Clearwater
Every Drop Counts!

Clearwater Underground Water Conservation District
P.O. Box 729, Belton, Texas 76513
Phone: 254/933-0120 Fax: 254/770-2360
www.clearwaterdistrict.org

December 26, 2007

J. Kevin Ward, Executive Administrator
Texas Water Development Board
1700 N. Congress Avenue
Austin, TX 78701

Re: Desired Future Conditions Submittal for GMA 8

Dear Mr. Ward:

The Clearwater Underground Water Conservation District is the administrator for Groundwater Management Area 8 (GMA 8). On behalf of GMA 8, we are submitting desired future conditions (DFC) for five of the nine major and minor aquifers within our boundary. The aquifers for which DFCs have been adopted are as follows: Edwards BFZ; Blossom; Brazos River Alluvium; Nacatoch; and Woodbine.

Our submittal includes the following information:

1) Desired Future Conditions Report for the 5 aquifers above.
2) Copies of agendas announcing the meeting at which the DFCs were adopted from each of the groundwater conservation districts in GMA 8. Approved minutes are not currently available but will be provided when approved at the next GMA 8 meeting.
3) A signed resolution adopting the desired future conditions and recording the member votes. The resolution references "Appendix B" which includes various groundwater availability model requests and results, hydrogeologic reports, and other studies used in developing the DFCs. These have not been included in this submittal but are available upon request.

Please note that the adopted DFCs reflect future aquifer conditions anticipated as a result of pumping from both exempt and non-exempt wells. When the managed available groundwater (MAG) figures are developed, they will reflect the amount of water available for use; however, if this full amount is permitted the desired future conditions will not be maintained because exempt well owners are also pumping groundwater. Therefore, it is our understanding that the groundwater conservation districts may reserve water for exempt well use which would result in a permitting figure that is less than the full MAG.

Please feel free to contact me if you have any questions or need additional information.

Sincerely,

Cheryl Maxwell

Cheryl Maxwell, AICP
Clearwater Underground Water Conservation District Manager
GMA 8 Administrator

cm
attachments

RESOLUTION TO ADOPT DESIRED FUTURE CONDITIONS

FOR AQUIFER(S) IN GROUNDWATER MANAGEMENT AREA 8

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

WHEREAS, Texas Water Code § 36.108 requires the groundwater conservation districts located in whole or in part in a groundwater management area ("GMA") designated by the Texas Water Development Board to adopt desired future conditions for the relevant aquifers located within the management area;

WHEREAS, the groundwater conservation districts located wholly or partially within Groundwater Management Area 8 ("GMA 8"), as designated by the Texas Water Development Board, as of the date of this resolution are as follows: Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Fox Crossing Water District, McLennan County Groundwater Conservation District, Middle Trinity Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Saratoga Underground Water Conservation District, Tablerock Groundwater Conservation District, and Upper Trinity Groundwater Conservation District (collectively hereinafter "the GMA 8 Districts");

WHEREAS, the GMA 8 Districts are each governmental agencies and bodies politic and corporate operating under Chapter 36, Water Code;

WHEREAS, the GMA 8 Districts desire to fulfill the requirements of Texas Water Code § 36.108 through mutual cooperation and joint planning efforts;

WHEREAS, the GMA 8 Districts have had numerous public meetings at which they have engaged in joint planning efforts to promote more comprehensive management of the aquifers located in whole or in part in Groundwater Management Area 8;

WHEREAS, the GMA 8 Districts may establish different desired future conditions for: (1) each aquifer, subdivision of an aquifer, or geologic strata located in whole or in part within the boundaries of GMA 8; or (2) each geographic area overlying an aquifer in whole or in part or subdivision of an aquifer within the boundaries of GMA 8;

WHEREAS, the GMA 8 Districts recognize that GMA 8 includes a geographically and hydrologically diverse area with a variety of land uses and a diverse mix of water users;

WHEREAS, the GMA 8 Districts have considered the relevant aquifers, subdivisions thereof, and geologic strata located in whole or in part within the boundaries of GMA 8, and have further considered the hydrogeologic characteristics of the same, as well as the various uses and users of groundwater produced from such aquifers, subdivisions, and strata;

WHEREAS, GMA 8 Districts held a meeting, which was open to the public, at 10:00 a.m. on Monday, December 17, 2007, in the Bellmead City Hall located at 3015 Bellmead Drive, Bellmead, Texas;

WHEREAS, notice of said December 17, 2007, meeting was properly given by each and all of the GMA 8 Districts in accordance with Chapter 36, Water Code, and Chapter 551, Government Code, and a true and correct copy of each of the notices has been attached hereto in Appendix A and is incorporated herein for all purposes;

WHEREAS, at least two-thirds of the GMA 8 Districts had a voting representative in attendance at said December 17, 2007, meeting in accordance with Section 36.108(d-1), Texas Water Code; to wit, the following districts had a voting representative in attendance at said meeting: Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Fox Crossing Water District, McLennan County Groundwater Conservation District, Middle Trinity Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Saratoga Underground Water Conservation District, Tablerock Groundwater Conservation District, and Upper Trinity Groundwater Conservation District;

WHEREAS, it is the intent and purpose of the GMA 8 Districts by adoption of this resolution to fulfill the requirements of Texas Water Code § 36.108, including establishing "desired future conditions for the relevant aquifers" within GMA 8 for the specific aquifer(s) and desired future conditions described under "Appendix B" attached hereto and incorporated herein for all purposes;

WHEREAS, at said December 17, 2007, meeting, after a motion was duly made and seconded that the GMA 8 Districts adopt this resolution establishing desired future conditions for the aquifer(s) described under "Appendix B", the motion prevailed by the following vote:

Edwards BFZ 10 Ayes and 0 Nays;

Blossom 8 Ayes, 1 Nays and 1 Abstention;
to wit, the voting representatives of the following districts voted "Aye": Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Fox Crossing Water District, Middle Trinity Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Saratoga Underground Water Conservation District, Tablerock Groundwater Conservation District;
the voting representatives of the following districts voted "Nay": McLennan County Groundwater Conservation District;
and, the voting representatives of the following districts abstained: Upper Trinity Groundwater Conservation District;

Brazos River Alluvium 10 Ayes and 0 Nays;

Nacatoch 9 Ayes, 0 Nays and 1 Abstention;
to wit, the voting representatives of the following districts voted "Aye": Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Fox Crossing Water District, McLennan County Groundwater Conservation District, Middle Trinity Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Saratoga Underground Water Conservation District, Tablerock Groundwater Conservation District;
and, the voting representatives of the following districts abstained: Upper Trinity Groundwater Conservation District;

Woodbine 10 Ayes and 0 Nays;

WHEREAS, in establishing these desired future conditions for the aquifer(s) set forth under Appendix B, the GMA 8 Districts have considered all of the criteria required by Chapter 36 of the Texas Water Code and other information, including without limitation groundwater availability models and runs of those models to determine the effects of various conditions and parameters, hydrogeologic reports available for the relevant aquifers, and other technical data and information;

WHEREAS, many of the groundwater availability models, runs, hydrogeologic reports, and other technical data and information considered and determined to be reliable sources of information by the GMA 8 Districts in establishing these desired future conditions for the aquifer(s) have been attached hereto or referenced in the documents attached hereto under Appendix B;

WHEREAS, in establishing these desired future conditions for the aquifer(s) set forth under Appendix B, the GMA 8 Districts have considered the uses and conditions of the aquifer(s) in different geographic areas within GMA 8 and what the effects and impacts of adopting such desired future conditions will have upon the condition of the aquifer(s) and the uses and users of groundwater from the aquifer(s) both now and in the future;

WHEREAS, after considering such anticipated effects and impacts these desired future conditions will have on the aquifer(s), uses, and users of groundwater, and considering all of the other criteria required by Chapter 36 of the Texas Water Code, including without limitation the groundwater resource management duties and responsibilities of the GMA Districts individually and collectively, the GMA 8 Districts have determined that the desired future conditions for the aquifer(s) set forth under Appendix B are reasonable;

NOW, THEREFORE, BE IT RESOLVED BY THE AUTHORIZED VOTING REPRESENTATIVES OF THE GMA 8 DISTRICTS AS FOLLOWS:

1. The above recitals are true and correct.

2. The authorized voting representatives of the GMA 8 Districts hereby establish the desired future conditions of the aquifer(s) as set forth in Appendix B by the vote reflected in the above recitals.

3. 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.

4. The desired future conditions of the aquifer adopted by the GMA 8 Districts and attached hereto shall be effective immediately and shall continue in effect until amended, superseded, or repealed.

AND IT IS SO ORDERED.

PASSED AND ADOPTED on this 17th day of December, 2007.

ATTEST:

Richard S Bowman

Central Texas Groundwater Conservation District

Clearwater Underground Water Conservation District

Fox Crossing Water District

McLennan County Groundwater Conservation District

Middle Trinity Groundwater Conservation District

Northern Trinity Groundwater Conservation District

Post Oak Savannah Groundwater Conservation District

3. 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.

4. The desired future conditions of the aquifer adopted by the GMA 8 Districts and attached hereto shall be effective immediately and shall continue in effect until amended, superseded, or repealed.

AND IT IS SO ORDERED.

PASSED AND ADOPTED on this 17th day of December, 2007.

ATTEST:

_____

Central Texas Groundwater Conservation District

_____

Clearwater Underground Water Conservation District

_____

Fox Crossing Water District

_____

McLennan County Groundwater Conservation District

_____

Middle Trinity Groundwater Conservation District

_____

Northern Trinity Groundwater Conservation District

_____

Post Oak Savannah Groundwater Conservation District

3. 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.

4. The desired future conditions of the aquifer adopted by the GMA 8 Districts and attached hereto shall be effective immediately and shall continue in effect until amended, superseded, or repealed.

AND IT IS SO ORDERED.

PASSED AND ADOPTED on this 17th day of December, 2007.

ATTEST:

_____
Central Texas Groundwater Conservation District

_____
Clearwater Underground Water Conservation District

_____
Fox Crossing Water District

_____
McLennan County Groundwater Conservation District

_____
Middle Trinity Groundwater Conservation District

_____
Northern Trinity Groundwater Conservation District

_____
Post Oak Savannah Groundwater Conservation District

3. 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.

4. The desired future conditions of the aquifer adopted by the GMA 8 Districts and attached hereto shall be effective immediately and shall continue in effect until amended, superseded, or repealed.

AND IT IS SO ORDERED.

PASSED AND ADOPTED on this 17th day of December, 2007.

ATTEST:

_____

Central Texas Groundwater Conservation District

_____

Clearwater Underground Water Conservation District

_____

Fox Crossing Water District

Rodney McNeill

McLennan County Groundwater Conservation District

_____

Middle Trinity Groundwater Conservation District

_____

Northern Trinity Groundwater Conservation District

_____

Post Oak Savannah Groundwater Conservation District

3. 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.

4. The desired future conditions of the aquifer adopted by the GMA 8 Districts and attached hereto shall be effective immediately and shall continue in effect until amended, superseded, or repealed.

AND IT IS SO ORDERED.

PASSED AND ADOPTED on this 17th day of December, 2007.

ATTEST:

_____

Central Texas Groundwater Conservation District

_____

Clearwater Underground Water Conservation District

_____

Fox Crossing Water District

_____

McLennan County Groundwater Conservation District

_____

Middle Trinity Groundwater Conservation District

_____

Northern Trinity Groundwater Conservation District

_____

Post Oak Savannah Groundwater Conservation District

3. 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.

4. The desired future conditions of the aquifer adopted by the GMA 8 Districts and attached hereto shall be effective immediately and shall continue in effect until amended, superseded, or repealed.

AND IT IS SO ORDERED.

PASSED AND ADOPTED on this 17th day of December, 2007.

ATTEST:

_____
Central Texas Groundwater Conservation District

_____
Clearwater Underground Water Conservation District

_____
Fox Crossing Water District

_____
McLennan County Groundwater Conservation District

_____
Middle Trinity Groundwater Conservation District

_____
Northern Trinity Groundwater Conservation District

_____
Post Oak Savannah Groundwater Conservation District

Saratoga Underground Water Conservation District

W. H. Ament

Tablerock Groundwater Conservation District

Upper Trinity Groundwater Conservation District

ATTACHMENTS
Appendix A: Copies of notices of December 17, 2007, meeting
Appendix B: Adopted Desired Future Conditions and supporting information

Saratoga Underground Water Conservation District

Tablerock Groundwater Conservation District

Mike Massey
Upper Trinity Groundwater Conservation District

ATTACHMENTS
Appendix A: Copies of notices of December 17, 2007, meeting
Appendix B: Adopted Desired Future Conditions and supporting information

David B. Hamilton

Saratoga Underground Water Conservation District

Tablerock Groundwater Conservation District

Upper Trinity Groundwater Conservation District

ATTACHMENTS
Appendix A: Copies of notices of December 17, 2007, meeting
Appendix B: Adopted Desired Future Conditions and supporting information

Appendix 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, consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Fox Crossing Water District, McLennan County Groundwater Conservation District, Middle Trinity Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Saratoga Underground Water Conservation District, Tablerock Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a ***Joint Planning meeting at 10:00 A.M. on Monday, December 17, 2007,*** in the Bellmead City Hall located at 3015 Bellmead Drive, Bellmead, Texas 76705. The meeting will be open to the public. The following items of business will be discussed:

1. Call meeting to order and establish quorum.
2. Welcome and introductions.
3. Public comment.
4. Approve minutes of November 27, 2007 GMA 8 meeting.
5. Discuss action taken at the February 8, 2007 GMA 8 meeting regarding the adoption of desired future conditions for the minor aquifers, except the Woodbine.
6. Hold public hearing on proposed desired future conditions for the major and minor aquifers within GMA 8 to include the following: Edwards BFZ, Trinity, Blossom, Brazos River Alluvium, Ellenburger-San Saba, Hickory, Marble Falls, Nacatoch, and Woodbine.
7. Discussion and possible action to ratify adoption of proposed desired future conditions for the major and minor aquifers within GMA 8 as described above.
8. Discussion and possible action to amend contract with TCB, Inc. to develop the desired future conditions for the aquifers in GMA 8.
9. Discussion and possible action on renewal of interlocal agreement.
10. Committee member comments.
11. Discuss agenda items for next meeting.
12. Set date, time, and place of next meeting.
13. Closing comments.
14. Adjourn.

Dated this 7th day of December, 2007.

Richard S. Bowers, General Manager
Central Texas Groundwater Conservation District

POSTED
Dec. 7, 2007
Janet Parker
County Clerk - Burnet County, Texas
By _____ Deputy

The Central Texas Groundwater Conservation District is committed to compliance with the Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 512-756-4900 at least 24 hours in advance if accommodation is needed.

