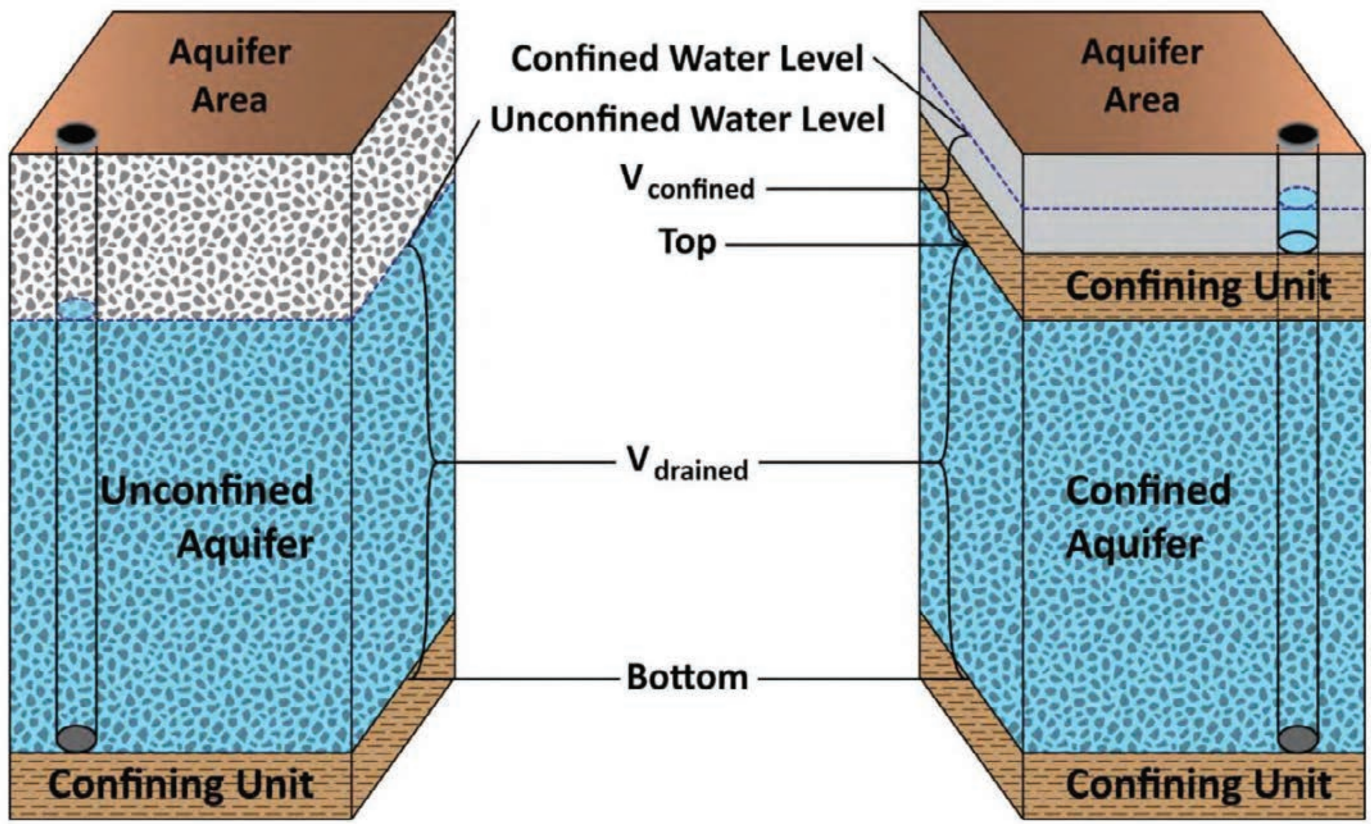
Total Estimated Recoverable Storage (TERS)



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Total Estimated Recoverable Storage (TERS)

Trinity Aquifer in GMA 8

County	25 percent of Total Storage (acre-feet)	75 percent of Total Storage (acre-feet)
Bell	14,750,000	44,250,000
Bosque	10,000,000	30,000,000
Brow	650,000	1,950,000
Burnet	2,750,000	8,250,000
Callahan	450,000	1,350,000
Collin	22,000,000	66,000,000
Comanche	2,075,000	6,225,000
Cooke	11,250,000	33,750,000
Coryell	8,500,000	25,500,000
Eastland	400,000	1,200,000
Ellis	19,500,000	58,500,000
Erath	5,000,000	15,000,000
Falls	9,000,000	27,000,000
Fannin	19,750,000	59,250,000
Grayson	15,750,000	47,250,000
Hamilton	5,500,000	16,500,000
Hill	13,000,000	39,000,000
Hood	2,750,000	8,250,000
Hunt	3,000,000	9,000,000
Johnson	8,750,000	26,250,000
Kaufman	2,350,000	7,050,000
Lamar	19,250,000	57,750,000
Lampasas	3,000,000	9,000,000
Limestone	2,750,000	8,250,000
McLennan	14,750,000	44,250,000
Milam	5,500,000	16,500,000
Mills	2,125,000	6,375,000
Montague	1,950,000	5,850,000
Navarro	9,750,000	29,250,000
Parker	5,500,000	16,500,000
Red River	11,000,000	33,000,000
Rockwall	1,225,000	3,675,000
Somervell	1,500,000	4,500,000
Tarrant	12,250,000	36,750,000
Taylor	157,500	472,500
Travis	9,750,000	29,250,000
Williamson	19,250,000	57,750,000
Wise	5,000,000	15,000,000
Total	339,882,500	1,019,647,500

Total Estimated Recoverable Storage (TERS)

Edwards (Balcones Fault Zone) Aquifer in GMA 8

County	25 percent of Total Storage (acre-feet)	75 percent of Total Storage (acre-feet)
Bell	2,750	8,250
Travis	1,475	4,425
Williamson	19,500	58,500
Total	23,725	71,175

Woodbine Aquifer in GMA 8

County	25 percent of Total Storage (acre-feet)	75 percent of Total Storage (acre-feet)
Collin	8,000,000	24,000,000
Cooke	300,000	900,000
Dallas	7,500,000	22,500,000
Denton	2,225,000	6,675,000
Ellis	6,250,000	18,750,000
Fannin	9,750,000	29,250,000
Grayson	8,000,000	24,000,000
Hill	1,675,000	5,025,000
Hunt	2,050,000	6,150,000
Johnson	1,125,000	3,375,000
Kaufman	1,175,000	3,525,000
Lamar	5,250,000	15,750,000
McLennan	225,000	675,000
Navarro	850,000	2,550,000
Red River	1,125,000	3,375,000
Rockwall	11,500	34,500
Tarrant	1,325,000	3,975,000
Total	56,836,500	170,509,500

