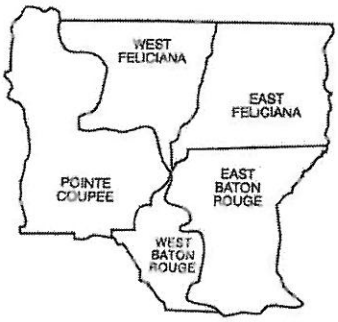


Capital Area Ground Water Conservation Commission

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 34, Number2 **NEWSLETTER** *October 2008*

Commission & District News

Scheduled Meetings. – The Technical Committee will meet at 1:30 p.m. Tuesday, December 2, 2008 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 9, 2008 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 Meeting – Because of the destruction and accompanying hardships following hurricane Gustav, the Technical Committee meeting scheduled for September 9th and the Commission meeting scheduled for September 16th were both canceled. The Commission meeting was rescheduled for October 7th.

At the October 7th meeting, the nominating committee recommended Jerry Klier for Chairman, Jake Causey for Vice-Chairman and John Hashagen for Treasurer for the coming year. They were approved by the Board without opposition. Three Commissioners, Barry Brewer, John Steib and Keith Stoma are finishing their second terms effective December 1, 2008. The staff and Board of Commissioners are appreciative of their faithful six years of service to the Commission.

Aftermath of Hurricane Gustav

September came in like a lion and roared through the Capital Area on the 1st (Labor Day). In its wake were damaged and ruined homes, trees blown down by the thousands and a mangled power infrastructure. At least one shining light in all this misery was a reliable water supply when everything else was shut down. We owe a debt of thanks to our suppliers who kept our water systems operable.

We made a survey of the municipal systems and water districts in the area and found that they were well equipped to deal with the power outage that lasted for days, and in some cases, weeks. Water wells are equipped with generators or diesel engines with gear drives for emergencies. A summary of backup power for some public and private systems is shown below.

Supplier	Wells with Generator Backup	Wells with Diesel Engine/Gear Drive
Baton Rouge Water Company	4 site generators run 19 wells	23
Baker	4	
Zachary	5	
St. Francisville	1(for chlorinator)	2
New Roads	Local power plant	
Port Allen	1	
West Baton Rouge (All Districts)		6
East Feliciana Water System	7	
West Feliciana District #13	5	

West Feliciana Water Levels

In this issue we will review the water levels in the aquifers most used in West Feliciana Parish. Water use data show that water is primarily drawn from three aquifers that are common to the Baton Rouge area. In 2007, the average pumpage from these aquifers is indicated in the table. Hydrographs are shown in Figure 1.

"2,000-foot" sand	2.417 mgd
"2,400-foot" sand	1.070 mgd
"2,800-foot" sand	1.050 mgd

Also, of importance to the Feliciana Parishes is the shallow terrace sands and gravels that are pumped for domestic household use, livestock and hunting and fishing camps. These wells are exempt from pumpage fees. Water levels since 1995 for well WF-158 are seen in figure 1. The water-level trend in WF-158 is downward since 1999. Figure 2 shows the amount of rainfall at St. Francisville from 1995 through 2007. The years 1998 through 2000 had an average rainfall of 47 inches, whereas the period of record from 1995-2007 averaged 60 inches. Eight of the 13 years are below average, and may have contributed to the slight water-level decline.

In East Feliciana Parish, the "2,800-foot" sand and Catahoula aquifer, which contains fresh water, are the two main sources of ground-water pumpage.

"2,800-foot" sand	1.603 mgd
Catahoula aquifer	.789 mgd

Vignettes

Arsenic Removal. – Removal of arsenic by filtration through iron oxide coated sand has long been demonstrated to be effective in removing arsenic and other metals from drinking water. More recent experiments with fibrous materials such as fiberglass were evaluated for their ability to retain iron coatings to absorb and remove arsenates. Fiberglass and cellulose coated with iron oxide had the highest arsenate absorption densities, suggesting that these materials may offer advantages over iron oxide coated sand. (AWWA Journal, Apirl 2008)

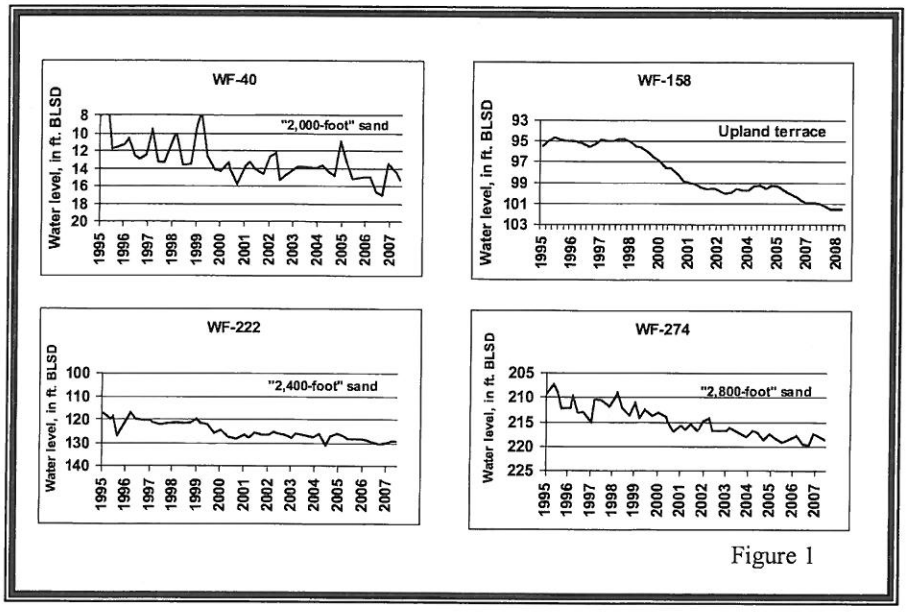


Figure 1

Copper Chemistry. – Copper in drinking water from aquifers serving the Capital Area District is normally very low in concentration. The Baton Rouge Water Company 2007 report to consumers indicated the highest detection level was at 0.1 mg/L. The EPA action level for copper is 1.3 mg/L. Copper contamination can be caused in situations where household plumbing contains copper pipe. Because copper is more readily soluble in low pH water, it could reach the EPA action level at a pH of 5.5. If water is raised to a pH level of 8.5, the copper solubility would reach only 0.3 mg/L. (Opflow, Sept. 2008) The aquifers in our area contain water having a pH range of 7.5 up to 9.0. An exception might be the shallow domestic wells in East and West Feliciana Parishes that are screened in the upland terrace sands. Water quality records in these sands show pH levels ranging from 5.0 to 7.0.

Ground Water Velocity. – There are two common questions we receive occasionally from the public. The first is: where does our ground water come from and secondly, how long will it take to travel from the recharge area to the major zone of pumping in Baton Rouge? The diagram on page 3 is a hypothetical rendering showing a vertical slice through the surface and down to the underlying aquifers. Recharge to discharge can occur in a relatively short time (years or decades) or a much longer period (centuries or millennia). The source of water is precipitation that percolates downward into the sands.

The velocity at which ground water moves is dependent on the sand's permeability, porosity and the hydraulic gradient. The gradient is not constant but increases as the water moves from the recharge to the discharge (pumping) area. Using the "2,000-foot" sand as an example, the average velocity from recharge to

discharge area is around 200 ft/yr with a time-of-travel of about 1,000 years. This can only be considered a rough estimate because permeability and porosity are assumed to be constant throughout the aquifer.

Abandoned Wells

Occasionally we need to remind well owners of their responsibility to plug abandoned wells on their property. It's the law. In an era when agricultural land is being replaced by urban development, the real estate transaction of land transfer overlooks checking for the presence of abandoned wells. Many of these wells may pre-date the enactment of the state's first registration law in 1975.

Abandoned wells pose two hazards: (1) they could be a source of contamination of underground aquifers (2) they may become a safety hazard around the wellhead. Not only is the abandoned equipment around the well an eyesore, but caving may occur around the borehole causing it to be a safety hazard.

Twenty one years ago in Midland, Texas, the eyes of the nation were riveted on the drama of a toddler trapped at the bottom of a well. Rescue units worked nonstop by drilling a parallel shaft and tunneling over to the well where she was trapped. Her rescue was emotional, as rescuers and onlookers wept for joy. The press dubbed her "baby Jessica", and that moniker is still used today. That little girl is now 23 and has a one year old son.

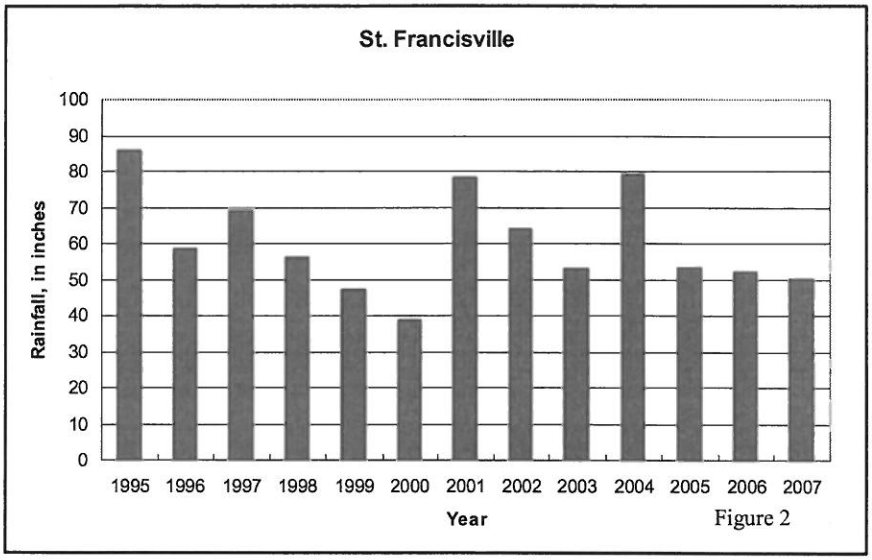


Figure 2

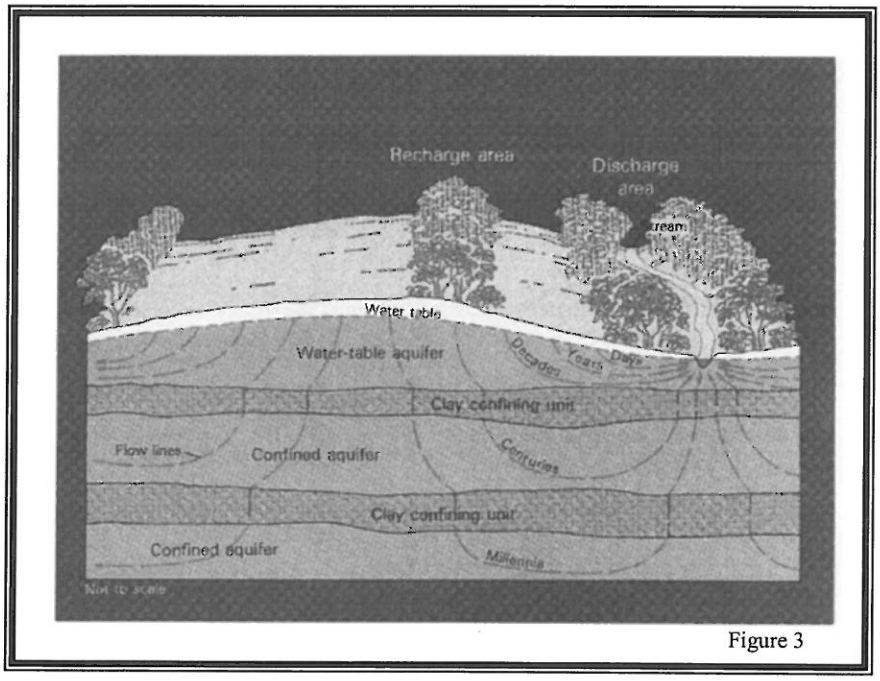
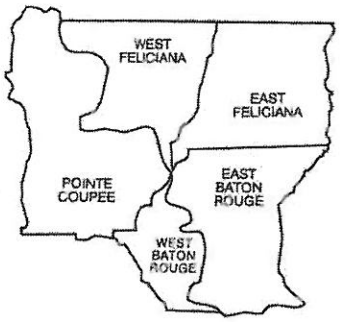


Figure 3

Lighter Side

A government man arrived at a farmer's house and announced that he was there to inspect the property. He showed the farmer his identification card and the farmer said go ahead but don't go into the south pasture. The arrogant government man said, "Mister, I'm a Government Agent and I have the right to inspect wherever I want." The farmer didn't answer and went about doing his chores. In a little while he heard screams coming from the south pasture and looking up he saw his bull in full pursuit of the government man. The bull was gaining. The farmer quickly ran to the fence and shouted to the man, "SHOW HIM YOUR CARD, SHOW HIM YOUR CARD!"



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 34, Number 3 **NEWSLETTER** *January 2009*

Commission & District News

Scheduled Meetings. – The Technical Committee will meet at 1:30 p.m. Tuesday, March 10, 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, March 17, 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.

December Meetings – Don Dial gave a presentation on the connector well project that was completed in1999. The project consisted of constructing a well that was screened in the "800 and 1,500-foot" sands. The head difference between the two sands would allow free-flow from the upper to the lower sand. The head buildup in the "1,500-foot" sand was designed to counter the encroachment of salty water in the "1,500-foot" sand toward two public-supply wells on Government Street.

Flow tests were made on the completed connector well, and the free-flow was measured going into and coming out of the well. The flow average was about 475 gallons per minute. Flow will vary slightly depending on the pumping activity at Government Street. For example, when a pumping well is turned on, it creates a drawdown and increases the flow between the two sands. The well has operated continuously since 1999 without any interruption. A satellite hookup at the well site records real-time data that can be downloaded on computers at the office.

Jason Griffith, U. S. Geological Survey, gave a progress report on the Baton Rouge area modeling study. The progress and significant findings are summarized in the December 2008 progress report.

The Commission held its Administrative Committee meeting on December 9th. John Hashagen reported on the Administrative Committee. Copies of the Financial Conditions as of November 30, 2008 were distributed for review and comment. Bill Gaines, CPA, gave a presentation on the Commission's financial statements for the fiscal year ended June 30, 2008. He reported a slight loss for the fiscal year which was anticipated with the current U.S. Geological Survey modeling project. A pumping rate increase to $4.00 per million gallons on April 1, 2008 should bring in about $250,000 per year.

