

# **Capital Area Ground Water Conservation Commission**



## Watching out for A Treasured Earth Resource

Dedicated to the conservation, orderly development and protection of quality of ground water in the Capital Area

## Volume 37, Issue 2

## NEWSLETTER

**October 2011** 

## **Commission News**

## **Upcoming Meetings**

The Technical Committee will meet at 1:30 p.m. Tuesday, December 6, 2011 in the conference room of the U.S. Geological Survey at 3535 South Sherwood Forest Boulevard, Baton Rouge, Louisiana.

The regular meeting of the Board of Commissioners will be held at 9:30 a.m., Tuesday, December 13, 2011 in the conference room of the U.S. Geological Survey.

The Administrative Committee will meet at 8:30 a.m. in the Commission office, Suite 129, 3535 South Sherwood Forest Boulevard, one hour before the regular meeting.

## September Meetings

The Technical Committee met on Tuesday, September 13, 2011 in the Conference Room of the US Geological Survey.

Chairman Dennis McGehee brought the meeting to order and introduced Dr. Frank Tsai of the LSU Civil and Environmental Engineering Dept. Dr. Tsai gave an overview of the final report on the Scavenger Well Operation Model.



He began by reviewing the tasks of the study:

- 1. Develop and calibrate a "1,500-foot" sand saltwater intrusion model;
- 2. Evaluate saltwater intrusion for the next 50 years under current pumpage rate; and
- 3. Develop scavenging designs to reduce chloride concentrations at EB-658.

Several animations of saltwater intrusion towards the Lula Pumping Station were shown, as were graphs of Chloride Concentration at Lula through 2055 if no action were taken. Potential scavenger well locations and operational scenarios were presented. Practical scavenger well locations were given as the Progress Park test well, an additional well north of that location and two more wells to the south.

Several cross-sections and fence diagrams were shown, including several that gave a very good graphical representation of the "leaky areas" of several sands across the Denham Springs-Scotlandville and Baton Rouge Faults (see below).



Dr. Tsai's conclusion was that:

- 1. Progress Park test well confirms the saltwater intrusion pattern predicted by the model.
- 2. The scavenging approach is feasible, but induces extra drawdown (<2m).
- 3. Baton Rouge fault acts as a horizontal barrier to many sands. The Denham Springs-Scotlandville fault shows horizontal hydraulic continuity.
- 4. Potential saltwater leaky areas along the Baton Rouge fault have been identified.

Jason Griffith (USGS) gave a progress report on the Baton Rouge model (Simulation of Ground-Water Flow in the "1,500-foot" and "2,000foot" Sands and Movement of Saltwater in the "2,000-foot" Sand of the Baton Rouge Area) that USGS has been working on.

#### PROGRESS AND SIGNIFICANT FINDINGS:

- 1. Interpolated the effective cumulative sand thickness for each aquifer interval throughout the flow-model domain.
- 2. Estimated the vertical hydraulic conductivity within confining units above the 1200-ft sand, the 1500-ft sand, the 2000-ft sand, and the 2400-2800-ft sand.
- 3. Identified and corrected errors in simulated

groundwater withdrawals from numerous production wells.

- 4. Identified and corrected errors in the MT3D and SEAWAT numerical simulation codes.
- 5. Calibrated the MODFLOW groundwater-flow model.
- 6. Compared simulatedconcentration distributions between constant-density and variable-density groundwater simulations.
- 7. Refined the representation of the Baton Rouge Fault within the 2000-ft sand by adding hydrologic-flow barriers to impede the flow across the fault in some areas.
- 8. Compared simulated concentrations to observed concentrations at representative wells within the 2000-ft sand.

#### PLANS FOR NEXT OUARTER:

Continue calibration of solutetransport simulation.

The final agenda item was consideration of a request for a letter of recommendation from Dr. Frank Tsai and Dr. Jeff Hanor for a proposal to the LSU Board of Regents for studying unconventional hydraulic control for deep-aquifer saltwater intrusion mitigation under uncertainty. The project goal is to develop a saltwater intrusion management model that utilizes unconventional hydraulic control techniques to mitigate saltwater encroachment in the 1,500foot sand and 2,000-foot sand (deep

aquifers) in the Baton Rouge area. The unconventional hydraulic control consists of: (a) horizontal wells in individual aquifers; and (b) slant-hole wells across a sequence of aquifers. These wells can act as scavenger wells (i.e., extraction wells) to pump out saltwater at multiple locations or inject freshwater to form hydraulic barriers. This is an advantageous technology for deep aquifers because the unconventional hydraulic control uses far fewer wells than would be required using vertical wells and avoids purchase of additional land.