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Total Estimated Recoverable Storage (TERS)

Nacatoch Aquifer in GMA 8

County	25 percent of Total Storage (acre-feet)	75 percent of Total Storage (acre-feet)
Bowie	525,000	1,575,000
Delta	25,000	75,000
Ellis	17	50
Franklin	1,825	5,475
Hopkins	82,500	247,500
Hunt	137,500	412,500
Kaufman	30,000	90,000
Lamar	3,000	9,000
Navarro	23,750	71,250
Rains	4,500	73,500
Red River	145,000	435,000
Rockwall	70	210
Total	978,162	2,934,485

Blossom Aquifer in GMA 8

County	25 percent of Total Storage (acre-feet)	75 percent of Total Storage (acre-feet)
Bowie	227,500	682,500
Lamar	242,500	727,500
Red River	1,300,000	3,900,000
Total	1,770,000	5,310,000

Brazos River Alluvium Aquifer in GMA 8

County	25 percent of Total Storage (acre-feet)	75 percent of Total Storage (acre-feet)
Bosque	2,400	7,200
Falls	40,000	120,000
Hill	1,650	4,950
McLennan	22,500	67,500
Milam	2,175	6,525
Total	68,725	206,175

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Aquifer Uses and Conditions

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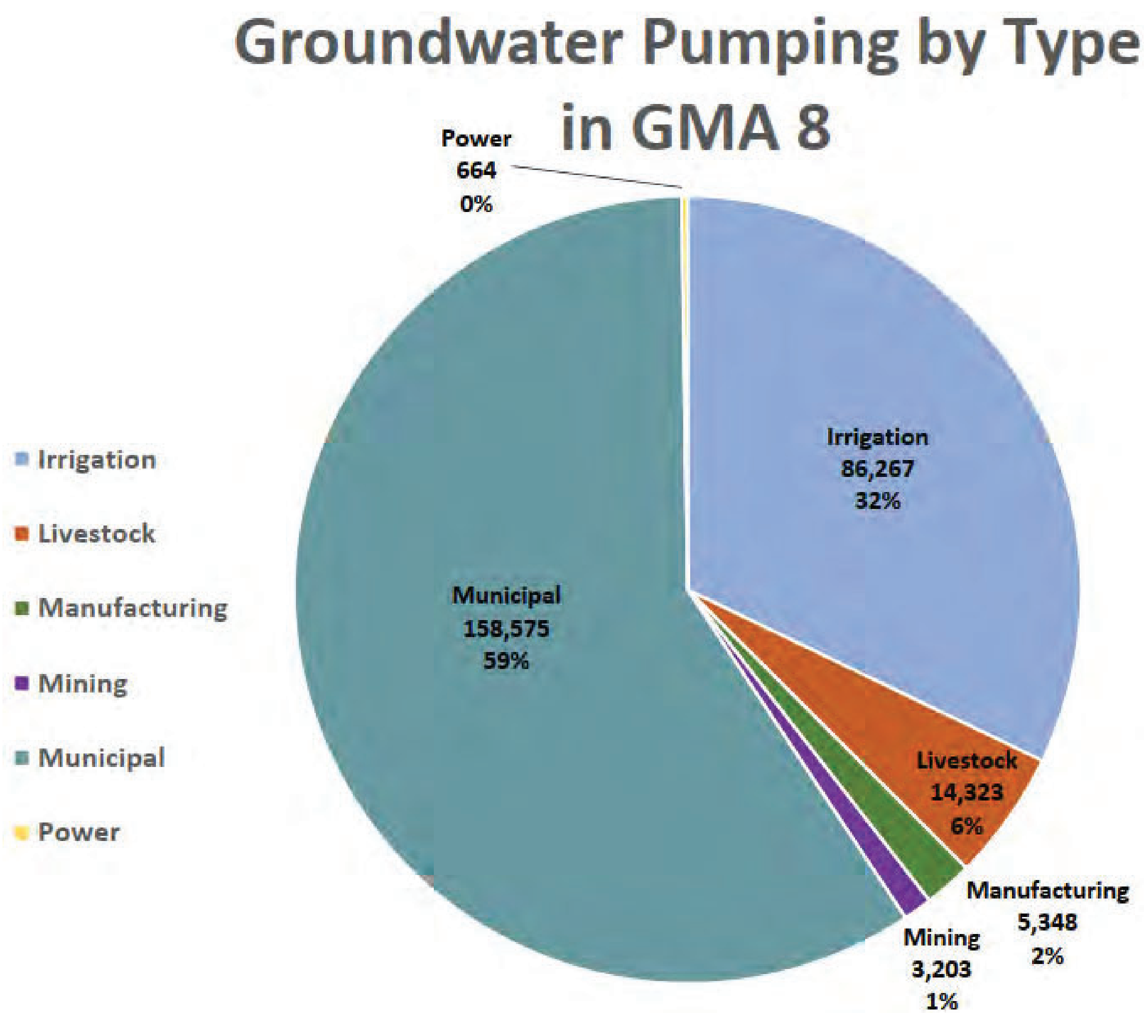

