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The Pink Side of Water: An Investigation of Estrogen in Northeast Colorado Water Sources

The first purpose of this project is to evaluate the possible content of estradiol, a common human estrogen, in river water downstream of multiple large cities or towns due to the release of effluent into the river. The second purpose of this project is to evaluate the possible content of estradiol in groundwater that is adjacent to, and supplied by, the river as stated in the first purpose. The groundwater will be sampled from household well systems. The researcher hypothesizes that small concentrations of estradiol will be found in river water due to the effluent being released into the river from settlements upstream. The researcher also hypothesizes that no estradiol will be found in groundwater obtained from household wells due to the soil's natural purifying properties. The researcher gathered water samples from two sites on the South Platte River from six households operating on well systems. The researcher then assayed them using an Estradiol EIA Kit. The Estradiol EIA Kit operated by absorbance readings from the competition of estradiol and Acetylcholinesterase in a 96-well plate. The researcher's first hypothesis was supported but much larger concentrations of estradiol were found in the South Platte River water than was expected. Concentrations averaged 110 pg/ml. The researcher's second hypothesis was not supported as estradiol was found in groundwater at an average of about 50 pg/ml. This illustrates that estradiol is being introduced to groundwater by the South Platte River but is being limited by the soil's purification properties.