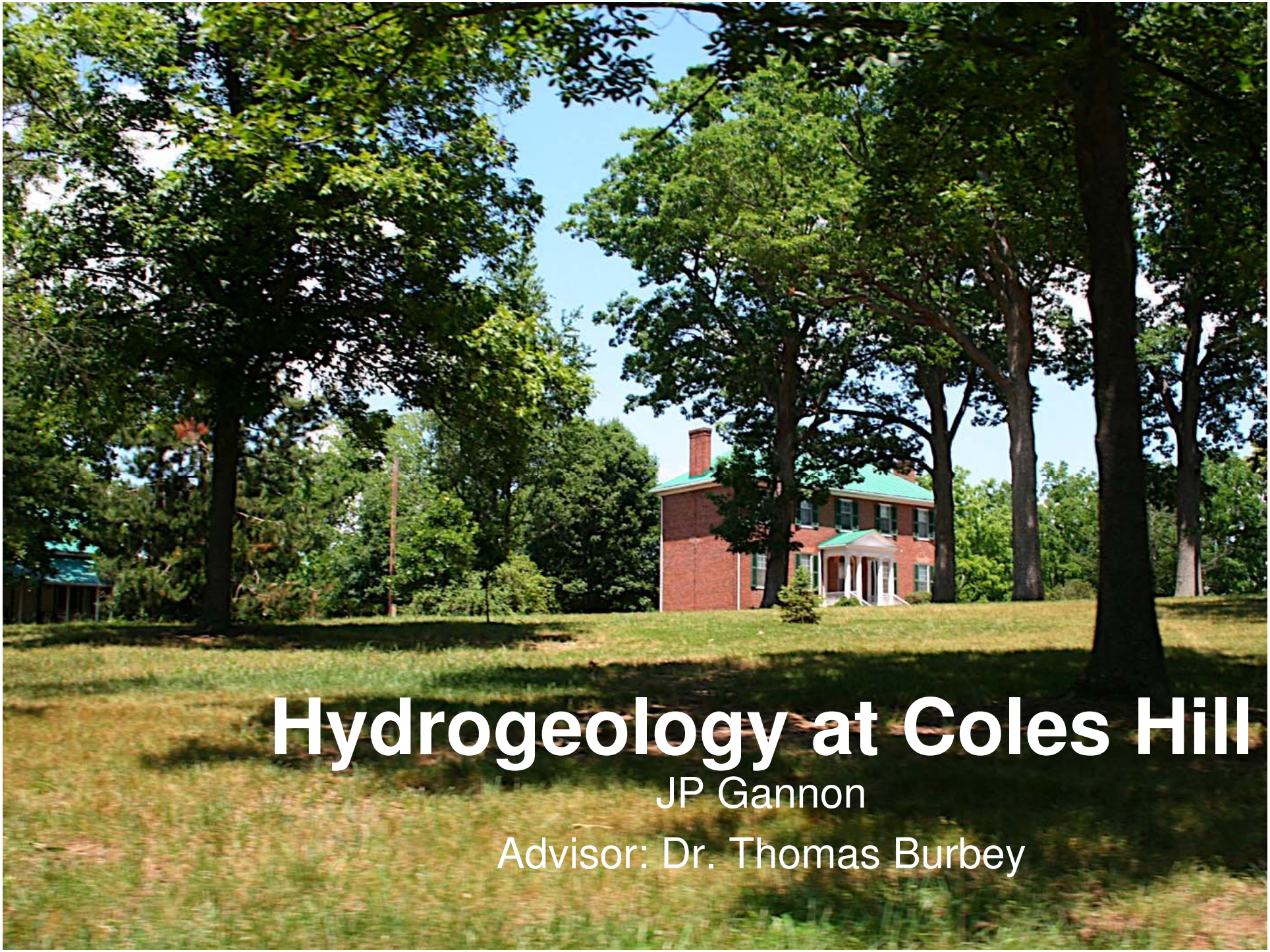


Hydrogeology at Coles Hill

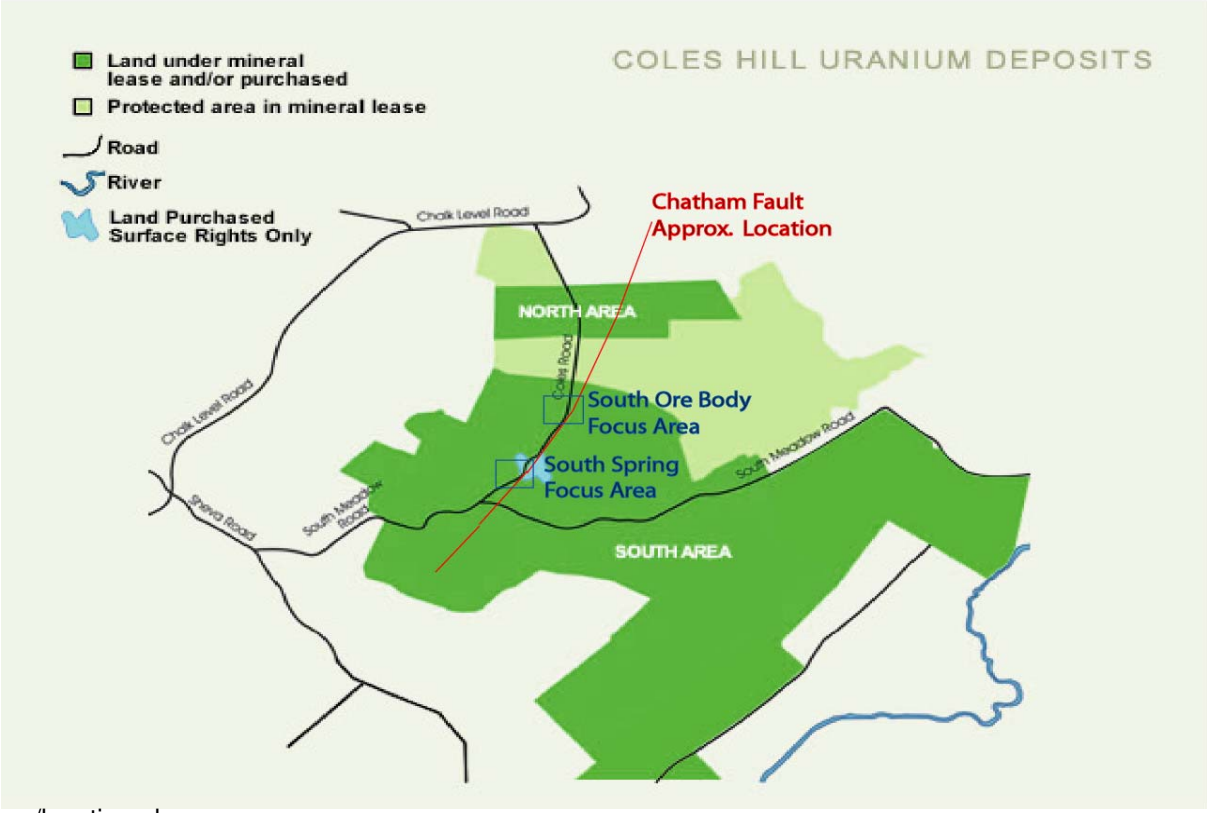
JP Gannon

Advisor: Dr. Thomas Burbey

Outline

- General Overview
- Field Processes
- Current Focus Area
- Suspected Coles Hill Hydro
- Future Work

Where are we?