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, consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Fox Crossing Water District, McLennan County Groundwater Conservation District, Middle Trinity Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Saratoga Underground Water Conservation District, Tablerock Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a ***Joint Planning meeting at 10:00 A.M. on Monday, December 17, 2007,*** in the Bellmead City Hall located at 3015 Bellmead Drive, Bellmead, Texas 76705. The meeting will be open to the public. The following items of business will be discussed:

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9. Discussion and possible action on renewal of interlocal agreement.
10. Committee member comments.
11. Discuss agenda items for next meeting.
12. Set date, time, and place of next meeting.
13. Closing comments.
14. Adjourn.

FILED FOR RECORD
2007 DEC 7 AM 10 24

Dated this 14th day of December, 2007.

Horace Grace, CUWCD President

By: Cheryl Maxwell
Cheryl Maxwell, CUWCD Asst. Secretary

The Clearwater Underground Water Conservation District is committed to compliance with the Americans with Disabilities Act. Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 254-933-0120 at least 24 hours in advance if accommodation is needed.

FOX CROSSING WATER DISTRICT
NOTICE OF MEETING
GROUNDWATER MANAGEMENT AREA 8

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9. Discussion and possible action on renewal of interlocal agreement.
10. Committee member comments.
11. Discuss agenda items for next meeting.
12. Set date, time, and place of next meeting.
13. Closing comments.
14. Adjourn.

FILED FOR RECORD
At 8:20 O'clock A M

DEC 07 2007

CAROLYN FOSTER
County and District Clerk
Mills County, Texas
By Joy Nowell Deputy

Dated this 6TH day of December, 2007.

By: Jerry Priddy
Secretary, Fox Crossing Water District

NOTICE OF MEETING
GROUNDWATER MANAGEMENT AREA 8

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9. Discussion and possible action on renewal of interlocal agreement.
10. Committee member comments.
11. Discuss agenda items for next meeting.
12. Set date, time, and place of next meeting.
13. Closing comments.
14. Adjourn.

Dated this 7th day of December, 2007.

By: _____
Scooter Radcliffe, Vice-President
McLennan County Ground Water Conservation District

The Clearwater Underground Water Conservation District is committed to compliance with the Americans with Disabilities Act. Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 254-933-0120 at least 24 hours in advance if accommodation is needed.

NOTICE OF MEETING
GROUNDWATER MANAGEMENT AREA 8

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9. Discussion and possible action on renewal of interlocal agreement.
10. Committee member comments.
11. Discuss agenda items for next meeting.
12. Set date, time, and place of next meeting.
13. Closing comments.
14. Adjourn.

9:20 POSTED
A.M. ____ P.M.

DEC 13 2007
GWINDA JONES, COUNTY CLERK
ERATH COUNTY, TEXAS
BY ____ DEPUTY

Dated this 13th day of December, 2007.

By: _____
Joe Cooper, General Manager

The Middle Trinity Groundwater Conservation District is committed to compliance with the Americans with Disabilities Act. Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 254-965-6705 at least 24 hours in advance if accommodation is needed.

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, consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Fox Crossing Water District, McLennan County Groundwater Conservation District, Middle Trinity Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Saratoga Underground Water Conservation District, Tablerock Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a ***Joint Planning meeting at 10:00 A.M. on Monday, December 17, 2007,*** in the Bellmead City Hall located at 3015 Bellmead Drive, Bellmead, Texas 76705. The meeting will be open to the public. The following items of business will be discussed:

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9. Discussion and possible action on renewal of interlocal agreement.
10. Committee member comments.
11. Discuss agenda items for next meeting.
12. Set date, time, and place of next meeting.
13. Closing comments.
14. Adjourn.

Dated this 7th day of December, 2007.

Russell Laughlin, NTGCD President

By: _____
Mark Mendez – Tarrant County liason/staff

The Northern Trinity Groundwater Conservation District is committed to compliance with the Americans with Disabilities Act. Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District at 817-884-2729 at least 24 hours in advance if accommodation is needed.

NOTICE OF MEETING
GROUNDWATER MANAGEMENT AREA 8

December 17, 2007 – 10:00 a.m.
Bellmead City Hall
3015 Bellmead Drive
Bellmead, Texas 76705

AGENDA

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, consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Fox Crossing Water District, McLennan County Groundwater Conservation District, Middle Trinity Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Saratoga Underground Water Conservation District, Tablerock Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a ***Joint Planning meeting at 10:00 A.M. on Monday, December 17, 2007,*** in the Bellmead City Hall located at 3015 Bellmead Drive, Bellmead, Texas 76705. The meeting will be open to the public. The following items of business will be discussed:

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9. Discussion and possible action on renewal of interlocal agreement.
10. Committee member comments.
11. Discuss agenda items for next meeting.
12. Set date, time, and place of next meeting.
13. Closing comments.
14. Adjourn.

Signed this 7th day of December, 2007.

Gary Westbrook, General Manager. POSGCD

NOTICE OF MEETING
GROUNDWATER MANAGEMENT AREA 8

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5. Discuss action taken at the February 8, 2007 GMA 8 meeting regarding the adoption of desired future conditions for the minor aquifers, except the Woodbine.
6. Hold public hearing on proposed desired future conditions for the major and minor aquifers within GMA 8 to include the following: Edwards BFZ, Trinity, Blossom, Brazos River Alluvium, Ellenburger-San Saba, Hickory, Marble Falls, Nacatoch, and Woodbine.
7. Discussion and possible action to ratify adoption of proposed desired future conditions for the major and minor aquifers within GMA 8 as described above.
8. Discussion and possible action to amend contract with TCB, Inc. to develop the desired future conditions for the aquifers in GMA 8.
9. Discussion and possible action on renewal of interlocal agreement.
10. Committee member comments.
11. Discuss agenda items for next meeting.
12. Set date, time, and place of next meeting.
13. Closing comments.
14. Adjourn.

Dated this 6th day of December, 2007.

David Hamilton, Chairman SUWCD

By: _____
Cheryl Maxwell, CUWCD Asst. Secretary

The Saratoga Underground Water Conservation District is committed to compliance with the Americans with Disabilities Act. Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 512-556-8271 at least 24 hours in advance if accommodation is needed.

Certification

I, the undersigned authority, do hereby certify that on December 7, 2007, at or before 5:00 PM the attached notice of the December 17, 2007 meeting of the Groundwater Management Area 8 groundwater conservation districts was posted in the Coryell County Judge's administrative assistant's office in a place convenient and readily accessible to the general public and that it remained so posted continuously for at least 72 hours preceding the scheduled time of said meeting in accordance with Chapter 551, Texas Government Code.

W. W. Ament, President
Tablerock Groundwater Conservation District
Wyllis Ament

John E. Firth
Coryell County Judge

DEC. 21, 2007
Date

State of Texas
County of Coryell

This instrument was acknowledged before me this 21st day of December, 2007, by Wyllis Ament and John E. Firth, personnally known as identification.

M. JEAN MORRISON
Notary Public, State of Texas
My Commission Expires
June 08, 2011

M. Jean Morrison
Notary Public, State of Texas

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, consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Fox Crossing Water District, McLennan County Groundwater Conservation District, Middle Trinity Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Saratoga Underground Water Conservation District, Tablerock Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a ***Joint Planning meeting at 10:00 A.M. on Monday, December 17, 2007,*** in the Bellmead City Hall located at 3015 Bellmead Drive, Bellmead, Texas 76705. The meeting will be open to the public. The following items of business will be discussed:

1. Call meeting to order and establish quorum.
2. Welcome and introductions.
3. Public comment.
4. Approve minutes of November 27, 2007 GMA 8 meeting.
5. Discuss action taken at the February 8, 2007 GMA 8 meeting regarding the adoption of desired future conditions for the minor aquifers, except the Woodbine.
6. Hold public hearing on proposed desired future conditions for the major and minor aquifers within GMA 8 to include the following: Edwards BFZ, Trinity, Blossom, Brazos River Alluvium, Ellenburger-San Saba, Hickory, Marble Falls, Nacatoch, and Woodbine.
7. Discussion and possible action to ratify adoption of proposed desired future conditions for the major and minor aquifers within GMA 8 as described above.
8. Discussion and possible action to amend contract with TCB, Inc. to develop the desired future conditions for the aquifers in GMA 8.
9. Discussion and possible action on renewal of interlocal agreement.
10. Committee member comments.
11. Discuss agenda items for next meeting.
12. Set date, time, and place of next meeting.
13. Closing comments.
14. Adjourn.

Dated this 7th day of December, 2007.

Horace Grace, CUWCD President

By: Cheryl Maxwell, CUWCD Asst. Secretary

The Clearwater Underground Water Conservation District is committed to compliance with the Americans with Disabilities Act. Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 254-933-0120 at least 24 hours in advance if accommodation is needed.

Current Meeting Notices

Agency Name:	**Upper Trinity Groundwater Conservation District**
Date of Meeting:	12/17/2007
Time of Meeting:	10:00 AM **(Local Time)**
Board:	GMA 8
Status:	Active
Street Location:	3015 Bellmead Drive
City Location:	Bellmead
Meeting State:	TX
TRD ID:	2007010241
Submit Date:	12/07/2007
Emergency Meeting?:	No
Additional Information Obtained From:	Cheryl Maxwell 254-933-0120

Agenda:

1. Call meeting to order and establish quorum.

2. Welcome and introductions.

3. Public comment.

4. Approve minutes of November 27, 2007 GMA 8 meeting.

5. Discuss action taken at the February 8, 2007 GMA 8 meeting regarding the adoption of desired future conditions for the minor aquifers, except the Woodbine.

6. Hold public hearing on proposed desired future conditions for the major and minor aquifers within GMA 8 to include the following: Edwards BFZ, Trinity, Blossom, Brazos River Alluvium, Ellenburger-San Saba, Hickory, Marble Falls, Nacatoch, and Woodbine.

7. Discussion and possible action to ratify adoption of proposed desired future conditions for the major and minor aquifers within GMA 8 as described above.

8. Discussion and possible action to amend contract with TCB, Inc. to develop the desired future conditions for the aquifers in GMA 8.

9. Discussion and possible action on renewal of interlocal agreement.

10. Committee member comments.

11. Discuss agenda items for next meeting.

12. Set date, time, and place of next meeting.

13. Closing comments.

14. Adjourn.

Appendix B

TCB
400 West 15th Street, Suite 500, Austin, Texas 78701
T 512.472.4519 F 512.472.7519 www.tcb.aecom.com

Memorandum

To: Cheryl Maxwell, Administrative Manager
Clearwater Underground Water Conservation District
Administrative Agent for Groundwater Management Area 8

From: Charles R. Williams, P.G. No. 526

Date: December 14, 2007

Re: Desired Future Conditions of N. Edwards BFZ Aquifer

Introduction

Groundwater Management Area 8 (GMA-8) is a groundwater management area of the State of Texas as defined by Statute with responsibility for developing a desired future condition (DFC) for aquifers within an approximately 46-County area. Membership of the GMA is composed of the groundwater conservation districts (GCDs) that occur all or in part within the GMA boundary. (Fig. 1) At the request of GMA-8, TCB Inc. (TCB) developed statements describing DFCs for the portions of the northern segment of the Edwards Balcones Fault Zone (BFZ) aquifer occurring in the areas of Bell, Travis and Williamson Counties, Texas lying within GMA-8. (Fig. 2)

Methodology

Clearwater Underground Water Conservation District (CUWCD) previously assessed the availability of groundwater in the N. Edwards BFZ aquifer of Bell County, Texas through an application of the Texas Water Development Board (TWDB) groundwater availability model for the N. Edwards BFZ aquifer (N. Edwards GAM). (Jones, 2003) GMA-8 used information from the CUWCD assessment of N. Edwards BFZ aquifer availability in adopting the maintenance of the aquifer discharge to creek and springs (spring flow) as the preferred metric for the DFCs for the N. Edwards BFZ aquifer. (Williams and others, 2006) GMA-8 requested TWDB to perform two simulations of the N. Edwards GAM and provide a report of the results to GMA-8. GMA-8 subsequently used information given in the TWDB reports to develop DFCs for the N. Edwards BFZ aquifer. (Anaya, $2007_{1 \text{ and } 2}$)