5-year average for years 2014-2018


Supply Needs &
Management Strategies
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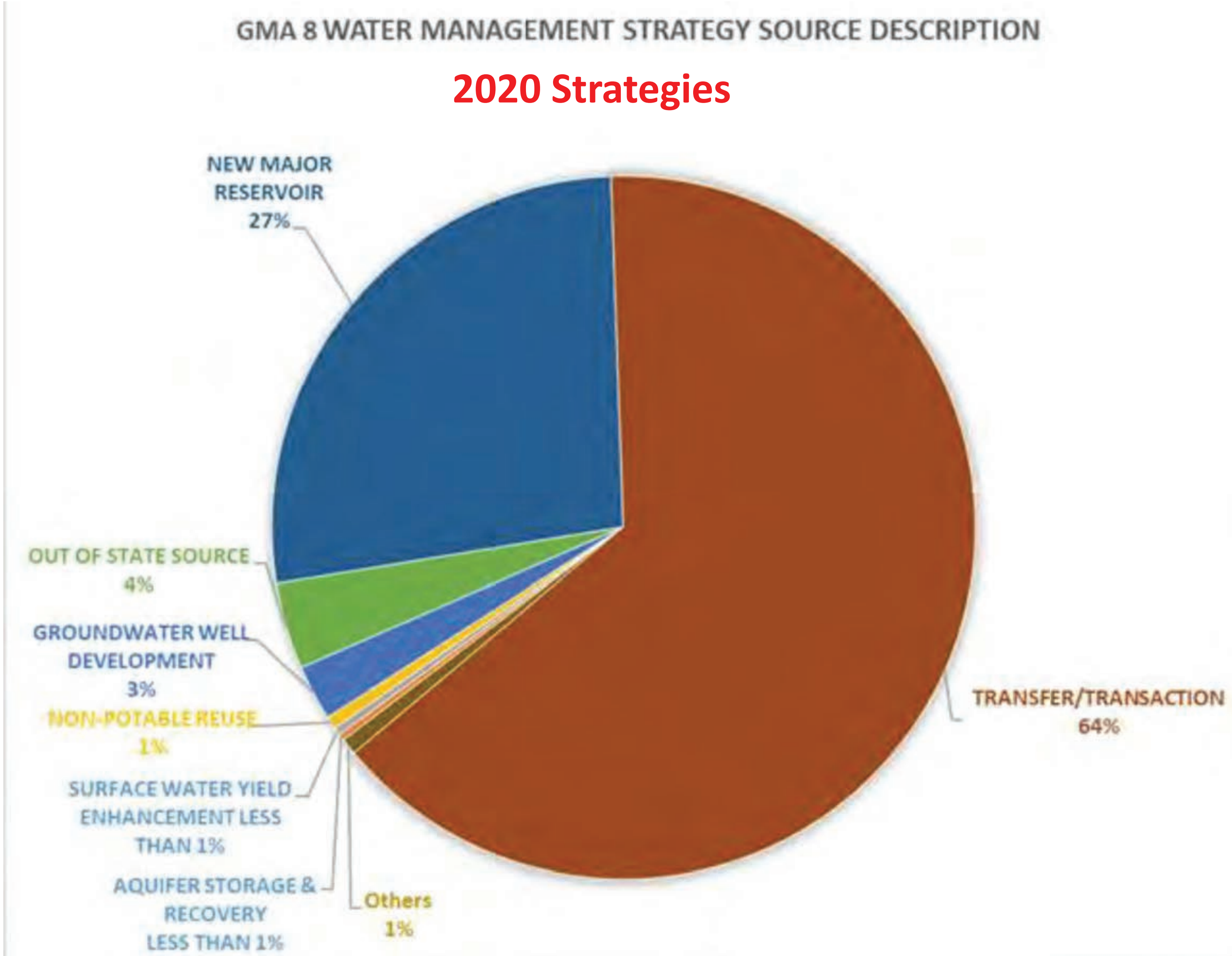
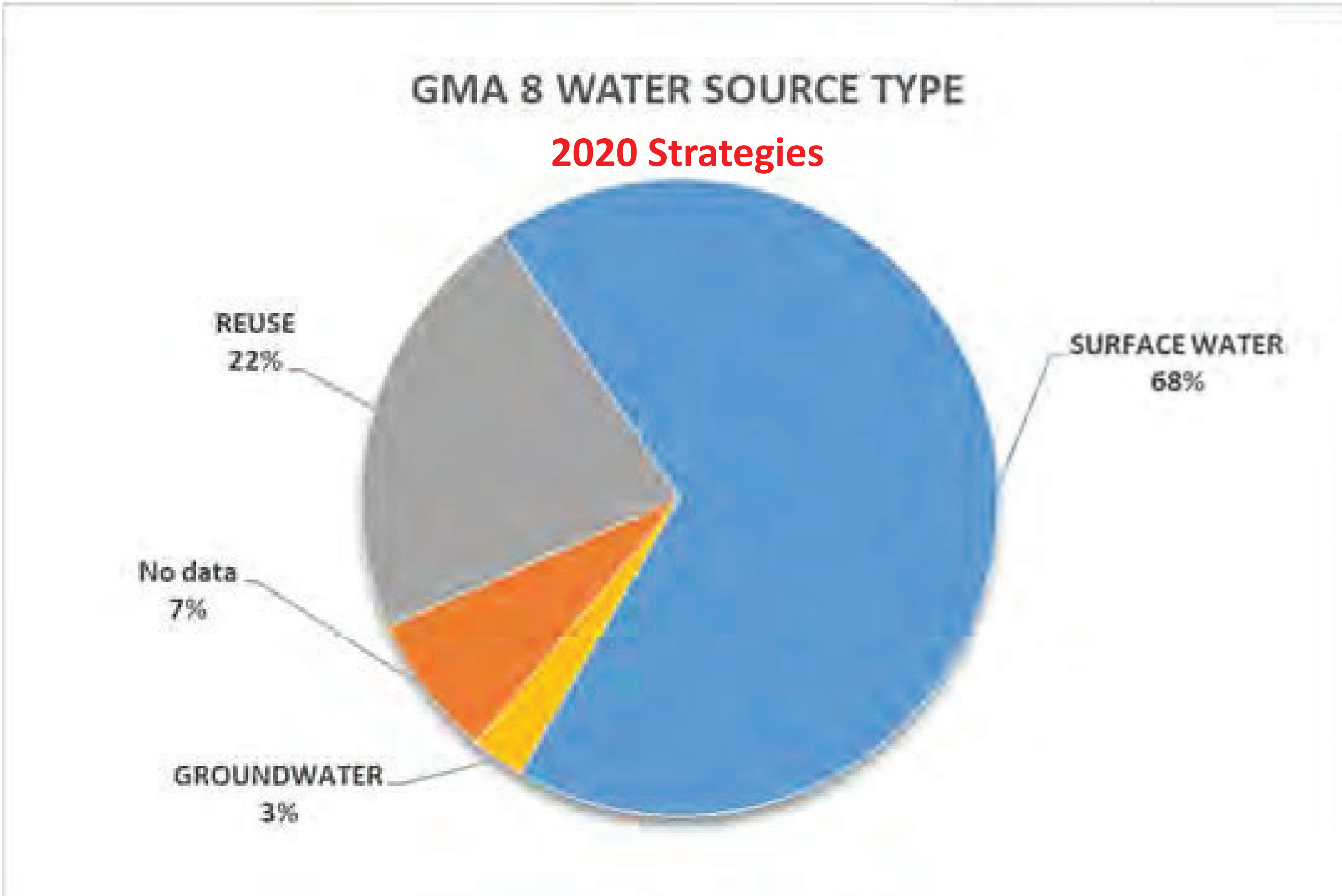
At a glance