http://www.virginiauranium.com/location.php

Piedmont Hydrogeology

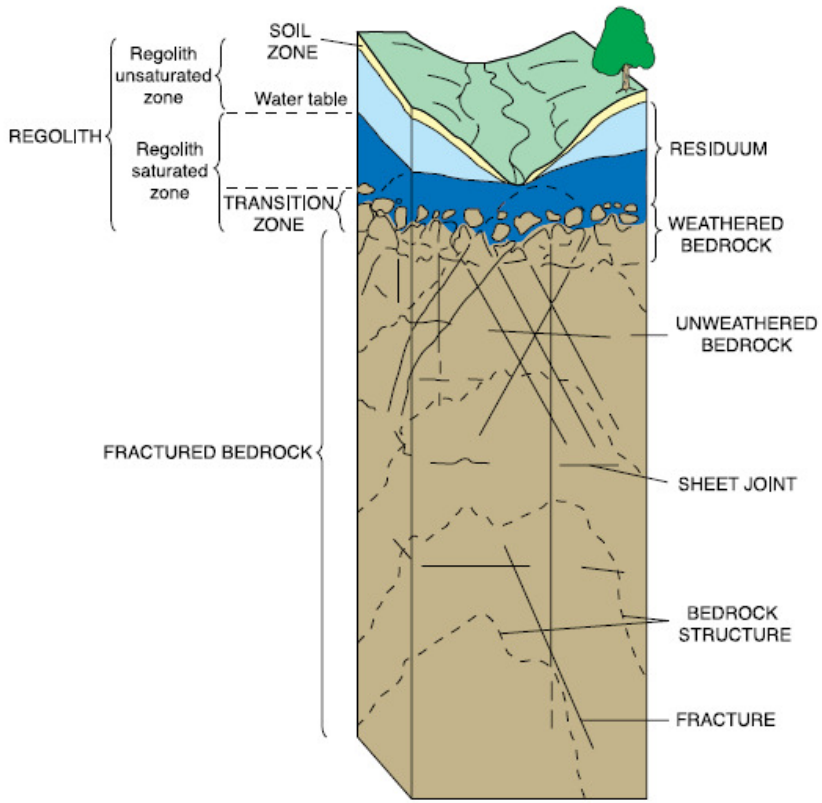


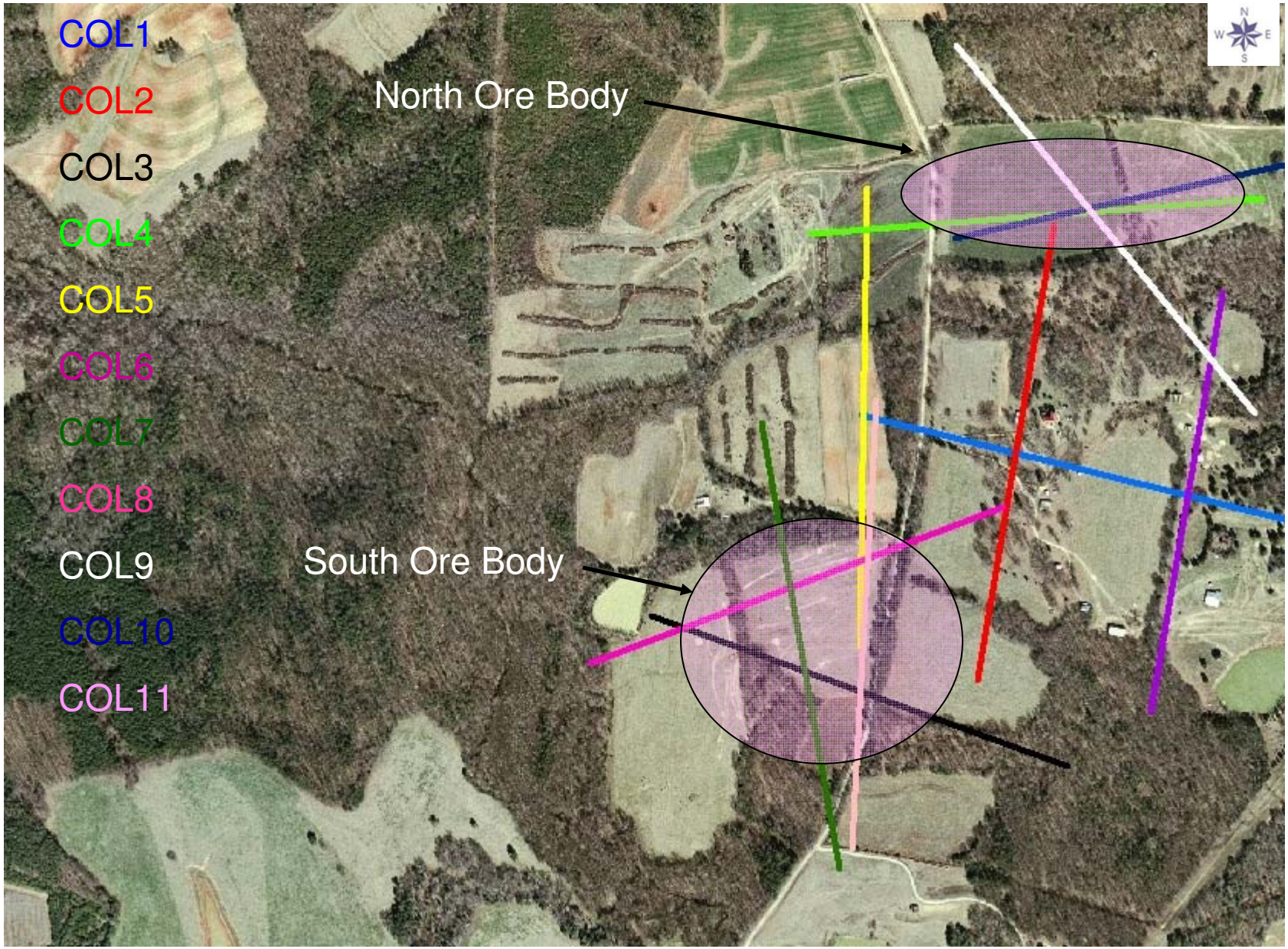
Figure 2. Principal hydrogeologic components of regolith and bedrock in the Valley and Ridge, Blue Ridge, and Piedmont Physiographic Provinces. (From Daniel and others, 1997, fig. 4.)