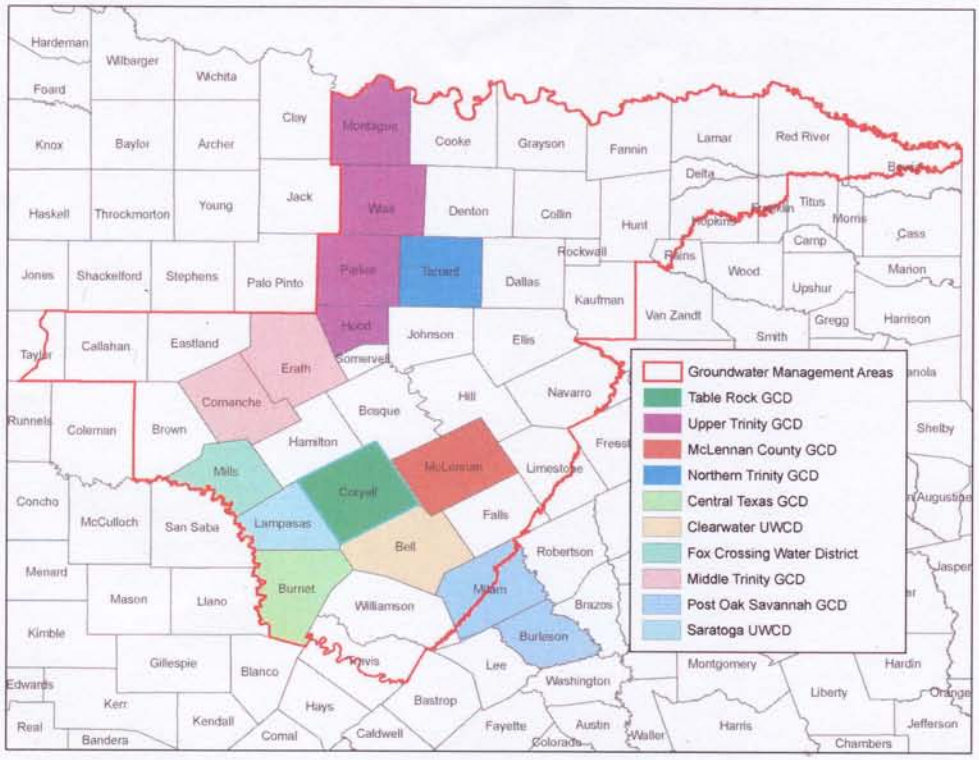

Figure 1, the Boundaries and Member GCDs of GMA-8

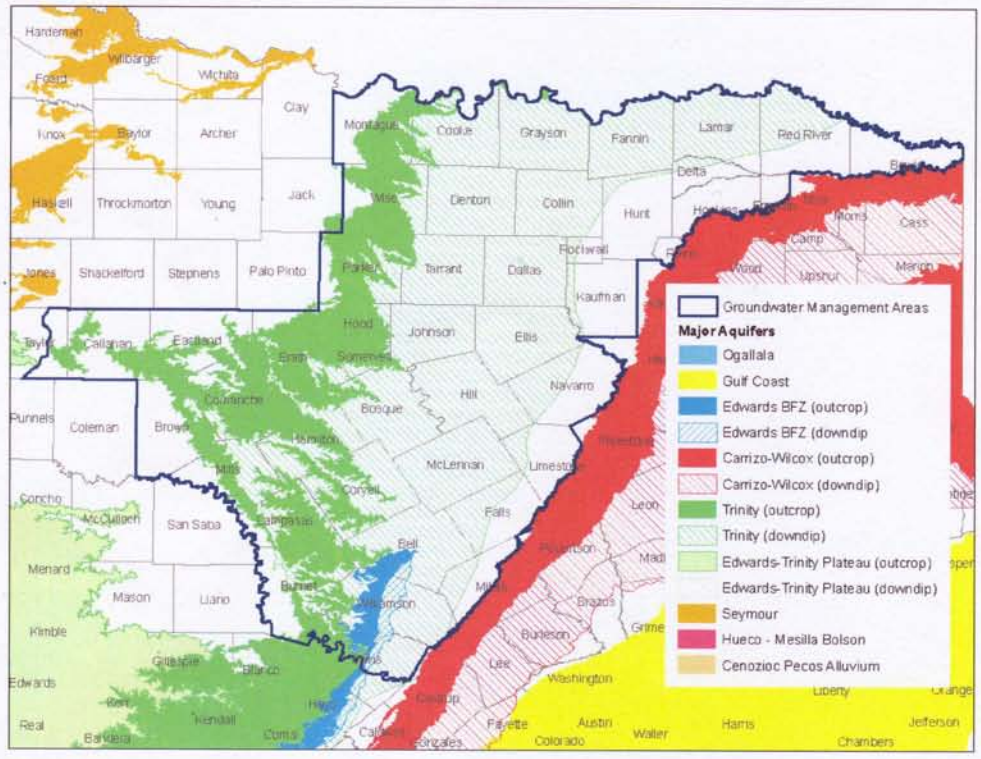

Figure 2, the Major Aquifers of GMA-8

Discussion

The N. Edwards GAM simulations performed by TWDB included the drought of record (DOR) by using recorded monthly historical rainfall totals for the Bell, Williamson and Travis County areas for the decade of the 1950s. (Fig. 3) Simulated pumping was applied to the areas of Bell, Williamson and Travis County included in the N. Edwards GAM. (Table 1) Pumping was held constant in Williamson and Travis Counties throughout the GAM simulations because no groundwater management entity exists in those areas. In Bell County, pumping was reduced by approximately 20 percent during periods of climatic stress to reflect the implementation of conservation measures by CUWCD. (Fig. 3)

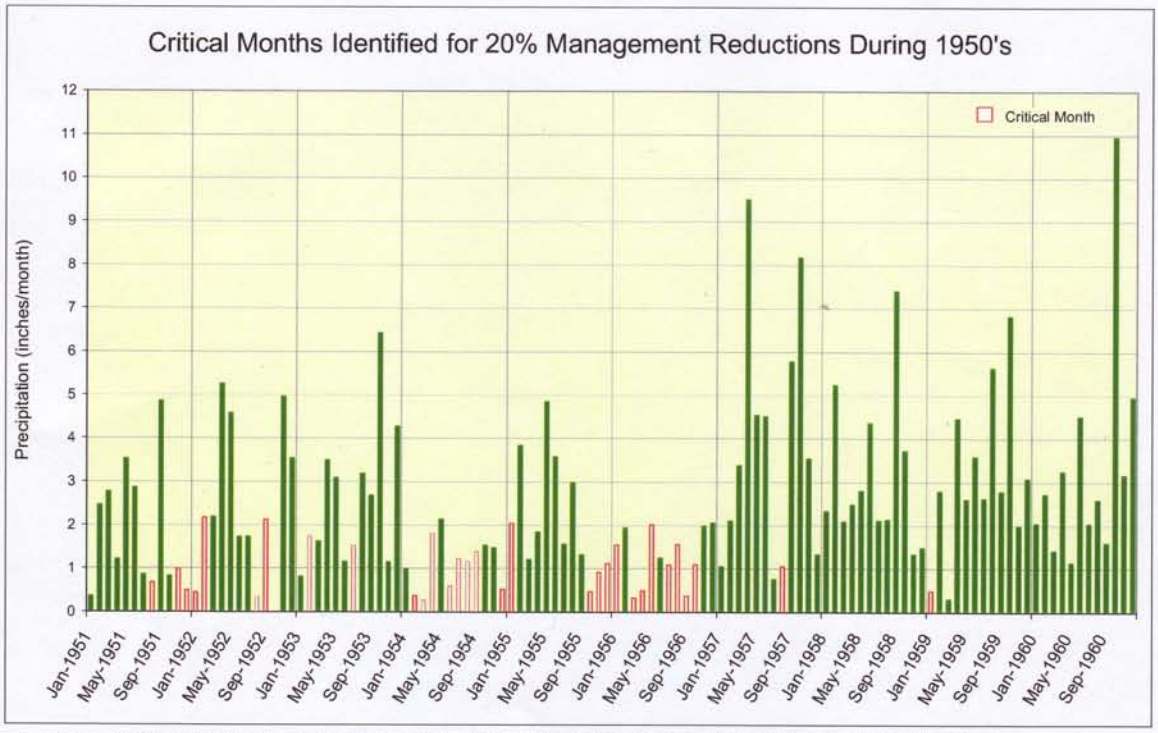

Figure 3, 1950s Monthly Rainfall Totals with Climatic Stress Periods Identified in Red

County	Pumping Specified for GAM-Run 07-15 in Acre-Feet per Year	Pumping Specified for GAM-Run 07-21 in Acre-Feet per Year
Bell	~ 7,509	~ 7,509
Williamson	~ 18,331	~ 21,372
Travis	~ 4,870	~ 4,870

Table 1, GAM-run Predictive Pumping Amounts for Bell, Williamson and Travis Counties

DFC Development Approach

The GMA reviewed the results of GAM-runs 07-15 and 07-21 and found that the levels of simulated pumping in Bell and Travis Counties allowed for the maintenance of spring flows during the simulated repeat of the DOR in both GAM-runs. The minimum predictive spring flow for Bell County occurs in Stress Period 332. Stress period 332 is equivalent to the climatic conditions in September 1956. The minimum predictive spring flow for Travis County occurs in Stress Period 334. Stress period 334 is equivalent to the climatic conditions in November 1956. (Table 2) The GMA compared the results of both GAM simulations. The comparison found that the predicted levels of spring flow in both Bell County and Travis County appeared to be negatively affected by the increased pumping simulated for Williamson County in GAM-run 07-21. (Table 3) GMA-8 determined that an acceptable DFC for the N. Edwards aquifer in each of those Counties could be developed by describing the amount of spring flow maintained during the simulated repeat of the DOR. A DFC was developed for each of Bell and Travis Counties describing the minimum predictive spring flow results as presented in GAM-run 07-21. The development of a DFC for Bell and Travis Counties based on GAM-run 07-21 reflects the belief that without management, pumping in Williamson County is likely to continue at rates simulated in GAM-run 07-21.

County	Predictive Spring Flow in Stress Period 332	Predictive Spring Flow in Stress Period 334
Bell	~ 109	~ 510
Williamson	~ 0	~ 164
Travis	~ 49	~ 46

Table 2, Predictive Monthly Spring Flow Values in Acre-feet per Month from Selected Stress Periods in GAM-run 07-15

County	Predictive Spring Flow in Stress Period 332	Predictive Spring Flow in Stress Period 334
Bell	~ 101	~ 501
Williamson	~ 0	~ 106
Travis	~ 45	~ 42

Table 3, Predictive Monthly Spring Flow Values in Acre-feet per Month from Selected Stress Periods in GAM-run 07-21

In Williamson County the GAM-runs indicated that spring flow was not maintained during the simulated repeat of the DOR. The results from GAM-run 07-15 show that in 7 (non-sequential) months the predicted spring flow was 0 acre-feet during the simulated repeat of the DOR at the levels of pumping simulated for Williamson County. The results from GAM-run 07-21 show that in the same 7 (non-sequential) months the predicted spring flow was 0 acre-feet during the simulated repeat of the DOR at the increased levels of pumping simulated for Williamson County as compared to GAM-run 07-15. In other words, no additional months of 0 acre-feet spring flow are identified in the results of

GAM-run 07-21. (Table 4) The comparison of results of the two GAM-runs also indicated that in stress periods where the Williamson County predicted spring flow is greater than 0 acre-feet per month that spring flows are reduced in GAM-run 07-21 compared to GAM-run 07-15. (Table 5)

The hydrographs of predictive spring flow in GAM-run 07-15 and 07-21 illustrate large monthly or seasonal variations in predictive spring flows. The magnitude of the variations in predicted spring flows and the similarity to hydrographs of historic rainfall variations provide evidence that recent recharge is likely the dominant control over spring flow in the N. Edwards BFZ aquifer. However, the comparison of tabular results of GAM-runs 07-15 and 07-21 indicate that pumping has some influence over spring flow with respect to maintaining minimum spring flow rates.

GMA-8 agreed that that a DFC for the N. Edwards BFZ aquifer in Williamson County should be adopted describing an amount of spring flow to be maintained during the simulated repeat of the DOR. The level of spring flow selected by GMA-8 to be maintained during a simulated repeat of the DOR in Williamson County is 1 cubic foot per second (CFS) as expressed in acre-feet per month.

Stress Period	Climatic Conditions Equivalent Date	Predictive Spring Flow in GAM-run 07-15	Predictive Spring Flow in GAM-run 07-21
276	January 1952	~ 0	~ 0
285	October 1952	~ 0	~ 0
311	December 1954	~ 0	~ 0
326	March 1956	~ 0	~ 0
327	April 1956	~ 0	~ 0
332	September 1956	~ 0	~ 0
333	October 1956	~ 0	~ 0

Table 4, GAM-run Stress Periods and Climatic Conditions Equivalent Dates where the Predictive Spring Flow Values for Williamson County are 0 Acre-Feet per Month

Stress Period	Climatic Conditions Equivalent Date	Predictive Spring Flow in GAM-run 07-15 in Acre-feet per Month	Predictive Spring Flow in GAM-run 07-21 in Acre-feet per Month
264	January 1951	~ 93	~ 67
275	December 1951	~ 21	~ 4
283	August 1952	~ 105	~ 77
302	March 1954	~ 11	~ 0.7
322	November 1955	~ 74	~ 45
330	July 1956	~ 30	~ 5
362	March 1959	~ 146	~ 125

Table 5, Comparison of Williamson County Predictive Spring Flow Values in Selected GAM-run Stress Periods and Climatic Conditions Equivalent Dates

GMA-8 Desired Future Conditions for the N. Edwards BFZ Aquifer

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

Note: The observations and assessments made in this report were based on data supplied by CUWCD, TWDB or available from referenced published sources available at the time the report preparation. The conclusions drawn in the report are based on the available data and reasonable methods of assessment. The Desired Future Conditions presented in this report reflect policy decisions made by GMA-8. If new or different data is made available the conclusions of this report may change.

Bibliography

Anaya, Roberto, 2007;
(1) Texas Water Development Board: GAM run 07-15
(2) Texas Water Development Board: GAM run 07-21

Jones, Ian C., 2003; Groundwater Availability Model: Northern Segment of the Edwards Aquifer, Texas; Texas Water Development Board Report 358

Williams, Charles R., Way, Shao-Chih and Zoun, Reem, 2006; Availability of Groundwater in the Edwards BFZ Aquifer in Bell County; Clearwater Underground Water Conservation District

Desired Future Conditions

Edwards BFZ Aquifer
Bell, Travis and Williamson Counties

Desired Future Conditions

Woodbine Aquifer

Collin, Cooke, Dallas, Denton, Ellis, Fannin, Grayson, Hill, Hunt, Johnson, Kaufman, Lamar, McLennan, Navarro, Red River, Rockwall and Tarrant Counties

considered the TWDB report and requested 2 additional GAM simulations. (Donnelly, 2007) GMA-8 considered the results of the additional GAM simulations. (Wade, 2007) GMA-8 developed Woodbine aquifer DFCs from the GAM results.

