



3. Explain in detail how overuse of groundwater relates to **2 of the 3** situations below.
- i. Drinking water availability
  - ii. Subsidence of the ground
  - iii. Saltwater intrusion

4. In the Rio Grande River calcium (a major element) is present at 2.72 mg/L and chromium (a trace element) is present at 0.012 mg/L. Agricultural land adjacent to the river is amended with an organic mixture that contains calcium at 625 mg/kg and chromium at 92 mg/kg. Explain whether state regulators might be concerned with calcium contamination, chromium contamination or both.

5. A wetland is situated adjacent to an agricultural field. The wetland soils are saturated most of the year and the agricultural soils are usually unsaturated.

a. Identify each soil as aerobic or anaerobic

b. For the anaerobic soil, explain how it becomes anaerobic

c. Determine the oxidation state of As in each of the ions in the reaction below.



d. Which form of As would you expect to find in the wetland? Why?

6. An organic N fertilizer is applied to the agricultural field described in question 5.

a. Describe the transformations of the organic N fertilizer that will take place in the agricultural soils.

b. Describe the interaction of plants with the different forms of N in the agricultural soils.

c. Which forms of N are most likely to be transported away from the agricultural soils in a rain storm?