Swain, L.A., Mesko, T.O., and Hollyday, E.F., 2004, Summary of the hydrogeology of the Valley and Ridge, Blue Ridge, and Piedmont Physiographic Provinces in the Eastern United States: USGS Professional Paper 1422-A

Resistivity Work

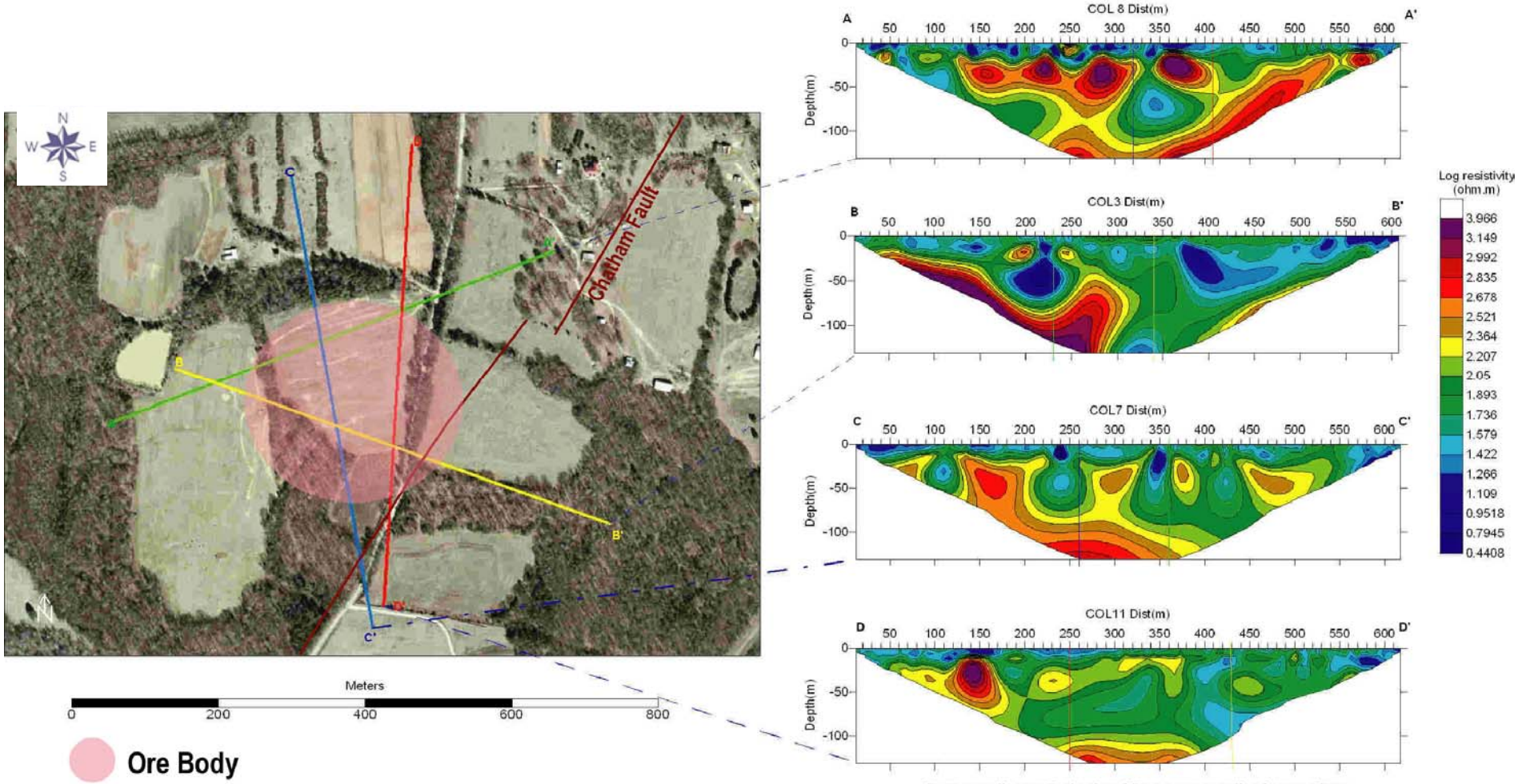
- Goals
  - Image Fault
  - Find Possible Fracture Locations
  - Determine Possible Groundwater Flow Paths
  - Determine Ideal Monitoring Well Locations

