

Laboratory Week 7

Meet at “Odell Acres”, the field south of ESF (site of the well sampling lab)

Installation of groundwater monitoring wells, soil pits

Tasks:

1. Observe drilling and well installation.
2. Learn how to write a soil boring log.
3. Observe various soil sampling devices that can be used by the drill rig.
4. Obtain soil samples for metal extraction in Week 7.

Each group will do the first three tasks together as demonstrated by Chris Aldrich of Specialty Drilling (Heindel and Noyes). Task 4, obtaining two soil samples for further analysis in Week 7, will be done under the guidance of the lab instructor and TA. One soil samples should be a composite 0-6” sample of a designated portion of the field. The second sample should be taken near a nearby building from a location likely to have some contamination (i.e. lead paint or metals from tires, gas or oil).

Details of Lab Report

One report will cover weeks five (well sampling at the ESF) and six (well installation). The following need to be included:

1. A fully completed soil boring log for one of the wells (10-12).
2. A brief description of the soil sampling devices that can be used by a drill rig (10-12).
3. A brief description of the method used for obtaining your two soil samples (10-12).
4. A brief description of the method you used to sample the wells in week 5, the depth of water in each well you sampled, and the conductivity of each well you sampled (from 9-28).
5. Using the data provided below and the map previously handed out, answer these questions:
 - a. Are there differences in the shallow and deeper groundwater? Which wells appear connected and which appear not to be connected?
 - b. Which way is the groundwater flowing? Draw a crude flow net, making a new map from the map provided in the handout for Week 5.
 - c. From which direction is the source of the chloride (i.e. high conductivity)?
 - d. The well depths should be the same but why are there some big differences in the height of the water between the two labs?

Once I have all the data I will post it in an EXCEL spreadsheet on the lab website.

| First Lab | Well | depth to water (ft) | depth to bottom (ft) | conductivity (mS) | reference elevation (ft) |
|------------|------------|---------------------|----------------------|-------------------|--------------------------|
| Group D | P1 shallow | no water | | | |
| | P1 deep | 15.53 | 21.30 | 0.47 | |
| Group B | P2 shallow | missing | missing | 3.71 | 307.07 |
| | P2 deep | missing | missing | 2.31 | 306.54 |
| Group C | P3 shallow | 8.8 | 12.0 | 1.55 | 304.61 |
| | P3 deep | 14.4 | 21.8 | 1.48 | 305.00 |
| Group F | P4 shallow | 11.42 | 12.91 | nd | 300.22 |
| | P4 deep | 11.60 | 23.57 | nd | 300.78 |
| Group A | P5 shallow | 12.6 | 14.5 | 0.31 | 300.22 |
| | P5 deep | 17.9 | 30.1 | 0.46 | 300.78 |
| Group G | P5 shallow | use Group A depths | | 0.34 | 308.53 |
| | P5 deep | | | 0.45 | 309.12 |
| Group E | P6 shallow | 11.2 | 28.0 | 0.59 | 299.55 |
| | P6 deep | 13.81 | 8.81 | 0.37 | 298.30 |
| | | | | | |
| Second lab | | | | | |
| Group J | P2 shallow | 9.1 | 12.51 | 2.51 | 307.07 |
| | P2 deep | 9.8 | 22.11 | 3.12 | 306.54 |
| Group I | P3 shallow | missing | 12 | 1.81 | 304.61 |
| | P3 deep | missing | 20.8 | 1.50 | 305.00 |
| Group L | P4 shallow | 11.6 | 12.95 | 0.74 | 300.22 |
| | P4 deep | 19.79 | 23.7 | 0.42 | 300.78 |
| Group H | P5 shallow | 13.09 | 14.45 | 3.22 | 308.53 |
| | P5 deep | 24.28 | 30.25 | 0.45 | 309.12 |
| Group K | P6 shallow | 9.0 | 14.1 | 0.53 | 299.55 |
| | P6 deep | 12.5 | 28 | 0.36 | 298.30 |

nd =not determined

