

CE 5364 Groundwater Transport Phenomena
Exercise Set 4

Exercises

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

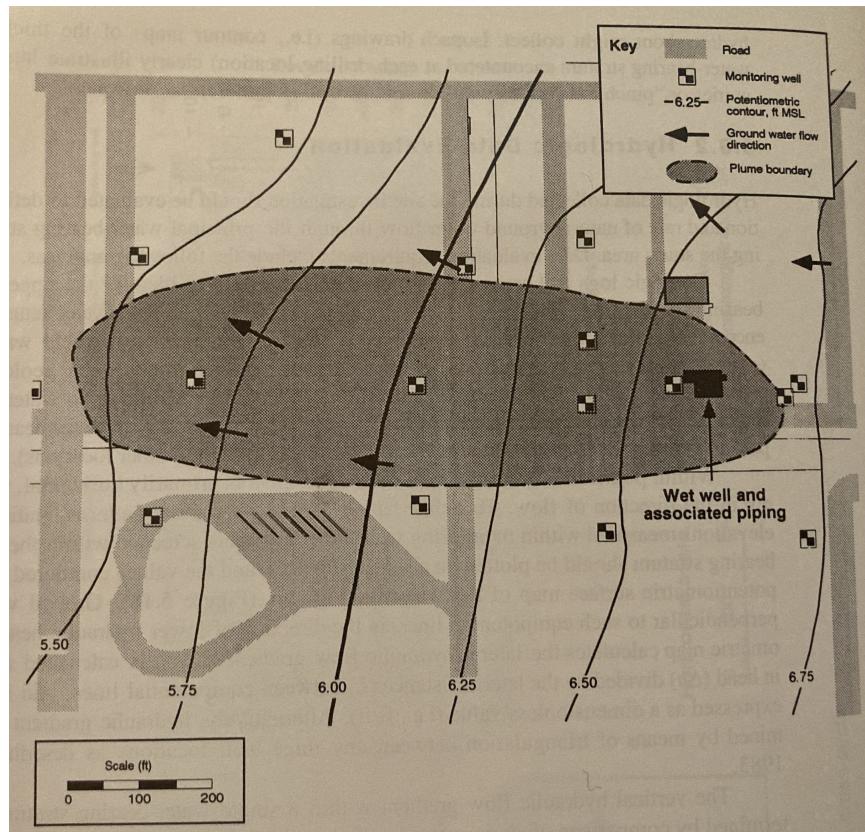


Figure 1: Plume Map (plan view)

Determine:

- Which well is expected to be the most contaminated.
- The groundwater velocity and seepage velocity across the plume.
- The duration (estimate) that the source has been contaminating the aquifer (neglect dispersion, diffusion, and adsorption).

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

- (d) The flow rate across the plume.
- (e) An explanation for contamination upgradient of the source zone.