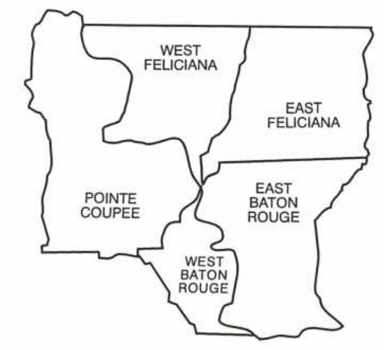

Capital Area Ground Water Conservation Commission

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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Commission & District News

Scheduled Meetings. – The Technical Committee will meet at 1:30 p.m. Tuesday, September 8, 2009 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, September 15, 2009 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.

June Meetings – The Technical Committee met Tuesday, June 9, 2009, in the conference room of the U.S. Geological Survey at 3535 South Sherwood Forest Boulevard, Baton Rouge, Louisiana.

Chairman Dale Aucoin called the meeting to order and Don Dial introduced the speaker, Dr. Jeff Hanor, Department of Geology and Geophysics at LSU who reported on his and Colleen Wendeborn's research on the Baton Rouge fault as to whether it acts as a barrier or conduit for the vertical or lateral flow of saltwater. A summary of their findings follows.

The Baton Rouge fault is a listric fault that cuts a thick sequence of complexly interbedded fluvial-deltaic sands. Sands to a depth of 1000 meters north of the fault are the principal supply of fresh water to the metropolitan and industrial Baton Rouge area. Sands near the fault are becoming increasingly contaminated by brackish water. Authors of a recent study of the geochemistry of ground water in southern Louisiana concluded that saline contamination has been produced by the dissolution of deep salt and that the saline water has migrated vertically up faults into shallow aquifers.

While it is probable that the elevated salinities near the Baton Rouge fault reflect salt dissolution, a more likely source of the saline contamination lies to the south, where dissolution of salt domes has produced saline plumes which extend all the way to the ground surface. Conduits for upward transport of brine appear to be faults associated with the domes rather than regional listric faults. A detailed study has been done of the spatial variations in salinity calculated from electrical logs for wells on either side of the Baton Rouge fault. Most of the logs were run in the 1960s, so the log information provides a snapshot in time of the salinity structure prior to significant ground-water contamination. The spatial variations in the salinity across the fault are consistent with natural lateral interfingering of freshwater derived from the north and brackish water from the south. A 2004-2005 study of chloride concentrations in the ground water showed that the highest chloride concentrations occurred at mid-depth in the aquifer system rather than the base, as might be expected if salt transport were up the fault.

Don Dial made a presentation of a lecture given by Dr. William Pecora, former Director of the U.S. Geological Survey, at the University of California in 1972. The lecture, entitled Nature…an environmental yardstick, has some thoughts and conclusions that are independent of the modern fickleness about global warming.

Some of Dr. Pecora's thoughts are summarized.

- Rain is a purifying agent – the residence time of particulate matter and chemicals in the atmosphere is a function of rainfall frequency.

- Precipitation as rain or snow carries with it compounds derived from the ocean and atmosphere.

- Three massive volcanic eruptions, Krakatoa 1883, Mt. Katmai 1912 and Mt. Hekla 1947 were calculated to have contributed more particulate matter and possibly natural gases than all of man's activity.

- Carbon dioxide (CO_2) concentration in the atmosphere was about 320 parts per million (1972). Dr. Pecora estimated an increase of 60 parts per million by 2000. (The prediction compares favorably with a Dept. of Energy table showing a CO_2 concentration of 368 ppm, in 2000.)

- Because of the three massive planetary reservoirs for gases – biosphere, atmosphere and hydrosphere—we cannot readily conclude that man's generation of CO_2 will be significant in climatic effect.

- Dial also pointed out that water vapor is not listed in the Department of Energy table. Actually, water vapor accounts for about 95% of all greenhouse gas emissions. The other 5% accounts for CO_2, methane, nitrous oxide, N_2O, and miscellaneous gases.

Water Levels in East Baton Rouge Parish

In the April 2009 newsletter, we reviewed the water levels in the "600-foot", "1,000-foot", "1,200-foot" and "1,500-foot" sands. Hydrographs of the four deeper sands, "1,700-foot", "2,000-foot", "2,400-foot", and "2,800-foot" sands are shown in this issue in figure 1.

