

**Final  
Minutes of Meeting  
North Bosque River TMDL Refinement Project Advisory Group  
December 19, 2006  
10:00 am -12:00 pm  
J. J. Pickle Research Campus  
MCC Building**

**Stakeholders Present:** Tom Conry (City of Waco, substituting for Ricky Garrett), John Cowan (Texas Association of Dairymen and Dairy Farmers of America); Richard Eyster (Texas Department of Agriculture); Allan Jones (Texas A&M University System); Tamilee Nennich (Texas Cooperative Extension substituting for Tony Provin); Pat Radloff (Texas Parks and Wildlife Department).

**Stakeholders Absent:** Norman Bade (Natural Resources Conservation Service); Jay Bragg (Brazos River Authority, replacing John Ellis); Shawneille Cambell (U.S. Environmental Protection Agency); John Foster (Texas State Soil & Water Conservation Board); Jerry Golden (City of Clifton); Norman Johns (National Wildlife Federation); Mark Kaiser (City of Stephenville); Richard Kiesling (U.S. Geological Survey); Ned Meister (Texas Farm Bureau); Justin Taylor (Sierra Club); Anjna O'Connor (U.S. Army Corp of Engineers); Joseph White (Baylor University).

**Support Team Present:** Larry Hauck (TIAER); James Houser (TIAER); George Ward (UT-CRWR)

**Others Present:** Larry Koenig (TCEQ); Lial Tischler (Tischler & Kocurek); Bruce Wiland (Wiland Consulting); Casey Johnson (TCEQ).

**Materials Distributed:**

The following was provided at the meeting: meeting agenda; draft minutes from the May meeting and from the dairy focused advisory meeting in July; and handouts on the presentation.

**Welcome & Introduction**

The sixth meeting of the North Bosque River TMDL Model Refinement Project Advisory Group was held on Tuesday, December 12, 2006 from 10:00 AM until 12:00 PM in Room 3.1004 of the MCC Building, J.J. Pickle Research Center, The University of Texas at Austin. Larry Hauck (TIAER) introduced the meeting and self-introductions were made.

**Old Business**

The group approved the minutes from the May meeting and from the dairy focused advisory meeting in July.

## **Meeting Overview**

Dr. Larry Hauck introduced the presentation and outlined what it would cover. The meeting covered three topics: A summary of the dairy farm assumptions meeting; the current state of the model validation process; and an introduction to potential allocation scenarios.

Dr. Hauck quickly reviewed the subjects addressed at the dairy farm assumptions meeting and highlighted the specific changes recommended or decisions that were reached by the group. During this presentation it was reviewed how the 2001 TCEQ measured data on soil test phosphorus (STP) for dairy waste application fields would be used to determine the start date for the short-term nutrient calibration simulation. Based on the distribution of the STP data, a question was raised as to whether the median or mean would be the better measure of central tendency for comparison to model simulated STP. TIAER agreed to study the matter further.

Dr. Jim Houser then discussed the model validation process. First, the purpose of model calibration and verification (the two processes involved in model validation) was discussed. Then Dr. Houser presented the results of the preliminary 30-year hydrologic model calibration to measured yearly data. Concerns were raised about how the model seemed to over-predict low flow years, and under-predict high flow years. It was noted that this is a response the model has demonstrated historically, but also that extreme hydrologic events of either very high flows or very low flows may be difficult to accurately measure in the physical system. Despite these concerns, the current calibration did fall within the pre-determined measures of model performance, but the calibration may need to be re-visited when changes are made during the short-term hydrologic calibration. The short-term hydrologic calibration based on monthly measured values was discussed next. Dr. Houser explained how TIAER has modified the model to accurately reflect the dimensions of the North Bosque River as measured by TIAER at a number of cross-sectional studies along the length of the river. Using the Manning's n input parameter, model modifications made it possible to calibrate simulated stream velocity at low flows based on measured time-of-travel studies performed by TIAER. Some in the group expressed the opinion that site-specific modification of model parameters (rather than only basin-scale changes) to improve the calibration should be permissible within reasonable limits.

Dr. Houser next explained how the calibration and verification periods for the short-term calibration were chosen based on the quantity and nature of the available data. The calibration period will be from January 1, 1993 through December 31, 1997, and the verification period will be from January 1, 1998 through December 31, 2000. It was also shown how a program was used to split stream flow into base and surface flow so that the hydrologic calibration could more accurately capture the true nature of the stream flow. Results of base flow and surface flow calibrations were presented. Results of the short-term hydrologic calibration for selected key sites along the North Bosque were shown. A

map of the precipitation stations in the North Bosque was shown to illustrate one reason why the model prediction is better in the Upper North Bosque than in the south. The northern region had good coverage with precipitation stations, while south of Hico there were relatively few weather records.

The last part of Dr. Houser's presentation focused on an interest that had been expressed at previous meetings regarding the use of measured data from two Public Law 566 (PL-566) reservoirs to determine nutrient removal efficiencies. There was interest to see how "typical" were the two reservoirs used in the determination of removal efficiencies. Dr. Houser showed a number of graphs that characterized all the PL-566 reservoirs in the watershed and demonstrated that the two studied reservoirs had typical characteristics compared to the other reservoirs. It was suggested that a sensitivity analysis be conducted for nutrient removal efficiencies in the PL-566 reservoirs.

Dr. Hauck presented the last section of the meeting, and gave a brief overview of BMPs used in the previous TMDL allocation scenarios. He initiated a discussion of other potential BMPs that might be appropriate to consider. This led to input from many participants and a lively discussion of new technologies and potential means of improving water quality that will be continued at future meetings. Some of the ideas discussed were:

- Lagoon clean-out and how those solids would be handled and modeled
- Strategically locating and building additional PL-566 reservoirs to reduce downstream nutrient concentrations
- Injection of liquid manure beneath the soil
- "Ripping" coastal fields on contour, which means cutting down into the soil along the contour resulting in less runoff. (It was mentioned that this practice makes harvesting more difficult, and therefore, may not be a technology farmers would be eager to adopt.
- Manure vacuum systems.

Dr. Hauck said that there would be a more thorough discussion of allocation scenarios at the next meeting sometime in Spring 2007.

The meeting adjourned at 12:00 PM.