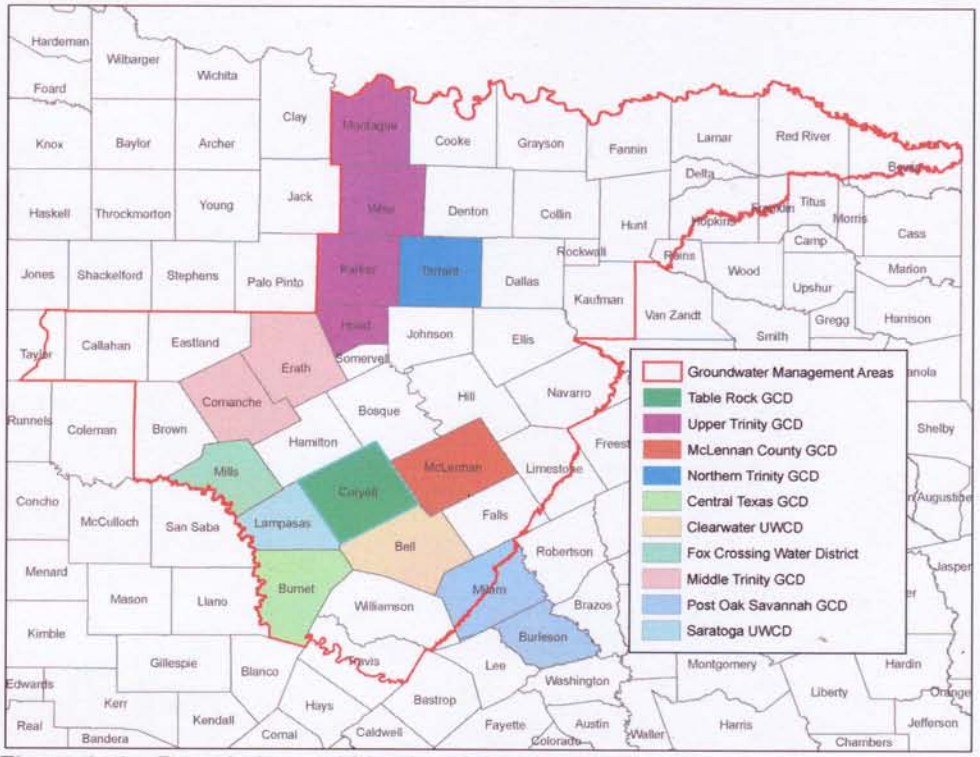

Figure 1, the Boundaries and Member GCDs of GMA-8

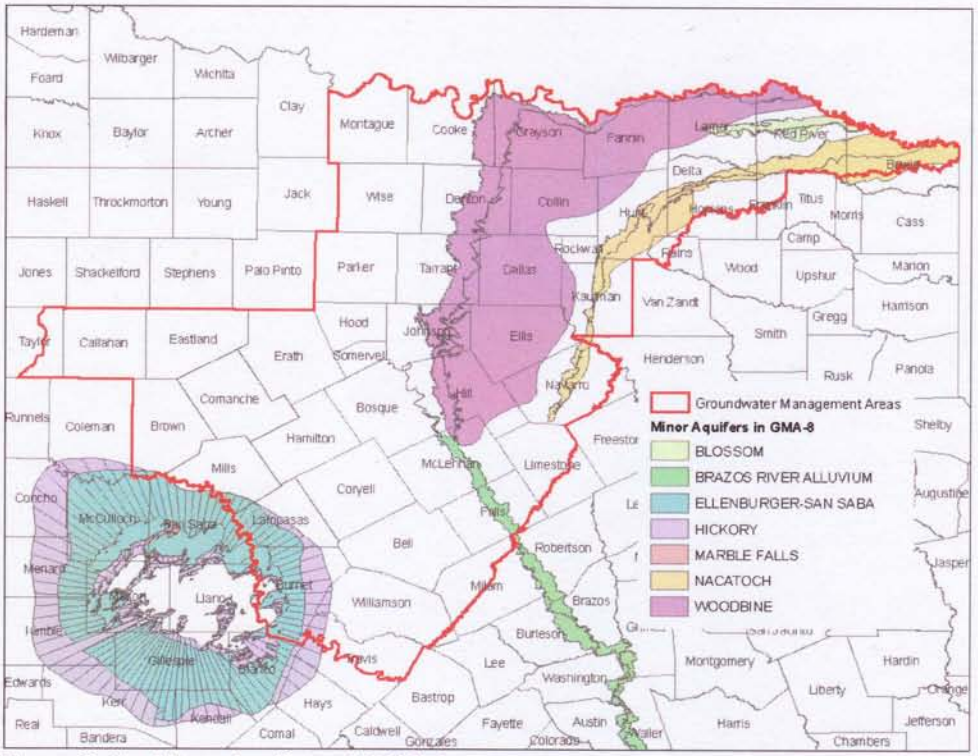

Figure 2, the Minor Aquifers of GMA-8

TCB
400 West 15th Street, Suite 500, Austin, Texas 78701
T 512.472.4519 F 512.472.7519 www.tcb.aecom.com

Memorandum

To: Cheryl Maxwell, Administrative Manager
Clearwater Underground Water Conservation District
Administrative Agent for Groundwater Management Area 8

From: Charles R. Williams, P.G. No. 526

Date: December 21, 2007

Re: Desired Future Conditions of the Woodbine Aquifer

Introduction

Groundwater Management Area 8 (GMA-8) is a groundwater management area of the State of Texas as defined by Statute with responsibility for developing a desired future condition (DFC) for aquifers within an approximately 46-County area. Membership of the GMA is composed of the groundwater conservation districts (GCDs) that occur all or in part within the GMA boundary. (Fig. 1) At the request of GMA-8, TCB Inc. (TCB) developed statements describing DFCs for the portions of the Woodbine aquifer that occurs within the bounds of GMA-8. (Fig. 2) GMA-8 approached development of the Trinity and Woodbine aquifer DFCs conjunctively; however, as of the date of this report GMA-8 has not adopted a Trinity aquifer DFC. This report describes the general DFC development process for both aquifers, but presents only the adopted DFCs for the Woodbine aquifer.

Methodology

The Woodbine aquifer is included with the N. Trinity aquifer in the Texas Water Development Board (TWDB) groundwater availability model for the N. Trinity and Woodbine aquifers (GAM). (Bene, Hardin and others, 2004) Clearwater Underground Water Conservation District (Clearwater) in Bell County, Central Texas GCD (Central TX) in Burnet County and Saratoga Underground Water Conservation District (Saratoga) in Lampasas County previously assessed Trinity aquifer availability using the GAM. GMA-8 considered the Clearwater, Saratoga and CTGCD experience in adopting the preferred metric for the Woodbine aquifer DFC. Groundwater use data from TWDB and Regional Water Plan (RWP) data were collected. New projections of Trinity and Woodbine aquifer pumping were considered. (Bene, Hardin and others, 2007) GMA-8 requested TWDB to perform a GAM simulation and report the results to GMA-8. GMA-8

DFC Development Approach

Clearwater, Saratoga and Central TX previously assessed Trinity aquifer groundwater availability in their jurisdictions. GMA-8 considered the experience gained by those GCDs in adopting the maintenance of water-levels (or stated alternatively the management of drawdown) in the Woodbine aquifer (as represented in the GAM). The initial approach adopted by GMA-8 provided for each GCD to specify an amount of pumping to be applied to the Trinity aquifer its area and the RWP aquifer availability values for the Trinity and Woodbine aquifers to be specified for all unprotected Counties in a simulation request to TWDB. At the inception of the GMA process no GCDs existed in GMA-8 with jurisdiction over the Woodbine aquifer.

During the GMA consideration of the Trinity aquifer pumping to be specified by the GCDs TWDB released a report giving new pumping projections for the Trinity and Woodbine aquifers. The report also describes the use and sources of water for enhanced gas production in the Barnett Shale. (Bene, Hardin and others, 2007) GMA-8 considered the new information and decided to use the new projections for use of the Trinity and Woodbine aquifers for the GMA-8 Counties included in the Medium Barnett Shale Development scenario given in the TWDB report. (Fig. 3)

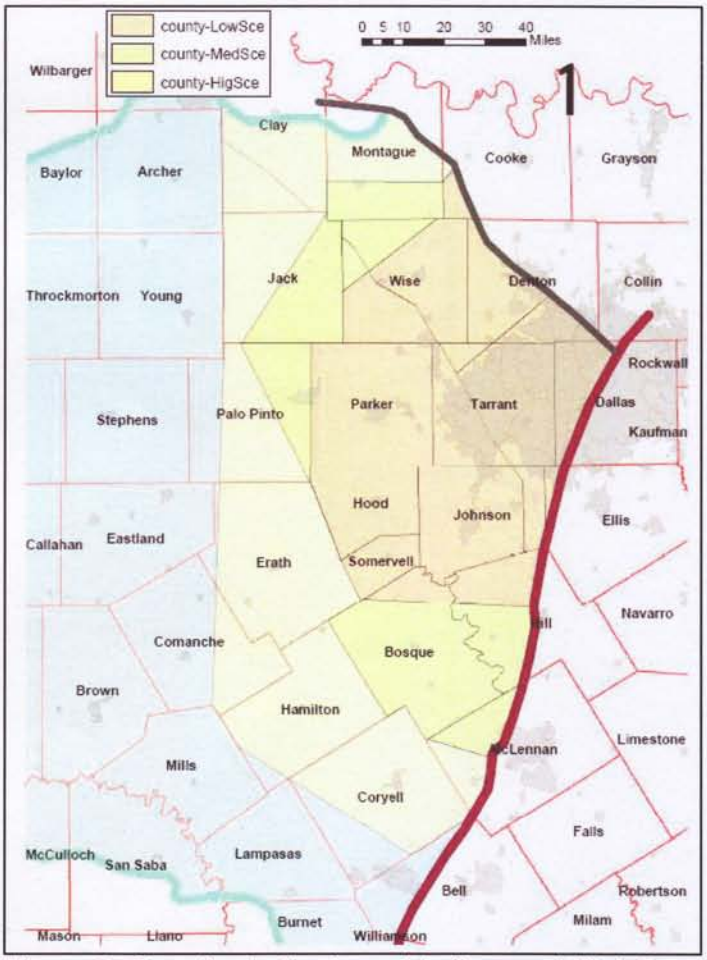

Figure 3, Counties in the Low, Medium and High Barnett Shale Development Scenarios, from Bene, Hardin and others, 2007

Discussion

The GAM consists of 7 layers representing the Woodbine and Trinity aquifers. Each layer in the GAM may represent an aquifer, an aquitard, or a subdivision of an aquifer. (Table 1) The pumping simulated in the GAM may be changed for each GAM run with respect to the amount of pumping applied to each layer and the spatial distribution of the pumping. Changes in the amount of pumping may be made to each layer individually, if desired, to all layers collectively or to one or more layers while the others remain unchanged.

The 50-year GAM simulations performed by TWDB included the drought of record (DOR) by using 47 of average climatic conditions (recharge) followed by 3 drought years (representing the 3 worst years of the 1950's drought). The GAM simulations maintained the spatial and vertical distribution (by model layer) of the original model predictive pumping data set. However, a revised simulated pumping amount was specified for each County in GMA-8 for each GAM run performed by TWDB. A total of three simulations were requested by GMA-8 and performed by TWDB. The results of the first simulation (GAM-run 07-09) suggested that the existing spatial distribution of Woodbine aquifer pumping in Lamar and Hunt Counties created an exaggerated cone of depression from the specified pumping. Additionally, the simulated Woodbine aquifer pumping specified for Delta County could not be applied because the spatial distribution of pumping in the original model did not include Delta County. The second and third runs had similar specifications and were combined by TWDB as GAM-run 07-30. GAM-run 07-30 revised the spatial pumping distribution in Hunt, Lamar and Delta Counties to address the previously identified issues in those Counties while maintaining pumping amounts specified for GMA-run 07-09. Simulation Request (Simulation) 2 of GAM-run 07-30 included revised Trinity aquifer pumping specifications for Comanche, Erath and McLennan Counties. Simulation 3 of GAM-run 07-30 differed from Simulation 2 only in revised Trinity aquifer pumping specifications for Comanche and Erath Counties.

<table>
<tr><th colspan="2">Geologic Unit</th><th>GAM Layer</th><th colspan="2">Hydrologic Unit</th></tr>
<tr><td colspan="2">Woodbine Fm.</td><td>Layer 1</td><td colspan="2">Woodbine Aquifer</td></tr>
<tr><td colspan="2">Fredericksburg Group</td><td>Layer 2</td><td colspan="2"></td></tr>
<tr><td colspan="2">Paluxy Sand</td><td>Layer 3</td><td>Upper Trinity</td><td rowspan="7">Trinity Aquifer</td></tr>
<tr><td colspan="2">Glen Rose Limestone</td><td>Layer 4</td><td>Upper / Middle Trinity</td></tr>
<tr><td rowspan="4">Travis Peak Fm.</td><td>Hensell Sand</td><td>Layer 5</td><td>Middle Trinity</td></tr>
<tr><td>Cow Creek Limestone</td><td rowspan="3">Layer 6
Treated as an Aquitard</td><td rowspan="3"></td></tr>
<tr><td>Hammett Shale</td></tr>
<tr><td>Sligo Limestone</td></tr>
<tr><td colspan="2">Hosston Conglomerate</td><td>Layer 7</td><td>Lower Trinity</td></tr>
</table>

Table 1, Generalized Relationships of Geologic Units to GAM Layers and Hydrologic Units

To develop the initial GAM-run request to TWDB, the GCDs of GMA-8 each specified the amount of Trinity aquifer pumping to be simulated in the GAM run for their area. Clearwater and Central TX specified the pumping to be applied to GAM Layers 3, 4, 5 and 7 maintaining the existing model spatial pumping distribution in each layer. The other GCDs specified a total pumping to be applied to Trinity aquifer in their area maintaining the existing distribution of pumping as a percentage of the total pumping specified and maintaining the existing spatial pumping distribution. The specified pumping for the Trinity aquifer or Trinity and Woodbine aquifers for the Counties in the Medium Barnett Shale scenario was equal to the highest year of the projected pumping values given in the TWDB report. The specified pumping for the Trinity aquifer or Trinity and Woodbine aquifers for the remaining Counties in GMA-8 was equal to the highest year value (after year 2000) of the aquifer availability given in the RWP. Pumping was held constant in all areas of the model where a pumping specification was provided. (Appendix A)

While TWDB processed the initial GAM-run request, the Tablerock GCD (Tablerock), McLennan County GCD (McLennan Co.), Northern Trinity GCD (N. Trinity) and Upper Trinity GCD (U. Trinity) were created and became members of GMA-8. GMA-8 prepared orientation material for the new GCD members to acquaint them with the GMA process and the prior decisions made by the original members. At the next GMA meeting the new GCD members were provided with the orientation and materials.

On receipt of the report for GAM-run 07-09, GMA-8 considered the results and determined that 2 additional GAM-run requests would be necessary. The runs were considered necessary to address the issues identified in GAM-run 07-09 related to spatial pumping distribution. The additional runs allowed Middle Trinity GCD (M. Trinity) and McLennan Co. to give further pumping specifications for their areas. In the first of the two runs, M. Trinity and McLennan Co. specified a total pumping to for the Trinity aquifer in their area maintaining the existing distribution of pumping as a percentage of the total pumping specified and maintaining the existing spatial pumping distribution. All other previous GAM-run specifications remained unchanged. (Appendix B) In the second of the two runs, M. Trinity specified a total pumping to for the Trinity aquifer in its area maintaining the existing distribution of pumping as a percentage of the total pumping specified and maintaining the existing spatial pumping distribution. All other previous GAM-run specifications remained unchanged. (Appendix C)

On receipt of the report for GAM-run 07-30, GMA-8 considered the results and determined that no additional GAM-run requests were immediately necessary. GMA-8 gave careful consideration to two possible strategies for development of DFCs for the Trinity and Woodbine aquifers. The first strategy was continuing investigation of the Trinity and Woodbine aquifers until the statutory deadline for DFC submission in 2010. The second strategy was develop DFCs by the TWDB deadline (January 2008) to require inclusion of the resulting values for Managed Available Groundwater (MAG) in the next round of RWP development and continue Trinity and Woodbine aquifer investigations. After deliberation, GMA-8 decided to develop DFCs for the Trinity and Woodbine aquifers so that the MAG values could be used in the next round of RWPs while continuing Trinity and Woodbine aquifer investigations was preferred. GMA-8 decided that the DFCs for the M. Trinity Counties should be based on the results of GAM-run 07-09 and the DFCs for all other Counties in GMA-8 be based on the results of Simulation 2 of GAM-run 07-30. In further consideration of the DFCs; GMA-8 adopted

the Woodbine aquifer DFCs on December 17, 2007 and deferred action on the Trinity aquifer DFCs.