Well WBR-100A in the "1,700-foot" sand is located on the west bank of the Mississippi River, but is a good indicator of the effect of pumping from that sand. The hydrograph shows a flat water-level trend since 1995.

The water-level trend in the "2,000-foot" sand is reflected in the hydrograph of well EB-297 located on

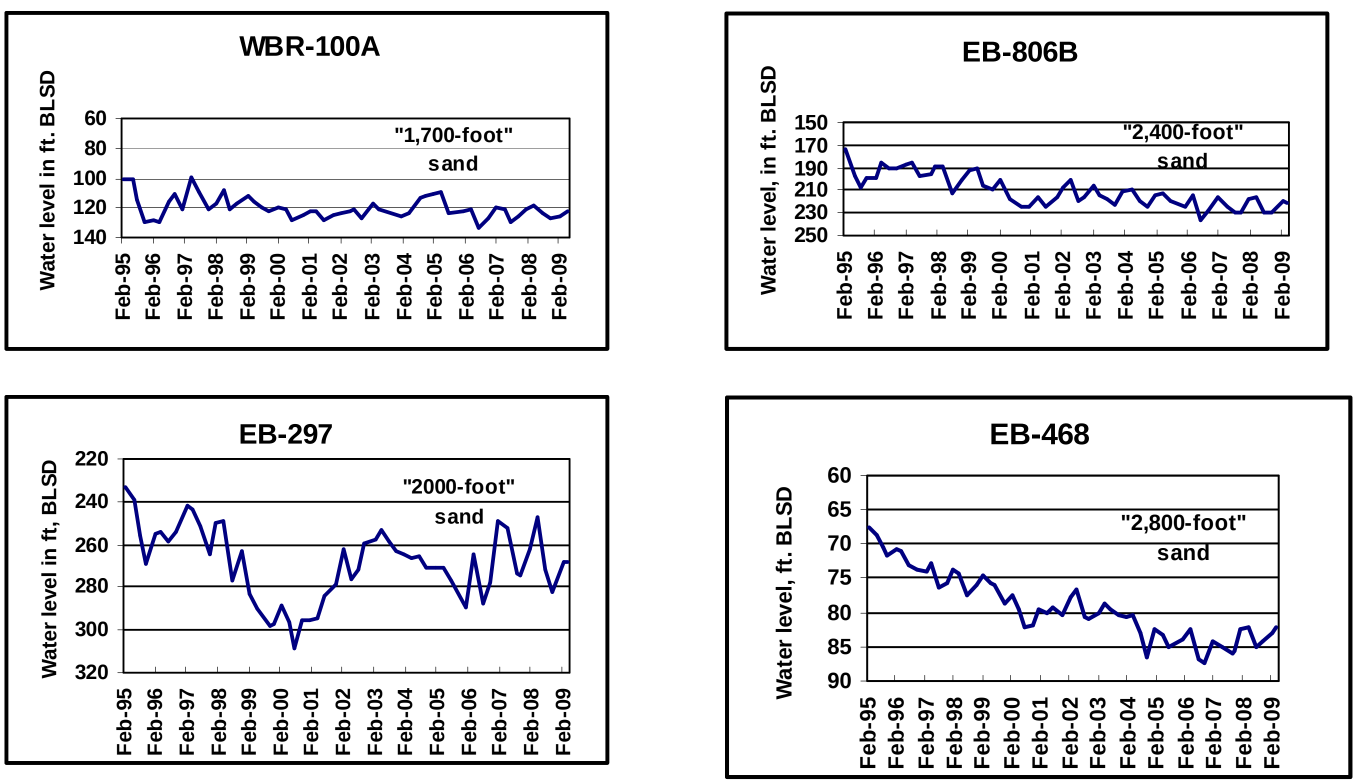

Figure 1

the north side of the industrial area. A temporary low slightly below 300 feet was reached in 2000 reflecting the hot and dry summers of 1998-2000. The maximum low water level of 372 feet was reached in 1972 for the “2,000-foot” sand. The Commission passed a resolution in 1991 to restrict future development in the industrial area and industries have cooperated in the effort to limit production from this important aquifer.

