

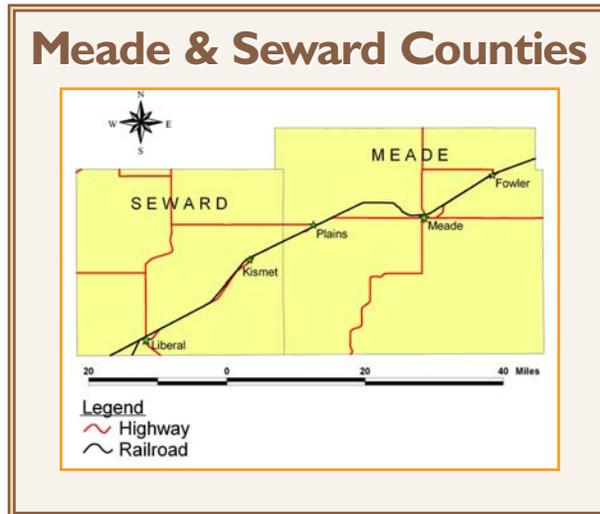
# Extreme weather demonstrates need for groundwater protection

**O**n the night of May 15, 2003, a thunderstorm developed over the high plains of Southwest Kansas. This thunderstorm was a little different from the typical storms experienced in the area. It had the usual rain, lightning and thunder, some wind and some hail. What made it unusual was the quantity of rain that fell from the sky. Estimated rainfall totals will likely never occur again from one storm in the lifetimes of the residents of Meade and Seward counties. In Kismet, it is believed that approximately 16 inches of rain fell. Areas nearby may have experienced over 20 inches. Swales quickly filled and carried water towards the Cimarron River and Crooked Creek. Playas, which are shallow

depressions found on the high plains, filled and held water for many months.

After the storm and many weeks afterwards, a number of domestic wells in the area of Kismet, Kan. were found to have bacterial contamination. Owners of these domestic wells were

given instructions on how to disinfect their wells and all were done. Initial sampling usually showed that the contamination was eliminated but many of the wells had subsequent sampling results showing that the contamination returned. A survey of the area found a capped water supply well used to drill an oil



well. The well, although capped, had a broken edge in the plastic casing below the cap, and was apparently submerged in a playa for a number of months after the

The Kansas Department of Agriculture's Division of Water Resources (DWR) regulates the use of water, including temporary use. (See K.S.A. 82a-727 & K.A.R. 5-9-1 to 11 sidebars.) Most

domestic use. Because mineral rights are often leased (and sold, traded, resold, etc.), control of the activities related to petroleum exploration on a person's land by a landowner can be a difficult task.

The Kansas Department of Agriculture's Division of Water

**Because Southwest Kansas is a mature oil and gas production area and groundwater is so widespread, the number of inactive and abandoned oil field water supply wells may number in the thousands.**

storm. Although it would be difficult to prove that this "inactive" water well was the cause of the local contamination, it is likely that it provided a direct conduit for floodwater to reach the underlying aquifer.

In Kansas, a permit is required to use water for a beneficial purpose except domestic use. Water wells used to supply water to drill oil wells fall under this requirement. This permit is to be in hand before a water well is drilled for this or any other non-

of the water wells drilled to supply water to oil well drilling projects are temporary, in the eyes of the drilling company. They only need water for their one-time drilling project. And when there is water underfoot, they find it most economical to drill a water well at the drilling site, instead of having a truck haul water from the nearest public water system or nearby creek, river or pond. The oil well drillers will typically file an application for a temporary permit, which can be approved for a period not to exceed six months,



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## **K.S.A. 82a -727.**

Temporary permits to appropriate water; extension; fee; rules and regulations.

- (a) Subject to existing water rights and the principle of beneficial use, the chief engineer may grant upon application made therefor temporary permits and extensions thereof to appropriate water in any case where the public interest in such water will not be unreasonably or prejudicially affected, except that the chief engineer shall not grant any such permit to appropriate fresh water in any case where other waters are available for the proposed use and the use thereof is technologically and economically feasible. No such temporary permit or any extension thereof shall be granted for a period of time in excess of six months. Each application submitted for a temporary permit or extension thereof shall be accompanied by an application fee of \$100, or commencing July 1, 2002, and ending June 30, 2010, a fee of \$200.
- (b) The chief engineer shall adopt rules and regulations to effectuate and administer the provisions of this section.
- (c) Nothing in this section shall be deemed to vest in the holder of any permit granted pursuant to provisions of this section any permanent right to appropriate water except as is provided by such permit.
- (d) All fees collected by the chief engineer pursuant to this section shall be remitted to the state treasurer as provided in K.S.A. 82a-731 and amendments thereto.

(History: L. 1977, ch. 356, § 1; L. 1982, ch. 4, § 19; L. 1985, ch. 339, § 4; L. 2002, ch. 181, § 24; L. 2004, ch. 85, § 19; July 1.)

Resources. Records of these wells drilled *after* 1978 exist if a permit was obtained, but only those permitted since the late 1980's are in an electronic database. It is possible that some of these water wells are located in areas that are convenient to the landowner for lawn and garden use or for livestock. It is more likely that most of them are not, however. Although it took an extreme weather event to cause groundwater contamination which affected the residents of the area, contamination by abandoned water wells is not dependent on extreme events like 500-year storms. Uncapped wells, wells with their casing broken off at or below grade, or poorly constructed wells can allow water and chemicals from the surface or shallow subsurface to flow into the aquifer.