All average draw down values provided by TWDB are from GAM-runs 07-09 and 07-30 for use in developing DFCs are rounded to the nearest 1-foot for presentation in the DFC statements using the normal rounding convention.

GMA-8 Desired Future Conditions for the Woodbine Aquifer

Collin County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 154 feet after 50 years.

Cooke County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 0 feet after 50 years.

Dallas County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 112 feet after 50 years.

Denton County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 16 feet after 50 years.

Ellis County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 102 feet after 50 years.

Fannin County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 186 feet after 50 years.

Grayson County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 28 feet after 50 years.

Hill County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 87 feet after 50 years.

Hunt County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 353 feet after 50 years.

Johnson County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 4 feet after 50 years.

Kaufman County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 211 feet after 50 years.

Lamar County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 297 feet after 50 years.

McLennan County (McLennan County GCD)

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 61 feet after 50 years.

Navarro County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 177 feet after 50 years.

Red River County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 202 feet after 50 years.

Rockwall County

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 241 feet after 50 years.

Tarrant County (Northern Trinity GCD)

- From estimated year 2000 conditions, the average draw down of the Woodbine aquifer should not exceed approximately 2 feet after 50 years.

Note: The observations and assessments made in this report were based on data supplied by the members of GMA-8, TWDB or available from referenced published sources available at the time the report preparation. The conclusions drawn in the report are based on the available data and reasonable methods of assessment. The Desired Future Conditions presented in this report reflect policy decisions made by GMA-8. If new or different data is made available the conclusions of this report may change.

Bibliography

Bene, James, Hardin, Robert and others, 2004; Northern Trinity / Woodbine Aquifer Groundwater Availability Model – Final Report to Texas Water Development Board

Bene, James, Hardin, Robert and others, 2007; Northern Trinity / Woodbine Aquifer Groundwater Availability Model – Assessment of Groundwater Use in the Northern Trinity Aquifer Due to Urban Growth and Barnett Shale Development

Donnelley, Andrew, 2007; GAM-run 07-09; Texas Water Development Board

Wade, Shirley, 2007; GAM-run 07-30; Texas Water Development Board

APPENDIX A

GMA-8 Simulation Request Specifications
For Northern Trinity/Woodbine Aquifer GAM

April 25, 2007

Clearwater Underground Water Conservation District (UWCD) acting on behalf of GMA-8 requests Texas Water Development Board (TWDB) to perform a projected pumping simulation of the N. Trinity / Woodbine aquifer Groundwater Availability Model (GAM). The N. Trinity / Woodbine aquifer GAM consists of 7-layers representing both water-producing and non water-producing zones. In the GAM, layer 1 represents the Woodbine aquifer and layers 3, 4, 5, 6 and 7 represent both the water-bearing and non water-bearing portions of the Trinity aquifer. Clearwater UWCD requests the GAM simulation be performed with the following specifications:

1. The simulation period should be for 50 years.
2. The simulation should use annual time steps.
3. The simulated climatic conditions should include 4 decades of average climatic conditions with the last decade beginning with average climatic conditions and ending in a simulated repeat of the drought of record.
4. The simulation should maintain the existing model spatial pumping distribution.

5. The simulation should maintain the existing distribution of pumping by layer (as a percentage of the total Trinity aquifer pumping within a County area) for layers 3, 4, 5, 6, and 7; except where specified otherwise.
6. Pumping should be held constant for each area for which a pumping amount is specified (*i.e.* by County total for the Trinity aquifer or by a layer specified within a County).
7. The projected pumping to be applied to layer 1 (Woodbine) by County should be as follows (note these projected pumping values are based on Regional Water Plan (RWP) groundwater availability values for the Woodbine aquifer; the balance of Counties using the Woodbine aquifer are addressed in request item 9 below):
    a. Collin – 2,500 ac-ft per year
    b. Delta – 16 ac-ft per year
    c. Fannin – 3,300 ac-ft per year
    d. Grayson – 12,100 ac-ft per year
    e. Hunt – 2,840 ac-ft per year
    f. Kaufman – 200 ac-ft per year
    g. Lamar – 3,658 ac-ft per year
    h. Limestone – 33 ac-ft per year
    i. Navarro – 300 ac-ft per year
    j. Red River – 170 ac-ft per year
    k. Rockwall – 144 ac-ft per year
8. The projected pumping to be applied to layers 3, 4, 5 and 7 (Trinity aquifer with total by County) should be as follows (note these projected pumping values are based on Regional Water Plan (RWP) groundwater availability values for the Trinity aquifer):
    a. Brown – 2,085 ac-ft per year
    b. Callahan – 3,787 ac-ft per year
    c. Collin – 2,100 ac-ft per year
    d. Coryell – 1,791 ac-ft per year
    e. Delta – 364 ac-ft per year
    f. Eastland – 4,853 ac-ft per year
    g. Falls – 161 ac-ft per year
    h. Fannin – 700 ac-ft per year
    i. Grayson – 9,400 ac-ft per year
    j. Hamilton – 2,146 ac-ft per year
    k. Hunt – 551 ac-ft per year
    l. Kaufman – 1,184 ac-ft per year
    m. Lamar – 1,320 ac-ft per year
    n. Limestone – 66 ac-ft per year
    o. Montague – 2,682 ac-ft per year
    p. Navarro – 1,873 ac-ft per year
    q. Red River – 528 ac-ft per year
    r. Rockwall – 958 ac-ft per year
    s. Taylor – 679 ac-ft per year
    t. Travis – 3,900 ac-ft per year
    u. Williamson – 1,810 ac-ft per year
9. The projected pumping to be applied to layers 1, 3, 4, 5 and 7 (as applicable with totals by County for Woodbine and Trinity aquifers) should be as follows (note these projected pumping values are based on the highest year for each requested County in the High Estimate of Predictive Groundwater Use given in

the TWDB report "Assessment of Groundwater Use in the Northern Trinity Aquifer Due to Urban Growth and Barnett Shale Development"):

a. Bosque – 7,509 ac-ft per year
b. Cooke – 7,018 ac-ft per year
c. Dallas – 7,807 ac-ft per year
d. Denton – 23,442 ac-ft per year
e. Ellis – 9,403 ac-ft per year
f. Hill – 5,412 ac-ft per year
g. Hood – 11,064 ac-ft per year
h. Johnson – 17,767 ac-ft per year
i. Mc Lennan - 15,234 ac-ft per year
j. Parker – 15,389 ac-ft per year
k. Somervell – 2,485 ac-ft per year
l. Tarrant – 19,615 ac-ft per year
m. Wise – 9,801 ac-ft per year

10. The projected Pumping to be applied to layers 3, 4, 5 and 7 (Trinity aquifer with total by County) in Middle Trinity Groundwater Conservation District (GCD) should be as follows:
    a. Comanche – 25,000 ac-ft per year
    b. Erath – 30,000 ac-ft per year
11. The projected pumping to be applied to layers 3, 4, 5, and 7 (Trinity aquifer with total by County) in Lampasas County (Saratoga UWCD) should be – 3,164 ac-ft per year.
12. The projected pumping to be applied to layers 3, 4, 5 and 7 (Trinity aquifer with total by County) in Milam County (Post Oak Savannah GCD) should be – 321 ac-ft per year.
13. The projected pumping to be applied to layers 3, 4, 5 and 7 (total by County) in Mills County (Fox Crossing Water District) should be – 2,400 ac-ft per year.
14. The projected pumping to be applied to the Trinity aquifer in Bell County (Clearwater UWCD) by layer is as follows:
    a. Layer 3 (Paluxy) – 112 ac-ft per year
    b. Layer 4 (Glen Rose) – 880 ac-ft per year
    c. Layer 5 (Hensell) – 1,100 ac-ft per year
    d. Layer 6 (Cow Creek, Hammett, Sligo) – No change from existing predictive pumping
    e. Layer 7 (Hosston) – 5,000 ac-ft per year
15. The projected pumping to be applied to the Trinity aquifer in Burnet County (Central Texas GCD) by layer is as follows:
    a. Layer 3 (Paluxy) – 200 ac-ft per year
    b. Layer 4 (Glen Rose) – 200 ac-ft per year
    c. Layer 5 (Hensell) – 700 ac-ft per year
    d. Layer 6 (Cow Creek, Hammett, Sligo) – No change from existing predictive pumping
    e. Layer 7 (Hosston) – 2,500 ac-ft per year

APPENDIX B

GMA-8 2nd Simulation Request Specifications
For Northern Trinity/Woodbine Aquifer GAM

October 4, 2007

Clearwater Underground Water Conservation District (UWCD) acting on behalf of GMA-8 requests Texas Water Development Board (TWDB) to perform a projected pumping simulation of the N. Trinity / Woodbine aquifer Groundwater Availability Model (GAM). The N. Trinity / Woodbine aquifer GAM consists of 7-layers representing both water-producing and non water-producing zones. In the GAM, layer 1 represents the Woodbine aquifer and layers 3, 4, 5, 6 and 7 represent both the water-bearing and non water-bearing portions of the Trinity aquifer. Clearwater UWCD requests the GAM simulation be performed with the following specifications:

16. The simulation period should be for 50 years.
17. The simulation should use annual time steps.
18. The simulated climatic conditions should include 4 decades of average climatic conditions with the last decade beginning with average climatic conditions and ending in a simulated repeat of the drought of record.
19. The simulation should maintain the existing model spatial pumping distribution, where possible. It is understood from TWDB GAM Run 07-09 that the existing

model spatial distribution does not provide for pumping in the Woodbine aquifer in Delta County nor provide for pumping in the Trinity aquifer of Delta and Kaufman Counties. It is further understood from TWDB GAM Run 07-09 that the existing model spatial distribution of pumping in the Woodbine aquifer in Hunt and Lamar Counties may contribute to extreme draw down resulting in concentrated areas. TWDB is requested to suggest an appropriate methodology or methodologies by which the requested amounts of pumping may be reasonably distributed in the above mentioned Counties and aquifers.

20. The simulation should maintain the existing distribution of pumping by layer (as a percentage of the total Trinity aquifer pumping within a County area) for layers 3, 4, 5, 6, and 7; except where specified otherwise.
21. Pumping should be held constant for each area for which a pumping amount is specified (*i.e.* by County total for the Trinity aquifer or by a layer specified within a County).
22. The projected pumping to be applied to layer 1 (Woodbine) by County should be as follows (note these projected pumping values are based on Regional Water Plan (RWP) groundwater availability values for the Woodbine aquifer; the balance of Counties using the Woodbine aquifer are addressed in request item 9 below):
    a. Collin – 2,500 ac-ft per year
    b. Delta – 16 ac-ft per year
    c. Fannin – 3,300 ac-ft per year
    d. Grayson – 12,100 ac-ft per year
    e. Hunt – 2,840 ac-ft per year
    f. Kaufman – 200 ac-ft per year
    g. Lamar – 3,658 ac-ft per year
    h. Limestone – 33 ac-ft per year
    i. Navarro – 300 ac-ft per year
    j. Red River – 170 ac-ft per year
    k. Rockwall – 144 ac-ft per year
23. The projected pumping to be applied to layers 3, 4, 5 and 7 (Trinity aquifer with total by County) should be as follows (note these projected pumping values are based on Regional Water Plan (RWP) groundwater availability values for the Trinity aquifer):
    a. Brown – 2,085 ac-ft per year
    b. Callahan – 3,787 ac-ft per year
    c. Collin – 2,100 ac-ft per year
    d. Coryell – 1,791 ac-ft per year
    e. Delta – 364 ac-ft per year
    f. Eastland – 4,853 ac-ft per year
    g. Falls – 161 ac-ft per year
    h. Fannin – 700 ac-ft per year
    i. Grayson – 9,400 ac-ft per year
    j. Hamilton – 2,146 ac-ft per year
    k. Hunt – 551 ac-ft per year
    l. Kaufman – 1,184 ac-ft per year
    m. Lamar – 1,320 ac-ft per year
    n. Limestone – 66 ac-ft per year
    o. Montague – 2,682 ac-ft per year
    p. Navarro – 1,873 ac-ft per year
    q. Red River – 528 ac-ft per year

d. Layer 6 (Cow Creek, Hammett, Sligo) – No change from existing predictive pumping
e. Layer 7 (Hosston) – 2,500 ac-ft per year

APPENDIX C

GMA-8 3rd Simulation Request Specifications
For Northern Trinity/Woodbine Aquifer GAM

October 4, 2007

Clearwater Underground Water Conservation District (UWCD) acting on behalf of GMA-8 requests Texas Water Development Board (TWDB) to perform a projected pumping simulation of the N. Trinity / Woodbine aquifer Groundwater Availability Model (GAM). The N. Trinity / Woodbine aquifer GAM consists of 7-layers representing both water-producing and non water-producing zones. In the GAM, layer 1 represents the Woodbine aquifer and layers 3, 4, 5, 6 and 7 represent both the water-bearing and non water-bearing portions of the Trinity aquifer. Clearwater UWCD requests the GAM simulation be performed with the following specifications:

32. The simulation period should be for 50 years.
33. The simulation should use annual time steps.
34. The simulated climatic conditions should include 4 decades of average climatic conditions with the last decade beginning with average climatic conditions and ending in a simulated repeat of the drought of record.