The water level in the “2,400-foot” sand is seen in the hydrograph of well EB-806B. This well is located on Laurel Street near downtown Baton Rouge. An average decline of about two feet per year occurs between 1995 and 2009. The maximum low water level for this sand is centered in the industrial area and estimated to be 10 to 20 feet lower than at well EB-806B (potentiometric surface of the “2,400-foot” sand, 2002, U.S. Geological Survey).

The “2,800-foot” sand is represented by well EB-468, located on Plank Road southeast of Baker. Pumping from this sand is centered in the northern half of East Baton Rouge Parish. For example, Baker and Zachary derive their water from this sand, but about 72% is pumped for industrial use. Well EB-468 shows a decline in water level of about one foot per year since 1995.

2008 Pumpage

The average annual pumpage for 2008 is summarized in table 2. The average of 170 million gallons per day (mgd) is approximately 1.5 mgd less than 2007. Most notable was a decline in industrial pumpage from the “400-600” sand.

The five major sands -- “1,200-foot”, “1,500-foot”, “2,000-foot”, “2,400-foot” and “2,800-foot” -- are summarized for East Baton Rouge Parish in Table 1.

Windmill Aeration

Windmill power has been applied to a public-supply reservoir in New York to clear up contamination according to the June issue of U.S. Water News. During the fall turnover, bottom sediments containing iron and manganese were stirred up and created problems at the treatment plant. Because the reservoir was in a remote location, the town decided against building a pre-treatment plant at the site. Also, the town considered operation of an air compressor and running pipe to the reservoir several miles away but abandoned that plan because of high cost and rugged terrain. The solution was a windmill that requires little maintenance and no electric power. The windmill (see picture) operates a diaphragm pump that supplies air to the reservoir.

Another application of the windmill was reported at a Seattle golf course pond that had algae problems during the summer months. A windmill solved the problem by aerating the pond, reducing the unpleasant odor and the mosquito population which thrived in stagnant water.

Backflow Prevention

The EPA guidance manual defines a cross-connection as a physical connection between a water system and another source of unknown quality. A cross-connection offers a pathway for harmful contaminants to enter drinking water supplies endangering safe delivery of water to the consumer.

In 1995 herbicides were back-siphoned into a public water system in Pointe Coupee Parish when a water main was accidentally broken at the same time a farmer was mixing the herbicides in the tank. A hose feeding water to the tank became a backsiphon and entered the public supply. Quick action by the local utility prevented the incident from becoming a catastrophe. However, the system was shut down until the lines were thoroughly flushed and declared safe. (Condensed and adapted from the October 2008 issue of Opflow)

Average Pumpage in MGD				
Sand	**2008 Usage**			
	Industrial (2008)	**Public Supply (2008)**	**2007**	**2008**
“1,200-foot”	42%	58%	22.019	22.041
“1,500-foot”	25%	75%	15.979	15.726
“2,000-foot”	82%	18%	21.244	23.975
“2,400-foot”	31%	69%	19.444	19.100
“2,800-foot”	72%	28%	27.394	28.072

Table 1

Pumpage by Aquifer 2008 (MGD))

Aquifer	East Baton Rouge	East Feliciana	Pointe Coupee	West Baton Rouge	West Feliciana	Totals
Shallow	0.048				0.005	0.053
400 ft	4.228					4.228
400/600 ft	7.308					7.308
600 ft	6.750					6.750
800 ft	3.072			1.184		4.256
1,000 ft	7.883			1.252		9.135
1,200 ft	22.041	0.016	0.781	1.209		24.047
1,500 ft	15.726	0.097	0.201	3.480		19.504
1,500/1,700 ft	7.607					7.607
1,700 ft	6.389		0.438	0.12		6.947
2,000 ft	23.975	0.006	0.306		2.174	26.461
2,400 ft	19.100	0.363	0.344		1.018	20.825
2,800 ft	28.072	1.627	1.855		0.468	32.022
Catahoula		0.784				0.784
Totals	152.199	2.893	3.925	7.245	3.665	169.927

Table 2