

Your Guide to the Geology of central and northern Lancaster County, Pennsylvania



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April 24, 2010
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Agenda

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| 9:05 am | Depart HACC – Lancaster Campus |
| 9:25 am | Stop 1. Rohrer's Quarry, Lititz |
| 10:55 am | Depart |
| 11:10 am | Stop 2. Bamford zinc mine |
| 11:30 am | Depart |
| 11:45 am | Lunch at Chickies Day Use Area |
| 12:15 pm | Depart |
| 12:20 pm | Stop 3. Chickies Rock - North End |
| 1:10 pm | Depart |
| 1:15 pm | Stop 4. Breezy Point – Susquehanna River and Topography |
| 1:35 pm | Depart |
| 2:05 pm | Stop 5. Miller Road Triassic rocks (There are actually 2 stops in one) |
| 2:40 pm | Depart |
| 3:00 pm | Stop 6. Conewingo Trail diabase |
| 3:25 pm | Depart |
| 4:00 pm | Arrive back at HACC-Lancaster |

STOP 1. Rohrer's Quarry – Host Karen Crouse

- Located within the Lowlands section of the Piedmont physiographic province.
- Limestone is being mined here
- This rock is classified as a sedimentary rock.
- The limestone belongs to the Epler formation of Ordovician age.
- Products being produced here include crushed stone, lime products and concrete.
- This area has been through intense tectonic activity. Can you identify folds and faults?
- Safety is of top priority in a quarry. There are many regulations and procedures that have to be followed.

Stop 2. Bamford zinc mine (Kellogg's Cereal plant)

- This was Jeri's first geological project and was conducted as a thesis for his college credits. Kellogg's Cereal built their building on this site in 1976 and exposed some of the ore, artifacts and surprises.

STOP 3. Chickies Rock

Physiography and Site History:

- Located in the Piedmont Uplands Section
- Elevation is 280 above sea level. Chickies Rock has been documented since history has been recorded. In the earliest geological report of York County, it was mentioned that gold was mined from here.
- A Mr. Samuel Haldeman, a well known 19th century naturalist, writer and educator lived at the base of the rock.
- He corresponded with Charles Darwin concerning a fossil he found at Chickies Rock.

- Our walk will take us through two rock types. The rocks encountered are quartzite and phyllite. Both are metamorphic rocks.

- This is the oldest formation containing fossiliferous rocks in this part of Pennsylvania.
- A fossil found in the Chickies formation known as *Scolithus linearis*, dated at 600 mya.
- There is a sedimentary feature found at Chickies Rock that helps to tell its geologic history. This feature is known as ripple marks,
- What did this area look like 600 mya?
- Chickies Rock is one of the finest examples of an anticline on the East Coast.
- The eroded fractures along the rock face are faults.
- Notice how the face of the rock is not exactly straight up and down. The face is actually perpendicular to the axis of this fold which plunges (dips) into the ground toward the east. This is called a plunging anticline.
- Folding probably first occurred here during the Taconic Orogeny with additional deformation during the Alleghanian Orogeny.

STOP 4. Breezy Point Overlook

- History of the Susquehanna River is incredible. Considered to be a very old river, once the river may have flowed in the opposite direction since the mountains were located to the east about 450 mya.

- Known for its water gaps, the river here has cut through Chickies Ridge and the Hellam Hills.

- It is thought that a fault exists in this gap which was a self-made channel for the river. If the fault wasn't present, the Susquehanna River would have flowed around the east end of Chickies Ridge close to Park City and returned to its present location near Washington Boro.
- Look at the topography on the York County side of the river. Softer rocks make up the valleys and harder rocks compose the ridges. That is why we have the topography in this area.
- One piece of evidence suggesting the fault in this gap is the lack of "Chickies Anticline" on the west side of the river.

STOP 5. Millers Road Triassic Roadcuts

Physiography:

- Elevation is 390 feet above sea level
- Located within the Gettysburg-Newark Section of the Piedmont
- This area is the youngest geologic area and tells a different story than the other previous stops.

Geology:

- This stop includes two different rock exposures – one just south of Ridge Road on the east side of Miller road and the other, a small exposure opposite the township pumping station along Miller road.

Road Cut:

- Sandstone and shale are found here. Notice the layering and direction of dip.
- Which rock weathers quicker?
- Notice the reddish color of the rock. This is due to the small amount of iron that was in the sediment prior to lithification and the sediment was exposed at times to atmospheric conditions.
- These rocks have not be deformed through any orogenies yet. Generally speaking, the rocks are dipping at the angle they were deposited.
- Notice the small depressions in the underside of the sandstone. What might be the origin of these depressions?

Pumping Station:

- A fanglomerate (similar to a breccia but formed in an alluvial fan environment) is found here.

- How many different types of rock fragments can you identify?
- Do you think these rock fragments were transported a short distance or long distance?

- Thinking that all of the rocks along Miller road are uniformly dipping in the same direction, is this rock older or younger than the fanglomerate?
- This rock is the basal rock unit belonging to the New Oxford formation formed about 210 mya measuring about 6,000 feet thick.

STOP 6. Conowingo Trail Diabase Outcrop

Physiography:

- Elevation is 390 feet above sea level
- Located within the Gettysburg-Newark Section of the Piedmont

Geology:

- This is a great exposure of a rock known as diabase. This rock formed as a result of magma cooling. This is called an intrusive rock.
- Notice there are no rocks surrounding the diabase ridge? What do you think happen to these rocks?
- This ridge is what a geologist would call a dike - a mass of igneous rock that intruded through surrounding rock. Most of the higher elevations to the west and north of Elizabethtown is composed of diabase. In this case, the rock was created during the breakup of the super continent, Pangaea. As Africa and North America pulled apart (rifted) openings in the crust were filled in by magma.
- Examine the crystal size of the diabase along the outside edge and that found toward the middle. Make a short comparison of the crystal size between the two locations.

FURTHER READING

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