

Fred H. Hennighausen specializes in water rights law with the firm of Hennighausen & Olsen. He received degrees in general and mechanical engineering from Duke University, and a J.D. from the University of Tulsa College of Law. Fred is a registered professional engineer and was District Supervisor with the Office of the State Engineer with responsibility for water resource investigations and water rights administration in southeastern New Mexico. He currently is Counsel to the Pecos Valley Artesian Conservancy District.



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Fred Hennighausen
Pecos Valley Artesian Conservancy District
PO Box 1415
Roswell, NM 88202-1415

The Roswell Groundwater Basin is located in Chaves and Eddy counties, New Mexico. It comprises most of the middle Pecos River basin. The general area of use extends up to 15 miles west of the Pecos River from about 30 miles north of Roswell to midway between Artesia and Carlsbad. The Pecos River forms the eastern boundary of the basin beyond which significant quantities of groundwater are scarce. The basin is recharged by snow melt, rainfall, and stream flow from the watershed to the west.

The basin was declared by the New Mexico State Engineer in 1931 after enactment of the pioneering New Mexico Groundwater Code. This legislation was passed in response to the concern of parties in the Roswell/Artesia area worried about

apparent overdraft of the basin. At the same time, legislation was introduced that provided for the creation of the Pecos Valley Artesian Conservancy District (PVACD) to protect and conserve the groundwater supply.

At the present time, over 350,000 acre-feet, more than one hundred billion gallons of water are pumped from the groundwater basin each year. The municipalities and towns of Roswell, Artesia, Dexter, and Hagerman, all commercial and industrial users, and over 110,000 acres of irrigated farmland rely and depend on the groundwater supply. Approximately 93% of the water pumped is used for irrigation; less than 7% is used for municipal, industrial and commercial purposes. About 65% is pumped from deep artesian aquifers in limestone formations and the

remaining 35% is pumped from shallow aquifers in sands, gravels, and valley fill materials. On the eastern side of the basin, the groundwater aquifers are hydrologically related to the Pecos River, which is a gaining stream as it traverses the basin from north to south.

In recent years, groundwater levels in most of the area have generally stabilized or have risen. This situation has been the result of considerable long-term efforts on the part of all parties concerned, including water users, the State Engineer, and the Pecos Valley Artesian Conservancy District. In the early 1950s, hydrographic surveys were commenced and in the middle 1950s litigation was started to adjudicate, or define by court decree, all water rights within the basin as to place and type of use, point of diversion, priority and quantities to be pumped. During the process, some 12,000 acres of farm land, found to be illegally irrigated, were enjoined from further irrigation. In 1966, the Court ordered the installation of water meters on all wells adjudicated and established a basin Water Master under the direction of the State Engineer, with expenses reimbursed by the Pecos Valley Artesian Conservancy District. Subsequently, a five-year accounting period was confirmed by the Court wherein the amount of water adjudicated for each use could be exceeded in any year provided the total amount in a five-year period did not exceed five times the average annual duty.

The compulsory use of meters had several benefits: 1) it made the water user aware of the actual quantity of water being used, and thus made the user more careful with that use; 2) it prompted the use of conservation measures throughout the District to meet the Court decreed limitations on the quantity that could be pumped; and 3) it resulted in considerably less total water being pumped from the basin.

Even prior to the installation of the meters, the District instituted a low interest loan program to further implement water saving conservation measures and to help reduce overall pumpage. The funds for the loan program are borrowed from the New Mexico Interstate Stream Commission Irrigation Works Construction Fund. These funds are then re-loaned by the District for conservation purposes at 3 1/2% interest. Close to \$20,000,000 has been loaned to date for those measures. There are now probably more conservation measures in place in the District

than in any other area of the state. Individual users have benefitted by a more stable long-term water supply, decreased pumping lifts and costs, more efficient farming practices and decreased labor costs.

In the same period of time, the District purchased, banked, and retired some 6,700 acres of irrigation water rights to further help reduce overdraft on the groundwater basin.

At a still later date, the New Mexico Interstate Stream Commission purchased and retired some 6,100 acres of surface water and groundwater rights adjacent to the Pecos River for the purpose of meeting requirements under the Pecos River Compact. Many of the rights purchased had supplemental groundwater wells and the reduction of that pumpage further reduced any overdraft on the basin.

Water right transfers are made within the basin between different types and places of use under the law of supply and demand. In addition to municipal transfers from irrigation use, in the past ten years many irrigation rights have been transferred to commercial dairies. The State Engineer generally conditions such transfers to prevent impairment and to prevent additional effects on the Pecos River that might affect deliveries to Texas under the Pecos River Compact. The diversions under water right transfers are limited to the consumptive use value of the right transferred and return flow if any can be proven.

Unfortunately, some of the progress made to bring the Roswell Groundwater Basin into balance has been diminished by other factors. These factors include the unrestricted drilling and use of domestic wells in the watershed and recharge area to the basin; changes in vegetation in the watershed; the invasion of non-native, high-water using plants adjacent to the Pecos and tributaries; and periods of severe drought in the entire Pecos Stream System.

Other problems having the potential to affect severely the availability of groundwater remain. First, water users downstream claim that pumpage from the basin should be further reduced to increase flow in the Pecos River to meet their claimed surface water rights. These claims are now involved in the adjudication of all water rights on the Pecos Stream System that has been ongoing since 1978.

Secondly, the Pecos River Compact between New Mexico and Texas and subsequent Court decisions mandate that shortfalls to Texas related to

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1947 conditions can not occur. If potential shortfalls do appear eminent, a priority call on the whole stream system could be made with draconian economic effects for all. The Interstate Stream Commission, the State Engineer, and the New Mexico Pecos River Compact Commissioner have made heroic efforts to prevent this from happening by purchasing and leasing water rights to meet projected shortages and build credits against such shortages.

Thirdly, and more recently, there has been an increased demand for more water in the stream system for habitat for the Blunt Nosed Shiner, the Pecos Pupfish, the Roswell Spring Snail, the Pecos Sunflower, and other species considered to be threatened or endangered.

The Pecos Valley Artesian Conservancy District appreciates the work being done by the New Mexico Interstate Stream Commission, the New Mexico Pecos River Commissioner, the State Engineer, and others to resolve the ongoing problems on the Pecos River Stream System. The Conservancy District is cooperatively involved in many of these programs and also is actively involved in the ongoing adjudication of all rights in the Pecos River Stream System, numerous studies, regional water planning, and other related matters.