35. The simulation should maintain the existing model spatial pumping distribution, where possible. It is understood from TWDB GAM Run 07-09 that the existing model spatial distribution does not provide for pumping in the Woodbine aquifer in Delta County nor provide for pumping in the Trinity aquifer of Delta and Kaufman Counties. It is further understood from TWDB GAM Run 07-09 that the existing model spatial distribution of pumping in the Woodbine aquifer in Hunt and Lamar Counties may contribute to extreme draw down resulting in concentrated areas. TWDB is requested to suggest an appropriate methodology or methodologies by which the requested amounts of pumping may be reasonably distributed in the above mentioned Counties and aquifers.
36. The simulation should maintain the existing distribution of pumping by layer (as a percentage of the total Trinity aquifer pumping within a County area) for layers 3, 4, 5, 6, and 7; except where specified otherwise.
37. Pumping should be held constant for each area for which a pumping amount is specified (*i.e.* by County total for the Trinity aquifer or by a layer specified within a County).
38. The projected pumping to be applied to layer 1 (Woodbine) by County should be as follows (note these projected pumping values are based on Regional Water Plan (RWP) groundwater availability values for the Woodbine aquifer; the balance of Counties using the Woodbine aquifer are addressed in request item 9 below):
    a. Collin – 2,500 ac-ft per year
    b. Delta – 16 ac-ft per year
    c. Fannin – 3,300 ac-ft per year
    d. Grayson – 12,100 ac-ft per year
    e. Hunt – 2,840 ac-ft per year
    f. Kaufman – 200 ac-ft per year
    g. Lamar – 3,658 ac-ft per year
    h. Limestone – 33 ac-ft per year
    i. Navarro – 300 ac-ft per year
    j. Red River – 170 ac-ft per year
    k. Rockwall – 144 ac-ft per year
39. The projected pumping to be applied to layers 3, 4, 5 and 7 (Trinity aquifer with total by County) should be as follows (note these projected pumping values are based on Regional Water Plan (RWP) groundwater availability values for the Trinity aquifer):
    a. Brown – 2,085 ac-ft per year
    b. Callahan – 3,787 ac-ft per year
    c. Collin – 2,100 ac-ft per year
    d. Coryell – 1,791 ac-ft per year
    e. Delta – 364 ac-ft per year
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    l. Kaufman – 1,184 ac-ft per year
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q. Red River – 528 ac-ft per year
r. Rockwall – 958 ac-ft per year
s. Taylor – 679 ac-ft per year
t. Travis – 3,900 ac-ft per year
u. Williamson – 1,810 ac-ft per year

40. The projected pumping to be applied to layers 1, 3, 4, 5 and 7 (as applicable with totals by County for Woodbine and Trinity aquifers) should be as follows (note these projected pumping values are based on the highest year for each requested County in the High Estimate of Predictive Groundwater Use given in the TWDB report "Assessment of Groundwater Use in the Northern Trinity Aquifer Due to Urban Growth and Barnett Shale Development"):
    a. Bosque – 7,509 ac-ft per year
    b. Cooke – 7,018 ac-ft per year
    c. Dallas – 7,807 ac-ft per year
    d. Denton – 23,442 ac-ft per year
    e. Ellis – 9,403 ac-ft per year
    f. Hill – 5,412 ac-ft per year
    g. Hood – 11,064 ac-ft per year
    h. Johnson – 17,767 ac-ft per year
    i. Parker – 15,389 ac-ft per year
    j. Somervell – 2,485 ac-ft per year
    k. Tarrant – 19,615 ac-ft per year
    l. Wise – 9,801 ac-ft per year
41. The projected Pumping to be applied to layers 3, 4, 5 and 7 (Trinity aquifer with total by County) in McLennan County (McLennan County Groundwater Conservation District (GCD)) should be – 20,694 ac-ft per year
42. The projected Pumping to be applied to layers 3, 4, 5 and 7 (Trinity aquifer with total by County) in Middle Trinity GCD should be as follows:
    a. Comanche – 35,000 ac-ft per year
    b. Erath – 42,000 ac-ft per year
43. The projected pumping to be applied to layers 3, 4, 5, and 7 (Trinity aquifer with total by County) in Lampasas County (Saratoga UWCD) should be – 3,164 ac-ft per year.
44. The projected pumping to be applied to layers 3, 4, 5 and 7 (Trinity aquifer with total by County) in Milam County (Post Oak Savannah GCD) should be – 321 ac-ft per year.
45. The projected pumping to be applied to layers 3, 4, 5 and 7 (total by County) in Mills County (Fox Crossing Water District) should be – 2,400 ac-ft per year.
46. The projected pumping to be applied to the Trinity aquifer in Bell County (Clearwater UWCD) by layer is as follows:
    a. Layer 3 (Paluxy) – 112 ac-ft per year
    b. Layer 4 (Glen Rose) – 880 ac-ft per year
    c. Layer 5 (Hensell) – 1,100 ac-ft per year
    d. Layer 6 (Cow Creek, Hammett, Sligo) – No change from existing predictive pumping
    e. Layer 7 (Hosston) – 5,000 ac-ft per year
47. The projected pumping to be applied to the Trinity aquifer in Burnet County (Central Texas GCD) by layer is as follows:
    a. Layer 3 (Paluxy) – 200 ac-ft per year
    b. Layer 4 (Glen Rose) – 200 ac-ft per year

c. Layer 5 (Hensell) – 700 ac-ft per year
d. Layer 6 (Cow Creek, Hammett, Sligo) – No change from existing predictive pumping
e. Layer 7 (Hosston) – 2,500 ac-ft per year

Desired Future Conditions

Blossom Aquifer
Bowie, Lamar and Red River Counties

Brazos River Alluvium Aquifer
Bosque, Falls, Hill, McLennan and Milam Counties

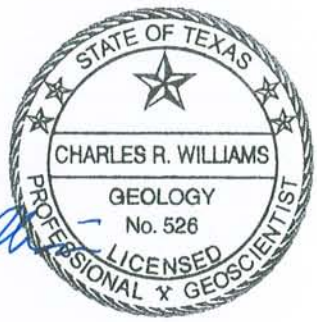
Nacatoch Aquifer
Bowie, Delta, Franklin, Hopkins, Hunt, Kaufman, Lamar, Navarro, Rains and Red River Counties

TCB
400 West 15th Street, Suite 500, Austin, Texas 78701
T 512.472.4519 F 512.472.7519 www.tcb.aecom.com

Memorandum

To: Cheryl Maxwell, Administrative Manager
Clearwater Underground Water Conservation District
Administrative Agent for Groundwater Management Area 8

From: Charles R. Williams, P.G. No. 526



Date: December 14, 2007

Re: Adopted Desired Future Conditions of Minor Aquifers

Introduction

Groundwater Management Area 8 (GMA-8) is a groundwater management area of the State of Texas as defined by Statute with responsibility for developing a desired future condition (DFC) for aquifers within an approximately 46-County area. Membership of the GMA is composed of the groundwater conservation districts (GCDs) that occur all or in part within the GMA boundary. (Fig. 1) At the request of GMA-8, TCB Inc. (TCB) developed statements describing DFCs for the portions of the Blossom, Nacatoch and Brazos Alluvium Aquifers recognized by the Texas Water Development Board (TWDB) to occur in whole or in part within GMA-8. (Fig. 2)

Methodology

To predict the effects of pumping in the Blossom, Nacotoch and Brazos Alluvium aquifers TCB developed two-dimensional (2-D) spreadsheet models. The models use estimates of recharge area, annual rainfall, recharge rate, aquifer saturated thickness and effective porosity (specific yield) to predict the percentage of saturated thickness maintained in the aquifer after a specified time period for a range of pumping amounts. Predictions are made for the Nacatoch aquifer as a whole and for specified areas of the Brazos River Alluvium and the Blossom aquifers. Aquifer recharge area estimates are from the TWDB geographic information system (GIS) coverages. Estimates of annual rainfall are from National Oceanic and Atmospheric Agency (NOAA) data. Estimates of the recharge rate, saturated thickness, and effective porosity of the Blossom and Nacatoch aquifers are from TWDB publications. (McLaurin, 1988; Ashworth, 1988) For the Brazos Alluvium aquifer, reasonable estimates are used of the recharge rate, saturated thickness, or effective porosity of similar materials from the aquifer in other areas. (Baker and others, 1974; Driscoll, 1986) The predictive time period is 50 years.

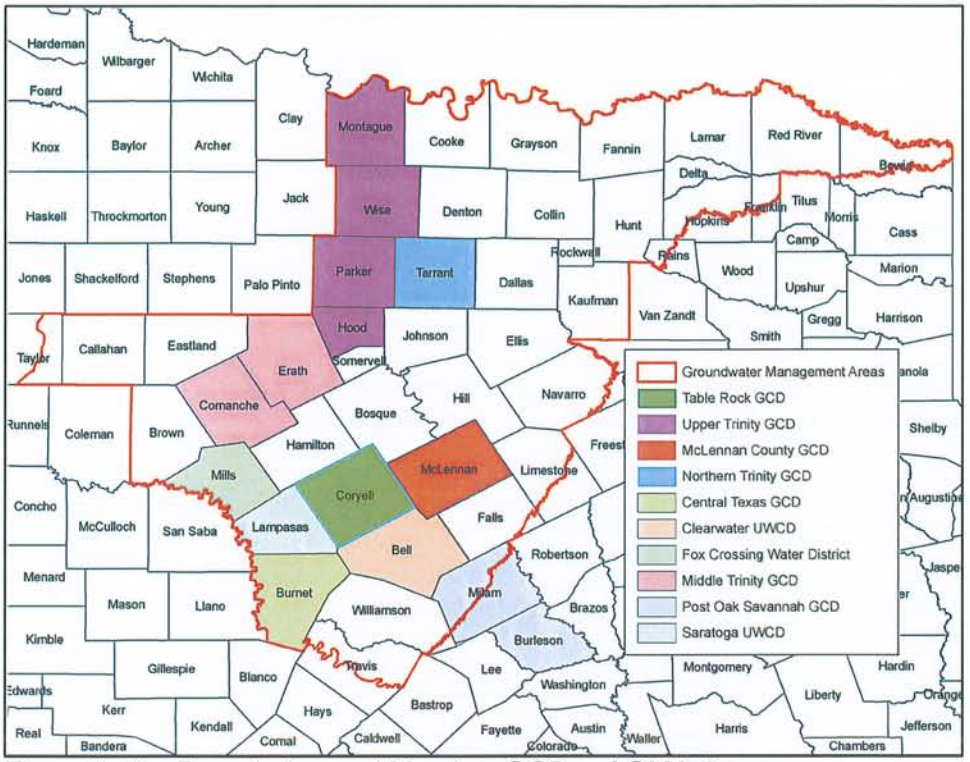


Figure 1, the Boundaries and Member GCDs of GMA-8

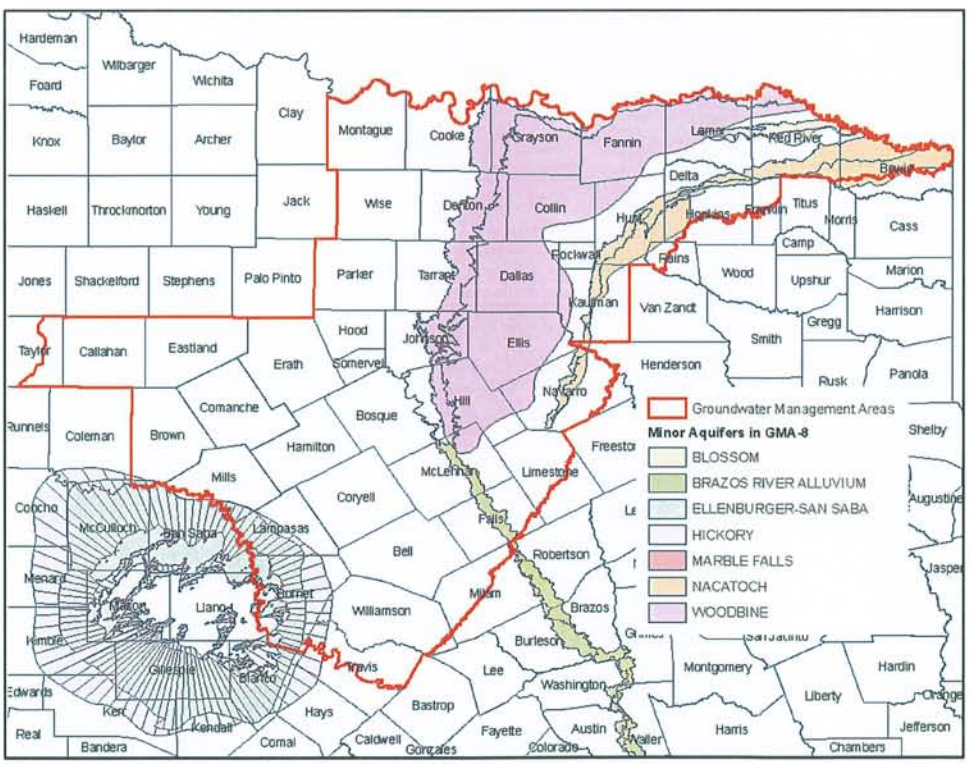


Figure 2, the Minor Aquifers of GMA-8

Discussion

The purpose of the 2-D models is to conveniently predict the potential results of a range of predictive pumping amounts over time. The models are used to aid in the DFC development process for aquifers where a TWDB GAM is not available. Results are presented in tabular and graphic formats, both of which allow indexing between pumping amounts and predicted changes in the saturated thickness of the aquifer.

An assumption of the 2-D models is that the aquifer is in an unconfined condition. However, the 2-D models may be reasonably applicable to aquifers that have both an unconfined and a confined component if, either the confined (artesian pressured) portion of the aquifer is relatively limited in area or if pumping in the aquifer is reasonably confined to near the aquifer recharge zone for the area of interest. The Brazos River Alluvium aquifer is an unconfined aquifer. The Blossom and Nacotoch aquifers both have limited confined zone areas. In areas where the models are applied to several Counties, the arithmetic mean of the average annual rainfall values of the several Counties is used. The 2-D models project the effects of pumping using the following relationships:

The term Groundwater Availability is used to express the annual amount of pumping in the area of interest and is composed of two components;
Groundwater Availability = Groundwater Availability $_{Storage}$ + Groundwater Availability$_{Recharge}$

GWA = GWAS + GWAR

Where:
GWA = Groundwater availability (ac-ft/yr)
GWAS = Groundwater availability from storage (ac-ft/yr)
GWAR = Groundwater availability from recharge (ac-ft/yr)

GWAS = (1-DD)*B*A*N/Y/43560
Where:
DD = average percentage of drawdown maintained (%)
B = average saturated thickness of aquifer (ft)
A = area of aquifer (ft^2)
N = effective porosity
Y = time duration (yrs)

GWAR = P*A*R/43560

Where:
P = average yearly precipitation (ft/yr)
R = % precipitation that infiltrates into groundwater system

Equation: GWA = GWAS + GWAR = (1-DD)*B*A*N/Y/43560 + P*A*R/43560

DFC Development Approach

Brazos Alluvium

In GMA-8, the Brazos River Alluvium occurs in five Counties. A GCD exists in two of the five Counties. The unprotected Counties bound one GCD and separate it from the other GCD. For the portions of the Brazos River Alluvium occurring within a GCD a County-specific model was applied for each GCD. After reviewing the model results the GCD selected the preferred percentage of aquifer saturated thickness to be maintained in the portion of the aquifer under its management authority. A DFC statement was developed describing the selected condition. (Figs 3-6) For Counties outside of a GCD, two models were applied. One model covers Falls County and the other combines Hill and Bosque Counties which are located on opposing banks of the same reach of the Brazos River.

