

TESTIMONY – ROLFE MANDEL, KANSAS GEOLOGICAL SURVEY
HOUSE WATER & ENVIRONMENT COMMITTEE
17 JANUARY 2017

Mr. Chairman, Members of the Committee,

Thank you for the opportunity to appear before you today. My name is Rolfe Mandel. I am the interim director of the Kansas Geological Survey (KGS). With me is Jim Butler, head of the KGS Geohydrology Section. The KGS is a research and service division of the University of Kansas. Our mission is to study and report on the state's natural resources and hazards. We do not have any regulatory responsibility and we do not take positions on policy. We do provide credible information that informs policy decisions.

Our primary focus is on energy and water issues. On the water side, our primary focus is groundwater, and we provide a number of services related to it. We work with the Division of Water Resources (DWR) in the Kansas Department of Agriculture to measure groundwater levels in central and western Kansas every January, providing a snapshot of current conditions and long-term trends. We collect and disseminate logs from water wells drilled in the state, information that is useful both for understanding the state's subsurface, and for individuals and businesses interested in drilling water wells. We provide support to the state's water agencies and to local water-related governmental units, such as groundwater management districts (GMDs). This support includes working with the DWR to develop an on-line reporting system for state water use data, linking that data to well log and water-level data bases (state master well inventory), assisting GMDs in reviewing management approaches, and creating numerical groundwater flow models to assess a range of possible future conditions.

As I mentioned, the KGS role is one of research and reporting. We do not take positions on policy. However, the Chairman asked us to discuss our views on priorities for state water programs, and we do so with the understanding that our priorities are those programs and efforts that enable us to better understand the state's water resources and better provide the information that informs water policy. I currently serve as an *ex officio* member of the Kansas Water Authority. As such, my predecessor was involved with the development of the Kansas Water Plan and in defining a long-term water vision for the state of Kansas.

With that in mind, we will discuss our two highest priorities. These two priorities are directed at addressing major groundwater challenges that the state will face in the coming decades.

Our first priority relates to the High Plains aquifer. The High Plains aquifer, which includes the well-known Ogallala aquifer, is the most important water source for much of western and south-central Kansas, supplying 70 to 80% of the water used by Kansans each day. Water from the High Plains aquifer supports the region's cities, industry, and much of its agriculture. However, large-volume pumping from this aquifer has led to steadily declining water levels in the western portion of the region, and the area faces critical water-related issues. The public information

circular attached to my testimony provides information about the High Plains aquifer and its current status.

The KGS is deeply involved in numerous studies focused on the High Plains aquifer. The specific priorities of the KGS regarding the High Plains aquifer are as follows:

a. Continuation of the Ogallala-High Plains Aquifer Assessment Program

The Ogallala-High Plains Aquifer Assessment provides data, research, and technical support to assist the three western GMDs, the Kansas Water Office, and the DWR in the assessment, planning, and management of the groundwater resources of western Kansas. Examples of assistance include providing information on water use, water levels, water rights, hydrogeologic characteristics, and groundwater quality of the aquifer. Most recently, the KGS has developed a tool for potential Local Enhanced Management Area (LEMA) and Water Conservation Area (WCA) groups to quickly assess how much reduction in water-level declines will be achieved by a given reduction in pumping. What we have found is that relatively modest reductions in pumping (20%) will have a significant impact on water-level declines in western Kansas.

b. Continuation and Expansion of the Index Well Program

The High Plains Aquifer Index Well Program is directed at developing improved approaches for measuring and interpreting water-level responses at the section to township scale in western and south-central Kansas. The project, which began in 2007 with the installation of three wells in the three western GMDs with equipment for real-time monitoring of water levels, has been expanded to a network of 15 wells in four GMDs; these include one well in the Sheridan-6 LEMA and one on the Willis Water Technology Farm. Additional wells in the program have equipment for continuous, but not real-time, monitoring of water levels. The highly detailed information obtained through this program is critical for reliable assessment of how the aquifer responds throughout the growing season and what the future holds for the High Plains aquifer in western and south-central Kansas.

c. Continuation of GMD Modeling Studies

Aquifer models have been developed for each of the GMDs by the KGS and others. These models are used to assess the aquifer response to various proposed future pumping and climatic conditions, so they must be periodically (every five years) updated to stay current. In addition, individual GMD models should be gradually combined to better represent the long-term behavior of the aquifer to future pumping and climatic stresses.

These priorities are generally reflected in the state water plan and in the water vision documents.

Our second priority relates to the Kansas River alluvial aquifer. This aquifer provides water from the alluvium, or geologic material that surrounds the river bed.

The Kansas River corridor is projected to continue to be a major area of population and economic expansion in the coming decades, and the groundwater from the Kansas River alluvial aquifer will be utilized to help support that expansion. Currently, however, we have insufficient information to reliably assess how water levels in the aquifer and the Kansas River will respond to an increase in pumping. Management of groundwater storage in the aquifer in conjunction with management of reservoir system storage requires this information. The KGS proposes to improve our understanding of this aquifer and its relationship to Kansas River flow through the following activities:

a. Development of Observation Well Network in the Kansas River Alluvial Aquifer

This network would be similar to the index well network in the High Plains aquifer. A series of wells with equipment for real-time monitoring of water levels would be installed from upstream of Manhattan to the junction with the Missouri River. The information obtained from these wells would be used to develop a better understanding of how water levels respond to current pumping activity and how the aquifer and the Kansas River interact.

b. Development of a Groundwater Model of the Kansas River Alluvial Aquifer

This model would extend from upstream of Manhattan to the junction with the Missouri River and would be used to examine the effects of future aquifer development on groundwater and river levels, as well as how river flow controlled by reservoir operations affects aquifer water levels. The model would be updated every five years so that the state has a tool based on the most current data to evaluate future conditions in this most important aquifer in eastern Kansas.

This priority is generally not reflected in the current state water plan, but has been identified as a priority in the water-vision documents. Both of these programs, High Plains aquifer studies and Kansas River alluvial aquifer studies, should be a high priority. They will provide important information for managing the state's water resources for decades to come.

Again, I appreciate the opportunity to appear today and I would be glad to answer questions or provide additional information.