

# 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*

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NEWSLETTER

April 2010

### Commission & District News

**Scheduled Meetings.** – The Technical Committee will meet at 1:30 p.m. Tuesday, June 8, 2010 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, June 15, 2010 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.

**March Meetings** – The Technical Committee met Tuesday, March 9, 2010 at 1:30 p.m. in the U.S. Geological Survey conference room, 3535 South Sherwood Forest, Baton Rouge, Louisiana. Chairman Mark Walton brought the meeting to order and Don Dial gave a review of the results of a modeling study of the “1,200-foot” sand by Halford and Lovelace (DOTD Technical Report 54). Some concern has been expressed about the increased use of the “1,200-foot” sand in the industrial area. Resolutions that were previously

approved by the Commission reserved the “1,000-foot”, “1,500-foot” and “1,700-foot” sands for public-supply use. Also, a moratorium limiting pumpage and water –level declines in the “2,000-foot” sand was designated for the industrial area. Saltwater has not been a problem for the “1,200-foot” sand, and no restrictions are placed on it.

The modeling report ran six simulations of varied pumping conditions for the “1,200-foot” sand. Hypothetical pumping centers designated “A” and “B” are located in eastern East Baton Rouge Parish away from the area of major drawdown in the industrial district. (See figure.)

**Simulation 1:** Increase pumping to 6 mgd for 1 year at two “A” locations  
**Result:** Water levels lowered 25 feet from 1988 levels

**Simulation 2:** Increase pumping to 6 mgd for 1 year at two “B” locations  
**Result:** Water levels lowered 35 feet from 1988 levels

**Simulation 3:** Increase pumping to a total of 12 mgd for 1 year at the “A” and “B” locations  
**Result:** Water levels lowered an additional 60 feet at “A” and “B”

**Simulation 4:** Decrease pumping 1% per year for 50 years  
**Result:** Recovery of almost 30 feet from 1988 levels in the industrial district

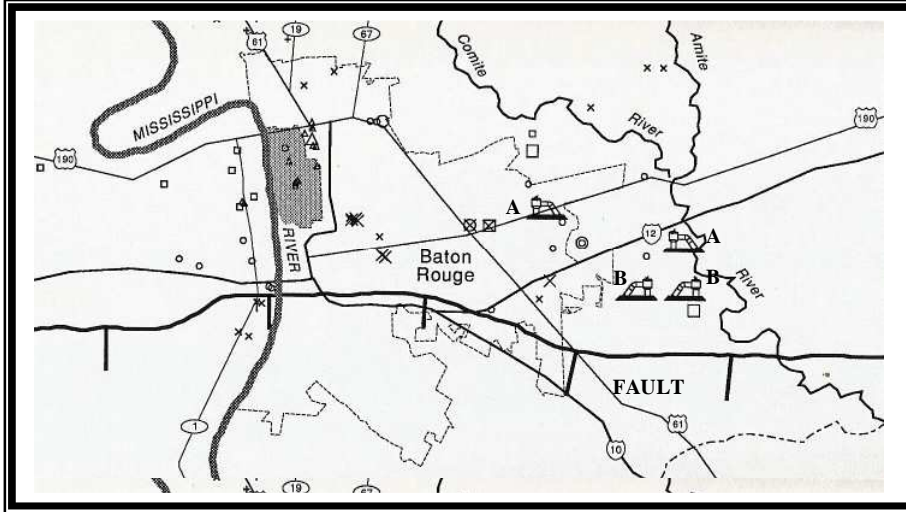
**Simulation 5:** Increase pumping 1% per year for 50 years  
**Result:** Decline of almost 30 feet from 1988 levels in the industrial district

**Simulation 6:** Pumping in simulation 3 was increased 1% per year for 50 years  
**Result:** Decline of 120 feet in area of “A” and “B”. New drawdown cone established between Baton Rouge and Denham Springs

Jason Griffith, USGS, gave a progress report on the “1,500/2,000-foot” sand modeling project. Calibration of the SEAWAT model has begun, and about 21 months of calibration work is planned for this phase. A number of issues were discussed by Jason and are summarized in the quarterly report that was handed out.

### Saltwater Monitoring

For a number of years the Commission, in cooperation with the parishes in the District and the U.S.



Geological Survey, has had a monitoring program in place to assess the movement of saltwater in the sands north of the Baton Rouge fault. Because almost all of the pumpage is north of the fault, most of the sands are affected by saltwater moving across the fault. Therefore, the advance of saltwater toward pumping areas is critical to the future use of these sands by the industrial and public-supply users.

Ten aquifers are pumped in the District, and a summary of the status of saltwater encroachment in them is discussed. Exceptions are the Catahoula and Gonzales-New Orleans aquifers which have minimal pumpage in the District.