Jerry Klier presented the outgoing Chairman, John Steib with a plaque of appreciation for his services since 2002. He thanked the Commission and stated that he had been impressed with the Commission Board and staff.

Water Treatment

Acid mine drainage. – Runoff from mining areas has long been a problem because of the accumulation of metals in the acidic water. Historically, lime was used to remove metals from the water. However, that process created metal-laden sludge which had to be dealt with. Depending on the metals involved, some of the sludge may be classified as hazardous waste.

Reverse osmosis has not been effective in the mining industry because it requires costly maintenance and consumes a great deal of energy. Membranes need to be replaced regularly because of the buildup of calcium and sulfate.

A promising alternative is being used by one mining company according to an article in U.S. Water News (October 2008). Biologically generated hydrogen sulfide gas is used to remove metals from acid mine drainage. Metallic sulfides are collected and recycled back into the mining operation. In a year's time the operation reclaims about 740 million gallons. The water can either be re-used or released to the local watershed.

Perchlorate. – Perchlorate in treated drinking water may result from the use of sodium hypochlorite as a purifier. Studies by the Massachusetts Department of Environmental Protection reported in the AWWA Journal, November 2008, a buildup of perchlorate in sodium hypochlorite can occur while it is being stored. Therefore, perchlorate may be a concern for utilities that store sodium hypochlorite longer than short periods. Plotted data from several test samples all showed an increase in perchlorate with time. The report concludes that perchlorate levels should not be a concern for utilities that use sodium hypochorite within a few weeks of its production.

Massachusetts is using the U. S. EPA guideline for 1 ug/L (microgram per liter) maximum for perchlorate concentration in treated water. In contrast, the Department of Defense contends that perchlorate up to 100 ug/L has no lasting effect on humans. Perchlorate is a byproduct of rocket fuel production.

Perchlorate affects the thyroid gland's ability to take up iodine which is needed to make thyroid hormones. These are released into the bloodstream and regulate many body functions. A low hormone count, hypothyroidism, can result in a number of health problems.

Late breaking news on the web (January 12th) reports that EPA is seeking advice from the National Academy of Sciences (NAS) on the subject. In the meantime, EPA is issuing an interim health advisory of 15 micrograms per liter to assist state and local governments to address local contamination of perchlorate.

Water Levels in West Baton Rouge Parish

Pumpage from West Baton Rouge Parish 2007 totaled 6.9 million gallons per day from five aquifers. The pumpage by aquifer is shown below:

Sand	Pumpage in mgd
800-foot	1.179
1,000-foot	1.240
1,200-foot	1.270
1,500-foot	3.030
1,700-foot	.192
TOTAL	6.911

Water-level declines in West Baton Rouge Parish are indicated in the hydrographs of observation wells in figure 1.

"1,200-foot" sand. – Well WBR-5 in Port Allen shows a decline of about 2.5 feet per year since 1995.

"1,500-foot" sand. – Pumpage from this sand occurs in the area south of the Baton Rouge fault. Since 1996 the water level in well WBR-173 has declined about 1.5 feet per year.

"1,700-foot" sand. – This sand has very little pumpage in West Baton Rouge Parish but shows a slight decline due to pumage in East Baton Rouge Parish. Well WBR-100B (River Road) show no downward trend since 2001(figure1).

"800-foot" sand & "1,000-foot sand. –These two sands are pumped north of Port Allen. The water level in well WBR-160 (graph not shown) has not declined, except seasonally since 1995. No hydrograph is available for the "1,000-foot" sand. However, a moderate decline of 1 foot/year occurs in the eastern part of East Baton Rouge Parish.

Vignettes

The water utility in Madison, Wisconsin is offering a rebate plan to convert to high-efficiency toilets. A $100 per dwelling rebate is being offered to install the toilet. The utility's goal is to cut residential water use by 20% by the year 2020. A total of $250,000 per year will be allotted to this project, which would provide 2,500 toilet replacements per year. The plan, which also includes a rate increase, will go to the City Council for review and approval. (GW Monitoring & Remediation, Fall 2008).

An auto plant in Ohio has constructed some rainwater detention ponds on its property to hold runoff for 24 hours. The largest is a 7-acre pond that holds 20 million gallons of water collected from roofs and parking lots. During warm weather, (April to October) the plant uses water from the pond to cool the plant. The water is pumped to the plant's cooling towers where it enters a closed-loop cooling system.

Prior to the construction of ponds the plant pumped ground water for its cooling needs. The plant reports an annual reduction of 40 million gallons of ground water. Not only does the plant conserve ground water but the pumping costs are cheaper when pumping the pond water.

Earth Renewable Technologies has launched the Earth Bottle, a biodegradable bottle that is made almost entirely from plants. The bottle was developed through a partnership between Gaia Herbs of Brevard, NC and Clemson University. Commercial use of the bottle began in November 2008 and is reported in Waste & Recycling News to have a positive response from its customers.

The polymer bottles are petroleum free. A key ingredient is polylactic acid, or PLA, a plastic-like material made from corn. Commonly used plastics are PET and HDPE, both of which are petroleum based. Used PLA bottles, when composted, return to their natural sources. The producers report they don't want to be a one-hit wonder, but are looking at applications in other areas such as auto parts, toys, medical field, construction, industry and cosmetics.

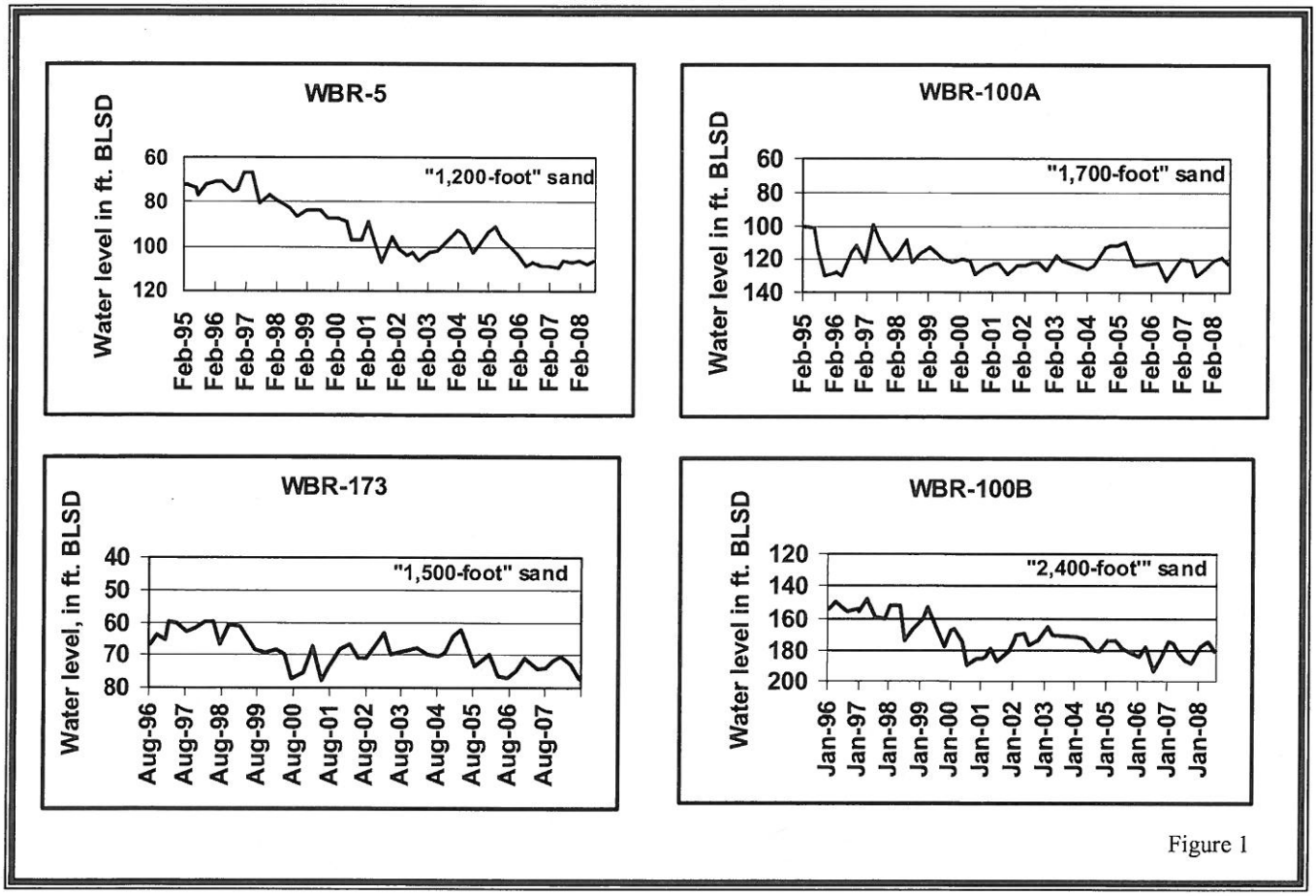


Figure 1

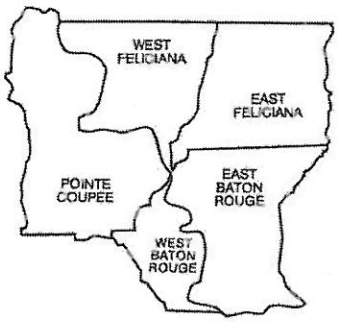
yes, it counts!
Water Wasted is Water Lost

Harry Truman, from Missouri, was a different kind of President. He probably made as many important decisions regarding our nation's history as any of the other Presidents. However, a measure of his greatness may rest on what he did after he left the White House.

When he retired from office in 1952, his income was U.S. Army pension reported to have been $13,507.72 a year. Congress, noting that he was paying for his stamps and personally licking them, granted him an 'allowance' and, later, a retroactive pension of $25,000 per year.

After President Eisenhower was inaugurated, Harry and Bess drove home to Independence, Missouri by themselves. There was no Secret Service following them.

When offered corporate positions at large salaries, he declined, stating, "You don't want me. You want the office of the President and that doesn't belong to me. It belongs to the American people and it's not for sale."



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 34, Number 4 **NEWSLETTER** *April 2009*

Commission & District News

Scheduled Meetings. – The Technical Committee will meet at 1:30 p.m. Tuesday, June 9, 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, June 16, 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.

March Meetings – The Technical Committee met Tuesday, March 10th, 2009 at the Georgia-Pacific plant at Port Hudson. The group was shown a video presentation of the plant's history of operations. The plant's location in northern East Baton Rouge Parish allows for minimal pumping interference with the industrial area in Baton Rouge. Much of the plant's ground-water usage is from the shallow "400- and 600-foot" sands. (This was done by design, so that the plant location and pumpage would have minimal effect on the deeper heavily pumped aquifers in Baton Rouge.)

A tour through the plant started with a view of the incoming logs which are stripped of bark and ground up into wood chips. Both hardwood (oak, gum, etc.) and softwood (pine) are used. The chips are converted to pulp, which is run through a bleaching process resulting in a pure white product. The final products at the plant are paper towels, toilet tissue and copy paper.

Water Reclamation

Innovative techniques to reclaim and reuse water are being employed in different areas of the country. In water-starved California, the West Basin Municipal water district has been in operation since 1947 to inject imported water into a coastal aquifer to act as a barrier between seawater and fresh ground water. The pressure ridge created by injection prevents the seawater from moving further inland. On a smaller scale the Commission's connector well serves as a barrier against encroaching saltwater in the "1,500-foot" sand.

In 1995, West Basin began using effluent from a Los Angeles water treatment plant. With further improvements over time, the water was additionally purified through an advanced treatment process. As a result, the district was recently authorized to inject 100% of the treated water into barrier wells.

Another water reclamation project, reported in U.S. Water News (July, 2008) involves returning wastewater to a wetlands area by means of a PVC pipeline (see photo, page 2). The pipeline is supported on wooden cradles. Treated wastewater is returned to the wetland area. This water is distributed evenly by placing spigots along the pipeline at 50-foot intervals.

Technology for the conservation and reuse of water is more advanced than the public's perception and acceptance of it. As we see populations increasing and using a finite amount of available water, the public mindset will be forced into looking at different options.

In 2003 the Commission and East Baton Rouge City-Parish signed a contract to retain URS Corporation to do Phase 1 of a study involving alternative sources of water for industrial use. One conclusion was that, in the long term, reclaimed water use will probably become more

common as the perception of water-quality issues change.

The Commission, City-Parish and DOTD are currently sponsoring a modeling study of the "1,500- and 2,000-foot" sands in cooperation with the U.S. Geological Survey. The completed model will be used in a variety of simulated conditions to evaluate and possibly regulate future ground-water use.

In the future it is not inconceivable that reclaimed water in Baton Rouge, which would be recycled ground water, could be used to supply barrier wells to counter salt-water encroachment. This activity is standard procedure in the West Basin (Los Angeles) as already noted. The compatibility of water quality should be no problem because the injected water would be returned to its source.

Addressing public attitudes about reclaimed water is the theme of an article in Opflow (October 2008). Because technical people are solution-oriented, they may present a solution before their audience realizes there is a problem. Therefore, it is important to have good communication at all levels and to explore the alternatives that are available. If there is public understanding of a problem, the people will respond more willingly.

Water Levels in East Baton Rouge Parish

Hydrographs for four sands in East Baton Rouge Parish are shown on page 3. For the period shown, well EB-824 in the "600-foot" sand showed a water-level decline of about 0.6 ft/year. Pumpage of 6.6 million gallons per day (2007) is about equally distributed between industrial and public-supply use.

Well EB-782A in the "1,000-foot" sand showed a water-level decline of 1.6 ft/year over 13 years. Pumpage from the "1,000-foot" sand is virtually all for public-supply use. Pumpage for 2007 was 6.5 million gallons per day.

Water levels in well EB-146 in the "1,200-foot" sand declined about 2.3 ft/year for the period shown. Total pumpage for 2007 was about 20 million gallons per day of which 40% was industrial and 60% public supply.

Water levels in the "1,500-foot" sand are indicated by the hydrograph of EB-168. Water levels declined about 1.9 ft/year for the period of record. The total pumpage of nearly 20 million gallons per day in 2007 was 38% industrial and 62% public-supply use. The July 2009 newsletter will look at water levels in the four deepest sands.