Resistivity Coverage



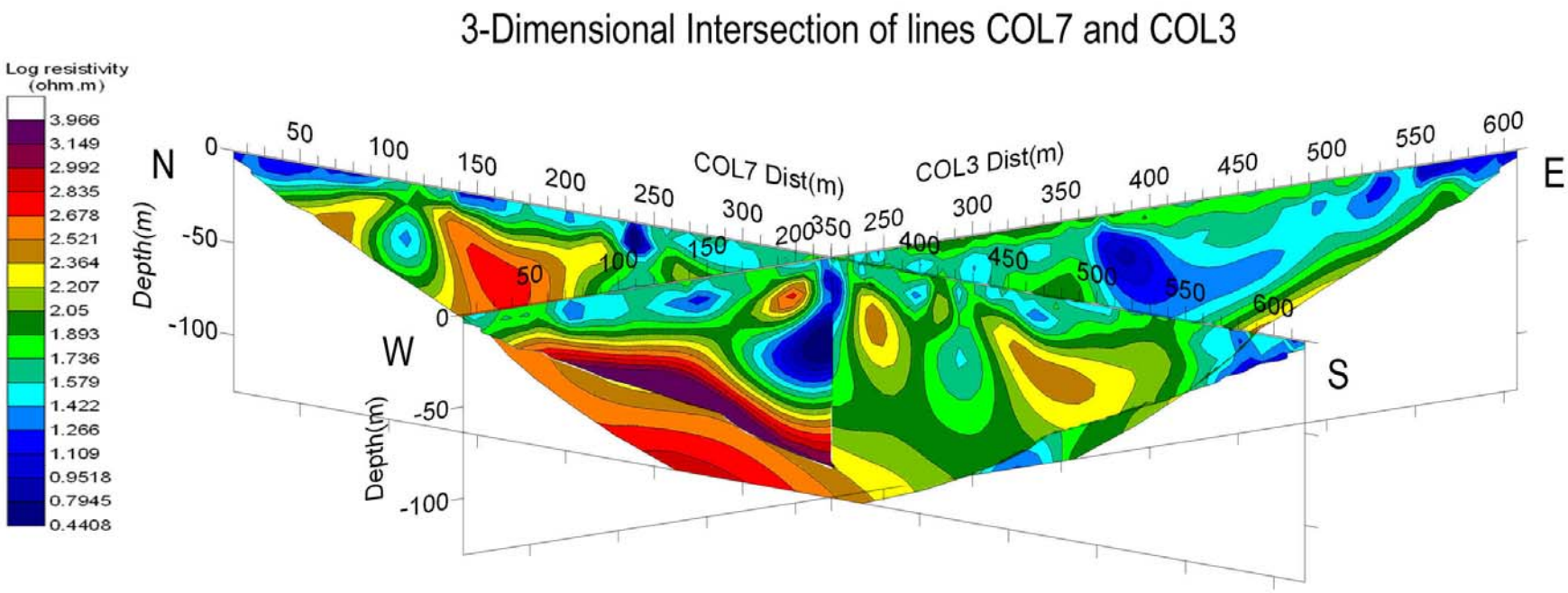
Close up of South Ore Body

Coles Hill South Ore Body Resistivity Lines



Corresponding vertical colored lines represent line intersections.
(ie: COL8 and COL11 intersect at the red line on both)

Visualization of low resistivity zone at south ore body.

