Name_____Date_____Period_____

Stratigraphy and Geological Correlations II

Background

Now that you have been introduced to the concept of stratigraphy and geologic correlations, it is time to put that knowledge to use in a practical example. In this second part of the lab, you will represent a company that is asked to conduct a field study to determine the feasibility of mining commercially valuable rock/mineral resources. In order to determine the subsurface geology of the region, your company will drill six test cores along a sixty mile line crossing through the region and analyze the findings from the core samples.

First, you must determine what rocks are contained in each of the drill cores. After determining what rocks are present, a stratigraphic column for each core will have to be produced. The columns will then be correlated in order to determine the geological setting and the likelihood of finding valuable resources.

Instructions

1. Take a look at the drill core data, identify the six rock types from the list below and fill in the chart with the correct rock name. If necessary, look up the rock types if you are not sure what they are.

Fossiliferous Limestone	Carbonaceous Shale	Coal
Red Sandstone	White Sandstone	Argillaceous Shale

2. Review the drill core logs that indicate the depths of each rock type found. Using a scale of 1 mm (on paper) = 2 feet (in actual depth), construct a scaled diagram of each core sample on the blank stratigraphic column diagram. Note that a small amount of space in each column will have to be added to allow for the 1 mm = 2 ft scale to work. Add it to the top of the column (think superposition).

3. For each rock type, fill in the stratigraphic columns with the appropriate rock type symbol. Rock type symbols are available on the Downloads section of the Structural Geology E-Unit.

4. Draw in any correlations that can be made from one drill core to the next.

-If Time Permits-

5. Once you have conducted a complete analysis of the core samples and answered the lab questions, obtain a clear acrylic tube (there are enough for approx. 1 for every three students). You will be assigned one of the drill cores (1-6) to recreate using the colored gravels. The color code is as follows:

Fossiliferous Limestone - Blue	Carbonaceous Shale - Brown	Coal - Black
Red Sandstone - Red	White Sandstone - White	Argillaceous Shale - Green

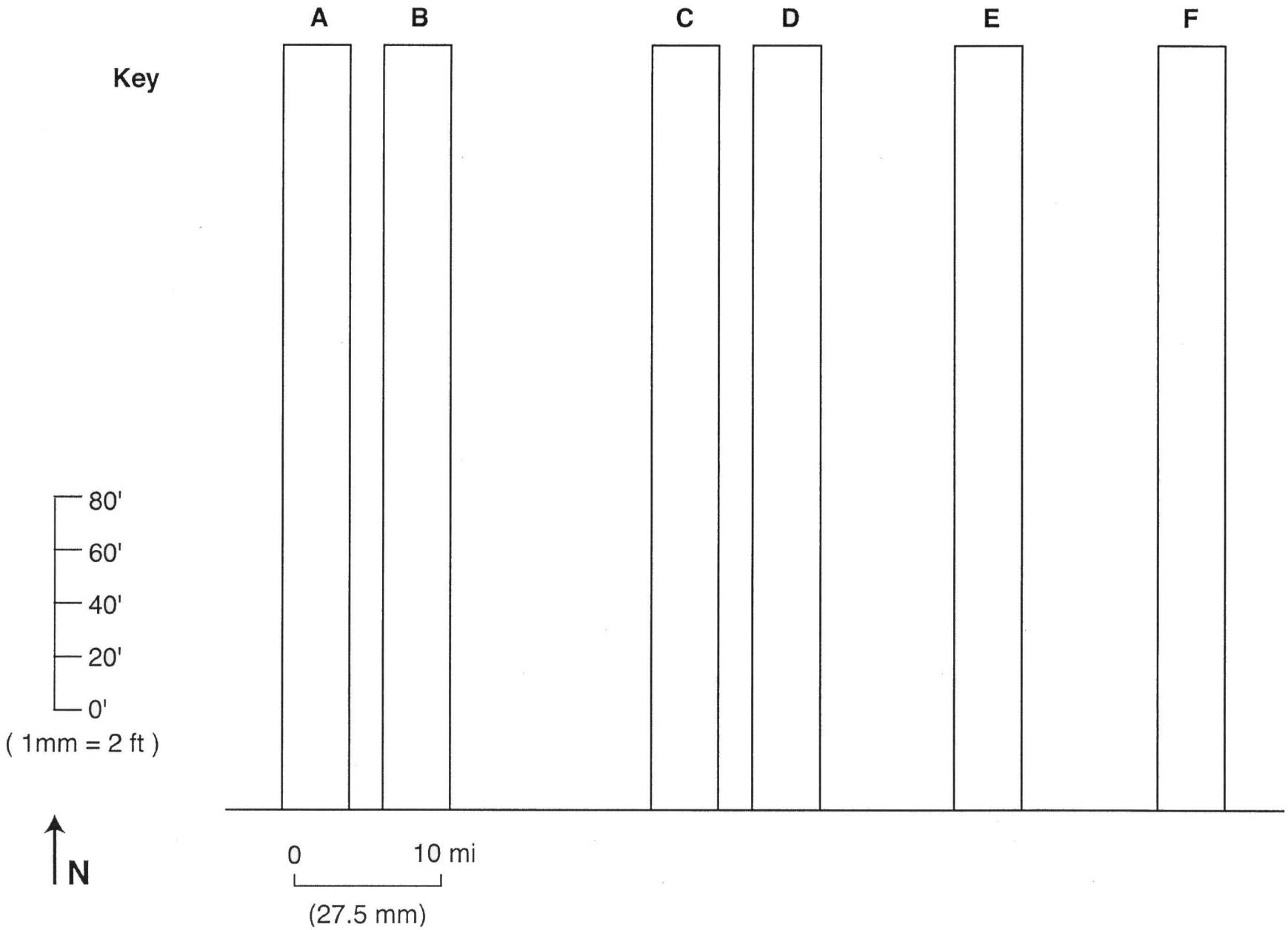
6. Using a scale of 1mm = 2ft, recreate the geologic profile for the assigned drill core. *Note this scale will require you to add 7mm to the top of the stratigraphic column as currently drawn.*

7. Once all drill cores have been assembled on the model, draw in the correlations on the acrylic board using a dry erase marker. If it has been constructed correctly, it should resemble your own diagram. Check them for accuracy.