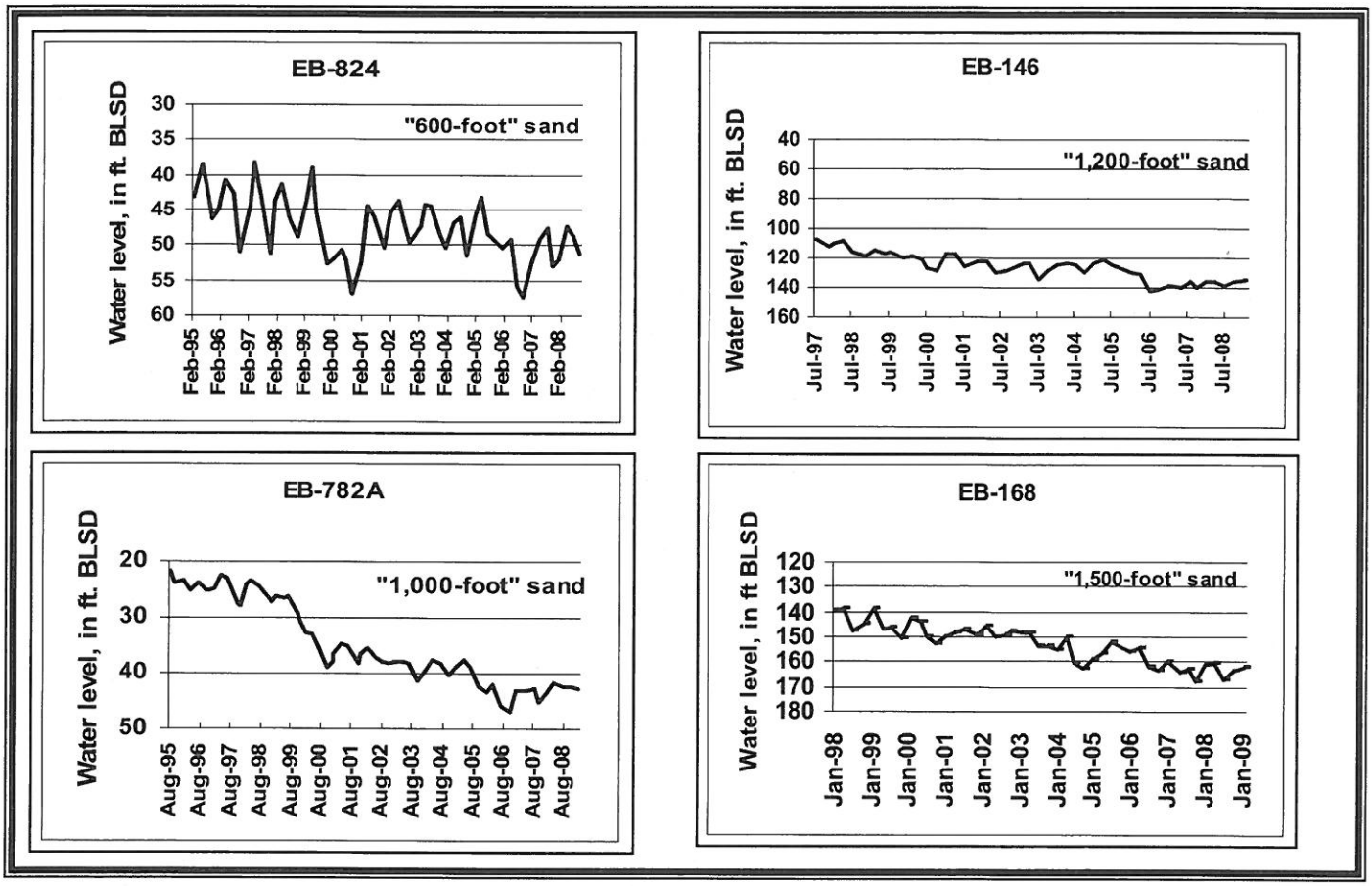
Why Measure Water Levels?

In the Capital Area District there are eleven different sands from which water is pumped. Water levels in each of these sands is measured periodically to keep a historical record of the effects of pumping. Each sand is separated from adjoining sands by confining layers (clays). Therefore, the water level in each particular sand reflects the amount of withdrawal from the sand, and each sand responds independently.

Observation wells located throughout the District are measured quarterly. Contour maps of the water-level surfaces reflect any changes that are taking place over a period of time. For example, heavy pumping in the "2,000-foot" sand in the industrial area prompted the Commission to restrict pumping within a defined area to stabilize water-level declines in that sand. Other measures were taken to reserve the "1,000-, 1,500- and 1,700-foot" sands for public-supply use.

The parishes contribute funds to the water-level program which are matched by the U.S. Geological Survey. The history of each well is recorded in the USGS data base. Some useful information from water levels is listed.

- Water-level trends – Hydrographs give a pictorial record of water-level decline and recovery periods.
- Pump settings – intake of pump is set well below static water level.



- Total dynamic head determines the size and capacity of pump needed to move water from static level to delivery point.

Vignettes

An article in a recent trade magazine reported that the president signed a memorandum March 9th to restore "scientific integrity" to information used in making policy decisions. The Office of Science and Technology Policy was given 120 days to develop a strategy to ensure the integrity of scientists and technology professionals. Is the implication here that scientists have become something less than forthright? This will surely come as a slap in the face to honest and dedicated professionals who seek accuracy in their work instead of today's headlines. We might suggest of the president that he also call on the Office of Truth in Politics (fictitious) to develop a strategy to ensure "political integrity". At this point, it seems to be more in demand.

Receiving minimal media coverage, an international conference on climate change met March 8-10 at the New York Marriott Marquis Hotel. About 800 people attended the event sponsored by Heartland Institute and 60 co-sponsoring organizations. The theme of the conference: **WAS IT EVER A CRISIS?** This was the largest-ever gathering of global-warming skeptics.

The conference was devoted to answering questions overlooked or ignored by the United Nations Intergovernmental Panel on Climate Change (IPCC). IPCC concluded that global temperatures may have already reached crisis proportions and human activity was a key driver in raising temperatures, notably the release of carbon dioxide into the atmosphere. Some substantially different viewpoints were presented among the 80 speakers at the conference. A few speakers are highlighted below.

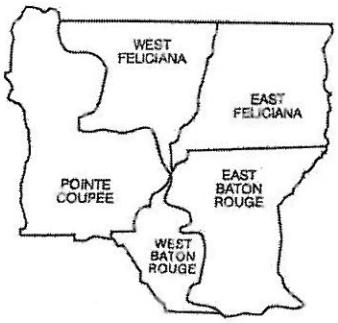
- Vaclav Klaus, president of the Czech Republic – "Environmentalism and global warming alarmism is challenging our freedom. I'm afraid the current crisis will be misused for radically constraining the market economy around the world."

- Astronaut Dr. Jack Schmitt, a geologist PH.D. – the last living man to walk on the moon – "too many of my colleagues lost grant money

when they haven't gone along with the political consensus that we're in a human-caused global warming".

- William Gray, Colorado State University, claims global warming alarmists have hijacked the American Meteorological Society.

- Arthur Robinson, curator of a petition signed by more than 32,000 American scientists, rejecting the assertion that global warming has put the earth in a crisis caused primarily by mankind.



Capital Area Ground Water Conservation Commission

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Volume 35, Number 1 **NEWSLETTER** *July 2009*

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

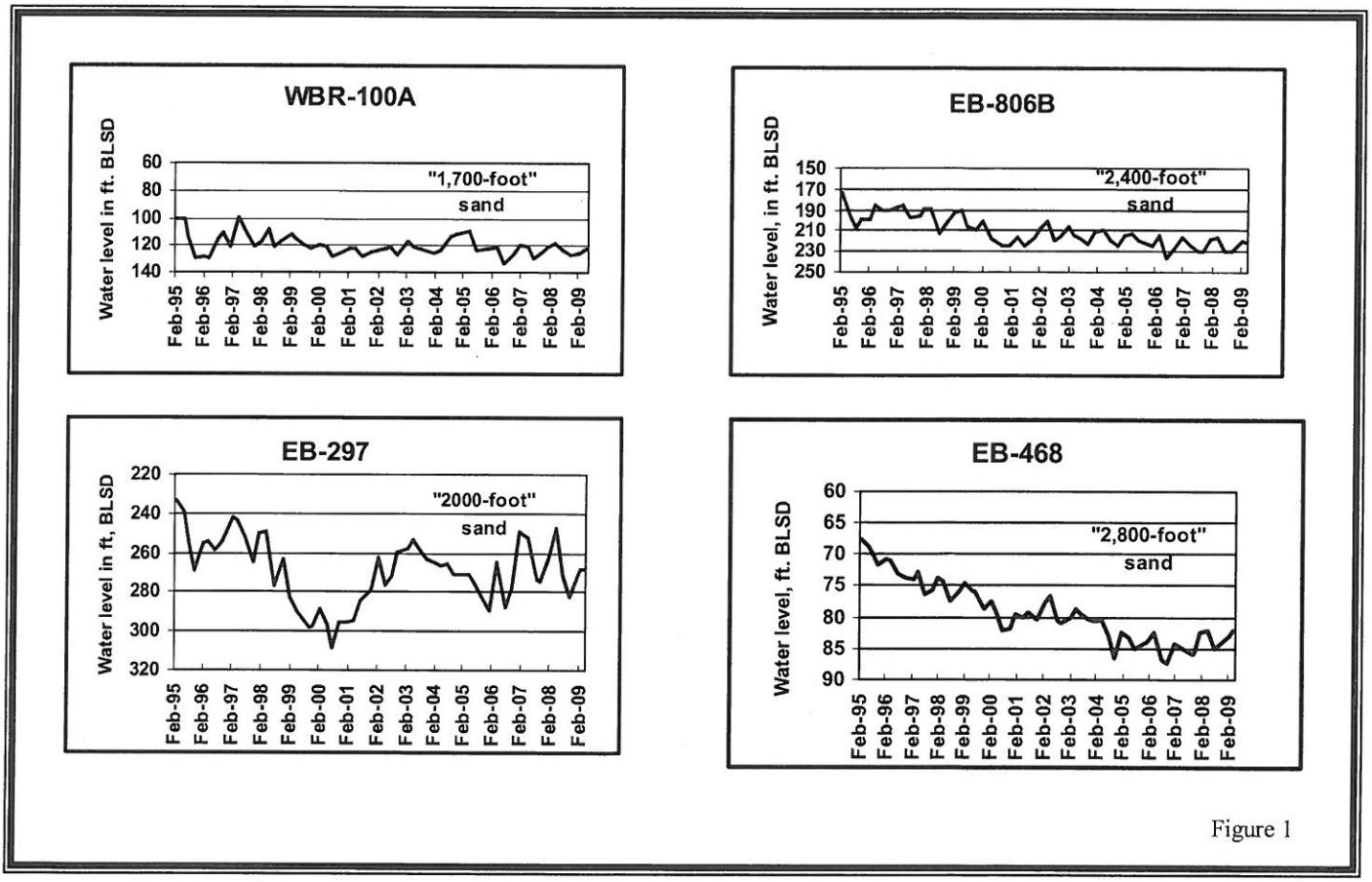


Figure 1

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

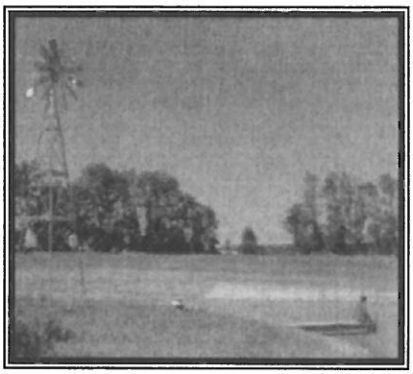
The average annual pumpage for 2008 is summarized in table 2. The average of 170 million gallons per day (mgd) is approximately 1.5 mgd less than 2007. Most notable was a decline in industrial pumpage from the "400-600" sand.

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.

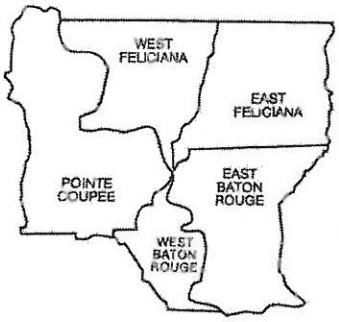
In 1995 herbicides were back-siphoned into a public water system in Pointe Coupee Parish when a water main was accidentally broken at the same time a farmer was mixing the herbicides in the tank. A hose feeding water to the tank became a backsiphon and entered the public supply. Quick action by the local 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



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 35, Number 2 **NEWSLETTER** *October 2009*

Commission & District News

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

September Meetings – The Technical Committee met Tuesday, September 8, 2009, in the conference room of the U.S. Geological Survey at 3535 South Sherwood Forest Boulevard, Baton Rouge, Louisiana.

Dan Tomaszewski, USGS, gave a video presentation of the Southern Hills aquifer system. The talk was also given at the State Ground Water Commission seminar on August 26, 2009.

The Southern Hills aquifer system includes sands of Pleistocene, Pliocene and Miocene age. The base of the fresh water in Baton Rouge extends to the "2,800-foot" sand. The table below shows the hydrogeologic equivalent units in southwestern Louisiana.

Southwest Louisiana	Baton Rouge Area
Chicot	"400-foot" sand
	"600-foot" sand
Evangeline	"800-foot" sand
	"1,000-foot" sand
	"1,200-foot" sand
	"1,500-foot" sand
	"1,700-foot" sand
Jasper	"2,000-foot" sand
	"2,400-foot" sand
	"2,800-foot" sand

The recharge area of the Southern Hills aquifer includes the upland terrace deposits in southwest Mississippi and Louisiana extending as far south as the East Baton Rouge-East Feliciana border. Infiltration from rainfall enters the near-surface terrace deposits and supplies the base flow of southward flowing streams that originate in the area. A small percentage of water reaches the deeper confined aquifers and moves downdip where it is used for public supply and for industrial applications.

Leak Detection

In my growing-up years of the early 1950s, the conservation of water was not a subject of great concern. Water was cheap and there seemed to be an unlimited amount of it. In the 21st century that is no longer the case. The conservation of water is now almost universal in our thinking. Droughts over the past decade brought us to the realization that water supply was not something that we could take for granted. In many places around the country, such as Atlanta, for example, water restrictions were imposed. As our population grows, so will the need for a more conservation-minded population.

An article on leak detection was published in the August 2009 AWWA Opflow, and their findings are summarized in the discussion on page 2. The technology makes use of the fact that water escaping from a pressured pipe makes sound.

Studies were conducted on large and small mains as seen in the tables.