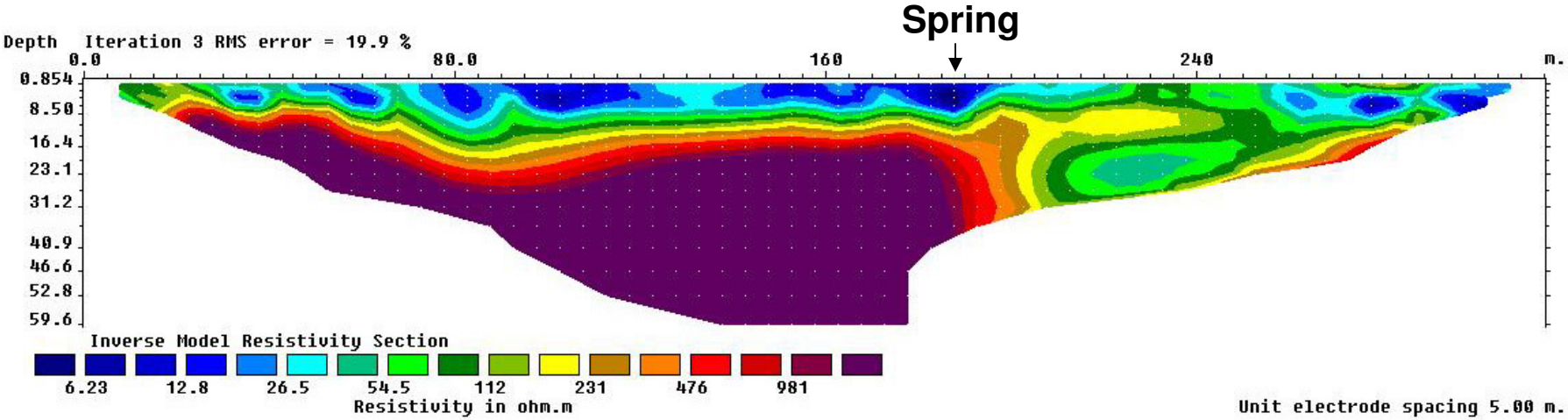


Resistivity Summary

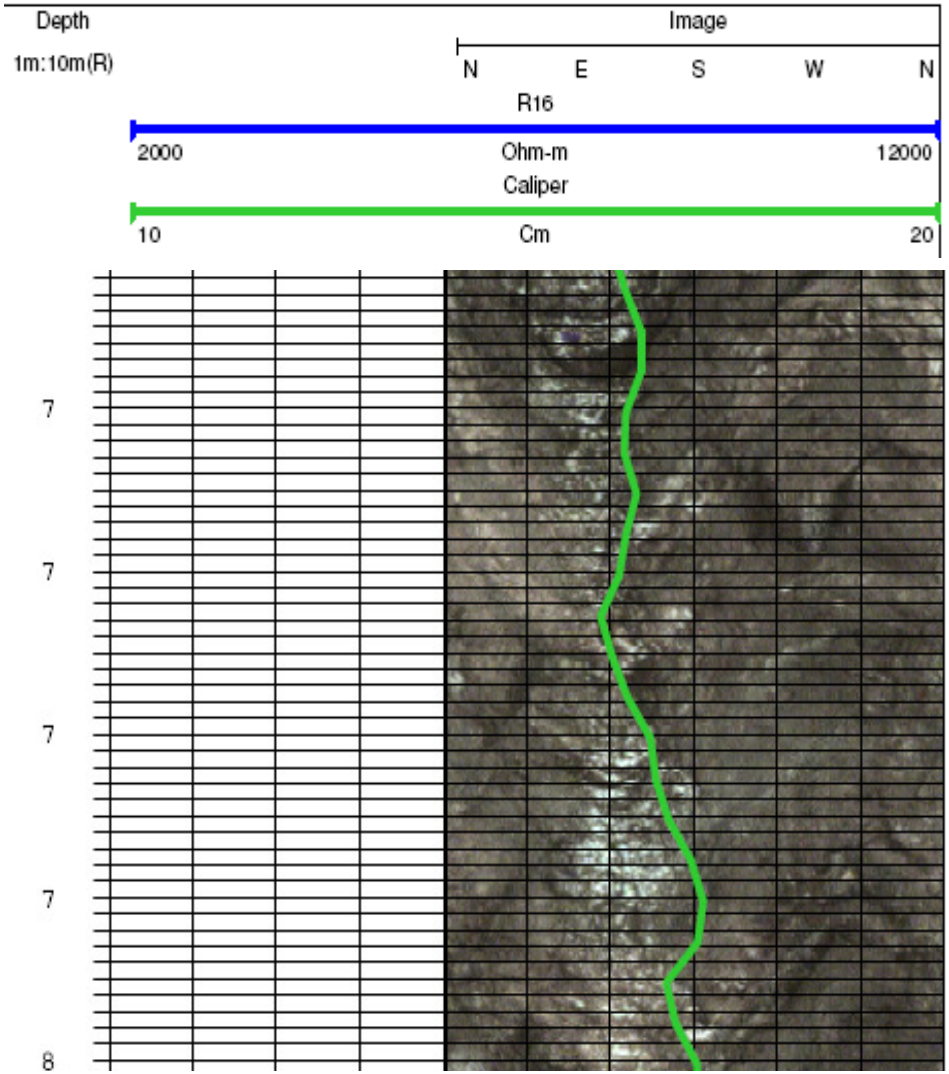
- Comprehensive coverage
- Many zones of saturation seen
- No data to define these zones
- Very valuable information if paired with well data