Discussion centered on how this would be advantageous and fell in line with the purpose of the CAGWCC. Commissioner Mark Walton felt that the Technical Committee should recommend to the Commission that a letter of recommendation be sent to the Board of Regents The general consensus was that the letter of recommendation should be placed on next week's General Meeting Agenda for a vote. (NOTE: Commission voted to send a letter of recommendation to the Louisiana **Board of Regents.)** 

## Moving into the Digital Age Email Newsletter Option

The Capital Area Ground Water **Conservation Commission** will offer a choice of newsletter delivery beginning in 2012. Those who wish to receive an electronic version of the newsletter as opposed to a hardcopy will be given that choice. Please send Shawn Scallan an email at shawn@cagwcc.com, or give her a call at (225) 293-7370 indicating whether you wish to receive the newsletter by email, hardcopy, or both. Newsletters will continue to be available on our website as well.



#### (a) Horizontal Wells

(b) Slant-hole Well

Fig. 3: Unconventional hydraulic control on saltwater using (a) horizontal wells in individual aquifers, and (b) a slant-hole well across multiple aquifers. Blocks in the horizontal wells and slant-hole wells represent pumps.

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## August 2011

Commissioner of Conservation Jim Welsh recommends that oil and gas operators with interest in developing the Tuscaloosa Marine Shale in Central Louisiana choose their water sources wisely for use in drilling or hydraulic fracture stimulation operations. Of particular interest are areas to the west of the Red River and east of the Mississippi River where the Chicot, Evangeline, Jasper, Catahoula and Southern Hills Aquifer systems are being used predominately for drinking water supply for domestic and public water supplies.

Based on information provided by the Louisiana Geological Survey, freshwater surface recharge areas for these aquifer systems are located throughout major portions of Central Louisiana and nearly all of the Northern Florida parishes east of the Mississippi River. Preventing and minimizing reductions of freshwater recharge into aquifer systems is a key aspect to maintaining and improving aquifer system sustainability.

Based on USGS and other published information on ground water resources Louisiana, the Red River and Mississippi River Alluvial aquifer systems are high yield systems comprised of coarse gravel and sand formations continuously recharged by the surface waters of their named rivers. It is further documented that the Red River and Mississippi River Alluvial aquifer systems, due to their hardness and high dissolved solids, are seldom used for domestic and public supply purposes, but are suitable water sources for industrial purposes.

Therefore, if ground water must be used for drilling or hydraulic fracture stimulation purposes, it is recommended that the Red River and Mississippi River Alluvial aquifers be utilized for these purposes, where feasible, as the source of ground water supply in lieu of the Chicot, Evangeline, Jasper, Catahoula and Southern Hills Aquifer systems. However, agency staff will continue to Extent of Tuscaloosa Marine Shale



evaluate water usage from these aquifer systems for hydraulic fracture stimulation operations according to state law.

The Commissioner further encourages oil and gas operators to use the available surface water resources or other acceptable alternative water sources in the Central and Florida parishes of Louisiana, where practical and feasible.

## Drought of 2011

Posted on Sat, Sep. 24, 2011

## Lee eased Louisiana drought

## ASSOCIATED PRESS

BATON ROUGE -- Tropical Storm Lee brought some relief from a recent drought to just under half of Louisiana.

According to the U.S. Drought Monitor, about 45 percent of the state -- primarily along the track of Tropical Storm Lee along the eastern side of the state -- is no longer considered in drought conditions. The Advocate reported that at the end of August, the state was in some form of drought.

"Lee took a big bite out of the drought in Louisiana," said state climatologist Barry Keim. "It produced that much rain."

At the Baton Rouge Metropolitan Airport, the rain gauge measured 8.81 inches of rain from Sept. 1 through Sept. 5 and the Louis Armstrong New Orleans International Airport had 11.05 inches during that same period. Some areas of the state got between 10 inches and 15 inches, Keim said. The rain fell over a matter of days instead of a few hours, allowing the rain to soak into the ground, he said.

Tropical Storm Lee helped some cattle farmers with extra hay they needed, but others were forced to sell their cattle, said Kurt Guidry, an agriculture economist with the LSU AgCenter. The storm was "too little, too late" for producers of row crops such as corn, soybean, and cotton, Guidry said.

"Most yields for row crops were already made by this time," Guidry said.



Comparison of drought conditions on July 12, 2011 and September 27, 2011

The respite could be temporary, Keim said. There hasn't been much rain since the storm, he said.

Keim also said a La Nina weather pattern has set up, although it's weak. That pattern usually means warmer and drier winters for Louisiana, Keim said.

So far this year, the state has received 31.1 inches of rain, which is below the normal rainfall by this point of 44.6 inches, Keim said.

"There's a good chance we'll move back into drought in Louisiana," he said.

#### COMMISSION STAFF Anthony J. Duplechin, Director Shawn O. Scallan, Administrative Assistant

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