Large Mains. – The leak location detector is a tethered inline sensor that is passed through a distribution pipeline. Water mains can be accessed through fire hydrants, valves and meters. Major leaks in water mains are serious problems that disrupt service, create sinkholes and may cause the collapse of roadways. For example, in Philadelphia the inline sensor was used successfully on two 48-inch mains crossing underneath an interstate highway. Two large leaks were identified and repaired before they caused a catastrophic failure. Large main leakage assessments for Philadelphia, Allentown and Dallas are described in table 1.

	DALLAS	ALLENTOWN, PA	PHILADELPHIA
Distance Surveyed (mi)	40	2.8	22.2
Leaks Detected	59	10	47
Average Leak Size (gpd)	82,000	50,000	50,000

Table 1

Small Mains. – A survey in Gwinnett County, Georgia covering 3,360 miles of distribution lines located more than 500 leaks. Water savings amounted to 1.8 million gallons per day and a monetary savings of $400,000 per year. A total of 42 water main leaks accounted for 49% of the water loss recovered.

A survey by Southwest Florida Water Management District tells a similar story. They surveyed more than 60,000 access points over a 15-year period and found 735 leaks. The repairs resulted in a lost water savings of more than 2 million gallons per day. The results of the small main leaks in the two water systems are summarized in table 2.

	Gwinnet County, GA		
Type	Number	Vol. Avg. (gpm)	Total (gpm)
Hydrants	290	1	295
Valves	24	1.9	46
Service Lines	90	2.1	187
Mains	42	14.3	600
Meters	88	1.1	94
Joints	n/a	n/a	n/a
Other	n/a	n/a	n/a

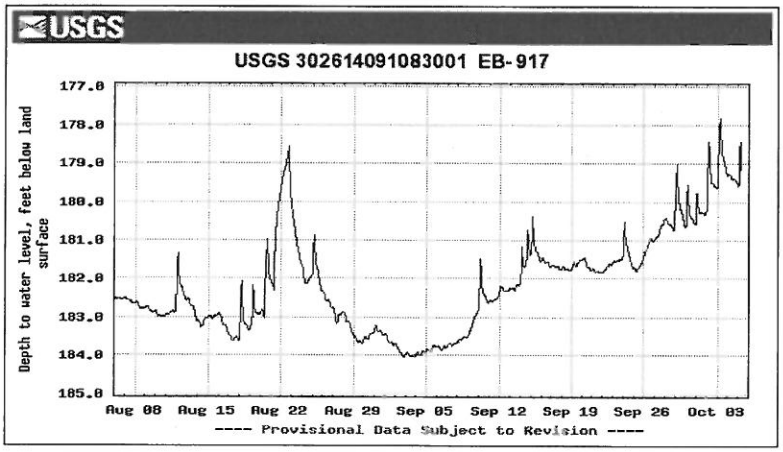
	SW Florida Water District		
Type	Number	Vol. Avg. (gpm)	Total (gpm)
Hydrants	293	0.1	37
Valves	233	0.1	29
Service Lines	76	0.3	19
Mains	69	18	1,242
Meters	n/a	n/a	n/a
Joints	18	5	90
Other	46	0.1	6

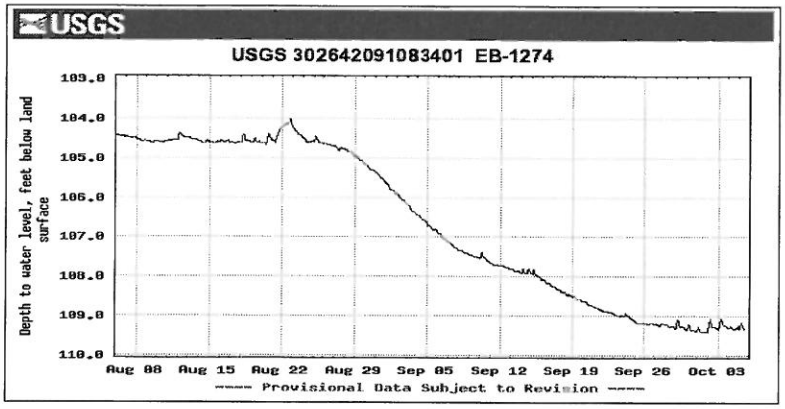
Table 2

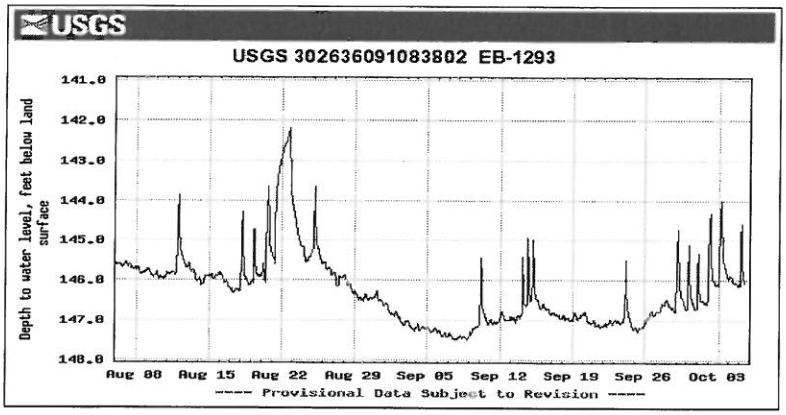
Connector Well

This year marks the tenth anniversary of the Commission's connector well (EB-1293) which was completed in 1999. The project was partially funded by a research grant obtained under section 319 of the Safe Drinking Water Act. The project involved the use of the "800-foot" sand to connect with and recharge the "1,500-foot" sand. The object of the recharging well was to raise the water level in the "1,500-foot" sand and inhibit the movement of saltwater northward toward the two public-supply wells at the Government Street pumping station. Judging from the hydrographs seen in the figures, the head difference between the two sands is around 70 feet. (See EB-917 and EB-1274). The difference varies somewhat seasonally and also with the pumping cycles of wells at Government Street. The water level in the connector well is a composite of the water levels in "800-foot" sand and "1,500-foot" sand.

Well EB-1274 ("800-foot" sand) shows a decline over the past month and correlates well with the falling stage of the Mississippi River. On the other hand, well EB-917 ("1,500-foot" sand) shows a relatively flat water level with some recovery in the first three weeks of September. The connector well hydrograph, EB-1293, mirrors the hydrograph of EB-917 except that its water level is about 40 feet higher than well EB-917. A 60-day water level record of each well is shown on page 3.





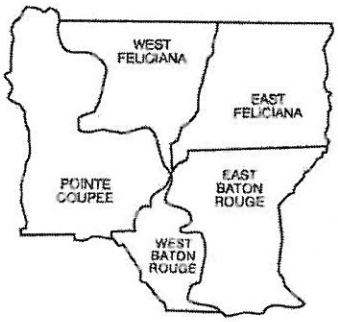


Vignettes

Congress has authorized a 30% tax credit, up to $4,000 for the installation of small wind turbines (100 kilowatts or less). According to the American Wind Energy Association the market for homes, farms and small businesses grew by 78 % in 2008 with the installation of 10,500 small turbines.

It occurred to me that wind turbines could possibly serve a dual purpose by generating power and pumping water at the same time. Traditionally, windmills in the past were used to produce water for household and livestock use mainly in the western states. The mechanical energy generated by a wind turbine could supply electric power and water thus "killing two birds with one stone".

A waste disposal facility near San Antonio reports a first-of-its-kind technology to harvest solar energy over the closed portion of a landfill. The procedure combines a geomembrane cover with flexible photovoltaic sheets over about 5 acres. In addition to a landfill gas recycling system, the combined gas and solar systems are expected to produce about 9 megawatts of electricity, or enough to power 5,500 homes. (Reported in Waste & Recycling News, 4/13/09).



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 35, Number 3 **NEWSLETTER** *January 2010*

Commission & District News

Scheduled Meetings. – The Technical Committee will meet at 1:30 p.m. Tuesday, March 9, 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, March 16, 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.

December Meetings – The Technical Committee met Tuesday, December 1, 2009, in the conference room of the U.S. Geological Survey at 3535 South Sherwood Forest Boulevard, Baton Rouge, Louisiana.

John Lovelace gave a presentation on the Southern Hills aquifer system which includes fresh water sands from the "400-foot" sand down through the "2,800-foot" sand in the Baton Rouge area. These sands are correlated with sands of similar age extending eastward across the Florida Parishes. Cross sections across this area by Griffith (Water Resources Technical Report 72, 2003) show the relation of Baton Rouge area sands to those which have been given names for geographic locations further east such as Hammond, Covington and Slidell aquifers.

Pumpage from the entire system is about 320 million gallons per day. Water level declines depend on location of the well. In the recharge area declines are less than one foot per year. South of the recharge area declines reach one foot per year or more. Areas of heavier pumpage show declines greater than one foot per year in most sands.

Jason Griffith gave a brief progress report on the modeling study in Baton Rouge. A more detailed report was mailed to each Commissioner. Plans for next quarter include working on flow patterns across the Baton Rouge fault, compiling chloride data and working on the SEAWAT model.

A brief discussion was held concerning two long-term observation wells (EB-824 and EB-825) that were destroyed in a construction area. The prospect of recovery of these wells is not known but the Commission plans to set up a meeting with Parish DPW, the contractor, and USGS to decide what measures can be taken. Legislation is needed to penalize those who destroy wells illegally.

Well Failure

The Baton Rouge Advocate reported on December 2nd a well failure in the town of Independence. The article reported that the well had not been "cleaned or inspected" for 12 years. Water well pumps, like anything else mechanical, should have a periodic inspection and maintenance schedule. The age of the well was reportedly unknown, which is an indication that no records were kept and no one had a clue that the well might someday fail. Water pressure was reported to drop to 10 pounds per square inch requiring school children to be sent home and emergency measures to be taken at a local hospital.

In our April 2008 newsletter we reported on an article written in a trade journal entitled "How Many Ways to Kill a Pump". A brief description follows:

1. **Ignore it** – This is a sure sign of trouble. Periodic checks should be made of the pump and motor.

2. **Strangle it** – Set the pump at a level that allows it to operate at less than maximum suction head. Cavitation caused by a too-high pump setting or clogged strainer, will result in an overworked pump.

3. **Fry it** – This may happen by closing down valves to control discharge. A pump should operate under the conditions for which it was designed.

4. **Overtax it** – Work it at higher than rated capacity and you can count on a broken shaft or bearing.

5. **Rip it apart** – If the pipes don't match with the pump, get out the come-along and contort the components until they fit.

6. **Vibrate it to death** – Misaligning the pump and motor can set up a vibration that will work on the bearings and shaft.

Metering for Baker. – The City of Baker has approved a plan to meter their public water supply usage. Previously the city operated on a flat-rate plan which is not conducive to good water conservation. Pricing that is based on meter usage should encourage users to be more conservative in the use of their valuable ground-water resource. Baker presently has four wells pumping from the "2,800-foot" sand.

Annual pumpage figures for 2007 and 2008 show an average pumpage somewhat above 2 million gallons per day. It will be interesting to compare this figure with pumpage after the installation of meters.

10-Year Summary of Pumpage

Table 1 records the average daily pumpage from each major aquifer for the period 1999-2008. Totals for each year are summarized on the bottom line. Total average pumpage for the period has remained relatively stable in the range of 160-170 million gallons per day (mgd). Maximum pumpage was recorded in 2000, a year of drought. A sizeable jump was noted in 2006, and may be explained by the increase in population after hurricane Katrina. A discussion of individual aquifer pumpage follows. (See Table 1 and Figure 1 reference)

"400-foot" sand. – Down slightly in the last half of the decade.

"400/600-foot" sand. – Relatively flat except for 2008 when pumpage decreased by 6 mgd. In 2007, Georgia-Pacific initiated technology improvements in the operation of its 20 production wells. Comparative figures for 2009 should be available by April 2010.

"600-foot" sand. – Relatively flat. Peak pumpage in 2006.

"800-foot" sand. – Pumpage increased after 2005 as new wells were completed.

"1,000-foot" sand. – Increase at the end of the period.

"1,200-foot" sand. – Slight upward usage trend over the 10-year period.

"1,500-foot" sand. – Upward usage trend over the first half of the decade.

"1,500/1,700-foot" sand. – This pumpage was previously classified as pumpage from the "2,000-foot" sand. The new classification was made in 2004 and was agreed upon by the Commission, the U.S. Geological Survey, and Louisiana Department of Transportation and Development. The conclusion was based on updated mapping of the aquifers in the Baton Rouge area (USGS Technical Report 72).

"1,700-foot" sand. – Total pumpage showed a sharp increase over the last half of the decade. The increase is attributed to the addition of new public-supply wells completed in East Baton Rouge Parish.

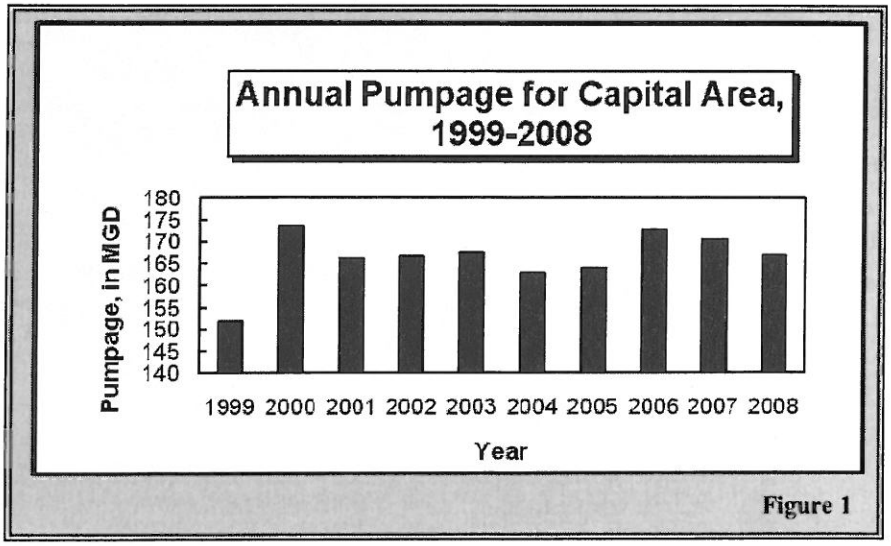


Figure 1

"2,000-foot" sand. – After a high of 41 mgd in 2000, pumpage settled back to a 30-40 mgd range until 2004. At that point total pumpage decreased further as some wells in East Baton Rouge Parish were re-classified as "1,500/1,700-foot" sand wells.

"2,400-foot" sand. – Pumpage shows a generally flat trend over the period.