Development of a DFC describing the percentage of saturated thickness maintained in the aquifer if pumping equivalent to the Regional Water Plan (RWP) aquifer availability occurred in each County or Counties was attempted. (Table 1) However, initial results suggested that some of the DFCs describing the predicted aquifer conditions may not be physically compatible with the DFC developed by an adjoining GCD. This is particularly true for the Bosque-Hill County and the McLennan County GCD models. Pumping equivalent to the combined Bosque-Hill County availability is predicted to reduce the saturated thickness to 0 percent. A DFC was subsequently developed describing the aquifer conditions in Bosque and Hill Counties predicted for pumping approximately 1,000 acre-feet per year less than the RWP availability for the two Counties. (Figs 7 and 8) A DFC was developed for Falls County describing aquifer conditions predicted from pumping an amount equivalent to approximately 1,000 acre-feet per year greater than the Falls County RWP availability. (Figs 9 and 10) The simulated pumping used for the Falls County DFC development is equal to approximately 97 percent of the estimated annual aquifer recharge in Falls County. Overall, the DFCs for the three-County area are based on an amount of pumping that is equal to the sum of the three-County RWP availability. (Table 2)

County	RWP Brazos Alluvium Aquifer Availability (acre-feet per year)
Falls	15,600
Bosque	2,500
Hill	0
Total	**18,100**

Table1, Regional Water Plan Availability Values for the Brazos River Alluvium in Falls, Bosque and Hill Counties

County	GMA-8 Brazos Alluvium Aquifer Simulated Pumping (acre-feet per year)
Falls	16,600
Bosque and Hill	1,500
Total	**18,100**

Table 2, GMA-8 Application of Simulated Pumping in the Brazos River Alluvium for DFC Development

% of saturated thickness maintained	GW availability from storage (ac-ft/yr)	GW availability from recharge (ac-ft/yr)	Total availability (ac-ft/yr)
100%	0	449	449
99%	2	449	451
98%	4	449	454
97%	6	449	456
96%	8	449	458
95%	10	449	460
94%	13	449	462
93%	15	449	464
92%	17	449	466
91%	19	449	468
90%	21	449	470

Sat. Thickness	35	(ft)	
Recharge Area	1997	(acres)	=
Effective porosity	0.15	(fraction)	
Time	50	(yr)	
Rainfall Rate	3	(ft/yr)	
Recharge Rate	0.075	(fraction)	

Figure 3, Model Input Values and Tabular Results for the Brazos River Alluvium in Milam County (Post Oak Savannah GCD)

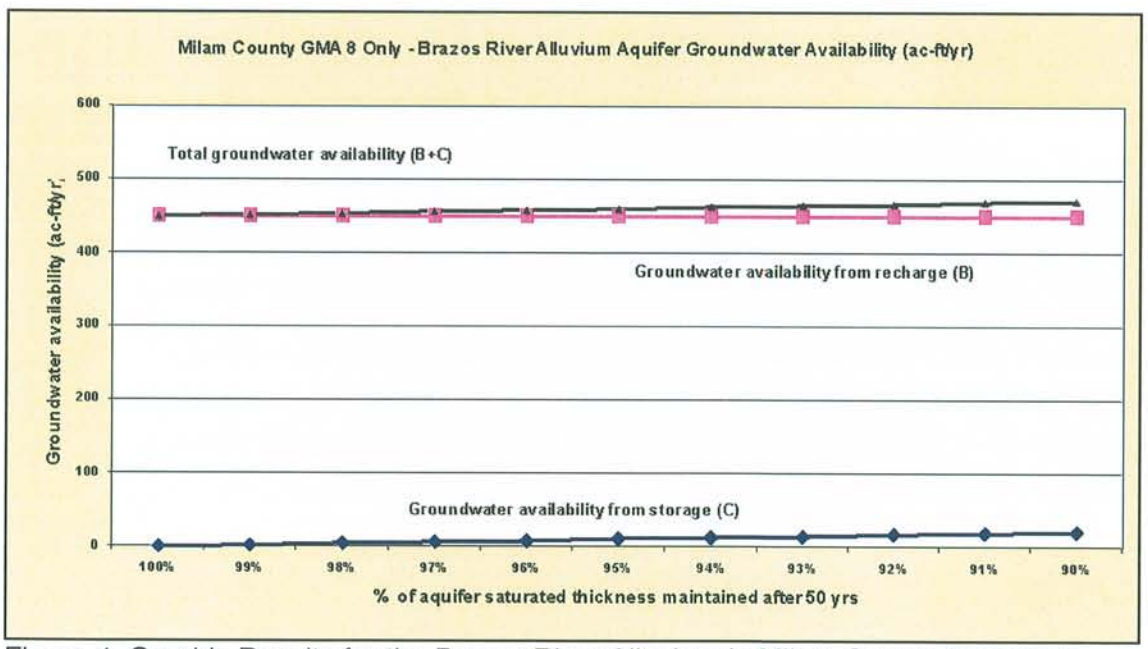


Figure 4, Graphic Results for the Brazos River Alluvium in Milam County (Post Oak Savannah GCD)

% of saturated thickness maintained	GW availability from storage (ac-ft/yr)	GW availability from recharge (ac-ft/yr)	Total availability (ac-ft/yr)
100%	0	14375	14375
98%	139	14375	14513
96%	278	14375	14652
94%	416	14375	14791
92%	555	14375	14930
90%	694	14375	15069
88%	833	14375	15207
86%	972	14375	15346
84%	1110	14375	15485
82%	1249	14375	15624
80%	1388	14375	15763

Sat. Thickness	35	(ft)	
Recharge Area	66090	(acres)	=
Effective porosity	0.15	(fraction)	
Time	50	(yr)	
Rainfall Rate	2.9	(ft/yr)	
Recharge Rate	0.075	(fraction)	

Figure 5, Model Input Values and Tabular Results for the Brazos River Alluvium in McLennan County (McLennan County GCD)

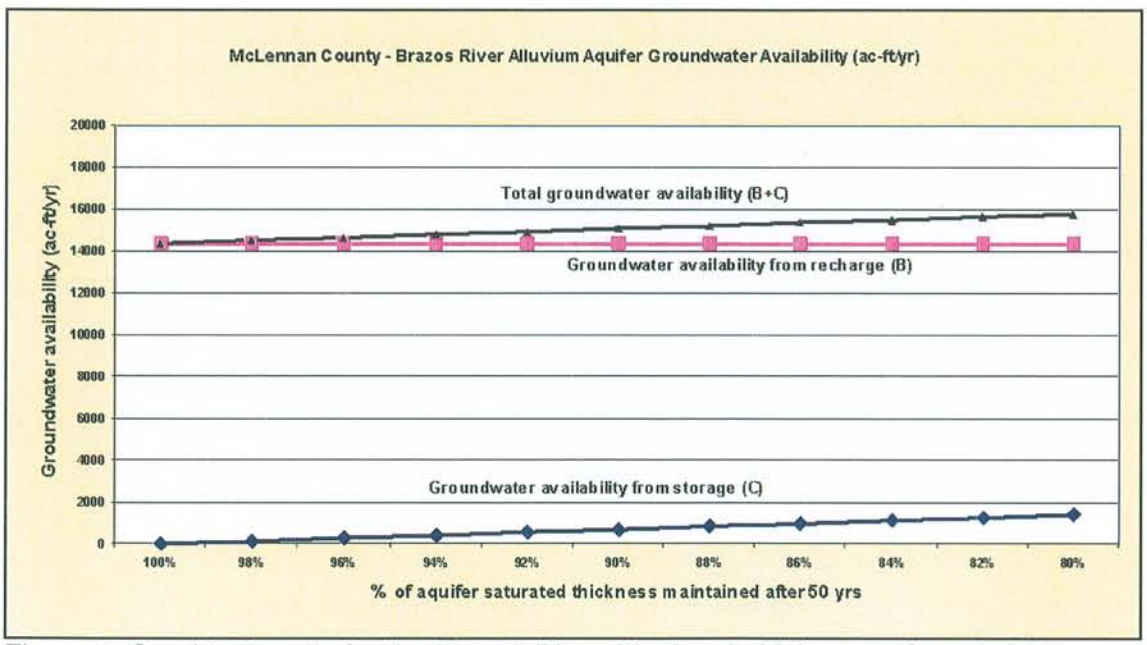


Figure 6, Graphic Results for the Brazos River Alluvium in McLennan County (McLennan County GCD)

% of saturated thickness maintained	GW availability from storage (ac-ft/yr)	GW availability from recharge (ac-ft/yr)	Total availability (ac-ft/yr)
100%	0	1442	1442
99%	7	1442	1449
98%	14	1442	1456
97%	21	1442	1463
96%	28	1442	1470
95%	35	1442	1477
94%	42	1442	1484
93%	49	1442	1491
92%	56	1442	1498
91%	63	1442	1505
90%	70	1442	1512

Sat. Thickness	35	(ft)
Recharge Area	6630	(acres) =
Effective porosity	0.15	(fraction)
Time	50	(yr)
Rainfall Rate	2.9	(ft/yr)
Recharge Rate	0.075	(fraction)

Figure 7, Model Input Values and Tabular Results for the Brazos River Alluvium in the Combined Area of Bosque and Hill Counties

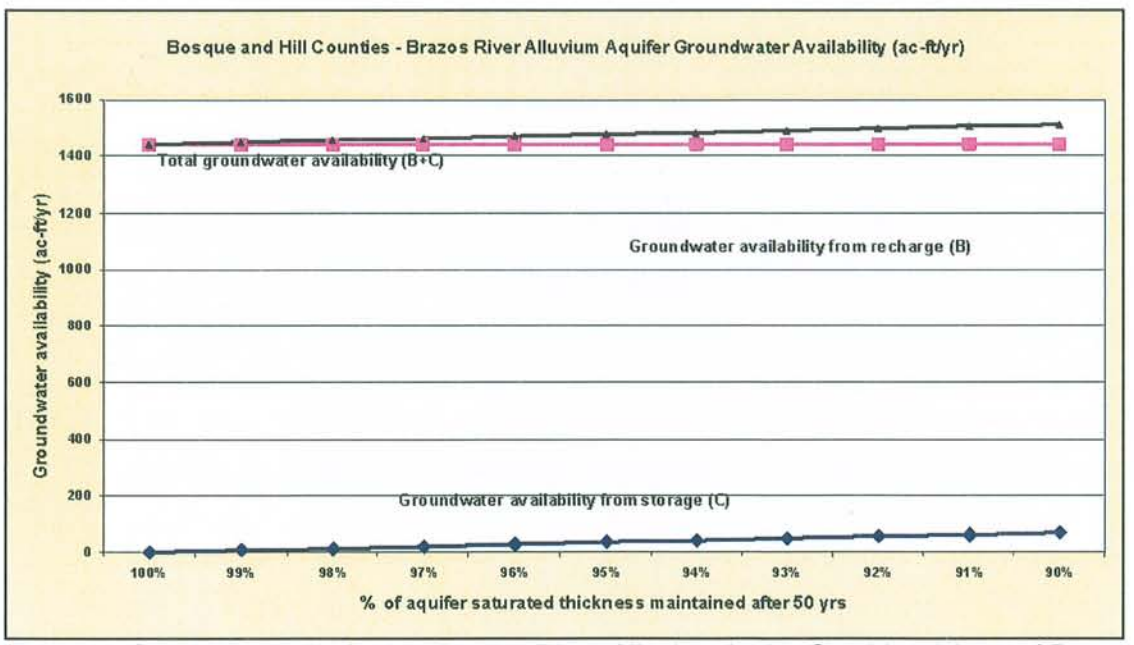


Figure 8, Graphic Results for the Brazos River Alluvium in the Combined Area of Bosque and Hill Counties

% of saturated thickness maintained	GW availability from storage (ac-ft/yr)	GW availability from recharge (ac-ft/yr)	Total availability (ac-ft/yr)
100%	0	17161	17161
99%	76	17161	17237
98%	152	17161	17313
97%	227	17161	17389
96%	303	17161	17464
95%	379	17161	17540
94%	455	17161	17616
93%	531	17161	17692
92%	606	17161	17768
91%	682	17161	17843
90%	758	17161	17919

Sat. Thickness	35	(ft)
Recharge Area	72182	(acres) =
Effective porosity	0.15	(fraction)
Time	50	(yr)
Rainfall Rate	3.17	(ft/yr)
Recharge Rate	0.075	(fraction)

Figure 11, Model Input Values and Tabular Results for the Brazos River Alluvium in Falls County

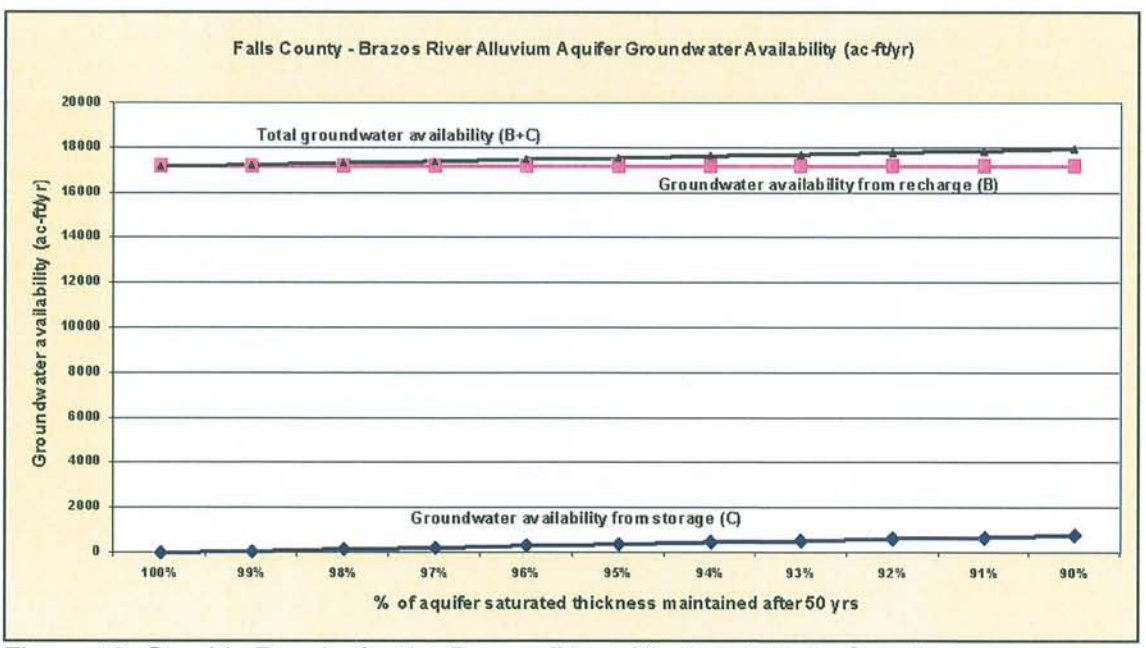


Figure 12, Graphic Results for the Brazos River Alluvium in Falls County

Nacatoch

For the Nacatoch aquifer; a DFC was developed for the entire aquifer in GMA-8. A model was developed for the aquifer and the results were reviewed by the GMA. (Figs 13 and14) The GMA selected the preferred percentage of saturated thickness to be maintained in the aquifer and a DFC statement was developed to describe the selected condition. The DFC describes the percentage of the aquifer saturated thickness maintained if pumping similar to the sum of the County values for the aquifer availability (highest value after year 2000) in the RWP were to occur. (Table 3) The exception is Rains County, the RWP aquifer availability is 10 acre-feet per year; however, the sum of RWP Nacatoch supplies and RWP recommended strategies is 77 acre-feet per year. The summed value of RWP Nacatoch supplies and strategies is used instead of the availability value. The total of the simulated pumping used in development of the DFC for the Nacatoch aquifer is approximately 88 percent of the estimated annual aquifer recharge.