Sources for New Strategies in GMA 8



At a glance

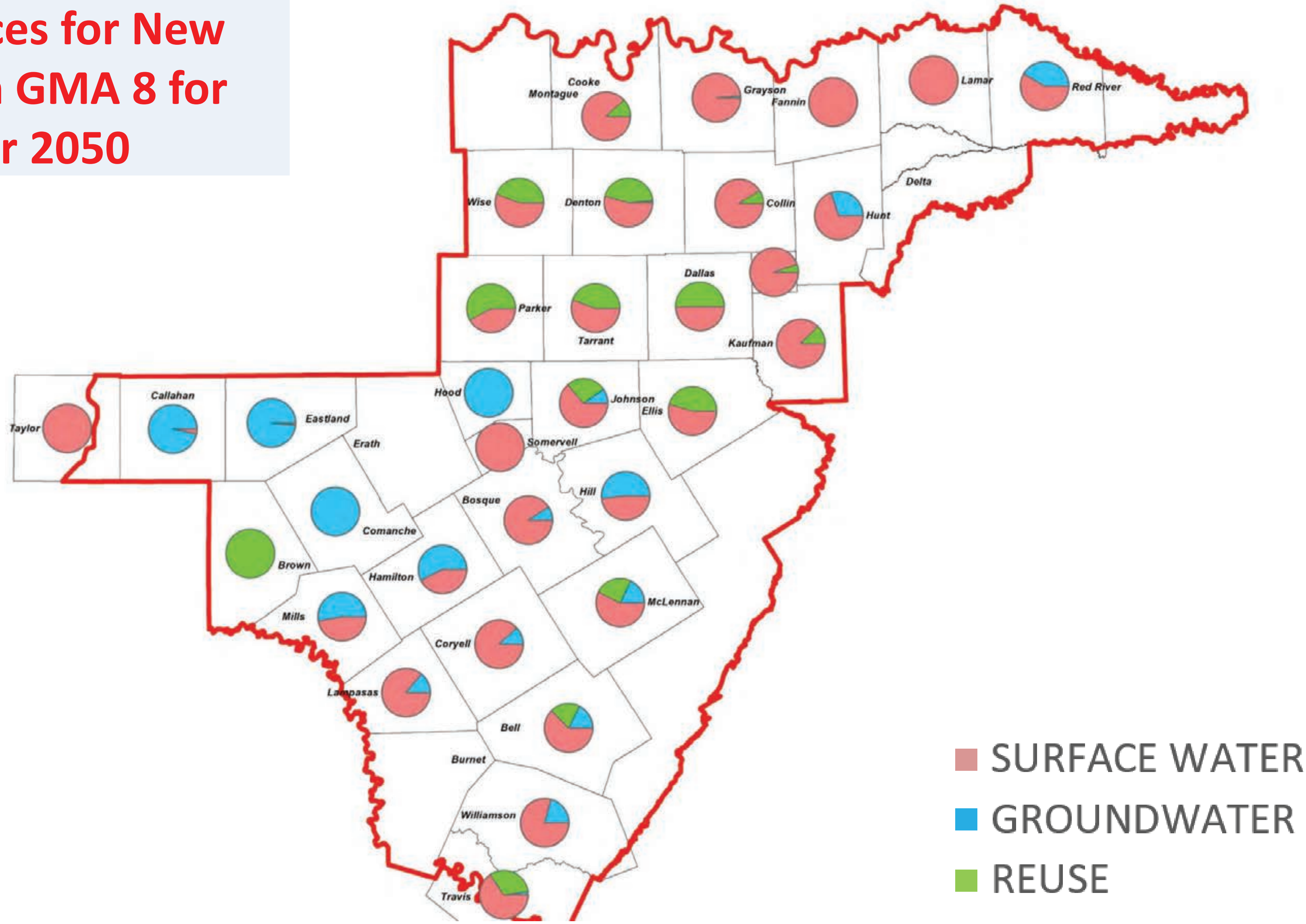
Water Sources for New Strategies in GMA 8



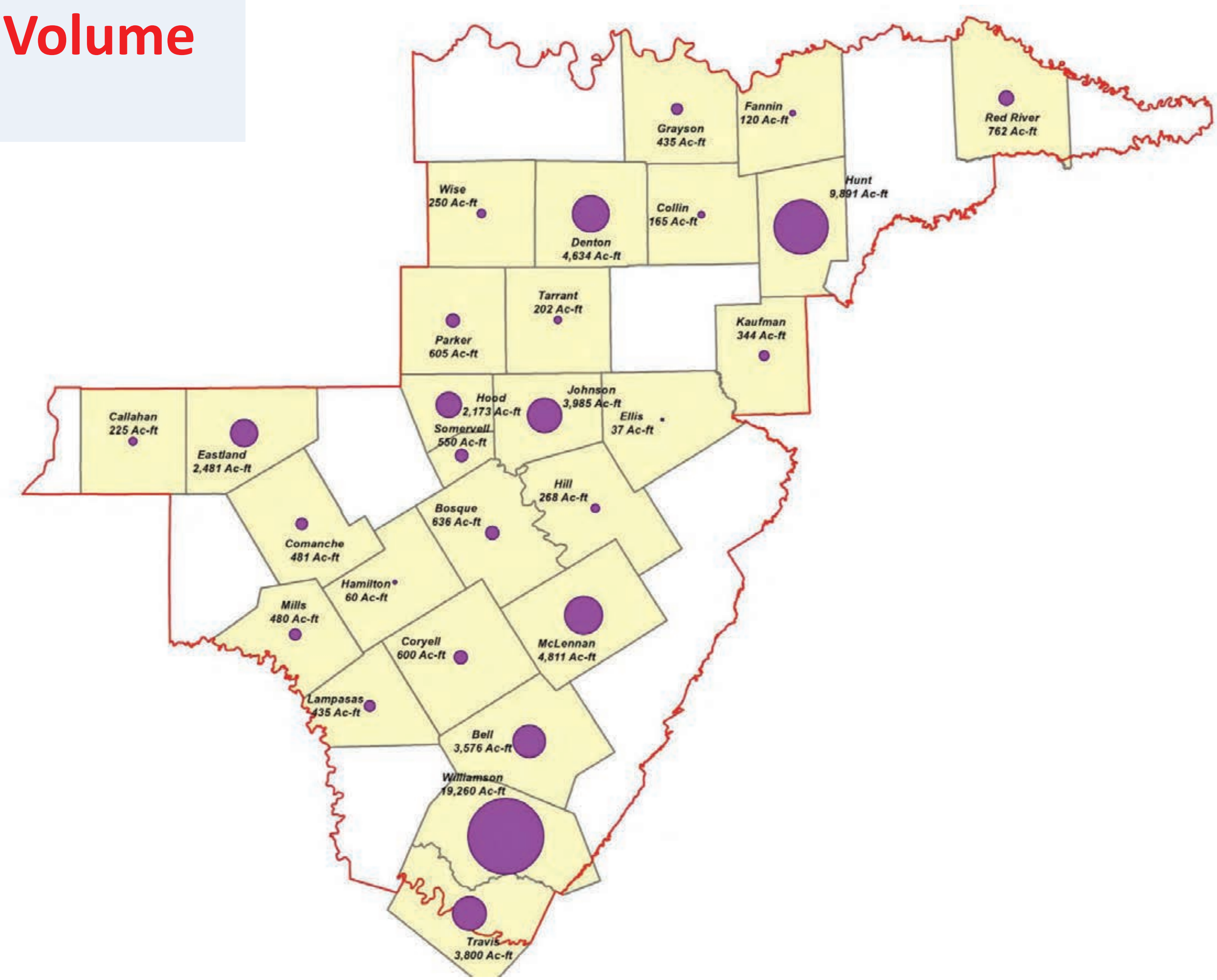
Supply Needs & Management Strategies

- Supply Needs
  - Need = Supply is less than Future Demand
  - Need = Current Supply - Future Demand
- Management Strategies
  - Infrastructure strategies to meet needs
  - 2020 and 2050 strategies