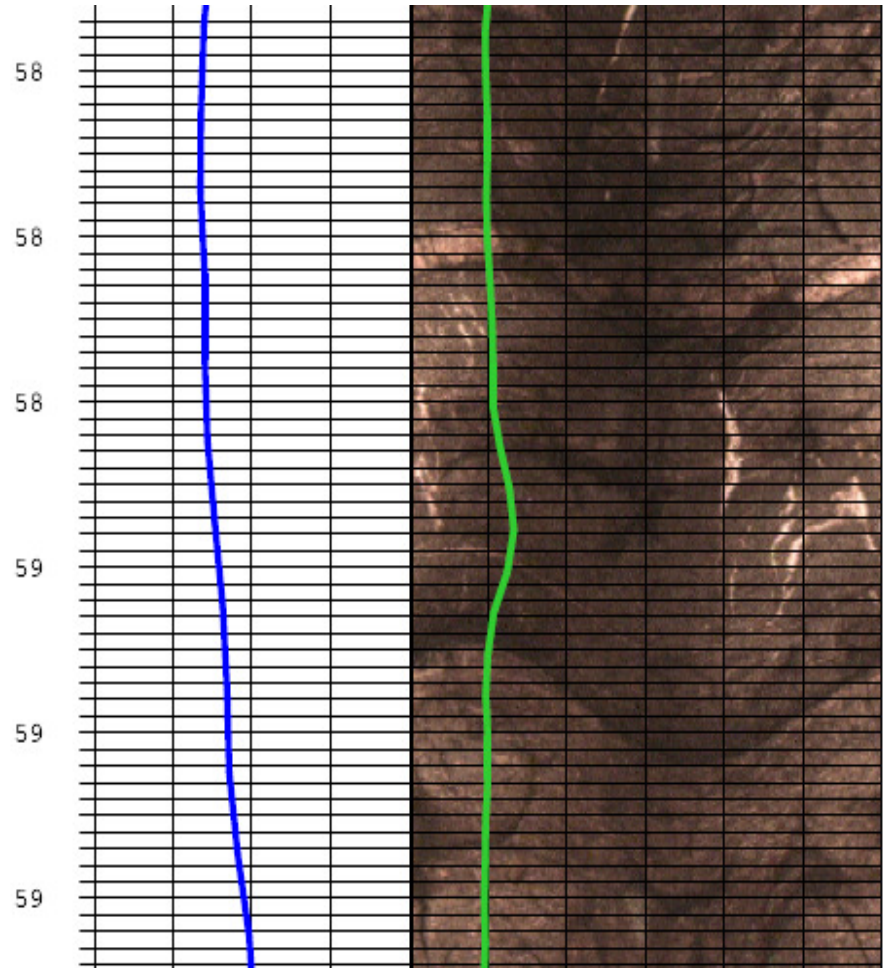
Current Focus Area

- Spring at local topographic high point
- Spring is near intersection of Chatham fault and possible cross fault.



