Groundwater Resources Division

1. **Purpose of meeting**: Annual meeting of the technical advisory group (TAG) for the groundwater availability modeling (GAM) program

2. **Date and location of meeting**: 8/18/05 room 1-111 Travis Building

3. **TWDB staff in attendance**: Roberto Anaya, Ali Chowdhury, Sarah Davidson, Scott Hamlin, Ian Jones, Robert Mace, Bill Mullican, Ron Pigott, Cindy Ridgeway, Richard Smith, Shirley Wade, and Kevin Ward

4. **Who was in attendance:** See Table 1

5. **Senators/Representatives/other VIPs in attendance**: None

6. **Meeting report filed by:** Cindy Ridgeway

7. **Date of meeting report filing:** 8/19/05

8. **Meeting report location and filename:** S:\PLANNING\Meeting Report\GwR_meeting_reports\2005\081805 ridgeway GAMTAG summary.doc

9. **Agenda/Outcomes/Comments:**

Purpose of the meeting:
To discuss (1) GAM TAG rules and selection of presiding officer (2) legislation that affects the GAM program, (3) proposed work for fiscal year 2006, and (4) TWDB responses to comments collected from the December 3, 2004, GAM TAG meeting.

Agenda:
- Introduction (Bill Mullican: 10 minutes)
- GAM TAG rules and selection of presiding officer (Robert Mace: 20 minutes)
- 2005 Legislative summary (Robert Mace: 30 minutes)
- Break (15 minutes)
- Proposed work for fiscal year 2006 (Cindy Ridgeway: 15 minutes)
- Responses to comments from December 3, 2004 GAM TAG meeting (Cindy Ridgeway 45 minutes)
- Summary (Robert Mace: 15 minutes)

(1) GAM TAG rules and selection of presiding officer:
Dr. Mace, Groundwater Resources Division Director, discussed the purpose of the GAM TAG group, which according to Texas Water Code Chapter 379.3 is to provide technical guidance to the TWDB regarding the development and evaluation of groundwater availability models used in the regional and state water planning process. The group is to advise and assist on developing guidelines on the development and documentation of groundwater flow models and on the evaluation of groundwater availability. TWDB rules also require that the advisory committee shall consist of not more than twenty-four members, who shall select from among their members a presiding officer.

Roll of the advisory committee was taken to determine if quorum was met (see Table 2). Nineteen out of twenty-four members or their delegates were present. Dr. Mace asked for volunteers to serve as presiding officer. Ken Rainwater and Alan Dutton offered their services. The advisory committee voted with ballots provided by TWDB staff. The advisory committee selected Alan Dutton as presiding officer, with 11 out of 19 votes. Alan Dutton accepted TWDB offer to take meeting notes on behalf of the advisory committee.

(2) Legislation that affects the GAM program:
Dr. Mace discussed recent budget cuts that have affected the GAM program (~$700,000 was cut from ~$2,300,000 initial budget for the biennium: current budget is $1,600,000 for fiscal years 2006 and 2007). Dr. Mace also observed that, under current law, groundwater conservation districts (GCDs) develop groundwater availability estimates that must not conflict with meeting needs as specified in the regional water plans.

On September 1, 2005, the enactment of House Bill (HB) 1763 will change this process. After September 1, GCDs must meet within the sixteen groundwater management areas (GMAs) and decide on the desired future condition of their aquifer(s). TWDB staff will then calculate estimates of managed available groundwater that achieve the desired future condition of the aquifer(s) using GAMs, GAM information, or other appropriate techniques. The managed available groundwater will be reported to the GCDs and RWPGs by aquifer, county, basin, and regional splits and by GCD. Since the RWPGs and GCDs must use the same estimates, conflicts between RWPGs and GCDs should be mitigated. Conflict resolution processes are discussed in more detail in the bill.

TWDB is encouraging GCDs in GMAs to submit draft proposals of the desired future condition of their aquifer(s) so they have a better understanding of possible impacts before submitting the final request. Because we did not receive our recommended funding to implement HB 1763, TWDB staff are proposing to their management and Board the following internal priority of GAM runs:
1. Final future desired condition of aquifer requests for managed available groundwater estimates.
2. Other required information for GCD groundwater management plans.
3. RWPG requested runs for regional water planning.
4. Draft submittals of future desired condition of aquifer requests for managed available groundwater estimates.
5. Other model runs for GCDs unrelated to the above.

GAM TAG members suggested phasing in priorities or possible future adjustments to the order of priorities. TWDB staff advised that the prioritization of runs was flexible and could be changed. Some discussion centered on specific issues of HB 1763, such as limitations of permitting up to managed available groundwater caps; what happens in GMAs without GCDs; what happens with counties in GMAs without GCDs; and if GCDs in a GMA may have different future desired conditions.