Water Sources for New Strategies in GMA 8 for the year 2050



Groundwater Volume 2050



Socioeconomic Impacts

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Socioeconomic Impacts

- Socioeconomic impacts considered:
  - Impacts of lowering water levels on costs of production.
  - Decreasing well yields and potential need for additional wells.
  - Potential for and additional costs of developing alternative supplies.
  - Need to meet water supply needs to avoid impacts of water shortages.
- Both positive and negative socioeconomic impacts may result.
- Socioeconomic impacts considered in management plan and rule updates.

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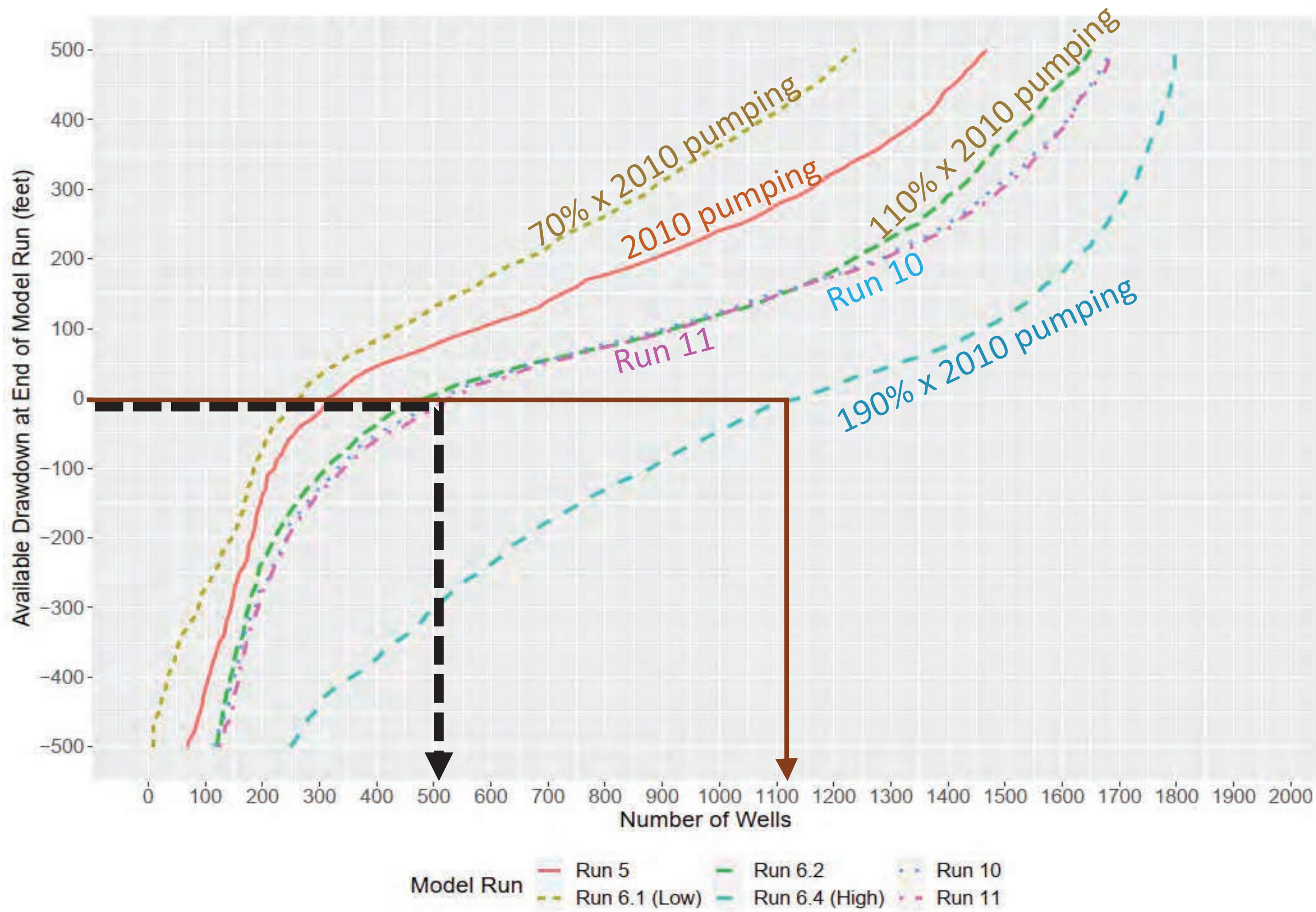
Public Water Supply Well Impacts



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Impacts on Private Property

Impact on Interests/Rights in Private Property

- Private property rights impacts considered:
  - Impacts on property rights of landowners and their lessees.
  - Expectations of existing and future well owners to recover reasonable investments in their water wells and properties.
  - Availability of affordable water of sufficient yield to all properties overlying the aquifer.
  - Availability of affordable water from alternative water supplies.
- Both positive and negative impacts to private property rights may result.
- Private property rights impacts considered in management plan, rule updates, and permit decisions.

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DFC Feasibility

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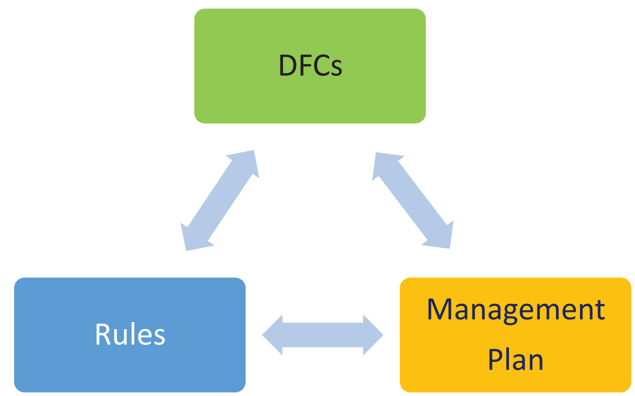
Feasibility of Achieving the DFC

- Physical Achievability
  - Is the DFC physically possible within the aquifer?
  - ➢ Groundwater Availability Models help ensure that DFCs are generally physically achievable in the aquifer
- Regulatory Achievability
  - Can the DFC be achieved via GCD management plan and rules?
  - Does the regulated community and stakeholders agree with the management approach required to achieve the DFC?
  - ➢ Have GCDs implemented Rules and have an approved Management Plan?



