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### ***Deep Well Yields Important Information on Arbuckle-Simpson Aquifer***

OKLAHOMA CITY –Researchers will begin drilling a deep water well this week to gather first-time information on the age and movement of water thousands of feet underground in the Arbuckle-Simpson aquifer.

This Wednesday, the U.S. Geological Survey will begin drilling a test well near the Blue River, just west of Connerville in Johnston County. Hydrologists expect water samples gathered from the well to answer important questions concerning aquifer characteristics and water quality in the lower portion of the Arbuckle-Simpson.

The project is a major component of the ongoing Arbuckle-Simpson Hydrology Study, which was launched by the Oklahoma Water Resources Board two years ago. Focusing on the aquifer's complex surface and groundwater relationships, the goal of the study is to gather information that will result in improved management and protection of the resource. The Arbuckle-Simpson supports the flow of numerous springs and rivers—such as Byrd's Mill Spring and the Blue River—that provide water supply, recreation and other important benefits to the region.

According to Noel Osborn, a geologist who is coordinating the study on behalf of the OWRB, the Arbuckle-Simpson Hydrology Study is the most intensive analysis of its kind ever conducted in Oklahoma. "Construction of this deep well was envisioned early on as a crucial milestone in the study. Analyses of the chemistry and age of water samples drawn from the well will help us answer key questions about the Arbuckle-Simpson aquifer and how water flows through it," she points out.

Drilling the well, which will be completed to a depth of up to 3,000 feet, is both a costly and difficult operation. Yet, according to Scott Christenson, a USGS hydrologist who specializes in groundwater hydrology and water quality, resulting data could prove well worth the expense.

"Data gathered from the well will increase understanding of the aquifer's transmissivity, or the rate at which water moves through the formation," Christenson says, "but one of the really intriguing opportunities we have here is to gather data that can tell us the age of water deep in the aquifer."

Christenson is a member of the Arbuckle-Simpson Study Technical Peer Review Team, consisting of experts from the USGS, Oklahoma Geological Survey, Oklahoma State University, and EPA, who contribute scientific and technical advice to the study. The USGS is also a major cooperater in the Arbuckle-Simpson Hydrology Study.

The chemical composition of water samples pulled from the well will tell the story of what has happened along the flow path,” he says. “Through radio carbon dating of deep water, we can discover how lower regions of the aquifer function, how fast water travels, where it comes from, and where it goes.”

Christenson emphasizes that results will render critical information on the depth and thickness of the aquifer, and ultimately how much water is generally available for allocation from the Arbuckle-Simpson. “If the lower part of the aquifer is not very transmissive, then the water will be relatively old and subsequent yields from the lower part of the aquifer could be somewhat limited.”

He adds that scientists currently have little to no information exclusively from the deeper portions of the Arbuckle. While a few deep wells have been drilled in the formation, either their type or location provides insufficient data through which to determine groundwater flow and movement. For example, the City of Ada utilizes deep wells from the aquifer but they provide water that is a mix of both shallow and deep.

Christenson says that additional deep drilling operations could be conducted in the Arbuckle-Simpson region depending upon future funding and partnering opportunities.

For more information on the Arbuckle-Simpson Hydrology Study, contact Noel Osborn at 405-530-8800 or visit the OWRB’s Web site at [www.owrb.state.ok.us](http://www.owrb.state.ok.us).

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