By Vance Kennedy

There has been a large increase in planting of trees in the foothills of this county, especially almonds.  There is no flood irrigation to replenish groundwater, which is being pumped by increasingly deep wells.  Rainfall in the area ranges between 12 and about 16 inches per year on average, of which perhaps half recharges groundwater.

Almond trees need about 30 inches of water per year to do well.  Hence, there is on the order of two feet of water deficiency from rainfall alone.  The rest of the needed water must come from pumped groundwater.  That seems fine if you have a ready and easily available groundwater supply.  But therein lies the problem.

In the foothills the rocks are tight and much of the water must come from fractures.  Overall, an estimate of 10 percent porosity is possibly a generous estimate.  So, when one pumps out a foot of water, the water table drops 10 feet.  Since perhaps 2 feet of water must be pumped a year, that means that the water table may drop 20 feet per year or more.  Initially, the trees may do fine and the orchard can be sold to an unsophisticated buyer at a very large profit.  However, in 10 years, the water table will be down about 200 feet, or much more if the porosity is less than 10 percent.  I have heard that some very large pumps are getting water at 300 to 400 feet.  That is very expensive and cannot be justified if prices go down.  One might say that the buyer will lose and that is his problem.  There is a Latin phrase to describe the situation – Caveat Emptor – let the buyer beware.  It is not that simple.

When a well begins removing water from an aquifer, that is a water-bearing rock, there is a “cone of depression” that forms around the well, so that there is a sloping water table toward the well.  As the well goes deeper that cone of depression extends further and further from the well and ultimately will start drawing water from neighboring properties, causing their water table to drop.  California law provides no protection for that adjacent property owner.  He can be ruined, and he has no legal recourse.

There is another problem, for society as a whole.  When the tree grower has removed the groundwater to 400 feet or so and lets his trees die, that property is useless for many decades.  The water table will only be recharged by rainfall and that can raise the water table perhaps 5 feet per year.  That almond grower has literally mined a valuable resources and harmed future generations.  He has actually caused an environmental disaster, and as matters stand, there is no way of stopping him.

Mr. Kennedy is a citrus grower and a retired Hydrologist with the U.S.G.S.