Bobbi Strait is the Seward County Zoning and Planning Director and also serves as the Local Environmental Protection Program Director. She has

in a quantity not to exceed 1,000,000 gallons and to be used at only one place of use (oil well drilling site). Because the permit and well are temporary, the applications ask the applicant to state what he or she will do with the well after its use. Almost every application states the water well will "revert" to the landowner, in essence, passing the oil well driller's or oil company's responsibility to plug the well to the landowner, who may have no knowledge that it is even there.

Because Southwest Kansas is a mature oil and gas production area and groundwater is so widespread, the number of inactive and abandoned oil field water supply wells may number in the thousands. It wasn't until 1978 that it became a requirement that all non-domestic water wells be permitted by the Division of Water

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recognized that abandoned water wells pose a significant problem and wants to have all of them plugged. To achieve this goal, she has received a grant from the Department of Health and

Southwest Kansas Local Environmental Protection Group which represents eight other counties in addition to Meade County, wants to use this money to plug as many wells as can be found.

of oil field water supply wells and the completion of the required well logs. Because the Ogallala has discontinuous layers of clay throughout its range, some zones of the aquifer may have no natural



*This oil well drilling rig in Ness County was found making good progress on a warm December afternoon in 2004. Water is an important component of drilling fluid, which carries rock from the bottom of the borehole and seals the formations the drill bit encounters.*

Environment, using funds distributed by the Environmental Protection Agency for non-point source pollution control made available by the Clean Water Act's Section 319. Seward County LEPP, in cooperation with the

On January 12, 2006, a meeting was held at the Finney County Farm Service Agency, in Garden City, Kan. Representatives from the Kansas Department of Agriculture – Division of Water Resources; Southwest Kansas Groundwater Management District No. 3; Kansas Department of Health and Environment; State Conservation Commission; Meade County Health Department; Seward County and Meade County Conservation Districts; Kansas Ground Water Association; Terrane Resources, a private consulting firm and Kansas Rural Water Association.

A roundtable discussion format was used to describe the history of the specific contamination event and the overall scope of the recently funded project.

A significant portion of the discussion was spent on understanding the geology of the Ogallala Aquifer, the construction

connection to the other zones above or below. If an upper zone has lower quality water and a well has been drilled with its gravel pack allowing the water from all the zones to be captured by the well, the proper plugging of this well will be more expensive than



*Doug Schneweis, KDHE Watershed Field Coordinator and Bobbi Strait, Seward County Planning and Zoning Director, discuss details of the well plugging project after the meeting.*

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## Temporary Permit Regulations - K.A.R. 5-1-1 through 5-1-11

K.A.R. 5-9-1 Application for temporary permit acceptable for filing.

To be acceptable for filing, an application for temporary permit to appropriate water for beneficial use shall meet the following requirements:

- (a) Be made on the form prescribed by the chief engineer;
- (b) be signed by the applicant or an authorized representative of the applicant;
- (c) be accompanied by the statutory application fee;
- (d) contain all the information requested for the proposed use as set forth in the prescribed application form; and
- (e) include any other information requested by the chief engineer that is necessary to understand the application.

(Authorized by and implementing K.S.A. 82a-706a and K.S.A. 2002 Supp. 82a-727; effective May 1, 1979; amended Oct. 24, 2003.)

K.A.R. 5-9-2 Priority.

Upon receipt in the office of the chief engineer of an acceptable application for temporary permit to appropriate water, accompanied by the statutory application fee, a stamp showing the date and time of receipt shall be placed on the application form. The date and time of receipt of the application shall establish the priority to the use of the water. The priority shall terminate on the date when use of water will be discontinued as set forth in the application or any authorized extension of time thereof.

(Authorized by K.S.A. 82a-727; effective May 1, 1979.)

K.A.R. 5-9-3 Quantity.

A temporary permit shall not be granted for a quantity in excess of 1,000,000 gallons except for dewatering purposes or when water is to be diverted from a source located on a construction site and used on the construction site in connection with a project that the chief engineer has approved under the authority of K.S.A. 82a-301 through 305a or K.S.A. 24-126.

(Authorized by K.S.A. 82a-727b; implementing K.S.A. 82a-727; effective May 1, 1979; amended Dec. 3, 1990.)

K.A.R. 5-9-4 Place of use limitation.

A temporary permit shall not be granted for more than one place of use.

(Authorized by K.S.A. 82a-727; effective May 1, 1979.)

a well with no clay confining beds.

Discussion also was focused on the sources of data available regarding the locations of these temporary wells and the need to make it more accessible. It was also stated that the eyes of the public were very important and that requesting information from them would be very valuable.

With a new understanding that the costs to plug abandoned water wells are variable and many times unknown until the professional is onsite, Ms. Strait said that she would likely focus the project in areas closest to public water supply wells in the two counties. There are 11 public water systems in Seward County and five in Meade County. She will work at

gathering as much data as possible from the various sources and work with the public water systems in the two counties to initiate wellhead protection plans.

This groundwater protection project has been in operation for over two years. It will likely take many more. The purpose of this article is not to recognize the good deeds of any particular person or agency, nor is it to cast any blame. It is not to show how to design a project or how to best accomplish a goal. It's purpose is to show that goals are important and that progress is possible. By working together, progress will be made.

### Check out these Source Water Protection Programs at the Annual Conference

#### Watershed Restoration and Protection Strategy

Ronald W. Graber  
Wednesday, March 29, 10:45 a.m.

#### Water Celebrations—Helping Water Systems and Customers

Melissa Arthur  
Wednesday, March 29, 1:30 p.m.

#### Water Rights and Water Resource Management

William J. Gilliland, L.G. and Tina Alder  
Wednesday, March 29, 1:30 p.m.

#### Groundwater Protection Using Groundwater Guardian

Rachael Herpel  
Wednesday, March 29, 4 p.m.