

GROUND WATER

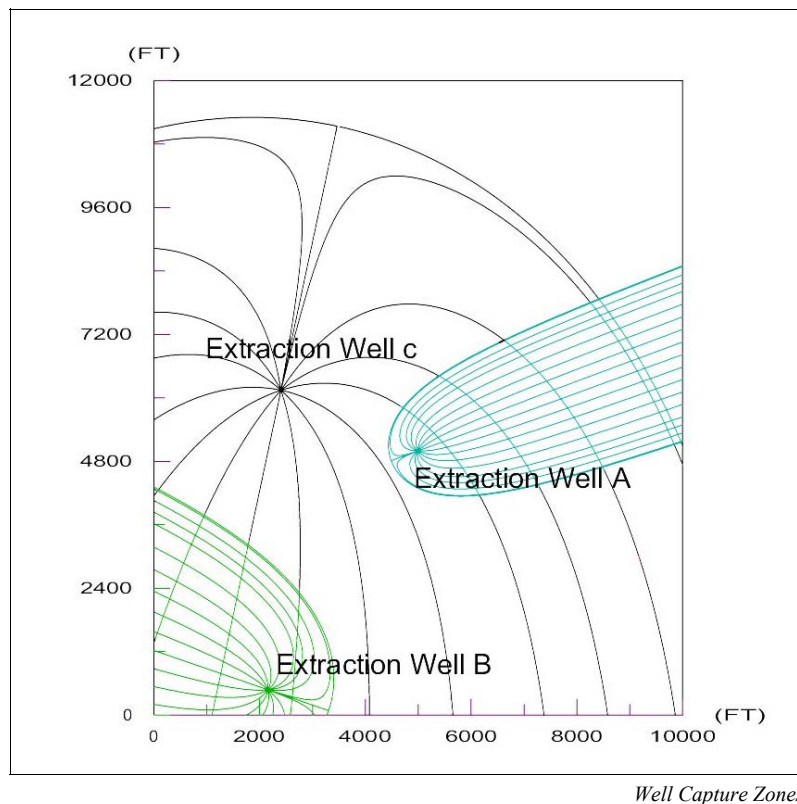
Wellhead Protection Delineation Studies

Westmoreland Coal Company - Aquifer Impact Analyses

Westmoreland Coal Company purchased a 2,600-acre parcel of land in the Raton Basin of Colorado near the Town of Weston, including the underlying decreed nontributary Dakota and Cheyenne aquifer water rights. The Company became concerned about a plan by a neighboring land owner to inject wastewater from coalbed methane degasification wells in the Raton-Vermejo-Trinidad formations back into the deeper Dakota aquifer.

Martin and Wood carried out an analysis into whether there was serious cause for

concern that the injection of the wastewater would degrade the quality of the water underlying Westmoreland Coal's parcel. Martin and Wood applied a two-phase approach that first involved a well capture zone analysis and then applied a mass balance model utilizing known wastewater characteristics in conjunction with estimated water quality parameters for the Dakota aquifer. The study found that there appeared to be little overall risk of significant degradation assuming that the injection rates for the neighboring well remained consistent with the analysis.



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