

**Pojoaque Valley Planning Committee Meeting Summary**  
**July 8th, 2004, 6:30-8:30pm**  
**Multi-Purpose Room – Pablo Roybal Elementary School**

The meeting started at 6:30 pm. Vicente Roybal-Jasso introduced guest speaker, Elizabeth Keating, groundwater expert who works as a technical staff member in the Earth and Environmental Sciences Division at Los Alamos National Laboratory. Dr. Keating began her presentation by stating her three goals for the talk. First, she said she would give an introduction to the basic concepts of groundwater. Second, she would talk about the groundwater basins of northern New Mexico and the research methods she is using in this region. And last she said she would give an overview of her own research in the Española Basin.

She began the introduction by talking about the movement of groundwater. LANL has published various articles discussing this topic. However this is not new information; this fact has been known for centuries. Then Dr. Keating showed the group the hydrologic cycle, talked about what recharge is, how recharging of the aquifer occurs, and how well pumping reduces aquifer storage and also stream flow.

Next Dr. Keating discussed the permeability of rocks. According to Dr. Keating, water will tend to seek the coarser, more permeable layers of rock in which to move through. Typical rock in our region is basalt. This type of rock is very tight and does not readily transmit water. Water will tend to flow through these cracks or fractures. Some fractures are open and can transmit water quite quickly; others are filled with clays and do not transmit water.

The next section of the presentation addressed the hydrogeology of northern New Mexico. She covered the details of the Rio Grande Rift. This trench has filled with sediments over time, which now comprises major aquifers. Most of our major cities and towns sit above these deep aquifers. Also, the trench is not continuous. It is broken into sub-basins, which are only partially connected. The northern sub-basins include the San Luis, Española, and Albuquerque Basins. These sub-basins, each of which has their own aquifer, has water flow occurring directly between them, and indirectly due to exchange between the aquifers and the Rio Grande. During a dry period, less recharge occurs. Water levels will slowly fall, and exchanges between basins will decline. If the dry period is long, the aquifer will stabilize at this new state. Dr. Keating pointed out that if we begin to pump water from the aquifer for a long period of time, water levels will decline, exchanges between basins will decline, and possibly a new equilibrium will be achieved. One possible scenario is that this equilibrium will be interrupted if a drought occurs and recharge is reduced. Water levels may fall below the bottom of the well. One solution to this problem is to drill a deeper well. Unfortunately, in most basins in New Mexico the deep water is too saline to drink. Of all the groundwater in the state, only about 25% is fresh enough to drink. So, drilling a deeper well may not solve the problem.

The USGS has developed a groundwater flow model for the Middle Rio-Grande Basin. Even before the aquifer was pumped for water supply, this basin was probably a net losing basin (more water was withdrawn from the aquifer, via evapotranspiration along the bosque) than was recharged. As well, when water is taken from the aquifer, the ground surface can fall. If pumping is too heavy in certain types of rocks, the aquifer can collapse

permanently. Dr. Keating also mentioned that according to satellite data gathered, there is an area of depression that happens to coincide with the location of the Buckman well field. The data shows that the ground surface dropped 10 – 15 mm during the time period 1993 – 1997. This dropping has produced cracks in the ground surface near Buckman. It is uncertain whether these changes are reversible. They are continuing to monitor the area.

Then Dr. Keating spoke specifically about the research that she has done in the Española Basin, which incorporates the areas from Santa Fe to Española, where Embudo is the northern boundary, Cochiti being the southern boundary. Much of the groundwater amount depends on the rock formation and material, and also how much water can move through the aquifer. Of the course the amount of precipitation affects the aquifer. In the Sangre de Cristos for example, only 10% of the rain that falls makes it into the aquifer. As well, plants and vegetation also compete with the aquifer for water.

Dr. Keating also discussed NM groundwater basin problems that exist with the presence of uranium and arsenic, some of which occur naturally. Also in the Española Basin there has been evidence in households of nitrate contamination, and benzene (gasoline leakage), TCE, and perchlorate in the industrial areas of the basin. Groundwater quality also depends, to some degree, on where you are in the basin and how old the water is. According to Dr. Keating, based on carbon dating we know that it takes tens of thousands of years for some waters to flow from the mountains into the Rio Grande.

In regards to uranium, Dr. Keating said that the source of it may be from thin ash layers. When the eruption that formed the Valles Caldera occurred several million years ago, ash was spewed as far east as Kansas. Many ash layers like this exist in rocks in our aquifers, and some of them are leaching uranium. She also stated that data collected from a well in lower Los Alamos Canyon showed that after 15 years of production, uranium concentrations began to rise and fluctuate with pumping rates. Therefore it is possible that ongoing pumping in the basin may cause water quality to deteriorate.

Last, Keating looked at future directions and how their research at the lab will impact other studies. Currently there is research that is being done on the amount of uranium in the surrounding areas of Los Alamos. The study shows that there are pockets of wells with elevated uranium levels, which may exceed EPA standards. Also LANL is beginning a study of the effect of drought on the aquifer. They are testing a new methodology on how the gravitational field at the earth's surface is influenced by the mass of water underground. According to Dr. Keating they measure the gravitational field once, then come back and re-measure the gravitational field later to see if there has been a change in mass (due to water inflow or outflow). LANL will repeat these measurements every 6 months for 3 years. This will hopefully give us a good picture of how pressures like drought are impacting storage in our aquifer.

Dr. Keating opened it up for questions. At 8:30pm Vicente closed by thanking Dr. Keating for her captivating presentation, and thanking the group for coming to the presentation. He mentioned to the group that the next PVPC meeting would be held on July 29<sup>th</sup>, at the original meeting space in the Pojoaque Valley Administrative Building.

Notes taken by RV