- **“400-foot” sand** – Encroachment is not a problem. The sand is used for both industrial and public-supply use. Quality of water is good in the eastern part of East Baton Rouge Parish but is compromised near the Mississippi River because of its connection with the alluvial aquifer.
- **“600-foot” sand** – A rise in chloride concentration was first discovered in the “600-foot” sand at well EB-123 located at City Park in the late 1940s. Some wells belonging to businesses in the downtown area became salty as the plume of saltwater moved in that direction. These wells had to be abandoned. Conditions remained static until recently when the chloride concentration showed a rise at well EB-870 located at Memorial Stadium. The sample taken on November 19, 2009 had a concentration of 504 mg/L (brackish). Test hole logs show the base of the “600-foot” sand to be a higher level to the north, and saltwater must move “uphill” to reach the industries that pump from it.
- **“800-foot” sand** – No problems have been encountered for this aquifer. It is used sparingly, mostly for public supply and at a considerable distance north of the fault zone. Two industrial wells were completed in the sand in 2009, both being located well north of the fault.
- **“1,000-foot” sand** – A high concentration of chloride (10,000 mg/L) is reported at monitor well EB-805 located

at the fault on Airline Highway at Nesser Overpass. However, industrial and public-supply withdrawal is some distance north of the fault. Observation well EB-632 at Cortana Station is about 3 miles north of well EB-805. Public-supply well EB-1328 at Weiner Station has shown an increase in chloride and is pumped sparingly. It is located about 1 mile north of the fault and 2 miles east of EB-805.

- **“1,500-foot” sand** – Extensive saltwater encroachment has occurred in this sand. Test drilling in 1965 revealed salty water at the fault (well EB-782B). Rollo (W.R. Bulletin 20, p.31) predicted in 1966 that the salty water would reach Government Street pumping station in about 20 years. A monitor well, EB-917, was placed in Webb Park in 1973. In 1990, chloride concentration in this well rose above background level to 21 mg/L. It fluctuated for several years, but showed a rising trend starting in 2004. In January 2009 chloride concentration had reached 158 mg/L. In 1999, the Commission installed a connector well, EB-1293, to counteract the movement of saltwater toward two wells, EB-413 and EB-771, pumping at Government Street. By diverting the water around these wells, their useful life was extended. Over the past 2 or 3 years however, we have seen chloride rise slightly above background level at Government Street. Moderate use of these wells should prolong their productive lives.

No mechanism is in place to protect the wells at Lula Street pumping station.

- **“1,700-foot” sand** – No saltwater problems have been found in this sand. It has good water quality but does not have widespread distribution across the area. Virtually all the pumpage is in East Baton Rouge Parish. Hydrogeologic sections reveal that the “1,500-foot” and “1,700-foot” sands merge in the Port Hudson area where they are pumped for industrial use.
- **“2,000-foot” sand** – In 1965, test drilling revealed the presence of saltwater north of the fault on South Acadian Thruway. Chloride concentration was up to 1,000 mg/L at well EB-781. Extensive use of this sand for industrial and public-supply use caused a northward migration of salty water toward downtown where a rise in chloride was noted in 1990 at Lafayette Station. Since that time pumpage at well, EB-630, has been cut back and chloride concentration has fluctuated between fresh and borderline salty (250 mg/L). The installation of a nearby well, EB-1253, with a dual screen in the “2,000-foot” and “2,400-foot” sands allows the deeper sand to recharge the “2,000-foot” sand when the well is idle.

In 1991, the Commission imposed some pumping restrictions on the “2,000-foot” sand in the industrial area. Within a designated area, pumpage withdrawal was restricted to 26 million gallons per day and new wells would be restricted to replacement of older wells.

A goal was set for water levels not to exceed 330 feet below land surface in the designated area. Three key observation wells, EB-90, EB-297 and EB-367 monitor water levels in and near the area of maximum drawdown. In 2009, the lowest water level among the three wells was at EB-367 at approximately 300 feet below land surface. The record low water level for this well was 372.20 feet below land surface on August 17, 1973.

- **“2,400-foot” sand** – No serious saltwater problems have been encountered to date in this sand. Test wells EB-794 drilled in 1965, and EB-804B in 1966 revealed freshwater on the north side of the Baton Rouge fault. In the early 1990s, EB-794 showed a chloride concentration above background level (>10 mg/L). When the water level in this well rose above the expected level for the “2,400-foot” sand, a cooperative venture by the USGS and Commission revealed casing leaks at the shallow level. After development by a water-well contractor, the four feet of screen at the base of the sand was opened up, but sampling for chloride concentration was problematic as it increased steadily when the well was pumped. The source of the saltier water is uncertain because the electrical log revealed the presence of salty water in sands of intermediate depth. A casing leak in that interval would recharge the “2,400-foot” sand. The closest well to EB-794 is EB-1149, a public-supply well on Convention Street, that remains at

background level of chloride concentration.

An observation well, EB-804B, located north of the fault on Jefferson Highway at Nesser Overpass showed a rise in chloride concentration beginning in the mid-1990s, and the latest sample, January 2010, showed a chloride level of 184 mg/L. However, pumping from the “2,400-foot” sand is far removed from the location of well EB-804B.

- **“2,800-foot” sand** – This is the deepest freshwater sand in East Baton Rouge Parish. Beneath the “2,800-foot sand, the Catahoula aquifer presumably contains no fresh water in the parish but is used sparingly in East Feliciana Parish.

Freshwater flushing across East Baton Rouge Parish was incomplete, resulting in a zone of salty water that extends west to east on the north side of the Baton Rouge fault. The “2,800-foot” sand is used extensively for industrial (28 mgd in 2008) and public-supply use (8 mgd in 2008).

Chloride concentration at well EB-798 (Robin Street) has fluctuated at or near the brackish level since the early 1990s. The latest sample showed chloride at 258 mg/L. Well EB-750 at Southern University shows chloride concentration at 25 mg/L (12/9/09) with an almost imperceptible rise since the early 1990s. A third well, EB-700 at Mickens Road and Hooper Road shows a chloride history below background level (<10 mg/L).