"2,800-foot" sand. – Relatively flat since 2000. This sand is pumped for public-supply and industrial uses mostly in northern East Baton Rouge Parish.

Climate News

The Arctic Ocean is warming up, icebergs are growing scarcer and seals are finding the water too warm according to a report sent to the Commerce Department from the American Consulate at Bergen, Norway. Fishermen, seal hunters and explorers point to a radical change in climate and hitherto unheard of temperatures. Soundings to a depth of 3,100 meters show that the Gulf Stream is still very warm. Great masses of ice have been replaced by moraines and at many places well known glaciers have disappeared. Schools of herring and smelt, which have never ventured this far north, are reported in the old seal fishing grounds. Within a few years it is predicted that, due to the ice melt, the sea will rise and make most coastal cities uninhabitable. (*This article was reported by the Associated Press and printed in the Washington Post on November 2, 1922.*)

Reports

Tomaszewski, D.J., 2009, Ground-Water Resources in Rapides Parish, LA, 2005; Louisiana Water Resources Technical Report No. 78.

Prakken, L.B., and Wright, L.S., 2009, Water Withdrawals and Trends in Ground-Water Levels and Stream Discharge in Louisiana, 1996-2005; Louisiana DOTD Water Resources Technical Report No. 79.

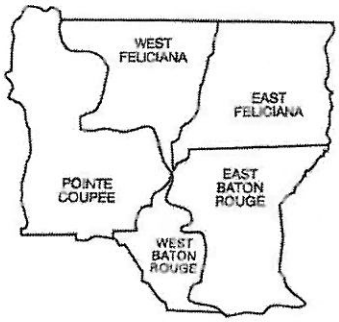
Nothing New Under the Sun

The budget should be balanced, the Treasury should be refilled, public debt should be reduced, the arrogance of officialdom should be tempered and controlled and the assistance to foreign lands should be curtailed lest Rome become bankrupt. People must again learn to work, Instead of living on public assistance.

AVERAGE PUMPAGE FROM MAJOR AQUIFERS OVER A 10-YEAR PERIOD

Aquifer	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
"400-foot"	5.293	5.948	5.064	5.455	4.689	4.094	4.425	4.344	3.604	4.228
"400/600" ft	4.731	12.975	12.401	12.533	12.232	11.663	11.521	11.495	13.223	7.308
"600-foot"	5.733	6.319	5.961	6.027	6.224	7.097	7.043	7.681	6.408	6.75
"800-foot"	2.037	2.486	2.129	1.941	2.325	2.53	2.663	4.326	5.001	4.256
"1,000-foot"	8.466	8.469	7.567	7.218	7.441	6.626	6.284	8.418	7.768	9.135
"1,200-foot"	21.100	21.793	21.026	23.153	23.057	22.083	23.018	23.858	24.037	24.047
"1,500-foot"	16.452	17.952	17.79	18.273	19.082	19.127	19.318	19.338	19.322	19.504
"1500/1700 ft"						7.818	7.975	7.983	7.664	7.607
"1,700-foot"	2.352	2.487	2.364	2.528	3.016	3.939	5.611	6.142	5.977	6.947
"2,000-foot"	39.633	41.115	37.690	36.167	35.858	24.527	24.444	25.198	24.024	24.291
"2,400-foot"	18.978	20.538	21.198	19.676	20.199	20.379	19.407	20.581	21.284	20.825
"2,800-foot"	27.350	33.596	33.091	33.868	33.515	31.417	32.445	33.417	31.321	32.022
Total MGD	152.125	173.678	166.281	166.839	167.638	161.300	164.154	172.781	169.633	166.920

Table 1



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 35, Number 4 **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

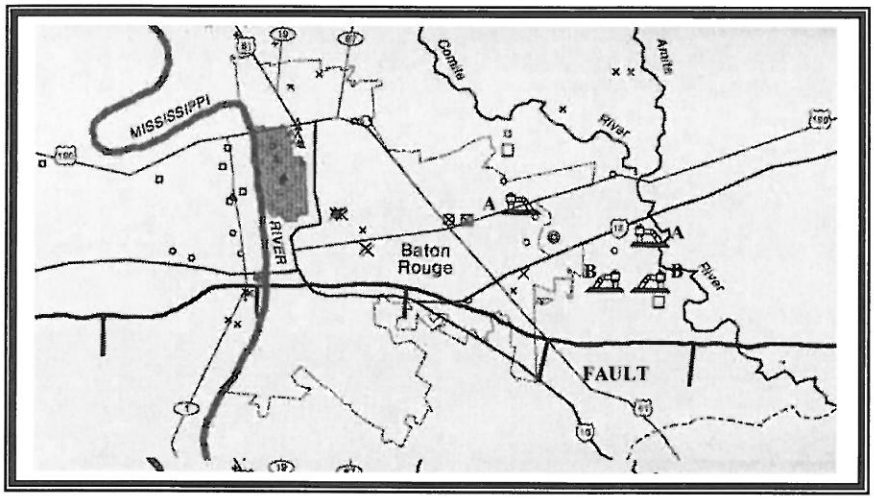
Simulation 5: Increase pumping 1% per year for 50 years
Result: Decline of almost 30 feet from 1988 levels in the industrial district

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 Streeet. 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.

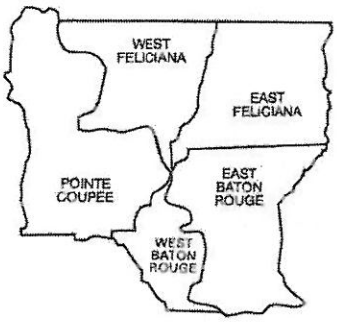
- **"2,400-foot" sand** – No serious saltwater problems have been encountered to date in this sand. Test wells EB-794 drilled in 1965, and EB-804B in 1966 revealed freshwater on the north side of the Baton Rouge fault. In the early 1990s, EB-794 showed a chloride concentration above background level (>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).



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 36, Number 1 **NEWSLETTER** *July 2010*

Commission & District News

Scheduled Meetings – The Technical Committee will meet at 1:30 p.m. Tuesday, September 14, 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, September 21, 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.

June Meetings – The Technical Committee met Tuesday, June 8, 2010 at 1:30 p.m. in the U.S. Geological Survey conference room, 3535 South Sherwood Forest, Baton Rouge, Louisiana.

Jason Griffith, USGS, gave a quarterly review of the "1,500/2,000-foot" sand modeling project. Model calibration involves matching of simulated water levels, for example, with observed historic water levels. Parameters that affect the model output are applied and re-adjusted a number of times to obtain the best match during the process of calibration. A summary of progress and significant findings was handed out to the Committee.

Jeff Jones, DNR, gave a presentation on their role in managing the state water well registration. Application for a new well requires a 60-day notification by the owner. The advance notice allows DNR to review and evaluate the proposed well.

In March 2010, the Water Resources Section at DOTD transferred all their ground-water files, including well registration and well driller's licensing to DNR. Well registration forms are sent to DNR within 30 days after completion of the well. Future plans are to transfer the DOTD database into DNR's file known as SONRIS.

The Commission's involvement in the "1,500-foot" sand scavenger well study was discussed but no action was taken. Copies of the proposal will be sent to each Commissioner and will be on the agenda at the June 15th meeting.

Other discussion included the proposal to limit future development of the "1,200-foot" sand to public-supply use. This subject was brought up before the Commission at our June 15th meeting and deferred until the September meeting. In the meantime, industries will be contacted so that they may have the opportunity to respond.

Commission Meeting – At the June 15th meeting the Board approved a sum of $40,000 to support a modeling study to determine the effectiveness of encroachment in the "1,500-foot" sand. The modeling study is under the direction of Dr. Frank Tsai at LSU. In recent years, chloride concentrations at the Lula Station have shown an increase. A report on the modeling results will be released in September 2010.

Pumpage Summary 2009

The total pumpage recorded for 2009 was 167 million gallons per day. Table 1 lists the pumpage by parish and by aquifer. The total for 2009 was essentially unchanged from 2008. In recent years, the highest total was approximately 174 million gallons per day in 2006 which probably reflects the mass migration of people to Baton Rouge after hurricane Katrina.

The five major aquifers are listed, showing the percentages for industrial and public supply use in the five-parish area for the year 2009.

Sand	Total (mgd rounded)	% Industrial	% Public Supply
2,800-foot	35	59	41
2,000-foot	23	72	40
1,200-foot	23	40	60
2,400-foot	21	24	76
1,500-foot	19	15	85

- Public-supply use from all aquifers in 2008 – 53%
- Industrial use from all aquifers in 2008 – 47%
- Public-supply use from all aquifers in 2009 – 55%
- Industrial use from all aquifers in 2009 – 45%

Other News

An interesting situation has developed in Washington D.C. that was reported on the opinion page of Water World, June 2010. The Government Accounting Office (GAO) nullified fees levied by the DC Water and Sewer Authority to improve the quality of storm water runoff. GAO ruled that the fees appear to be a tax on property owners, and instructed the Treasury Department not to make payment to the Water and Sewer Authority. As a property owner, the federal government owns upwards of 20 percent of the property in DC. The fees were imposed because of an EPA proposed permit to improve the quality of storm water runoff in DC. The Administration is also committed to improving the water quality in Chesapeake Bay which receives all of the runoff from DC. The case is under review by the Department of Justice.

In another development, the Department of Energy has abandoned plans to develop the Yucca Mountain site in Nevada into the nation's nuclear waste repository. In response, a group of electric companies have filed a petition in federal court. A trade group known as the National Association of Regulatory Utility Commissioners (NARUC) argues that the federal government is committed to the plan because it has been assessing fees amounting to billions of dollars from nuclear power plants. This money was intended to be used for transportation and disposal of nuclear waste. According to David Coen, president of NARUC, nuclear utility customers have faithfully contributed nearly 20 billion into the Nuclear Waste Fund. DOE has announced that it will delay closing the Yucca site until the legal proceedings are completed. (Condensed from an article in *Waste & Recycling News*, April 26, 2010)

Pumpage by Aquifer, 2009 (MGD)

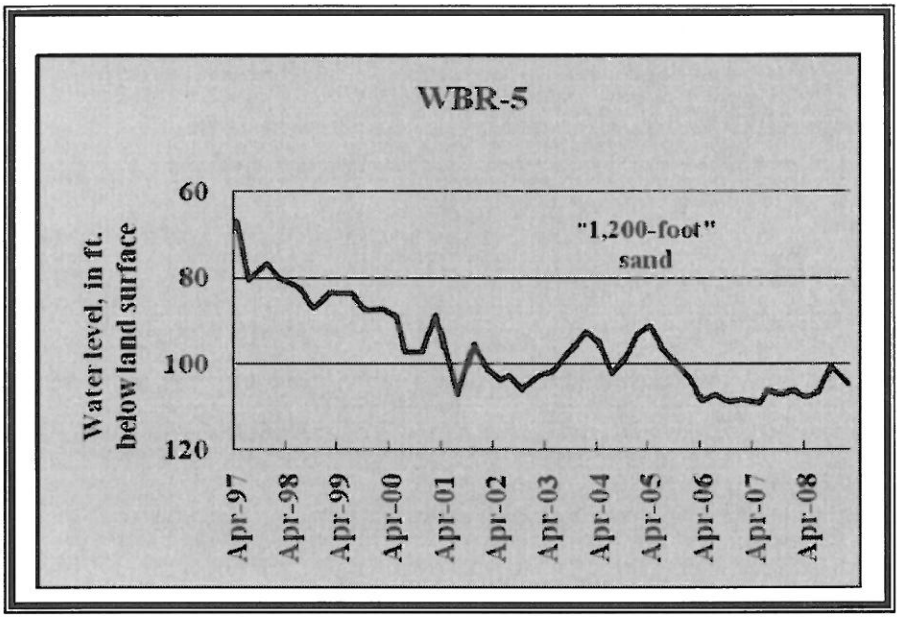
Aquifer	East Baton Rouge	East Feliciana	Pointe Coupee	West Baton Rouge	West Feliciana	Total
Shallow	.130				.001	0.130
400	3.763					3.763
400/600	5.676					5.676
600	6.479					6.479
800	3.377			1.282		4.659
1,000	8.065			1.346		9.411
1,200	20.467	0.016	0.960	1.156	0.001	22.600
1,500	15.474	0.095	0.210	3.343		19.122
1,500/1,700	8.327					8.327
1,700	6.298		0.477	0.152		6.927
2,000	20.705	0.030	0.323		2.391	23.449
2,400	19.608	0.381	0.307		1.001	21.297
2,800	30.956	1.705	1.381		0.772	34.814
Catahoula		1.758				0.758
TOTALS	49.325	2.985	3.658	7.279	4.166	167.413

"1,200-Foot" Sand

A proposal was made before the Commission at the March 16, 2010 meeting requesting that the "1,200-foot" sand be reserved for public-supply use only. The long-range plan for public-supply water involves the development of an area north of the main industrial area near the old Mississippi River bridge and the U.S. 190 loop.

A potentiometric map of the "1,200-foot" sand for the year 2001 was published as Water-Resources Investigations Report 03-4020 in a cooperative study with the U.S. Geological Survey. At that time the water level was about 140 feet below land surface (sheet 2 of report) in the industrial area. The nearest observation well, WBR-5, at Port Allen shows a current water level of about 100 feet below land surface (see graph).

As mentioned earlier, the effectiveness of a scavenger well system is being studied for the well field at Lula Station. At present, six wells pump from the "1,500-foot" sand.



Successful collection of saltwater from the base of this sand will add years of production from the pumping wells.

In the April 2010 issue of the newsletter, we did a summary of saltwater encroachment problems for the ten major aquifers in the Capital Area. Unfortunately, the "1,200-foot" sand was left out and is discussed below.

- "1,200-foot" sand. – Over the past decade well EB-621 at Westminister Station has shown chloride concentrations above background level (>10 mg/L). The well is located on the Baton Rouge fault line, and some leakage across the fault is suspected. No well logs are located nearby on the south side of the fault (downthrown side). Mentioned earlier, however, well EB-805 located at Nesser Overpass, 1 ½ miles to the east in the "1,000-foot" sand is known to contain salty water.

Water-Saving Tips

Occasionally we need to refresh our memories about water conservation practices around the household. Most of us are aware of the ideas listed below, but like most procedures such as safety regulations or defensive driving, we may become lax in following them.