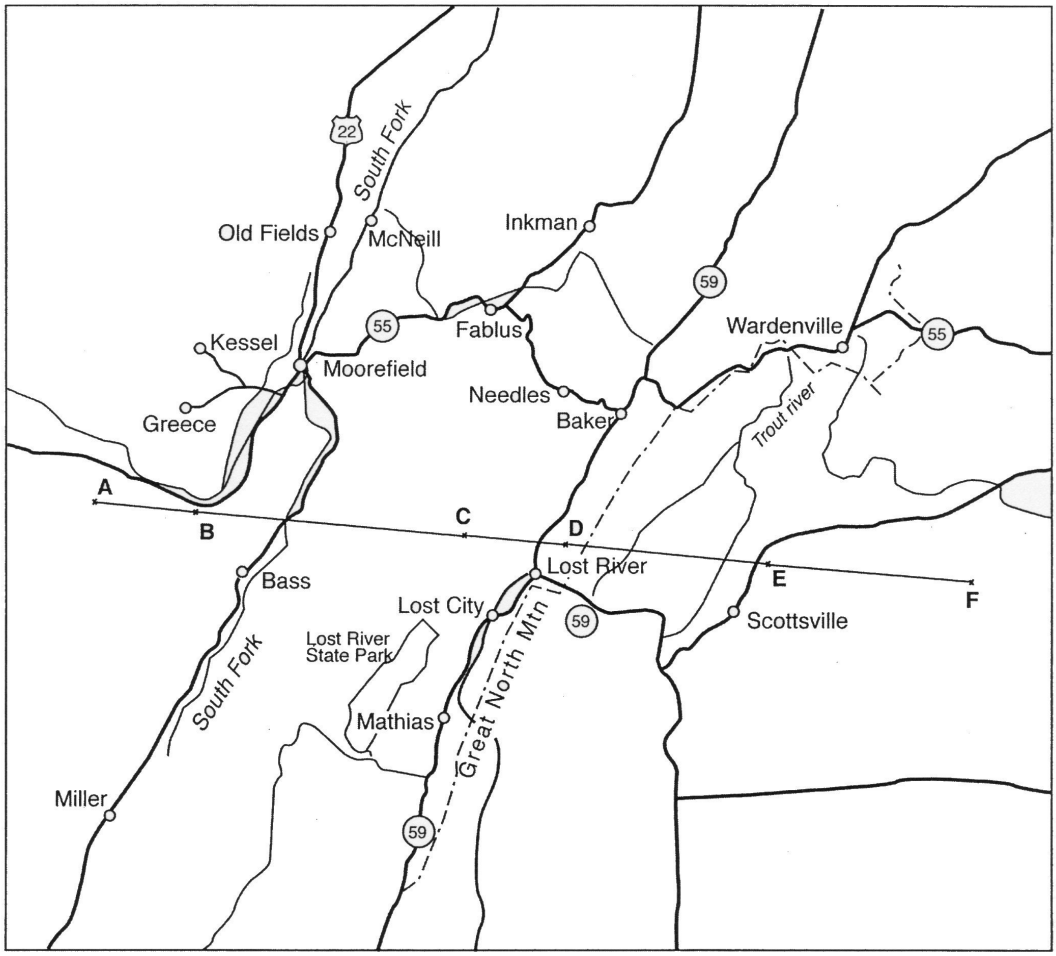
Drill Core Data

Rock	Description	Name	Site A	Site B	Site C	Site D	Site E	Site F
A	Relatively hard, rounded quartz and feldspar grains. Red "stain" on rock easily rubs off on fingers.		288' (Indicates depth of bottom of layer)	288'	288'	288'	288'	Not present
B	Flat black, very fine-grained with smooth, layered surface. Breaks easily into chips if bent. Contains some fossil ferns.		238'	220'	136'	178'	Not present	Not present
C	Black, very soft and contains remains of plant material. Rubs off when pressed between fingers.		170'	118'	102'	170'	Not present	Not present
D	Light colored and gritty. Mostly composed of rounded quartz grains.		Not present	Not present	84'	Not present	238'	288'
E	Grey in color with fossil shell impressions. Fizzed when exposed to HCl.		Not present	Not Present	Not Present	42'	154'	254'
F	Very fine grained smooth rock with trilobite fossils. Fairly soft and reduces to mud if wet.		Not present	Not present	Not present	Not present	34'	84'

Stratigraphic Column



Site Map



0 10 mi 20 mi

N

 250-0775

Lab Questions

1. From the available analysis, what resource(s) would most likely exist in commercially valuable quantities? At what site(s) would it make the most sense to consider mining operations?

2. Examine the *surface* rock found at each drill location. Assuming they are all the same age, describe the general environmental conditions that existed when these rock layers were laid down from west to east using the Principle of Lateral Continuity. Use specific examples from the stratigraphic columns to support your answer.