(3) <u>Proposed work for fiscal year 2006 and slightly beyond:</u>
Cindy Ridgeway, GAM team leader, suggested in fiscal year 2006 TWDB staff continue to develop the GAM geodatabases, write scripts to automate processes (such as a pumpamatic), and process GAM runs. Dr. Shirley Wade is taking the lead on developing a GAM for the Presidio-Redford portion of the West Texas Bolsons aquifer. Dr. Chowdhury will be working on separating the Evangeline aquifer into two layers and recalibrating the central part of the Gulf Coast aquifer GAM. Dr. Jones is adding the lower Trinity to the Trinity Hill Country GAM and updating the model in general. GAM staff plan to develop predictive datasets from the 2007 State Water Plan data and develop new predictive runs for all the GAMs.

TWDB is also working on contracts for research grants for WAM/GAM interaction, digital climate atlas of Texas, and an evapotranspiration study. We will be proposing to the Board in October to contract out models for the rest of the West Texas Bolsons (Eagle Flat, Red Light Draw, and Green River Valley) aquifer, Nacatoch aquifer, Dockum aquifer, and separating out the Edwards-Trinity (High Plains) as a distinct layer in the GAM of the southern part of the Ogallala aquifer.

(4) <u>TWDB responses to comments collected from the December 3, 2004 GAM TAG meeting:</u>
Copies of the 64 comments and TWDB responses were emailed on August 9, 2005, to the 90 GAM TAG participants invited to the August 18, 2005, meeting. In addition, the same document was included in the handout provided to those in attendance. Cindy Ridgeway summarized the responses into the following four categories and also discussed changes to next round of request for qualifications (RFQ):

1. Input data
    a. Better organization of data/standardization
        -**Response:** Developing geodatabase and developing scripts to automate processes.
    b.   Transition from historical to predictive
        - **Response:** Currently looking into this issue. Recommendations for predictive scenarios to TWDB management coming soon.
2. Model development
    a. Less stress periods. Recommend every 5 years instead of monthly or annual.
        - **Response:** Using annual stress periods
    b. No verification period during calibration.
        - **Response:** Agree
    c. Require more calibration targets per county or GCD.
        - **Response:** Added requirement to RFQ for consultant to visit with us. Will depend on the amount of data for minor aquifers.
        - **Response:** Also added requirement to summarize model on county-by-county level (also may include summaries by GCD areas).

       d. Add water quality to flow models or include 2 dimensional water quality models in documentation.
- **Response:** Restricted by funding. May be future enhancement.

3. Use of the models
       a. Need more instructions. Should describe limitations yet GAMs are useful tools. Misuse of models
- **Response:** Working on "tools in the toolbox paper"
- **Response:** Possibly holding workshops – pending funding
       b. Model visualization tools to help stakeholders understand model and aquifer. Many don't understand the complexity of the model.
- **Response:** Suggestion under consideration for better 3-D graphics/tools.

4. Model updates
       a. Get major aquifer right before working on the minors.
- **Response:** Working on doing both.
       b. Need process and mechanism for correcting errors. Better coordination with GCDs to collect data and fix errors.
- **Response:** We have process in place. Each completed GAM has a suggestion for improvements document that staff updates.
       c. Need stakeholder meetings prior to updates to get understanding of areas needing work and stakeholder involvement for any changes. Need to compile model criticism to be addressed in Request for Qualifications (RFQ).
- **Response:** Mostly contracting out new models for minors and updates with stakeholder meetings with GAM staff.
       d. Can regions or GCDs adopt models?
- **Response:** Still considering.

5. RFQ changes (highlights)
       a. new software requirements:
           i. MODFLOW-2000
           ii. Groundwater Vistas (version 4.0)
           iii. ESRI Arc/GIS (9.1 or later)
       b. geodatabases for source data and model files
       c. model results reported per county and/or GCD
       d. models no longer have a verification period
       e. transient calibration will extend from 1980 to 2002.
       f. no predictive runs
       g. reduced number of meetings:
           i. with contractor and TWDB GAM staff
           ii. stakeholders

Ms Ridgeway invited GAM TAG members to sign up to review the geodatabase requirement for the RFQ or to speak to Roberto Anaya or Scott Hamlin on specifics on the design. No one signed up. Other discussion included:

- **Question:** Funding for PEST or 3-D visualization would come out of research grant funds or GAM funds?
  -**Response:** GAM funds
- **Question:** Pros and cons of adding Dockum or Edwards-Trinity (High Plains) to southern part of Ogallala aquifer GAM versus separate models?
  - **Response:** High Plains is directly connected to the Ogallala and its spatial extent is more limited when compared against the spatially more wide-spread Dockum aquifer. In addition, the Dockum is more complex in that the water-bearing unit lies vertically midway through the system and may need to be modeled with multiple layers.
- **Question:** What does it mean to have a GCD adopt a model?
  - **Response:** having a GCD take over control of a GAM including alterations and refinements.
- **Question:** Request the GAM run reports and results have more explanation on the water budget.
  - **Response:** TWDB working on developing a glossary of terms, water budgets will be described in the "toolbox" paper (due late this year or early 2006), and requestor may also request additional clarification of terms or results when the draft GAM run report is sent to them for review.
- **Question:** Issues with structure of model and dry holes not being tracked in the groundwater database.
  - **Response:** Please let TWDB GAM staff know of any data collected that would assist with updating GAMs, including well logs or other documented reference information that would re-define structure. We expect the structure of the southern part of the Ogallala aquifer GAM will be revisited when the Edwards-Trinity (High Plains) is added as a separate layer. Dry wells are tracked in the TWDB groundwater database water level table with the code "46" in the remarks field. If the well is dry after three years of monitoring or three field visits, it is taken off the well schedule for future water level measurements. Wells that are drilled without reaching the water table and are capped immediately are not entered into the TWDB groundwater database.
- **Question:** Will geodatabase framework be available with the RFQ?
  - **Response:** Yes, printouts will be available and probably accessible through our web page. For questions on the geodatabase, please speak with Scott Hamlin or Roberto Anaya.
- **Question:** Groundwater database is immature and has many errors. Modelers should QA work.
  - **Response:** Please report any errors to Janie Hopkins or Roger Quincy. We agree that modelers should QA data and investigate causes for anomalies.
- **Question:** Why are you excluding predictive runs from the RFQ?
  - **Response:** Predictive runs will done later by TWDB staff and will not be part of model development contract.

Table 1. August 18, 2005, GAM TAG attendee list.

	First_Name	Last_Name	Affiliation
1	Tom	Michel	HGCSD
2	Alan	Dutton	UTSA
3	Judy	Reeves	HPWD
4	Bob	Pickens	Region K
5	Jim	Conkwright	HPWD
6	Bill	Hutchison	El Paso Water Utilities
7	C.E.	Williams	Panhandle GCD
8	James	Bene	RW Harden
9	Laura	Marbury	Environmental Defense
10	Bob	Kier	RSKC
11	Greg	Stanton	USGS
12	Van	Kelley	Intera
13	David	Villarreal	TDA
14	Cindy	Loeffler	TPWD
15	Kelly	Mills	TCEQ
16	Bridget	Scanlon	UT BEG
17	Neil	Blandford	DBS&A
18	Andy	Donnelly	LBG-Guyton
19	George	Ozuna	USGS
20	Andrew	Chastain-Howley	WPRC
21	Dave	O'Rourke	HDR
22	Ken	Rainwater	TTUWRC
23	Matt	Jones	TTUWRC
24	Ned	Troshanov	EAA
25	Haskell	Simon	CPGCD
26	L.G.	Raun	CBGCD
27	Richard	Bowers	NPGCD
28	Steve	Young	URS
29	Reem	Zoun	TC&B
30	Ted	Way	TC&B
31	J.P.	Nicot	UT BEG
32	James	Beach	LBG-Guyton
33	Allan	Standen	DBS&A
34	Rainer	Senger	Intera

Table 2. GAM TAG advisory committee invitees, affiliations, and delegates.

First_Name	Last_Name	Affiliation	Delegate	Attendance by Member or Delegate
John	Ashworth	LBG-Guyton	James Beach	Yes
Neil	Blandford	Daniel B. Stephens and Associates		Yes
Richard	Bowers	TAGD		Yes
Jim	Conkwright	High Plains UWCD #1		Yes
Richard	Eyster	Texas Department of Agriculture	David Villarreal	Yes
Weldon	Hammond	University of Texas - San Antonio	Alan Dutton	Yes
Bob	Harden	R.W. Harden and Associates	James Bene	Yes
Bill	Hutchison	El Paso Water Utilities		Yes
Norman	Johns	National Wildlife Federation	Laura Marbury	Yes
C. Allan	Jones	Texas Water Resources Institute		No
Bob	Joseph	USGS	Greg Stanton	Yes
Jobaid	Kabir	Lower Colorado River Authority		No
Van	Kelley	INTERA		Yes
Larry	Land	HDR Eng.	David O'Rourke	Yes
Cindy	Loeffler	TPWD		Yes
David	Maidment	University of Texas - Austin		No
Tom	Michel	Harris-Galveston Coastal Subsidence District		Yes
Mary	Ambrose	Texas Commission on Environmental Quality	Kelly Mills	Yes
Craig	Pedersen	URS	Steve Young	Yes
Ken	Rainwater	Texas Tech Water Resources Center		Yes
Bridget	Scanlon	UT/BEG		Yes
Jack	Sharp	The University of Texas - Austin		No
Matt	Uliana	Texas State University		No
C.E.	Williams	Panhandle GWCD, Region A		Yes