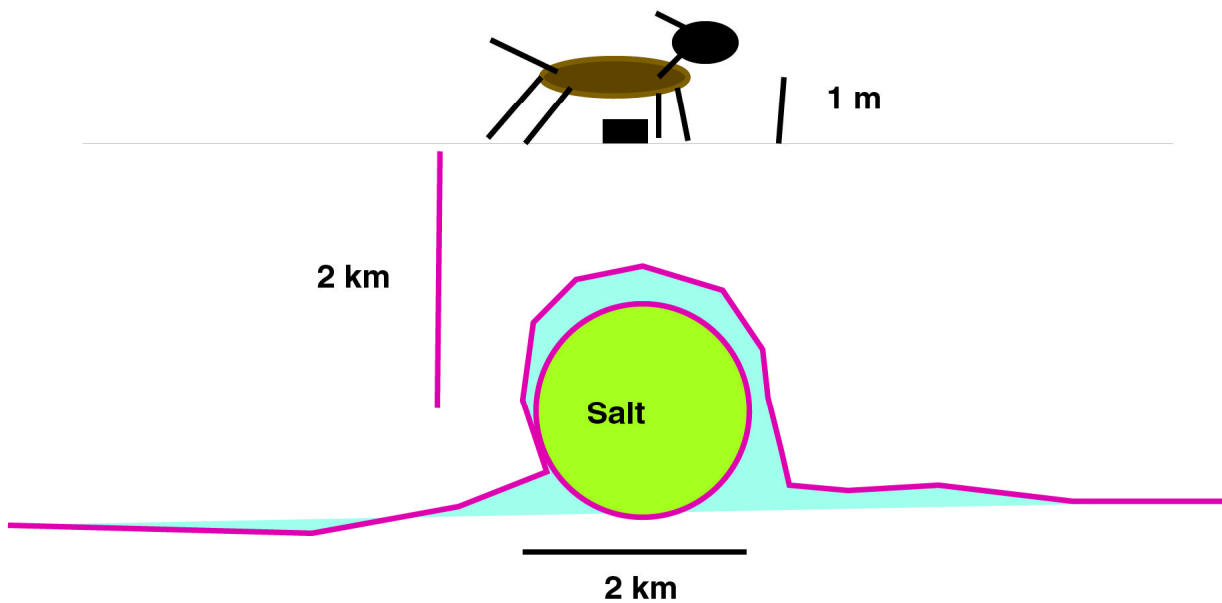


Geophysics 150: Home set due Nov. 01, 2002

1. The question often comes up in gravity surveys whether one needs to worry about nearby objects. You are measuring gravity looking for salt domes. A salt dome in your area is expected to have a shape that can be approximately represented as a buried sphere with a radius of 1 km centered at 2 km depth. It is 0.4 gm/cc less dense than the surrounding rocks. A 1000-kg cow wanders by and is 1 m above your instrument for one measurement. Assume a spherical cow!



a. Compute the gravity anomaly from the cow and from the salt dome. Can you ignore the cow?

b. Compute the vertical gradient of gravity from the cow, the salt dome, and the Earth as a whole (Free air correction). Can you ignore the cow?