

CE 5364 Groundwater Transport Phenomena
Exercise Set 4

Exercises

1. Figure 1 below shows a piezometric map for a shallow sand aquifer.¹ The hydraulic conductivity is estimated to be $1.5 \times 10^{-2} \frac{cm}{s}$, the saturated thickness is 40 feet, and the effective porosity is 0.3.

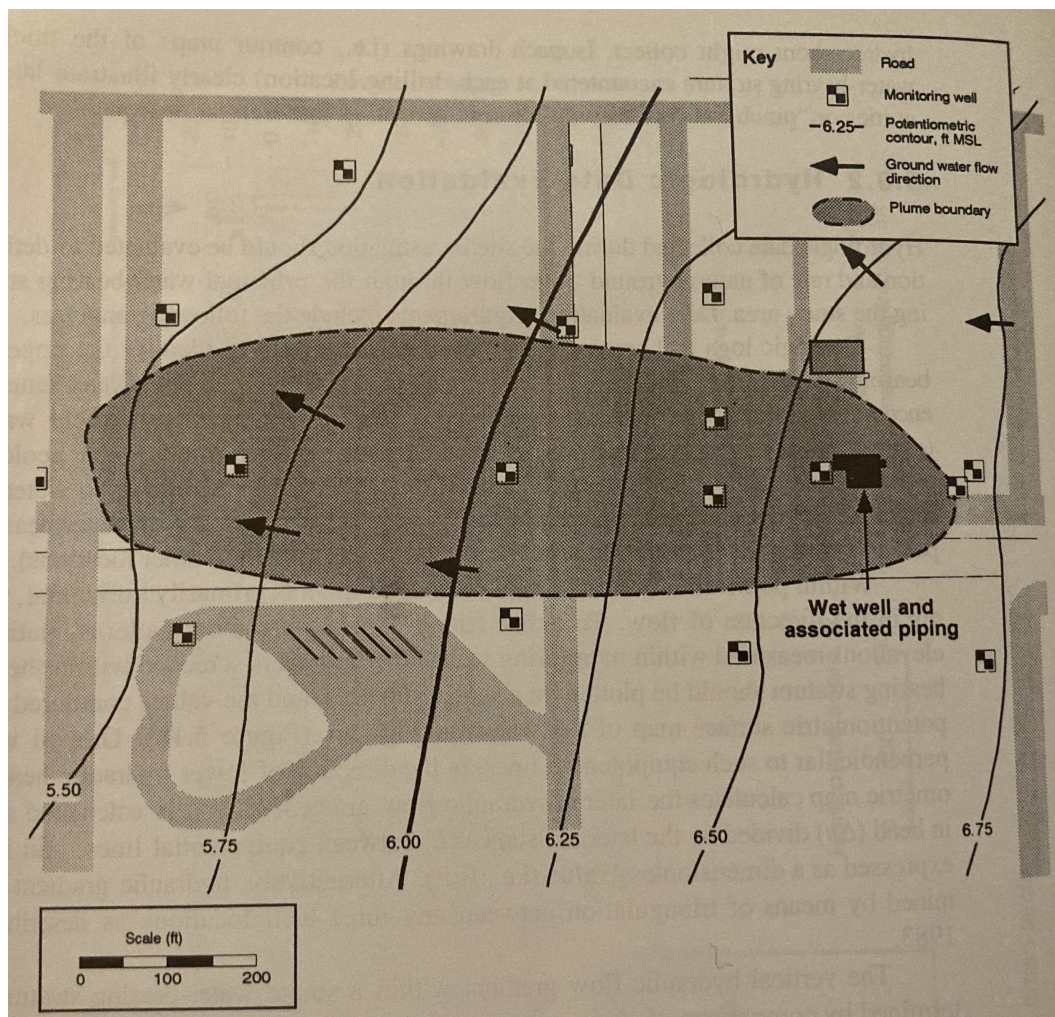


Figure 1: Plume Map (plan view)

¹Problem 2-8, pg. 578 in Bedient, et. al.

Determine:

- (a) A well naming scheme (suggest left to right, bottom to top but any scheme will do so you can identify specific wells)
- (b) Which well is expected to be the most contaminated.
- (c) The groundwater velocity and seepage velocity across the plume.
- (d) The duration (estimate) that the source has been contaminating the aquifer (neglect dispersion, diffusion, and adsorption).
- (e) The flow rate across the plume.
- (f) An explanation for contamination upgradient of the source zone.