

Using Darcy's Law

EVS 248 Environmental Geology and Hydrology

Fall Semester

We've got a difficult task today in lab—estimating the rate at which a contaminant would migrate from the K-Mart to the nearest receptor. We won't get a single estimate. Instead, we'll generate a range of values and then make a decision on how to proceed. To get to that point, let's start with the following exercises:

1. From our sample collection, it is clear that the surficial soils are primarily silts. Determine from published sources what range of values for hydraulic conductivity and porosity are consistent with a silt.
2. From our field trip and walking the site, it is clear that beneath the surficial silts is fractured limestone. Though not a karst, the limestone will have a much greater K than the silts. Determine likely values for K and n .
3. We have no measurements of hydraulic head directly beneath the K-Mart. However, from topographic maps, we can estimate the gradient of the ground surface. The gradient of the groundwater is certainly less than this.
4. Using the information gathered above, prepare a map of the site with flow lines and a range of travel times along the flow lines.
5. Some contaminants move at the rate of groundwater but most move slower. Based on your reconnaissance, pick three potential contaminants and discuss their likely fate and transport.