County	GMA-8 Nacatoch Aquifer Simulated Pumping (acre-feet per year)
Navarro$_1$	229
Kaufman$_1$	318
Hunt$_1$	2,956
Hopkins$_1$	915
Franklin$_1$	10
Delta$_1$	282
Red River$_1$	700
Bowie$_1$	3,936
Rains$_2$	77
Lamar$_1$	45
Total	**9,468**

Table 3, GMA-8 Application of Simulated Pumping in the Nacatoch Aquifer for DFC Development 1, RWP Aquifer Availability Value; 2, RWP Supplies + Strategies Value for Aquifer

% of saturated thickness maintained	GW availability from storage (ac-ft/yr)	GW availability from recharge (ac-ft/yr)	Total GW availability (ac-ft/yr)
100%	0	10751	10751
99%	1820	10751	12571
98%	3640	10751	14391
97%	5461	10751	16211
96%	7281	10751	18031
95%	9101	10751	19852
94%	10921	10751	21672
93%	12741	10751	23492
92%	14562	10751	25312
91%	16382	10751	27132
90%	18202	10751	28953

Sat. Thickness	80	(ft)
Recharge Area	568812	(acres) =
Effective porosity	0.2	(fraction)
Time	50	(yr)
Rainfall Rate	3.78	(ft/yr)
Recharge Rate	0.005	(fraction)

Figure 13, Model Input Values and Tabular Results for the Nacatoch Aquifer

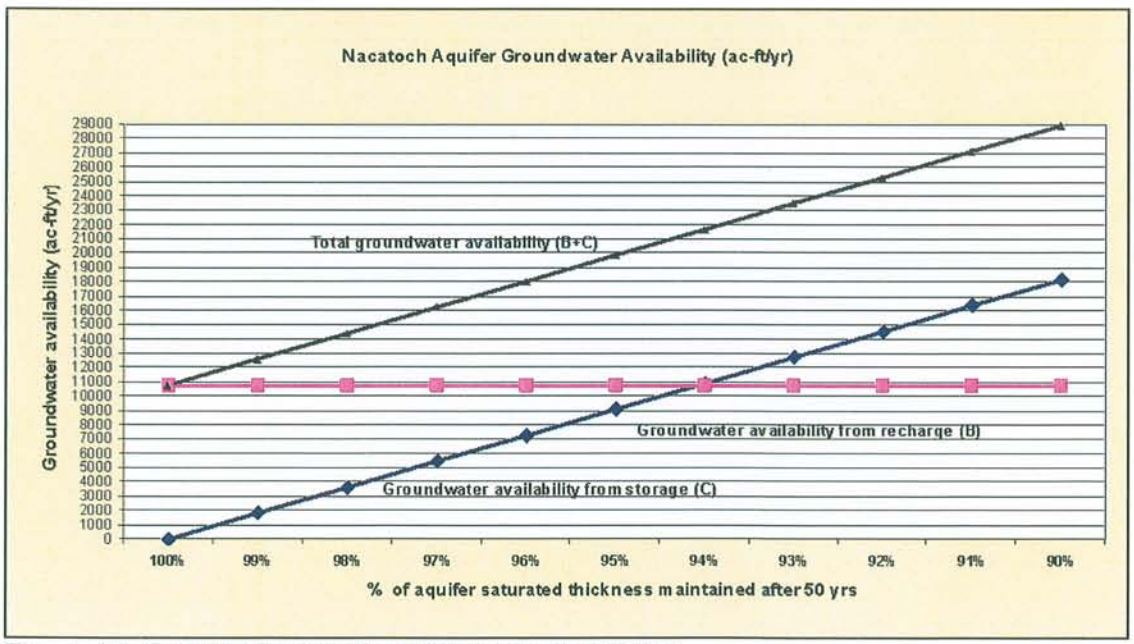


Figure 14, Graphic Results for the Nacatoch Aquifer

Blossom

DFCs were developed for two sections of the Blossom aquifer. The estimated average saturated thickness in Bowie County (approximately 60 feet) is significantly greater than in Lamar and Red River Counties (approximately 35 feet). Models were developed for each the two sections of the aquifer and GMA-8 reviewed the results. (Figs 15-18) GMA-8 selected the preferred percentage of saturated thickness to be maintained in each aquifer section and a DFC statement was developed to describe the selected condition. The DFC for the Lamar and Red River Counties aquifer section describes the percentage of the aquifer saturated thickness maintained if pumping equivalent to the sum of the County values for RWP aquifer availability (highest value after year 2000) were to occur. (Table 4) The Bowie County aquifer section DFC describes the percentage of aquifer saturated thickness maintained if pumping equivalent to the RWP aquifer availability value (highest value after year 2000) were to occur. (Table 5) The simulated pumping used for DFC development in each of the two Blossom aquifer sections is approximately equal to the estimated annual aquifer recharge of the same section.

County	GMA-8 Blossom Aquifer Simulated Pumping (acre-feet per year)
Lamar	391
Red River	1,679
Total	**2,070**

Table 4, GMA-8 Application of Simulated Pumping in the Blossom Aquifer for DFC Development in Lamar and Red River Counties

% of saturated thickness maintained	GW availability from storage (ac-ft/yr)	GW availability from recharge (ac-ft/yr)	Total GW availability (ac-ft/yr)
100%	0	2135	2135
99%	45	2135	2180
98%	90	2135	2225
97%	135	2135	2270
96%	180	2135	2315
95%	225	2135	2360
94%	270	2135	2405
93%	315	2135	2450
92%	360	2135	2495
91%	405	2135	2540
90%	450	2135	2585

Sat. Thickness	35	(ft)
Recharge Area	107028	(acres) =
Effective porosity	0.06	(fraction)
Time	50	(yr)
Rainfall Rate	3.99	(ft/yr)
Recharge Rate	0.005	(fraction)

Figure 15, Model Input Values and Tabular Results for the Blossom Aquifer in Lamar and Red River Counties

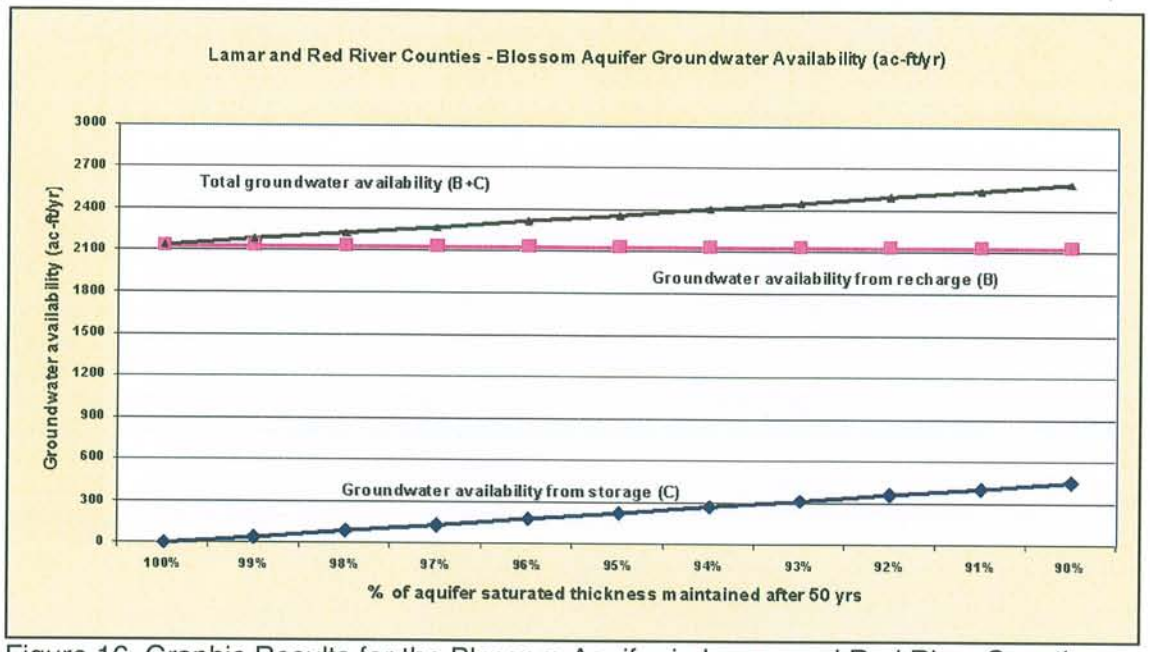


Figure 16, Graphic Results for the Blossom Aquifer in Lamar and Red River Counties

County	GMA-8 Blossom Aquifer Simulated Pumping (acre-feet per year)
Bowie	200
Total	**200**

Table 5, GMA-8 Application of Simulated Pumping in the Blossom Aquifer for DFC Development in Bowie County

% of saturated thickness maintained	GW availability from storage (ac-ft/yr)	GW availability from recharge (ac-ft/yr)	Total GW availability (ac-ft/yr)
100%	0	205	205
99%	7	205	212
98%	14	205	219
97%	21	205	226
96%	28	205	233
95%	35	205	240
94%	42	205	247
93%	48	205	254
92%	55	205	261
91%	62	205	268
90%	69	205	275

Sat. Thickness	60	(ft)
Recharge Area	9618	(acres) =
Effective porosity	0.06	(fraction)
Time	50	(yr)
Rainfall Rate	4.27	(ft/yr)
Recharge Rate	0.005	(fraction)

Figure 17, Model Input Values and Tabular Results for the Blossom Aquifer in Bowie County

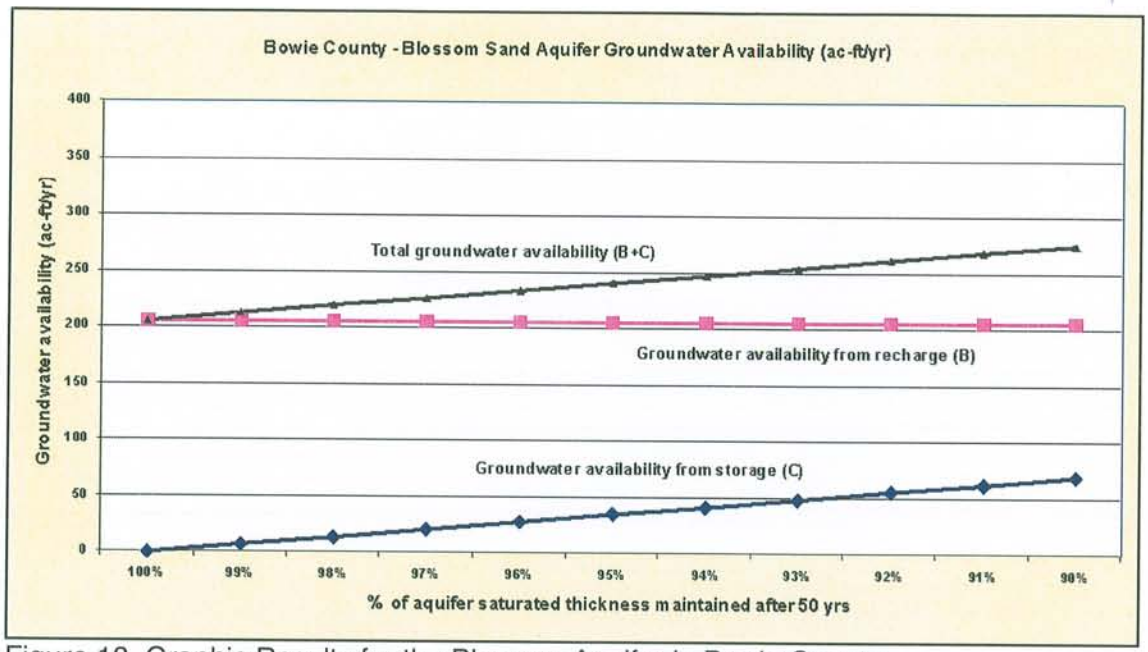


Figure 18, Graphic Results for the Blossom Aquifer in Bowie County

GMA-8 Desired Future Conditions for the Brazos Alluvium Aquifer

- Maintain approximately 90 percent of the estimated saturated thickness after 50 years in Milam County.
- Maintain approximately 100 percent of the saturated thickness after 50 years in Falls County.
- Maintain approximately 82 percent of the estimated saturated thickness after 50 years in McLennan County.
- Maintain approximately 90 percent of the estimated saturated thickness after 50 years in Hill and Bosque Counties.

GMA-8 Desired Future Condition for the Nacotoch Aquifer

- Maintain approximately 100 percent of the estimated saturated thickness after 50 years.

GMA-8 Desired Future Conditions for the Blossom Aquifer

- Maintain approximately 100 percent of the estimated saturated thickness after 50 years in Lamar and Red River Counties.
- Maintain approximately 100 percent of the estimated saturated thickness after 50 years in Bowie County.

Note: The observations and assessments made in this report were based on data supplied by GMA-8 members, TWDB, or available from referenced published sources available at the time of the report preparation. The conclusions drawn in the report are based on the available data and reasonable methods of assessment. The Desired Future Conditions presented in this report reflect policy decisions made by GMA-8. If new or different data is made available, the conclusions of this report may change.

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