Indoor tips. –

- Toilet tank leaks are a common source of water waste. Add a little food coloring to the tank. If there is a leak, color will appear in the toilet bowl. Replacement parts may be needed to correct the problem.
- Don't flush the toilet unnecessarily. Dispose of tissues, insects and other waste in the trash can instead of the toilet.
- Take shorter showers. Replace old shower heads with a low-flow version.
- Operate dishwashers and clothes washers only when fully loaded, or set the water use for the size of load being washed.
- Don't use running water to thaw meat or frozen foods. Defrost overnight in the refrigerator or use the defrost setting on the microwave.

Outdoor tips. –

- Don't overwater your lawn. A heavy shower eliminates the need for watering as long as two weeks.
- Don't water the street, driveway and sidewalk. Water the lawn and forget the paved areas.
- Don't use the garden hose to sweep down the driveway. Use a broom or blower instead.
- If you use a hose nozzle for watering, when finished shut off the hose at the faucet to avoid a leak at the nozzle.
- If you have a water well, check the pump occasionally to see if the pump kicks on and off when no water is being used. If it does, you may have a leak somewhere.

These are only a few suggestions. You can find others by going to the internet.

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 36, Issue 2 **NEWSLETTER** *October 2010*

Commission & District News

Scheduled Meetings – The Technical Committee will meet at 1:30 p.m. Tuesday, December 7, 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, December 14, 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.

September Meetings – The Technical Committee met Tuesday, September 14, 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 Dr. Frank Tsai, LSU, gave an update on the scavenger well modeling study in the vicinity of Lula pumpage station. Saltwater encroachment is moving northward toward the pumping wells at Lula and the purpose of the project is to delay or prevent saltwater from reaching the wells which are screened in the "1,500-foot" sand. In 2009, six wells at the station pumped an average of 7 million gallons per day.

Twelve scavenger well scenarios were presented with various configurations of wells beginning on January 1, 2011. Several findings and recommendations were noted and will help to develop an optimum plan of action to control the invasion of salty water toward Lula pumping station. Scavenger wells may also effectively reduce chloride concentrations in the Government Street wells.

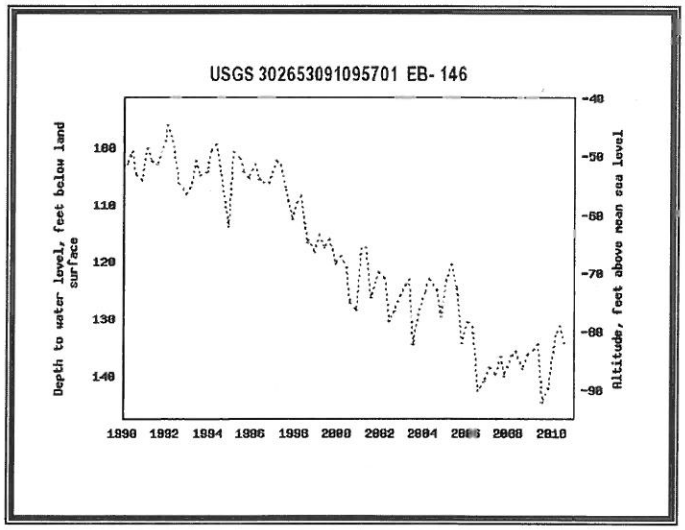
Dan Tomaszewski, USGS, presented some information on the "1,200-foot" sand in East Baton Rouge and surrounding parishes. The "1,200-foot" sand does not have the problem of saltwater encroachment such as the "1,500-foot" sand. However, some wells, for example EB-621, are located very close to the Baton Rouge fault, and have shown a rise in chloride concentration in the recent past. Hydrographs of observation wells in the Capital Area indicate water-level declines since the mid-nineties. The water level in EB-146, south of the cone of depression (see graph), has hovered between 130 and 140 feet below land surface for the past 4 years. The potentiomentric map of the "1,200-foot" sand in 2001 shows a maximum water level of about 150 feet.

Water Reclamation

Considering the droughts of recent years, many communities are looking at the reuse of wastewater as a valuable resource to be conserved. Southern California has led the way in the use of barrier wells to counter the advance of seawater into a freshwater aquifer. Originally, these wells were supplied by potable water from water treatment plants. Wasted sewer water is now considered useful in that area and is reused by treating it in an advanced water treatment facility. Aquifer recharge may be accomplished with direct injection into an aquifer by a combination of media filtration (MF), reverse osmosis (RO) or ultraviolet light (UV) which produces potable-quality water.

In Miami, Florida the Biscayne aquifer is designated a sole source aquifer. In 2007, the South Florida Water Management District issued a permit to use the South District Water Reclamation Plant as an alternative source to meet future water demands. The reclamation project, capable of producing 21 million gallons per day will become operational in 2014. Like the West Coast, injected water would act as a barrier to seawater invasion.

A study was made some years ago to look at the reuse of wastewater in the Capital Area. The public water supply here is excellent quality and with proper treatment, could be injected back in aquifers with the same water



quality from which it was originally pumped. The injection well(s) would be located at some distance from active pumping wells and the injected water would be treated to drinking water standards.

Alternative Sources for Baton Rouge

Mississippi River. – Although limitless in volume, the Mississippi River has high hardness which would require considerable treatment to be considered as an injection source for ground water. However, after treatment for hardness it may be possible to blend it with the public-supply ground-water distribution system which has a hardness generally less than 10 mg/L/.

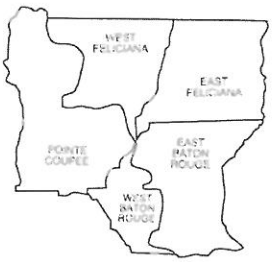
Amite River. – Unlike the Mississippi River, the Amite River is fed by source water within the Amite River Basin in Louisiana and and southern Mississippi. Fed primarily from overland runoff and shallow ground-water base flow, the water is of good quality, having low harness and total dissolved solids. Treatment would be simpler and the water would blend well with the ground-water system. The eventual completion of the Amite River Diversion Canal would also be a viable source of good quality water consisting mostly of local rainwater runoff.

Ground Water of Inferior Quality. – The undesirables in ground-water supplies usually consist of some combination of iron, manganese, hydrogen sulfide and possible color and pH. Some of the aquifers in the Capital Area are passed over because of these problems. However, with proper treatment these constituents can be treated to drinking water standards. The removal of suspended solids, such as in surface water, would not be needed. On-site treatment could be accomplished at each well site before the water entered the distribution lines.

Reverse Osmosis. – This procedure has been in operation for some time now, and through the technological advances made, is a viable means of producing fresh water from brackish or salty water. It is used primarily in coastal areas where the seawater is converted to potable drinking water. As the name implies, salty water under pressure is filtered by osmosis through a porous membrane to become fresh water. Permeate, or fresh water recovery requires a higher osmotic pressure the higher the salinity of the water. The moderately saline water in the local aquifers is considerably less salty than seawater and would operate more efficiently. According to a book titled ***desalination.com,*** seawater systems operate at a 30 to 40 percent recovery rate. Brackish water RO systems are able to convert 70 to 85 percent of the feed into potable water. For the brackish waters in the Capital Area, the disposal rate of saline water would be much less.

Scavenger Wells. – In areas of saltwater encroachment two wells, one pumping fresh water and the other pumping saltwater at the base of the aquifer, are pumped simultaneously. The salty water is collected for disposal or reinjected back into the salty zone of the aquifer and the fresh water is usable as a potable supply.

The Capital Area Ground Water Conservation Commission is currently involved with Baton Rouge Water Company and Louisiana State University to model a scavenger well system in the "1,500-foot" sand near Lula pumping station. If successful, the control of the salty water moving toward this pumping station would add years to the life of the public-supply wells located there.



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 36, Issue 3 **NEWSLETTER** *January 2011*

Commission & District News

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

December Meetings –The Technical Committee met Tuesday, December 7, 2010 at 1:30 p.m. at the U.S. Geological Survey conference room, 3535 South Sherwood Forest, Baton Rouge, LA.

Chairman Mark Walton brought the meeting to order. Don Dial introduced the speaker, Dale Nyman, who is a retiree from the U.S. Geological Survey and now works as a consultant. He talked about the physical and hydraulic characteristics of the group of sands that comprise the Southern Hills aquifer system. His work is being funded by DOTD, Water Resources Section under Zahir "Bo" Bolourchi. The results of the study will be published later.

The study focuses on the recharge (outcrop) areas and includes all the sands containing fresh water from the "400-foot" sand to the "2,800-foot" sand. Below the "2,800-foot" sand is the Catahoula aquifer which contains fresh water north of East Baton Rouge Parish. This little-used sand is a source of recharge to the sands above it, which are heavily pumped in the industrial area.

Nyman described each sand starting with the "400-foot" sand, including the area of recharge, sand thickness, hydraulic conductivity and time of travel from the recharge area to 6 miles south of the north border of East Baton Rouge Parish. Potentiometric maps and hydrographs were shown for each sand. Time of travel from the recharge areas in some cases, such as the "2,000-foot" sand, may be slowed by clay beds with low hydraulic conductivity. The discontinuity of the sand may be the cause of low water levels in the industrial area.

Nyman's conclusion was that we have a ground-water system of immeasurable value with a renewable source of water that will be available for generations to come.

Jason Griffith, USGS, gave a progress report on the Baton Rouge modeling study. Model calibration and parameter estimation are continuing with the PEST and MODFLOW programs. The primary problem of concern was the poor convergence between observed and simulated water levels in the "2,000-foot" sand near the Baton Rouge fault. For example, graphs showed that simulated levels at well EB-1028 north of the fault were higher than observed levels over the past 20 years. At well EB-803B south of the fault, the simulated levels were lower than observed levels over a 40 year period. The modeling team will try to determine which segments along the fault may be more or less leaky. A copy of the progress report is available at the District office.

Advocate Reports on Scavenger Wells

The November 8, 2010 issue of the Baton Rouge Advocate reported on the installation of scavenger wells to control saltwater encroachment moving toward the Lula Station. At present, six wells pump from the "1,500-foot" sand at that location, and chloride concentrations have been rising in some wells.

The purpose of scavenger wells is to locate the wells south of Lula Street to intercept salty water moving northward. The first test well was scheduled to be drilled in November 2010, and the purpose was to locate the leading edge of salty water. The scavenger wells will be positioned to act as barrier wells to prevent further encroachment toward the pumping station. The zone at the base of the aquifer that contains the denser salty water will be screened and pumped simultaneously with the public-supply wells. Electrical logs of the test wells will be needed to define the interface between fresh and salty water.

USGS Well Survey

More than a third of the U.S. population has public water systems that use ground water as their source. The U.S. Geological Survey reported in a recent survey that over 20 percent of untreated samples from 932 public wells across the country contained at least one contaminant that could be a health concern. The study focused on untreated water before treatment rather than the finished water delivered to the customers. Naturally occurring contaminants such as radon and arsenic accounted for about 75 percent of the contaminant concentrations in untreated source water. The other 25 percent included man-made contaminants such as herbicides, insecticides, solvents, disinfection by-products, nitrate and gasoline chemicals. Most of these were detected in unconfined aquifers.

The USGS reported that contaminant detection did not necessarily indicate health problems because the agency's analytical methods have improved to the point that they can detect contaminants at much lower concentrations than previously. Thus, many of the reported detections are

well below the maximum contaminant levels for the constituents.

The study was made to (1) determine the occurrence of contaminants in source water for public-supply wells and their effect on human health and (2) determine if the contaminants found in source water were removed in the finished water after treatment.

Ground-Water Withdrawal and Sea Level Rise

A recent article published in the Geophysical Review Letter (Nov. 20, 2010) indicated that runoff and evaporation from worldwide ground-water withdrawal accounts for about 25% of today's rising sea levels. It was reported that ground-water removal went from 99.7 million acre-feet in 1960 to 229.4 million acre-feet in 2000.

Researchers at Utrecht University (Holland) calculate the worldwide extraction of ground water to a rise in sea level of 0.8 mm per year. The total rise of 3.1 mm per year estimated by IPCC (Intergovernmental Panel on Climate Change) includes about 50% of the total to thermal expansion and 25% to runoff from glaciers and ice caps.

Ground-water mining is the process of extracting water from a source at a rate in excess of its replenishment rate causing ground-water levels to persistently decline. The final result would be exhaustion of the supply or a decline in pumping levels to uneconomic depths. Some areas of the world, e.g. Northern China, Northern India, the San Joaquin Valley in California and the U.S. High Plains area are heavily dependent on ground water as a major source of water.

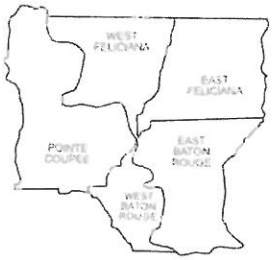
In coastal areas the apparent sea level rise may be due, in part, to land subsidence resulting from the extraction of ground water. Subsidence from low-lying areas near the coast in the Houston-Galveston area faced disastrous results affecting whole neighborhoods.

New Wells in the District

Several new wells are planned or completed in the Capital Area. In East Baton Rouge Parish, Formosa Plastics Company is drilling a new well in the "1,200-foot" sand. In West Baton Rouge Parish, well WBR-218 was completed last spring in the "800-foot" sand at Hunter's Run site for West Baton Rouge Gas & Water. The parish also has another well near completion south of Hunter's Run on the west side of Highway 1. It is expected to be completed in the "800-foot" sand. Wells are also in the planning stages for a well for West Baton Rouge Water District No. 2 south of Port Allen and for West Baton Rouge District No. 4 on East Hugh Loop Road on the north side of U.S. Highway 190. Port Allen is expected to drill a new well later this year to augment their supply. It will replace an older well that will be abandoned or placed on standby.

Freedom is never more than one generation away from extinction. We didn't pass it to our children in the bloodstream. It must be fought for, protected, and handed on for them to do the same, or one day we will spend our sunset years telling our children and our children's children what it was once like in the United States where men were free.

Ronald Reagan



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 36, Issue 4 **NEWSLETTER** *April 2011*

Commission & District News

Upcoming Meetings – The Technical Committee will meet at 1:30 p.m. Tuesday, June 7, 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, June 14, 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. **Please note this is a change from our normal second and third Tuesday rotation.**

March Meetings – Due to the Mardi Gras Holiday, there was no meeting of the Technical Committee this past March.

Passing of the Baton – Don Dial retired as Director effective February 5, 2011. Don earned a BS in Geology from Southern Illinois University in 1960, degree in geology, and a MS in Geology from SIU in 1962. He began working for the U.S. Geological Survey, Water Resources Division in 1965 as a Hydrologist. He retired from the USGS in 1987.

