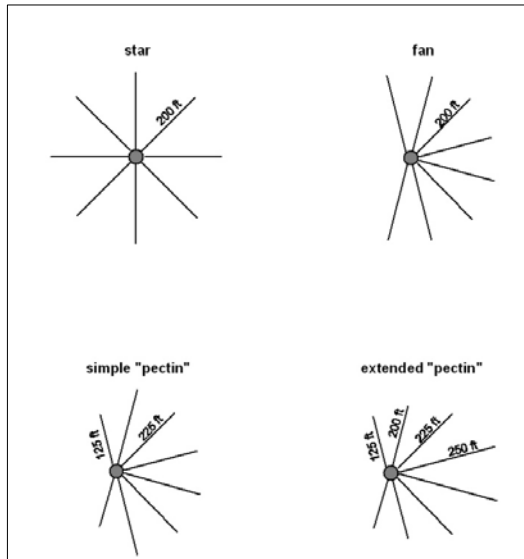


Quantifying Hydraulic Connection between Surface Water and Groundwater

Jefferson County, Arkansas



Lateral layout designs considered for collector wells at the 45 mgd well field.

Key Project Areas

Groundwater Flow Modeling

Collector Well Design

Regulation

Riverbank Filtration

Water Quality

In 2007, the Arkansas River Regional Intermodal Facilities Authority (ARRIFA) hired Layne to design a 45 mgd well field for a regional water supply in Jefferson County, Arkansas. We had worked at the site before, beginning with a feasibility study of collector wells along a section of the Arkansas River. The following year we were hired to estimate the composition of the new source water.

The final phase of the project was to assess the hydrogeologic conditions upstream and downstream from the original site to characterize the alluvial aquifer along the entire reach, to examine differences between potential collector well sites, to estimate aquifer properties, and to determine the best design for a 45 mgd well field.

During our analysis, we used a new set of software tools we developed for analyzing aquifer tests near surface waters and for simulating riverbank filtration systems. Our analysis allowed us to quantify the hydraulic connection between the aquifer and the river, which produced more accurate yield calculations.

Our recommendations included designs for six collector wells arranged along the Arkansas River in the proposed reach.

