CASE STUDY #3 - Kansas River Valley, Lawrence, KS

Lawrence, KS is a city of just over 100,000 people situated in and adjacent to the Kansas River Valley. Founded in 1854, Lawrence has always been dependent on the Kansas River for commerce, transportation, and as a source of municipal water.

Postcard from the early 1900's showing the Massachusetts Street Bridge across the Kansas River in Lawrence, KS. This Bridge is the sole connection between Lawrence and the north bank of the River.

Another postcard showing a flour mill and the Bowersock Dam on the Kansas River at the south end of the Massachusetts Street Bridge, Lawrence, KS.
Major flooding of the Kansas River has a strong historical precedent. Large flood events on the River occurred in 1785, 1844, 1903, and 1951. Before the establishment of civilization, these floods were probably not geological hazards and were responsible for replenishing soil fertility on the floodplain of the River. However, once permanent communities were established, flooding became something to be dreaded and feared.

Photograph above shows the Massachusetts Street Bridge nearly submerged by the 1903 flood (photograph by F. M. Knight, 1903).

Photograph above shows a temporary ferry established across the Kansas River after the Massachusetts Street Bridge was washed out by the 1903 flood (photograph by F. M. Knight, 1903).
Water levels for the 1951 flood were even higher than those observed in 1903. Photograph below shows the Massachusetts Street Bridge (reconstructed after 1903 flood) again nearly submerged by flood waters in 1951.

On the next several pages, you will examine a portion of the Kansas River Valley near Lawrence, KS and make some land use planning decisions based on your knowledge of flooding and river systems.
1. Draw a north arrow on the map.

2. The square areas on the map with numbers in the center are called sections. They are exactly 1 mile square (if surveyed correctly). Using this information, what is the scale for this map (1:??????)?

3. The Kansas River is a good example of which type of stream system?

4. Based on the historical records you have for major flooding on the Kansas River at Lawrence, KS, what is the average recurrence interval for big floods at this location
5. Several electrical power lines cross the right edge of the map area. Is it feasible to convert these from *aerial* (poles with wires strung between them) to underground conduit? Why or why not?

6. The excavation in the center of the map (marked *pit*) was originally dug to extract sand and gravel for construction and concrete making. The pit was later turned into a garbage dump (before the days of sanitary landfills). Evaluate the suitability of this site for municipal waste disposal based on the *base* material (what the pit is excavated into), the geographic location, and the proximity to the water table.

Based on your evaluations, would you recommend conversion of the the garbage dump to a sanitary landfill?

7. You are a member of the county planning commission and are creating a set of guidelines for types of future construction to be allowed in Sections 11 and 14 on the map shown on the previous page. For each Section, which of the following would you allow or disallow?

a) wild grass prairie or nature preserve  
b) airport  
c) hospital  
d) public hunting lands  
e) residential or multifamily housing  
f) agricultural  
g) oil refinery  
h) telephone microwave relay tower  
i) sewage treatment plant