

Answer Key for Environmental Geology Lab 10

1.

Rock	Minerals	Texture	Other Characteristics
Shale	Clay Minerals	Detrital	Select your own
Sandstone	Mostly quartz	Detrital	Select your own
Limestone	Calcite	Non-Detrital	Select your own
Coal	None - Consist of Organic Material	Non-Detrital	Select your own

2. Any place where plant organic material can accumulate such as swamps and lagoons

3. No because fossil fuels are formed within different types of sedimentary rocks.

4. Oil shale and tar sandstone but with the way prices are going these resources soon will become economic

5.

Rock	Source Rock	Reservoir Rock	Trap Rock
Shale	√		√
Sandstone		√	
Limestone		√	

6. Where the reservoir is deep below the window for oil formation. Depths greater than 4 km.

7. No because temperatures at these depths breakdown hydrocarbon molecules.

8. Because gas has a lower density than oil and will rise to the top of the reservoir.

9. Simple hydrocarbons are gasses and as hydrocarbon molecules become more complex the tendency is to find these compounds as liquids and even solids in the case of extremely complex hydrocarbons.

10. Temperature at 1 km - Temperature at 0 km = Geothermal Gradient

$$55\text{ }^{\circ}\text{C} - 28\text{ }^{\circ}\text{C} = 27\text{ }^{\circ}\text{C} / \text{km}$$

11.

- a. Stratigraphic Trap -Salt
- b. Stratigraphic Trap -Shale
- c. Structural Trap - Anticline
- d. Structural Trap - Fault
- e. Combination Traps - Fault and Stratigraphic (Shale)

12. Seven

13. El Paso

14. Natural Gas

15. No because there are no oil or natural gas fields immediately west of Austin.

16. Primary – Simple Pumping out of the Ground
Secondary – Inject fluids into a reservoir to promote a greater recovery
Enhanced Recovery – Directly target the source rock and add high pressure fluids to drive open small pores in the shale.

17. Pollution of ground water, depletion of water resources, triggering earthquakes, noise pollution, soil and air pollution.

18. Yes, the number of earthquakes per year has doubled in the later time period when production in the Eagle Ford ramped up.

19.

Rock	Degree of Shininess	Other Characteristics
Lignite	Not Shiny	Select your own
Bituminous	Somewhat Shiny	Select your own
Anthracite	Very Shiny	Select your own

20. Ancient swamps

21.

	Peat	Lignite	Bituminous	Anthracite
Carbon Content	_____ >			
Calorific Value	_____ >			
Moisture Content	< _____			
Volatile Content	< _____			

22. Lignite

23. Lignite, Bituminous

24. Surface resources are on Mines Road to the northwest of Laredo; subsurface resources are to the east of Laredo

25. No these resources are lignite, which are low in quality