Not one to be content just sitting at home, Don worked for the Louisiana Geological Survey as a Research Associate, involved with development of a Groundwater Protection Strategy. He also worked as a Research Associate doing water-quality and geologic reviews from 1988-1990. Don also worked for LA DEQ, as a geologist, in the Solid Waste Division and the Ground Water Protection Division from 1991-1992.

In 1994 Don succeeded George Cardwell as Director of the Capital Area Groundwater Conservation District. During his tenure as Director, Don worked on the ground water remediation project that was supported by a grant under section 319(h) of the Clean Water Act along with George Cardwell. A report, "A Connector Well to Protect Water-Supply Wells in the "1,500-foot" Sand of the Baton Rouge, Louisiana Area from Saltwater Encroachment" was published in 1999.

In 1997 the Commission began permitting water wells in the 5-parish area. The purpose of the permitting is to ensure that the drilling and construction of the water well will not adversely affect the ground water in the District.

More recently, a cooperative project, "Model Study of the Simulation of Ground-Water Flow in the "1,500-foot" and the "2,000-foot" Sands and Movement of Saltwater in the "2,000-foot" sand of the Baton Rouge Area, Louisiana" was begun with the City of Baton Rouge, the Louisiana Department of Transportation and Development & the Commission. This project is scheduled to be completed by September of 2012.

We wish Don the best in his "second" retirement. When not working out, Don can usually be found working in his garden or spending time with his family.

Around the State

Ruston Daily Leader Editorial
By Rick Hohlt
(reprinted with permission)

D'Arbonne water use a good plan

Residents of Lincoln and Union parishes enjoy an abundant usage of water.

One day, however, they could turn on the hose to clean their vehicles and discover that no water comes out.

The Sparta Aquifer, the primary source of water for Union, Lincoln and 13 other North Louisiana parishes, has for decades been used at a higher rate than it can naturally be replenished by rainfall. Due to overuse, the aquifer levels are declining between one and four feet per year, putting us on the path to eventually running out of water. The lower water levels have already caused water quality issues in a few areas.

Some Sparta users are tapping into alternative water sources. The municipalities of Ruston and Farmerville may be among this group in the coming years if funding is obtained. The Union-Lincoln Regional Water Supply Initiative is a proposed project that would allow Lake D'Arbonne to be utilized for drinking purposes. A facility would be constructed that would get the lake water up to drinking standards and then transport it via pipelines to the municipalities of Ruston and Farmerville.

It makes sense to utilize the lake for potable water purposes based on the following facts:

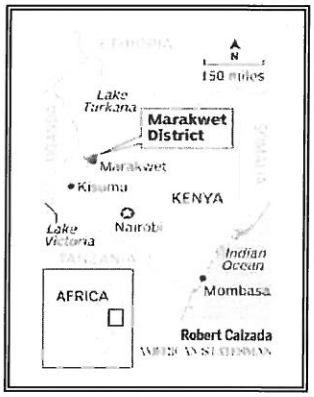
- When Lake D'Arbonne was built in the late 1960s and early 1970s, it was meant to be a future water supply for portions of Lincoln and Union parishes.
- Ruston and Farmerville own the rights to the lake.
- There is an ample supply of water in the lake, with water flowing over the spillway 90 percent of the time. Even in an extreme drought situation with no water entering the lake, the 12 million gallons of water per day drawn from the lake to be treated would only drop the water level 1/35 of an inch. This is significantly less than the rate of evaporation in the lake, which Bayou D'Arbonne Lake Watershed District Board of Commissioners Vice President Steve Cagle said is about a quarter inch per day.
- Due to lower water levels and the resulting saltwater intrusion, the quality of Sparta water is diminishing in some places, including parts of Union Parish.

North Louisiana faces a serious water crisis. We are fortunate that potential solutions are surfacing.

Around the World

(Dr. Bruce Darling is a graduate of ULL)

Nobel-prize winning Doctors Without Borders, famous. Dentists Without Borders ("We make the world smile")



and Engineers without Borders ("The Blueprint Brigade"), not so much.

Add to the latter list Hydrogeologists Without Borders, which recently dispatched an Austin hydrogeologist as a technical adviser for its work in Kenya.

Bruce Darling, 59 , an Austin Community College lecturer who works out of his Southwest Austin home as a consultant, returned in January from a trip scoping out clean water options for a rural region of Kenya.

What he and another hydrogeologist found was jarring: Women walked several times a day, up to 4½ miles , to bear as many as 8 gallons of water from springs and centuries-old furrows, basically modest canals. Around the springs' headwaters were feces, and some of the furrows were shared with goats. The region has little electricity, and villagers did not boil their water.

"There's a lot of waterborne disease," Darling said. "We want to improve access to safe water, to develop secure supplies that will have an impact on human health and help out their economies."

Darling, who plans to return to Kenya this summer, said the group is trying to figure out which springs are reliable and will probably engineer a system to pipe the water by gravity from upland springs to valley villages. They also want to do a public education campaign to stop the contamination of water resources.

The design phase of the project will cost as much as $150,000, said Laurra Olmsted, the Calgary, Alberta-based executive director of Hydrogeologists Without Borders, which got off the ground in 2005.

Parts of the developing world "don't have proper education to solve problems, they don't have water and they don't have resources, meaning money," she said.

The objective of Hydrogeologists Without Borders is to get water to people who need it, but the Kenya initiative began as a Christian mission by a pair of Anglican seminarians, one a native of the Kenya region and one in Tennessee. They approached the nonprofit group about the project, and a Tennessee Rotary club chipped in most of the money for the January trip.

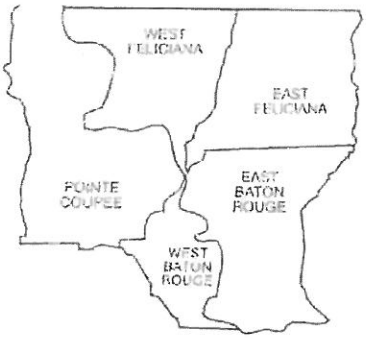
"There's a discrepancy between the way we live here and the way" they live, said Mina McVeigh, a member of a Tennessee church where the seminarians practice.

After the nonprofit decided to work on the project, it sought volunteers. The University of Texas' Jackson School of Geosciences e-mailed the request to a group of alumni and professionals, which is how Darling got wind of it.

"I had always wanted to go to Africa," said Darling, who has spent much of his career doing water development and exploration work in Texas.

He said he looks forward to returning, despite the hardships.

"Two weeks of cold showers, eating goat every day, takes a toll on you," said Darling. His nondescript, one-story home now sports a Masai spear, a gourd that once bore goat-milk, and a colorful yellow and red tablecloth announcing "Hakuna matata" — Swahili for "no worries."



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 1 **NEWSLETTER** *July 2011*

Commission & District News

Upcoming Meetings – The Technical Committee will meet at 1:30 p.m. Tuesday, September 13, 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, September 20, 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.

June Meetings – The Technical Committee met on Tuesday, June 7, 2011 in the Conference Room of the US Geological Survey.

Chairman Dennis McGehee introduced the new Director, Tony Duplechin, who opened a discussion on the issue of salt-water intrusion. He had been contacted by Baton Rouge Metro Councilman Rodney "Smokey" Bourgeois several weeks earlier, who asked him if he had read the "Hays Town report." This report, which as it turns out was a college term paper, talks about salt-water intrusion in Baton Rouge and recommends industry and power generators completely wean themselves from using groundwater. Councilman Bourgeois was to bring the issue before the Metro Council at the May meeting, but decided to wait until June after speaking to Mr. Duplechin, who planned to attend the Metro Council meeting the following afternoon.

The guest speakers were representatives of the Louisiana Department of Natural Resources Office of Conservation. Dr. M. B. Kumar is Director of the Oil and Gas Geological Division and Gary Snellgrove is Director of the Environmental Division. They offered a very thorough overview of the Office of Conservation's duties and responsibilities concerning the permitting, exploration, production, waste management and groundwater resource protection as is related to the Tuscaloosa Marine Shale oil play across the Florida Parishes and through Central Louisiana.

Dr. Kumar explained oil and gas well construction, and how the extraction of fluids from shales necessitates hydraulic fracturing, or "fracing" the shale. This is done by forcing water at very high pressures through the perforations in the well casing, then introducing propping agents into the fractures to allow for oil or gas to flow. So far only five wells have been completed in the Tuscaloosa Marine Shale; four in the Florida Parishes and one in Rapides Parish.

Mr. Snellgrove explained that wells completed in the Haynesville Shale in northwest Louisiana require approximately 5 million gallons of water per well to frac. He was not sure how much water is needed for the Tuscaloosa Marine Shale, but his Division authorizes the use of groundwater for such activities. Produced water is then either disposed of on-site or at an off-site facility.

The Office of Conservation, through its Engineering Division, is also responsible for inspection and enforcement activities at oil and gas exploration and production sites. District Offices are located in Shreveport, Monroe and Lafayette.

2011 Louisiana Legislative Update

Senate Bill 48 by Senator Gerald Long made some slight but important changes to the membership and meeting requirements of the Louisiana Groundwater Management Advisory Task Force, on which the Capital Area Groundwater Conservation District is represented.

SB 48 would statutorily place the Task Force within the Louisiana Department of Natural Resources' Office of Conservation. Membership on the task force was revised and includes:

A person representing the office of the governor appointed by the governor.

The president of the Louisiana Senate or his designee.

The speaker of the Louisiana House of Representatives or his designee.

The chair of the Senate Committee on Natural Resources or his designee.

The chair of the Senate Committee on Environmental Quality or his designee.

The chair of the House Committee on Natural Resources and Environment or his designee.

The district engineer of the United States Army Corps of Engineers, New Orleans District, or his designee.

The Louisiana State Conservationist, USDA Natural Resources Conservation Service or his designee.

The chancellor of the Louisiana State University Agricultural Center or his designee.

The executive director of the State Soil and Water Conservation Commission or his designee.

The director of the United States Geological Survey, Louisiana Water Science Center or his designee.

The director of the Louisiana Geological Survey or his designee.

The executive director of the Louisiana Wildlife Federation or his designee.

The president of the Louisiana Farm Bureau Federation or his designee.

The president of the Louisiana Chemical Association or his designee.

The executive director of the Coalition to Restore Coastal Louisiana or his designee.

The president of the Louisiana Rice Growers Association or his designee.

The executive director of Louisiana Mid-Continent Oil and Gas Association or his designee.

The president of the Louisiana Cotton and Grain Association or his designee.

One representative of the Capital Area Groundwater Conservation District.

One representative of the Sparta Groundwater Conservation District.

The executive director of the Louisiana Forestry Association or his designee.

One representative of the Sabine River Authority.

The president of the American Sugar Cane League or his designee.

One representative of the Red River Compact Commission.

The executive director of the Lake Pontchartrain Basin Foundation or his designee.

The executive director of the Barataria - Terrebonne National Estuary Program or his designee.

The president of the Louisiana Crawfish Farmers Association or his designee.

The chairman of the Louisiana Pulp and Paper Association or his designee.

A representative of the Louisiana Engineering Society who is a registered engineer with water resources management experience.
A representative from Louisiana State University, Department of Geology and Geophysics.

A representative from the University of Louisiana at Lafayette, Department of Geology.

A representative of the Association of Electric Utilities.

A representative of the League of Women Voters.

A representative of the Citizens for a Clean Environment.

A representative of the Louisiana Oil and Gas Association.

A representative from the Louisiana State University at Shreveport, Red River Watershed Management Initiative.

A representative of the New Orleans Sewerage and Water Board.

One representative of the Louisiana Rural Water Association.

The president of the Louisiana Soybean Association or his designee.

The president of the Louisiana Cattlemen Association or his designee.

A representative of the Louisiana Ground Water Association.

The dean of the Southern University College of Agriculture, Family, and Consumer Science or his designee.

A representative of the Irrigation Association.

The Ground Water Management Advisory Task Force was created to assist the commissioner of conservation and the Ground Water Resources Commission in continuing to develop a statewide ground water resource management program that would include, but not be limited to:

an evaluation of the state's ground water resources including current and projected demands on the aquifers of the state;

development of a water use conservation program;

study of alternatives to ground water use, such as surface water, to include treatment and

transmission systems; and reclaimed water;

incentives for conservation;

use of alternative technologies; and

education and conservation programs. The plan should stress conservation as the primary mechanism for the protection of the state's ground water resources.

SB 48 also specified that fifteen members of the task force shall constitute a quorum.and that when a quorum is present, the favorable vote of at least ten members of the task force or a simple majority of the total membership present, whichever is greater, shall be required for the commission to take action on any matter.

Finally, the meeting frequency of the Task Force has been reduced from once per calendar quarter to once per year, or more frequently as necessary.

SB 48 was signed into law by Governor Jindal as Act 301 of 2011.

Senate Resolution 141 by Senator Dan Claitor was drafted to urge and request the Capital Area Groundwater Conservation District to study saltwater intrusion into the groundwater resources in the capital area, and to consider the effects of industrial uses on such saltwater intrusion and groundwater resources.

The Resolution stated:

WHEREAS, the Capital Area Groundwater Conservation District ("district") was created to provide for the efficient administration, conservation, orderly development and supplementation of groundwater resources in the parishes of East Baton Rouge, East Feliciana, Pointe Coupee, West Baton Rouge and West Feliciana; and

WHEREAS, because of large withdrawals from the aquifer system in the capital area, historical patterns of groundwater flow have been altered over the years; and

WHEREAS, the district, in coordination with various public and private groups, has conducted numerous studies and modeling on the issues affecting the groundwater resources in the capital area; and

WHEREAS, recently, Hays Town, a hydrology student, made a presentation to the East Baton Rouge Parish Metropolitan Council about the effects of saltwater intrusion on 16 the freshwater supply of East Baton Rouge Parish; and

WHEREAS, Mr. Town indicated that the saltwater intrusion is being exacerbated by industries which pull excessive amounts of groundwater from the aquifer system in the capital area.

THEREFORE, BE IT RESOLVED that the Senate of the Legislature of Louisiana does hereby request the Capital Area Groundwater Conservation District to study saltwater intrusion into the groundwater resources in the capital area, to consider the effects of industrial uses on such saltwater intrusion and groundwater resources, and to report its findings and recommendations to the Senate Committee on Natural Resources by February 1, 2012.

BE IT FURTHER RESOLVED that a copy of this resolution be transmitted to the director of the Capital Area Groundwater Conservation District.

SR 141 was introduced on June 21 and was not acted upon by the Senate.

