

May 6, 2002

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***Southwest Oklahoma Groundwater Study  
Reveals Increases in Aquifer Recharge, Storage***

OKLAHOMA CITY – A report issued Monday by the Oklahoma Water Resources Board indicates that previously declining water levels in a southwest Oklahoma aquifer have recovered and recharge now exceeds local use of the basin. The report presents findings of a study of the Tillman Terrace aquifer, adjacent to the North Fork of the Red River in western Tillman County.

“Although results from recent groundwater monitoring efforts had led us to believe that water levels were stabilizing, data from this detailed study verifies the extent of aquifer recharge in relation to its usage for various purposes,” said Mike Mathis, chief of the OWRB’s Planning and Management Division.

“Fortunately, due to various factors, forecasted water level declines have not occurred. In fact, since the time of our initial survey, water levels in the aquifer have risen as much as 20 feet to historically high levels in 1993,” Mathis said.

The Tillman Terrace Groundwater Basin, an unconsolidated formation primarily comprised of sediments deposited through ancient flows of the Red River and North Fork of the Red River, encompasses about 290 square miles. Groundwater from the aquifer is used extensively for irrigation, public water supply, agriculture, mining, stock, and domestic purposes. The Basin is the primary source of irrigation water for cotton, wheat, alfalfa, and peanuts in the region. The cities of Tipton, Davidson and Manitou all rely to some extent upon the Tillman as a source of water supply for their citizens.

According to Noel Osborn, the agency's principal investigator on the Tillman study, many factors are believed to be the cause of the aquifer's replenishment. "In addition to increased precipitation, water levels in the groundwater basin have risen because farmers have implemented more efficient irrigation methods and many have converted to crops that require less irrigation. Other primary reasons include decreased withdrawals for public water supply due to regional population declines and high nitrate levels," she pointed out.

Osborn mentioned that the population of Tipton and Frederick declined about 24 percent between 1970 and 1998. Also, nitrate levels in water from the basin—from fertilizer, animal manure, septic tanks, and other sources—often exceed the U.S. Environmental Protection Agency's drinking water standard. "As a result, municipalities are withdrawing more of their water from surface water than from groundwater. For example, in 1975, Frederick switched its primary water supply from wells to Lake Frederick," she said.

During the early 1950s, the Tillman Terrace aquifer was heavily used for irrigation and municipal supply, eventually resulting in declining water levels and salt water encroachment from nearby rivers. In 1968, the OWRB declared Tillman County to be a critical groundwater area and in 1974, the agency's first hydrologic survey of the aquifer concluded that if existing pumping rates continued, the aquifer would be depleted within 20 years. In December 1978, the OWRB issued its first order allocating water rights in a state groundwater basin, approving an apportionment (i.e., maximum annual yield) of 1.0 acre-foot of water per acre per year for the Tillman Terrace.

Mathis added that this update of the 1974 Tillman study is also the first such revision ever conducted by the OWRB. The agency is required to update hydrologic surveys of the state's individual groundwater basins every 20 years. Hydrologic investigations effectively determine the share of groundwater available to overlying landowners.

The report, entitled "Update of the Hydrologic Survey of the Tillman Terrace Groundwater Basin, Southwestern Oklahoma," can be accessed and downloaded from the Technical Reports and Publications page of the OWRB's Web site at [www.owrb.state.ok.us](http://www.owrb.state.ok.us). Hard copies of the report are also available for \$5. For additional information on the study and report, please call Mike Mathis at 405/530-8800.

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