Agenda Item 8
Discussion and possible action on margin of error language for the Desired Future Conditions Statement.

- Due to the nature of the drawdown calculations, TWDB suggests that the GMA provide "variance assumptions"
- Proposed language for DFC Model Run submittal to TWDB:
  - *GMA 8 assumes the model results are consistent with the proposed DFCs if the average drawdowns calculated by the TWDB are within 5 percent or 5 feet (whichever is larger) of the proposed DFCs drawdown values.*

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Agenda Item 9
Discussion and possible action on a resolution to adopt proposed Desired Future Conditions.

- *Resolution was included in GMA 8 Packet*
- *Version 1 of Attachment B of the Resolution was sent to GCDs on 10/16/2020*
- *Only comments received were from Central Texas GCD regarding Table 7*
- *Those comments were integrated into Table 7 as shown below:*

Table 7 - GMA 8 DFCs adopted at a county scale for the Llano Uplift Aquifers based on total average feet of drawdown. Planning period from January 1, 2010 through December 31, 2080.

County	Ellenburger-San Saba Aquifer	Hickory Aquifer	Marble Falls Aquifer
Brown	3	3	3
Burnet	12	11	11
Lampasas	16	16	16
Mills	9	9	9

Agenda Item 9 Attachment B

Attachment B: Desired Future Conditions (DFCs) adopted by District Representatives in GMA 8 for all relevant aquifers.

Table 1 – GMA 8 DFCs adopted at an aquifer-wide scale for Northern Trinity and Woodbine aquifers based on total average feet of drawdown (both unconfined and confined drawdown). Planning period from January 1, 2010 through December 31, 2080

GMA 8 Adopted DFCs -Aquifer-Wide Scale	
Woodbine	146
Paluxy	193
Glen Rose	148
Twin Mountain	345
Travis Peak	207
Hensell	148
Hosston	262
Antlers	193

Table 2 - GMA 8 DFCs adopted at a GCD scale for Northern Trinity and Woodbine aquifers (except for Upper Trinity GCD, see Table 3 below for Upper Trinity GCD) based on total average feet of drawdown (both unconfined and confined drawdown). Planning period from January 1, 2010 through December 31, 2080.

GMA 8 Adopted DFCs - GCD Scale								
GCD	Wood-bine	Paluxy	Glen Rose	Twin Mtn	Travis Peak	Hensell	Hosston	Antlers
Central Texas GCD	—	—	2	—	19	7	21	—
Clearwater UWCD	—	17	83	—	333	145	375	—
Middle Trinity GCD	—	5	20	8	98	58	108	12
North Texas GCD	123	465	300	485	—	—	—	305
Northern Trinity GCD	6	105	163	348	—	—	—	177
Post Oak Savannah GCD	—	—	241	—	412	261	412	—
Prairielands GCD	35	44	142	170	323	201	364	—
Red River GCD	209	830	335	405	291	—	—	321
Saratoga UWCD	—	2—	1	—	6	1	11	—
Southern Trinity GCD	6	41	148	—	504	242	582	—

Table 3 - GMA 8 DFCs adopted for Upper Trinity GCD for Northern Trinity and Woodbine aquifers based on total average feet of drawdown, discretized based on outcrop and downdip extent. Planning period from January 1, 2010 through December 31, 2080.

GMA 8 Adopted DFCs - Upper Trinity GCD		
Antlers	**Outcrop**	47
	Downdip	154
Paluxy	**Outcrop**	6
	Downdip	2
Glen Rose	**Outcrop**	15
	Downdip	45
Twin Mtn	**Outcrop**	10
	Downdip	70

Table 4 - GMA 8 DFCs adopted at a county scale for Northern Trinity and Woodbine aquifers (except for Upper Trinity GCD counties, see Table 5 below for these counties) based on total average feet of drawdown (both unconfined and confined drawdown). Planning period from January 1, 2010 through December 31, 2080.

GMA 8 Adopted DFCs - County Scale								
County	Wood-bine	Paluxy	Glen Rose	Twin Mtn	Travis Peak	Hensell	Hosston	Antlers
Bell	—	17	83	—	333	145	375	—
Bosque	—	6	53	—	189	139	232	—
Bowie	—	—	—	—	—	—	—	—
Brown	—	2	1	—	2	1	1	2
Burnet	—	—	2	—	19	7	21	—
Callahan	—	—	—	—	—	—	—	1
Collin	482	729	366	560	—	—	—	596
Comanche	—	—	2	—	4	2	3	12

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Agenda Item 9 Attachment B

GMA 8 Adopted DFCs - County Scale								
County	Wood-bine	Paluxy	Glen Rose	Twin Mtn	Travis Peak	Hensell	Hosston	Antlers
Cooke	2	—	—	—	—	—	—	191
Coryell	—	5	15	—	107	70	141	—
Dallas	137	346	288	515	415	362	419	—
Delta	—	279	198	—	202	—	—	—
Denton	22	558	367	752	—	—	—	416
Eastland	—	—	—	—	—	—	—	4
Ellis	76	128	220	413	380	290	390	—
Erath	—	6	6	8	25	12	35	14
Falls	—	159	238	—	505	296	511	—
Fannin	259	709	305	400	291			269
Franklin	—	—	—	—	—	—	—	—
Grayson	163	943	364	445				364
Hamilton	—	2	4	—	26	14	38	—
Hill	20	45	149	—	365	211	413	—
Hopkins	—	—	—	—	—	—	—	—
Hunt	631	610	326	399	35	—	—	—
Johnson	4	-57	66	184	235	120	329	—
Kaufman	242	311	305	427	372	349	345	—
Lamar	42	100	107	—	125	—	—	132
Lampasas	—	—	1	—	6	1	11	—
Limestone	—	199	301	—	433	214	445	—
McLennan	6	41	148	—	504	242	582	—
Milam	—	—	241	—	412	261	412	—
Mills	—	1	1	—	9	2	13	—
Navarro	110	139	266	—	343	2995	343	—
Rains	—	—	—	—	—	—	—	—
Red River	2	24	40	—	57	—	—	15
Rockwall	275	433	343	466	—	—	—	—
Somervell	—	4	4	50	64	17	120	—
Tarrant	6	105	163	348	—	—	—	177
Taylor	—	—	—	—	—	—	—	0
Travis	—	—	83	—	219	68	226	—
Williamson	—	—	78	—	220	89	225	—

Table 5 - GMA 8 DFCs adopted at a county scale for Upper Trinity GCD counties for Northern Trinity and Woodbine aquifers based on total average feet of drawdown for outcrop and downdip areas. Planning period from January 1, 2010 through December 31, 2080.