Meanwhile, in Texas ... SB 332 signed into law

By Texas and Southwestern Cattle Raisers Association

FORT WORTH, TEXAS – The long-awaited groundwater ownership bill was signed into law by Gov. Perry today. SB 332, by Senator Troy Fraser (R-Horseshoe Bay) and Allan Ritter (R-Nederland), clarifies that landowners own the groundwater below their land as real property.

Landowner groups across Texas, including the Texas and Southwestern Cattle Raisers Association (TSCRA), worked alongside members of the Texas Legislature to ensure SB 332 was passed and made law.

"We want to thank Chairmen Fraser and Ritter, Lt. Gov. Dewhurst, Speaker Straus and the rest of the legislature who worked hard to pass SB 332," said Joe Parker Jr., rancher and TSCRA president. "And we want to especially thank Gov. Perry for recognizing the importance of this bill and signing it into law."

SB 332 states that, "The legislature recognizes that a landowner owns the groundwater below the surface of the landowner's land as real property." The bill goes on to say that landowners are entitled to drill for and produce the groundwater below the surface of real property. SB 332 reaffirms this landowner ownership, but still allows local groundwater conservation districts the ability to manage groundwater.

SB 332 will go into effect Sept. 1, 2011.

The Texas and Southwestern Cattle Raisers Association is a 134-year-old trade organization. As the largest and oldest livestock association in Texas, TSCRA represents more than 15,000 beef cattle producers, ranching families and businesses who manage approximately 4 million head of cattle on 51.5 million acres of range and pasture land, primarily in Texas and Oklahoma. TSCRA provides law enforcement and livestock inspection services, legislative and regulatory advocacy, industry news and information, insurance services and educational opportunities for its members and the industry.

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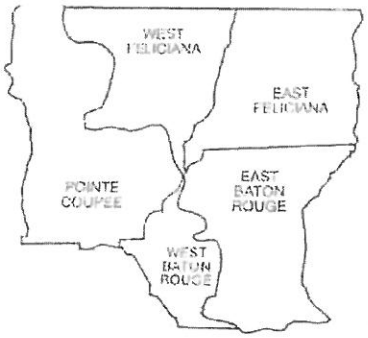


Capital Area Ground Water Conservation Commission

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.

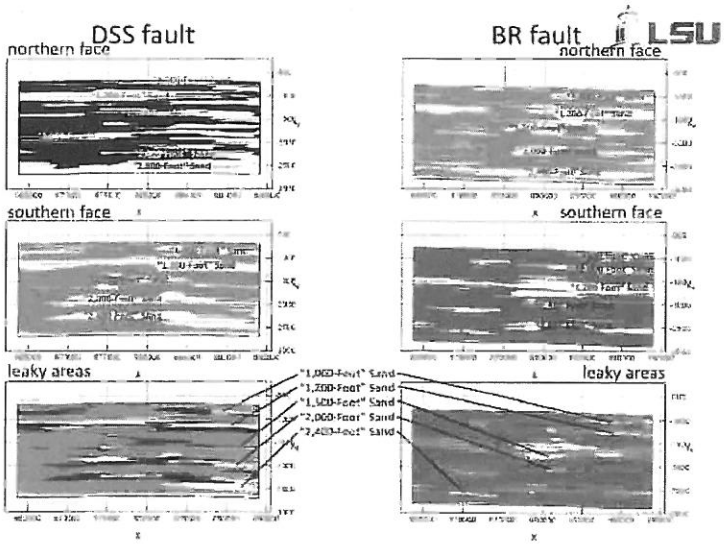
He began by reviewing the tasks of the study:

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 "2,000-foot" 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 simulated-concentration 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.

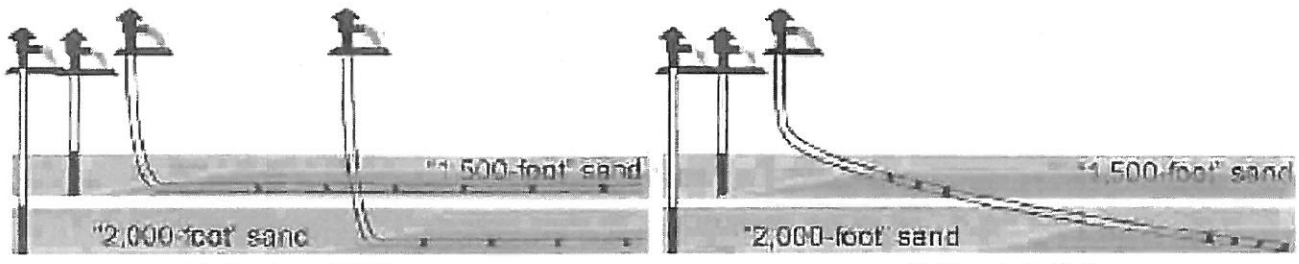
PLANS FOR NEXT QUARTER:
Continue calibration of solute-transport simulation.

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 1,500-foot 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.

Tuscaloosa Marine Shale

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

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.

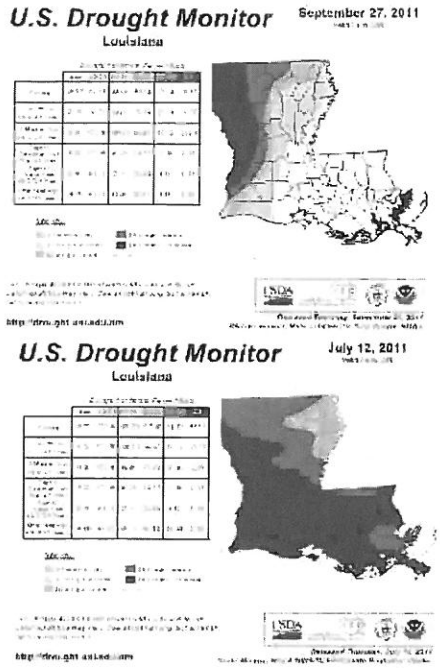
"Lee took a big bite out of the drought in Louisiana," said state climatologist Barry Keim. "It produced that much rain."

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.

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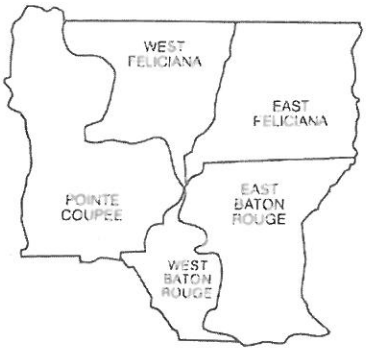


Capital Area Ground Water Conservation Commission

Watching out for A Treasured Earth Resource

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

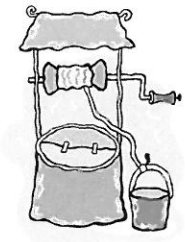
Volume 37, Issue 3 **NEWSLETTER** *January 2012*

Around the District

EBR Metro Council Request

The East Baton Rouge Metro Council recently sent a resolution to the Commissioner of the Louisiana Office of Conservation, Mr. James H. Welsh, requesting him to call a hearing to accept testimony and other evidence regarding "the lowering of the water table under East Baton Rouge due to excessive pumping of groundwater…". Commissioner Welsh, in turn, forwarded a request to the Capital Area Groundwater Conservation Commission (CAGWCC) for "… current and future plans approved or under consideration to address the saltwater encroachment over the Baton Rouge Fault and towards the location of public supply wells used to provide drinking water to residents of East Baton Rouge."

CAGWCC met on November 6 to discuss the request, and a response was submitted to Commissioner Welsh following the December 13 Commission meeting. Commission Chair Causey and District Director Duplechin met with Commissioner Welsh and his staff on January 17 to discuss the issue.



Commission News

Upcoming Meetings

The Technical Committee will meet at 1:30 p.m. Tuesday, March 13, 2012 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, March 20, 2012 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.

December Meetings

Technical Committee

The Technical Committee met on Tuesday, December 6, 2011 in the Conference Room of the US Geological Survey.

Chairman Dennis McGehee brought the meeting to order. The following topics were discussed:

1. Request from Commissioner Welsh (see story above)
2. Presentation from Dr. Doug Carlson of the Louisiana Geological Survey for a draft proposal titled:

   "Baseline Determination of Water Quality of Southern Hills Aquifer System, in South Louisiana."

   Dr. Carlson is seeking a letter of support for this project from CAGWCC. A motion to send a letter of support was passed unanimously.
3. Jason Griffith (USGS) gave a progress report on the Baton Rouge model (Simulation of Ground-Water Flow in the "1,500-foot" and "2,000-foot" Sands and Movement of Saltwater in the "2,000-foot" Sand of the Baton Rouge Area) that USGS has been working on and solicited comments on future possible simulation scenarios for the modeling project.

Progress

- Began calibration of the saltwater-transport simulation
- Began discussions with Capital Area District

water planners and managers about developing hypothetical future pumping scenarios.

- Continue writing text of the report.

Plans for Next Quarter

- Continue calibration of solute-transport simulation.
- Meet with water planners & managers to discuss future pumping scenarios.

Commission Meeting

The Capital Area Groundwater Conservation Commission met on Tuesday, December 13, 2011, in the Conference Room of the US Geological Survey.

There was much discussion about the response to Commissioner Welsh (see Technical Committee report), and a response was approved by unanimous vote. The Administrative and Technical Committees reports were presented. In addition, Commissioner Walton made a motion for the USGS to prepare a schedule and scope of costs for future studies and maintenance of the existing model to be presented at the March meeting. Mr. Causey seconded the motion and it passed unanimously. Mr. Causey requested that the Director send a letter to the U.S. Geological Survey requesting this information.

Mr. Tom Killeen, of the Louisiana Dept. of Environmental Quality Water Permits Division, stated that his department received a letter from Baton Rouge Water Company concerning potential surface water discharges from a possible new scavenger well. He stated that his department's primary role is to work with the Capital Area Ground Water Conservation Commission and the water company to make sure decisions are made comprehensively. Mr. Killeen stated that for example if the discharge is a half million gallons per day at about 2000 parts per million chloride that the department has an obligation to address it. The question would be how would the department address and define it. Some possibilities would be through a LPDES permit or by a letter authorizing the discharge. Mr. Killeen stated that his department intends to discuss this further with the Baton Rouge Water Company.

Groundwater Association holds Annual Meeting in Louisiana

The Groundwater Management Districts Association held their Annual Conference on January 11-13, 2012, in New Orleans at the Astor Crowne Plaza in the French Quarter.

GMDA is composed of local groundwater management districts in several Midwestern and Southern states.

At the Annual meeting there were presentations on Mississippi River Navigation and Dredging (US Army Corps of Engineers), the Atchafalaya Basin (Iberville Parish Council Office) and the Lake Pontchartrain Basin (Lake Pontchartrain Basin Foundation). A field trip was also held in which several post-Katrina USACE projects were highlighted, including the 17th Street Canal Pumping Station, the Seabrook Floodgate Complex and the Inner Harbor Navigation Canal Surge Barriers (as seen below).

Photo by Ray Devlin

Statewide Ground Water Management Plan

The Louisiana Department of Natural Resources (DNR), Office of Conservation, hosted a series of public meetings in November to provide information on the state's past and current ground water resources management practices and the draft recommendations for a state ground water plan.

Public comments were received during the meetings and written comments were accepted through November 21, 2011.

A draft copy of the recommendations document can be viewed at:

www.dnr.louisiana.gov/draftstatewidewaterplan

Public meetings were held in the following locations:

Ruston	Alexandria
Crowley	Baton Rouge
Shreveport	

Meeting transcripts and written public comments can be viewed at:

http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=475

Groundwater Awareness Week:

March 11-17, 2012

"Time to schedule your annual water well checkup!"

Just as you check your furnace or smoke detector batteries seasonally, spring is a good season to have an annual water well checkup before the peak water use season begins, according to the National Ground Water Association (NGWA).

Why is it a good idea to have my water well checked annually?

An annual checkup by a qualified water well contractor is the best way to ensure problem-free service and

Schedule your annual water well checkup

Wells can provide high-quality drinking water, and about half the U.S. population receives its drinking water from wells. But with well ownership comes the responsibility of keeping the water well in good working order. A check of your well by a qualified water well contractor may include:

- A flow test to determine system output, along with a check of the water level before and during pumping (if possible), pump motor performance (check amp load, grounding, and line voltage), pressure tank and pressure switch contact, and general water quality (odor, cloudiness, etc.).
- A well equipment inspection to assure it's sanitary and meets local code.
- A test of your water for coliform bacteria and nitrates, and anything else of local concern. Other typical additional tests are those for iron, manganese, water hardness, sulfides, and other water constituents that cause problems with plumbing, staining, water appearance, and odor.

NGWA also recommends that well owners:

- Keep hazardous chemicals, such as paint, fertilizer,

- Maintain proper separation between your well and buildings, waste systems, and chemical storage areas.
- Periodically check the well cover or well cap on top of the casing (well) to ensure it is in good repair and securely attached. Its seal should keep out insects and rodents.
- Keep your well records in a safe place. These include the construction report, and annual water well system maintenance and water testing results.

LEO BANKSTON GROUND WATER CONSERVATION AWARD

CAGWCC is pleased to announce the continuation of its annual Leo Bankston Ground Water Conservation Award. This award was instituted to recognize water users in our district that demonstrate outstanding ground water conservation practices. The CAGWCC hopes to encourage good stewardship of our ground water resource by showcasing these projects.

Examples of conservation practices that would be considered for awards include:

* Reduction in pumpage of ground water

* Increased use of shallow sands to decrease pumping stress on deeper sands

* Technology improvements such as installation of flow meter or automatic control

* Process modifications that would switch to alternative sources such as gray water, river water or shallow sands

* Water recycling such as cooling water reuse

* Identifying and properly plugging abandoned wells

Any water user in the five-parish District (East Baton Rouge, West Baton Rouge, East Feliciana, West Feliciana and Pointe Coupee) is eligible to receive the award. To be nominated, the project must have been implemented during the previous calendar year (2011). The winner will be recognized by the Board of Commissioners and in the Commission's newsletter. Press releases will also be sent to local newspapers. The application for the award can be found on the Commission's website at www.cagwcc.com.

The award is named for former Commissioner Leo Bankston. Mr. Bankston was on the first Board of Commissioners when the Commission was organized in 1975, and served as its first Chairman. During his long career with the Baton Rouge Water Company he worked tirelessly to protect and conserve the priceless ground water resources in the five parish Capital area. Past winners of the award include Georgia Pacific Corporation, Exxon/Mobil and Honeywell International, Inc.