Field Trip Workbook
G200 Field Studies—Sec 002 (Mt St. Helens south)
Fall, 2011
Professor in charge: Alex Ruzicka
TAs: Josh Brockway, Justin Oschlager attending.

Use this workbook to answer the following questions about the geology at the stops we will be making. This workbook also gives our itinerary.

Please note that the stops below correspond to the Field Guide prepared by other professors that has been made available to you on line, but that we will not be doing all of the stops in the same order as the Guide. The Field Guide may be useful for answering some of the following questions.

**STOP 0- Woodland, Exit 21 on I-5, start of drive on Hwy 503.** We will stop here for a bathroom break, if needed, at one of the fast food establishments, as our next opportunity for a bathroom will be STOP 2.

**STOP 1- Roadcut just past milepost 37 on Hwy 503.**

<table>
<thead>
<tr>
<th>Unit</th>
<th>Description</th>
<th>Answer to Q1</th>
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<tbody>
<tr>
<td>A</td>
<td>Dark, massive, most of outcrop</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Whitish vein-like material to right</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Dark, massive, linear body to left</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Reddish material (it differs far and close to C)</td>
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Q2. How did unit B form?

Q3. What type of rock body does unit C represent?

Q4 Units D and (especially) A compose most of the outcrop. One or both of these could represent the ‘country rock’ or main rock type in the area. What is this country rock made of? What is its age?

Q5. Summarize the geological history recorded by the rocks in this outcrop and put them together in a reasonable scenario.
Hwy 503 splits, we will take the 503 east spur.

STOP 2- Cougar. Bathroom stop. Snacks may be available across the road. This is also our last chance for gas.

We will proceed directly to Ape Cave, which is STOP 6 in the Field Guide.

STOP 3- No stop here, we will combine it with another stop later.
STOP 4- No stop here, we will do this on the return leg.

Turn on Road 83, then 2.7 miles later, turn left on Road 8303 towards Ape Cave.

STOP 5- No stop here, we will do this after Ape Cave.

STOP 6- Ape Cave. We will be hiking down Ape Cave in the dark, so wear warm clothing and take a flashlight if you have one. This would be a good place to have a buddy, one to hold lighting, the other to take notes. A pit toilet is available at the parking lot.
Q6. What is the rock type out of which the cave formed and how old is it?

Q7. Write down and describe all interesting features we see in the cave.

STOP 5- Trail of Two Forests, about 0.7 miles down the road from Ape Cave. We’ll explore outside first, then have lunch here. Pit toilets are available.
Q7. What is the rock type just below the surface?

Q8. Where have we seen it before?

Q9. Define Pahoehoe.

Q10. Looking at the pahoehoe texture, how would you define its viscosity? Express your answer in terms of things you are familiar with (a wrong example: like peanut butter in your refrigerator).

Q11. What interesting features are found along the main trail and how were they formed? List and define 3 of them.

Drive Road 8303 back to Road 83, then head east to Lahar Viewpoint.

STOP 7- No stop here. We don’t want to drive so many miles on a dirt road.

STOP 8—Lahar Viewpoint.
Q12. What is the difference between a lahar and a pyroclastic flow?

Q13. What kinds of rock are found on the surface of the ground here?

Q14. Describe what the surface looks like after a lahar passed through. If this solidified and became rock, what would you all it?
Q15. How can you tell the maximum height that this lahar attained?

*Drive to the eastern end of Road 83 towards Lava Canyon.*

**STOP 9- Lava Canyon. We will be hiking down the canyon, cross a suspension bridge, and make a loop. A pit toilet is available at the parking lot.**

Q16. What happened to form this canyon? Give 5 stages of development.

Q17. What features suggest that the surface of the lava flow was scoured by water?

Q18. What is the yellow/brown material on the rocks (Tertiary volcanics) that underlie the lava flow that fills this canyon?

Q19. What does the material in Q18 tell us?

Q20. What kinds of joints do you see in the main lava flow?

Q21. After crossing the suspension bridge, you will be standing on an intrusion. What is the name of this intrusion and where have we seen a similar structure? What kind of rock does this rock consist of?

Q22. The rock that composes the main lava flow in the canyon contains a white rectangular mineral. What is this mineral?

Q23. What is the kind of rock that composes the main lava flow?

*After Lava Canyon we will retrace our route back to Portland, making a stop soon after crossing the Swift Reservoir canal.*

**STOP 4- Outcrop on north (right) side of road, parking on south side. Stop 4 is located below a canal of the Swift Reservoir whose dam failed in April 2002.**

Q24. The outcrop has a distinctive surface texture. What is the texture called and how did it form?

Q25. What type of rock is visible here and where have we seen it before?

Q26. There is a distinctive structure visible in the rock outcrop. What is the name of this structure? Draw a sketch to illustrate what it looks like in cross section, and annotate it to indicate how the structure formed.

Q27. What caused the failure of the dam and how does it connect with the geology of the outcrop here?

Q28. How was the failure repaired?

*Return to Portland.*