GMA 8 Adopted DFCs - Upper Trinity GCD by county (O-Outcrop, D-Downdip)				
County	Antlers	Paluxy	Glen Rose	Twin Mtn
Hood -O	—	6	9	13
Hood-D	—	—	39	72
Montague-O	40	—	—	—
Montague-D	—	—	—	—
Parker-O	42	6	20	7
Parker-D	—	2	50	68
Wise-O	60	—	—	—
Wise-D	154	—	—	—

Table 6 - GMA 8 DFCs adopted the Edwards (BFZ) Aquifer. Planning period from January 1, 2010 through December 31, 2080. DFCs are in cubic feet per month spring/stream flow in Bell, Travis, and Williamson counties.

County	DFC
Bell	Maintain at least 100 acre-feet per month of stream/spring flow in Salado Creek during a repeat of the drought of record
Travis	Maintain at least 42 acre-feet per month of aggregated stream/spring flow during a repeat of the drought of record
Williamson	Maintain at least 60 acre-feet per month of aggregated stream/spring flow during a repeat of the drought of record

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Agenda Item 9 Attachment B

Table 7 - GMA 8 DFCs adopted at a county scale for the Llano Uplift Aquifers based on total average feet of drawdown. Planning period from January 1, 2010 through December 31, 2080.

County	Ellenburger-San Saba Aquifer	Hickory Aquifer	Marble Falls Aquifer
Brown	3	3	3
Burnet	12	11	11
Lampasas	16	16	16
Mills	9	9	9

Thank you!

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Appendix I
GCD Public Comments Summaries

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To: Mr. Joe B. Cooper | GMA 8 Chairman

From: Mitchell Sodek | Central Texas GCD General Manager

Date: July 2, 2021

Re: **Summary of written comments, any suggested revisions, and basis for any such revision on proposed DFCs**

The Central Texas Groundwater Conservation District (CTGCD) Board of Directors (CTGCD Board) held a public hearing on proposed Desired Future Conditions (DFCs) on January 22, 2021 and accepted written public comment during a 90 day comment period, which closed on February 15, 2021. CTGCD received one timely submission of written comment by Felps LLC for the proposed DFCs. At the January 22, 2021 public hearing, Felps LLC provided oral comments substantially the same as its written comments. The written comments in their entirety can be found as attachment A, which were provided to the CTGCD Board on April 13th, 2021. A summary of these comments is described as follows:

- *Request that the existing 90% of saturated thickness DFC be readopted by District since the use of 12 ft drawdown DFC is based on extremely flawed science.*

- *The District included technical failures for the Proposed Ellenburger-San Saba Aquifer DFC:*
    - *A. generating pumping files that are fundamentally flawed;*
    - *B. using the Llano Uplift Model which has a +/- 57 standard error when predicting water levels;*
    - *C. using a deeply flawed water management strategy;*
    - *D. not including proper and accurate water recharge files;*
    - *E. not properly activated/inactivated cells for ESS MAG Calculations;*
    - *F. not properly including spring flow; and*
    - *G. failing to properly calibrate the Llano Uplift Model with historical pumping amounts.*

- *The District failed to consider compliance issues with Proposed Ellenburger-San Saba Aquifer DFC:*
    - *A. aquifer use and conditions;*
    - *B. water supply needs and strategies;*
    - *C. impacts on spring flow and surface water; and*
    - *D. the impact on property owners and lessees.*

The CTGCD Board, Staff, Legal Counsel, and Hydrogeologic Consultant (INTERA) reviewed the comments. In response to the comments, the District requested and INTERA produced two technical memos, which were presented to the CTGCD Board on April 30, 2021 and are included in this summary as attachment B "Role of CTGCD in Development and Update of the LUAS GAM" and attachment C "Proposed Additional MAG Run." On April 30, 2021 the CTGCD Board voted to approve INTERA to execute an additional MAG Run and analysis of public water supply systems as outlined in attachment C. Note that the lettering system used in attachments B and C is consistent with the above comment summary.

On June 28, 2021 INTERA presented attachment D "Findings from Additional MAG Run" to the CTGCD Board with the results from the additional MAG run and analysis of public water supply systems for consideration of water supply needs and water management strategies. Based on the findings from INTERA and the CTGCD Board's review of the comments, the CTGCD Board: (1) adopted this summary of written comments (including Attachments A-D) with no revision to the proposed DFCs, (2) submits this summary of written comments to GMA 8, including in the submission package to GMA 8, the "WEL" pumping file and analysis of public water supply systems for consideration of water supply needs and water management strategies for GMA 8 to include in the explanatory report; and; finds, after the CTGCD Board's consideration of the comments in their entirety, that matters described in the comments not fully addressed in this summary, if any, are deemed not relevant.

List and Links to Attachments:

attachment A -Written comments received - Link

attachment B- "Role of CTGCD in Development and Update of the LUAS GAM" - Link

attachment C- "Proposed Additional MAG Run" - Link

attachment D- "Findings from Additional MAG Run"- Link

Link "WEL" file

Link to All attachments

CLEARWATER UNDERGROUND WATER CONSERVATION DISTRICT

Summary Report Submitted to Groundwater Management Area 8 Pursuant to Texas Water Code § 36.108(d-2)

The Clearwater Underground Water Conservation District ("District") Board of Directors held a public hearing on the proposed desired future conditions ("DFCs") relevant to the District pursuant to Texas Water Code § 36.108(d-2) on January 13, 2021. The public hearing was noticed and held in compliance with Texas Water Code § 36.063. The District provided a detailed review of the proposed DFCs relevant to the District during the public hearing and allowed both verbal and written comment to be provided both before and after the public hearing.

The District did not receive any verbal or written comments before or after the public hearing. The District therefore does not have a "summary of relevant comments received" as set forth in Texas Water Code § 36.108(d-2). The District Board of Directors does not recommend any changes to the proposed DFCs for the District, and requests that Groundwater Management Area 8 proceed with final adoption of the DFCs for the District as those proposed for adoption by Groundwater Management Area 8 on October 27, 2020.

MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT

Summary Report Submitted to Groundwater Management Area 8 Pursuant to Texas Water Code § 36.108(d-2)

The Middle Trinity Groundwater Conservation District ("District") Board of Directors held a public hearing on the proposed desired future conditions ("DFCs") relevant to the District pursuant to Texas Water Code § 36.108(d-2) on December 3, 2020. The public hearing was noticed and held in compliance with Texas Water Code § 36.063. The District provided a detailed review of the proposed DFCs relevant to the District during the public hearing, and allowed both verbal and written comment to be provided both before and after the public hearing.

The District did not receive any verbal or written comments before or after the public hearing. The District therefore does not have a "summary of relevant comments received" as set forth in Texas Water Code § 36.108(d-2). The District Board of Directors does not recommend any changes to the proposed DFCs for the District, and requests that Groundwater Management Area 8 proceed with final adoption of the DFCs for the District as those proposed for adoption by Groundwater Management Area 8 on October 27, 2020.

NORTHERN TRINITY GROUNDWATER CONSERVATION DISTRICT

Summary Report Submitted to Groundwater Management Area 8 Pursuant to Texas Water Code § 36.108(d-2)

The Northern Trinity Groundwater Conservation District ("District") Board of Directors held a public hearing on the proposed desired future conditions ("DFCs") relevant to the District pursuant to Texas Water Code § 36.108(d-2) on January 26, 2021. The public hearing was noticed and held in compliance with Texas Water Code § 36.063. The District provided a detailed review of the proposed DFCs relevant to the District during the public hearing, and allowed both verbal and written comment to be provided both before and after the public hearing.

The District did not receive any verbal or written comments before or after the public hearing. The District therefore does not have a "summary of relevant comments received" as set forth in Texas Water Code § 36.108(d-2). The District Board of Directors does not recommend any changes to the proposed DFCs for the District, and requests that Groundwater Management Area 8 proceed with final adoption of the DFCs for the District as those proposed for adoption by Groundwater Management Area 8 on October 27, 2020.

INTERA Incorporated
9600 Great Hills Trail Suite 300W
Austin, Texas 78759 USA
512.425.2000

May 7, 2021

Mr. Gary Westbrook , General Manager
Post Oak Savannah Groundwater Conservation District
310 E. Avenue C
Milano, TX 76556

RE: GMA 8 Proposed Desired Future Conditions for the Trinity Aquifer for Milam County

Dear Gary:

This memo is to convey that the 90-day public comment has closed on the proposed Desired Future Conditions (DFCs) for GMA and POSGCD did not receive any public comment. Based on our technical analysis of the GMA 8 documents, the proposed DFCs have been properly calculated using GMA 8's Run 10 for the Northern Trinity & Woodbine Groundwater Availability Model (GAM).

Table 1 compares the current and proposed DFCs for the four aquifers in that comprise the Trinity Aquifer in GMA 8 and in Milam County. All four proposed DFCs are higher than the current DFCs. The average increase among the four aquifers for the Proposed DFC is 17% more than the Current DFCs .

Table 1 Proposed DFC for the Trinity Aquifer in Milam County

Aquifer	Current DFC.	Proposed DFC
	Average Drawdown (ft) between January 2010 and December 2070	Average Drawdown (ft) between January 2010 and December 2080
Glen Rose	212	241
Travis Peak	345	412
Hensell	229	261
Hosston	345	412

POSGCD has no registered Trinity wells and there is no planned pumping the Trinity Aquifer in Milam County. All of the drawdown associated with the proposed DFCs is caused by pumping outside of Milam County.

We believe that the GMA 8 consultants have properly performed their tasks as requested by the member GMA 8 and endorse POSGCD's adoption of the Proposed DFC, pending acceptance by the POSGCD Board of Directors.

Sincerely,

Steven C Young

Steven Young, PG PE
Principal Geoscientist

SARATOGA UNDERGROUND WATER CONSERVATION DISTRICT

Summary Report Submitted to Groundwater Management Area 8 Pursuant to Texas Water Code § 36.108(d-2)

The Saratoga Underground Water Conservation District ("District") Board of Directors held a public hearing on the proposed desired future conditions ("DFCs") relevant to the District pursuant to Texas Water Code § 36.108(d-2) on January 19, 2021. The public hearing was noticed and held in compliance with Texas Water Code § 36.063. The District provided a detailed review of the proposed DFCs relevant to the District during the public hearing, and allowed both verbal and written comment to be provided both before and after the public hearing.

The District did not receive any verbal or written comments before or after the public hearing. The District therefore does not have a "summary of relevant comments received" as set forth in Texas Water Code § 36.108(d-2). The District Board of Directors does not recommend any changes to the proposed DFCs for the District, and requests that Groundwater Management Area 8 proceed with final adoption of the DFCs for the District as those proposed for adoption by Groundwater Management Area 8 on October 27, 2020.

SOUTHERN TRINITY GROUNDWATER CONSERVATION DISTRICT

Summary Report Submitted to Groundwater Management Area 8 Pursuant to Texas Water Code § 36.108(d-2)

The Southern Trinity Groundwater Conservation District ("District") Board of Directors held a public hearing on the proposed desired future conditions ("DFCs") relevant to the District pursuant to Texas Water Code § 36.108(d-2) on January 28, 2021. The public hearing was noticed and held in compliance with Texas Water Code § 36.063. The District provided a detailed review of the proposed DFCs relevant to the District during the public hearing, and allowed both verbal and written comments to be provided before and during the public hearing.

The District did not receive any substantive verbal or written comments before or during the public hearing. The District, therefore, does not have a "summary of relevant comments received" as set forth in Texas Water Code § 36.108(d-2). The District Board of Directors does not recommend any changes to the proposed DFCs for the District, and requests that Groundwater Management Area 8 proceed with final adoption of the DFCs for the District as those proposed for adoption by Groundwater Management Area 8 on October 27, 2020.

UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT

Summary Report Submitted to Groundwater Management Area 8 Pursuant to Texas Water Code § 36.108(d-2)

The Upper Trinity Groundwater Conservation District ("District") Board of Directors held a public hearing on the proposed desired future conditions ("DFCs") relevant to the District pursuant to Texas Water Code § 36.108(d-2) on January 25, 2021. The public hearing was noticed and held in compliance with Texas Water Code § 36.063. The District provided a detailed review of the proposed DFCs relevant to the District during the public hearing, and allowed both verbal and written comment to be provided both before and after the public hearing.

The District did not receive any verbal or written comments before or after the public hearing. The District therefore does not have a "summary of relevant comments received" as set forth in Texas Water Code § 36.108(d-2). The District Board of Directors does not recommend any changes to the proposed DFCs for the District, and requests that Groundwater Management Area 8 proceed with final adoption of the DFCs for the District as those proposed for adoption by Groundwater Management Area 8 on October 27, 2020.