

# Hydrologic Maps

## Environmental Geology

Fall, 2007

**My objective for the assignment:** *By completing this assignment, you will learn to use hydrologic maps to estimate groundwater flow.*

The attached maps from Hall County, Nebraska, are for an unconfined aquifer underlain by impermeable bedrock. The maps show

- A. water table elevation at 10ft contours,
- B. impermeable bedrock elevation at 50ft contours, and
- C. transmissivity at 50,000gal/day/ft contours.

Note that the maps do not overlap each other exactly. Use the outline of the town of Hastings as a guide. Submit all overlays and calculations with your answers to the following problems:

- From the water table and bedrock elevation maps, construct a contour map of saturated thickness for the outlined area. Use a 10 foot contour interval.
- From the previous map and the transmissivity map, construct a hydraulic conductivity map for the outlined area. First interpolate transmissivity contours to 10,000gal/day/ft spacing.
- Calculate the volume of water that flows into the region outlined and the volume that flows out of the region. What causes the difference? List at least one possible man-made and one natural cause.
- If average porosity is between 20% and 35%, how long will it take a contaminant to go from point X to point Y, assuming advective flow only?