Johns1 Log


Depth
1m:10m(R)
Image
N
E
S
W
N
R16
2000
Ohm-m
12000
Caliper
10
Cm
20
7
7
7
7
8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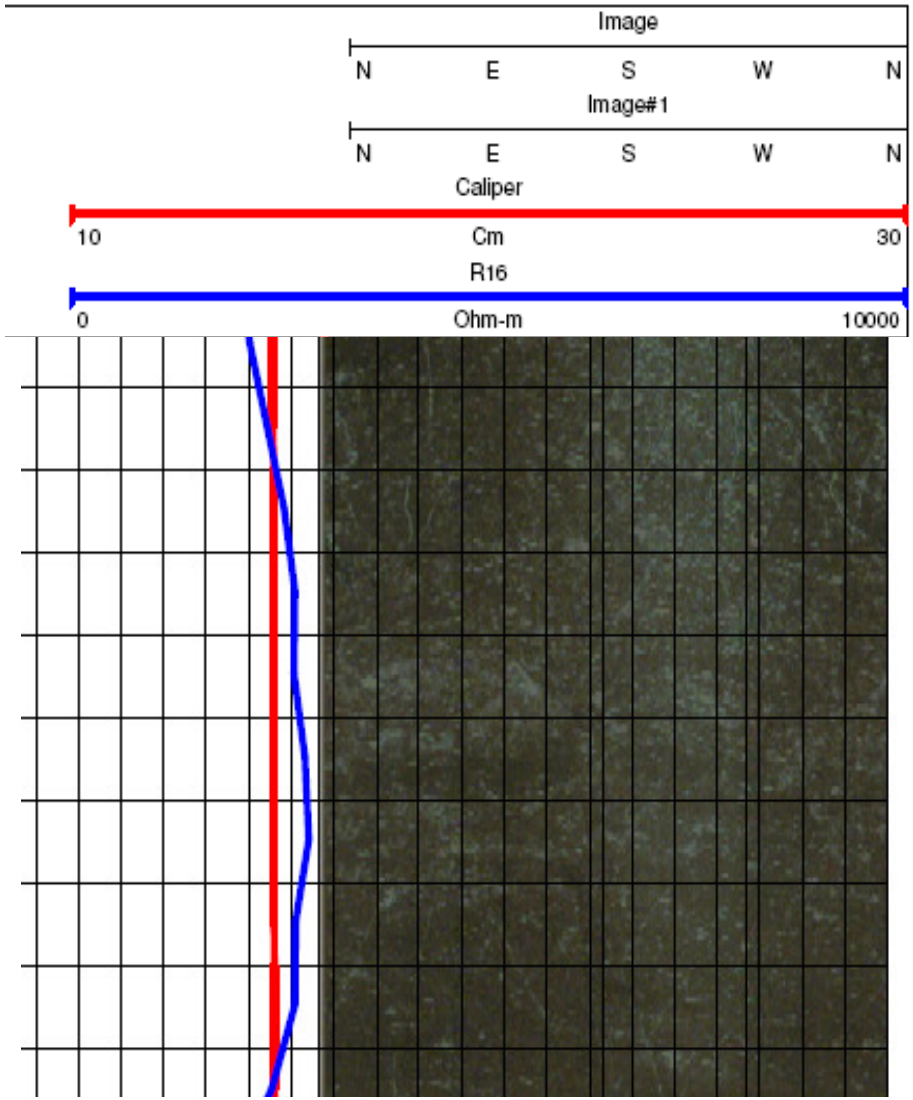
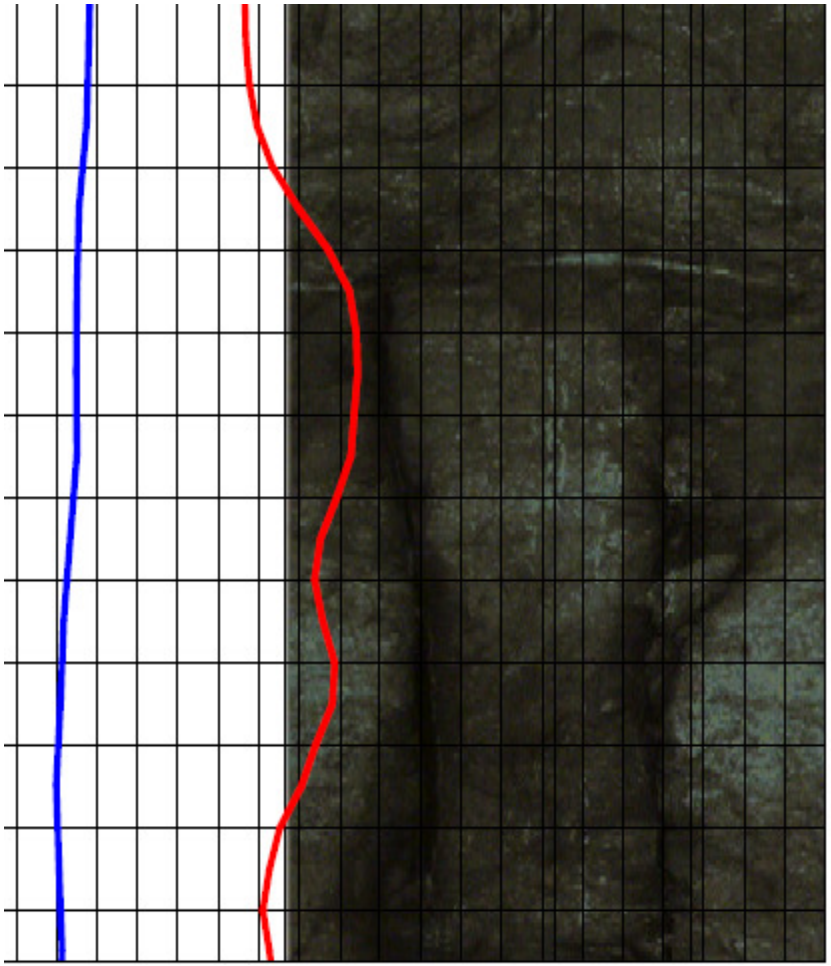
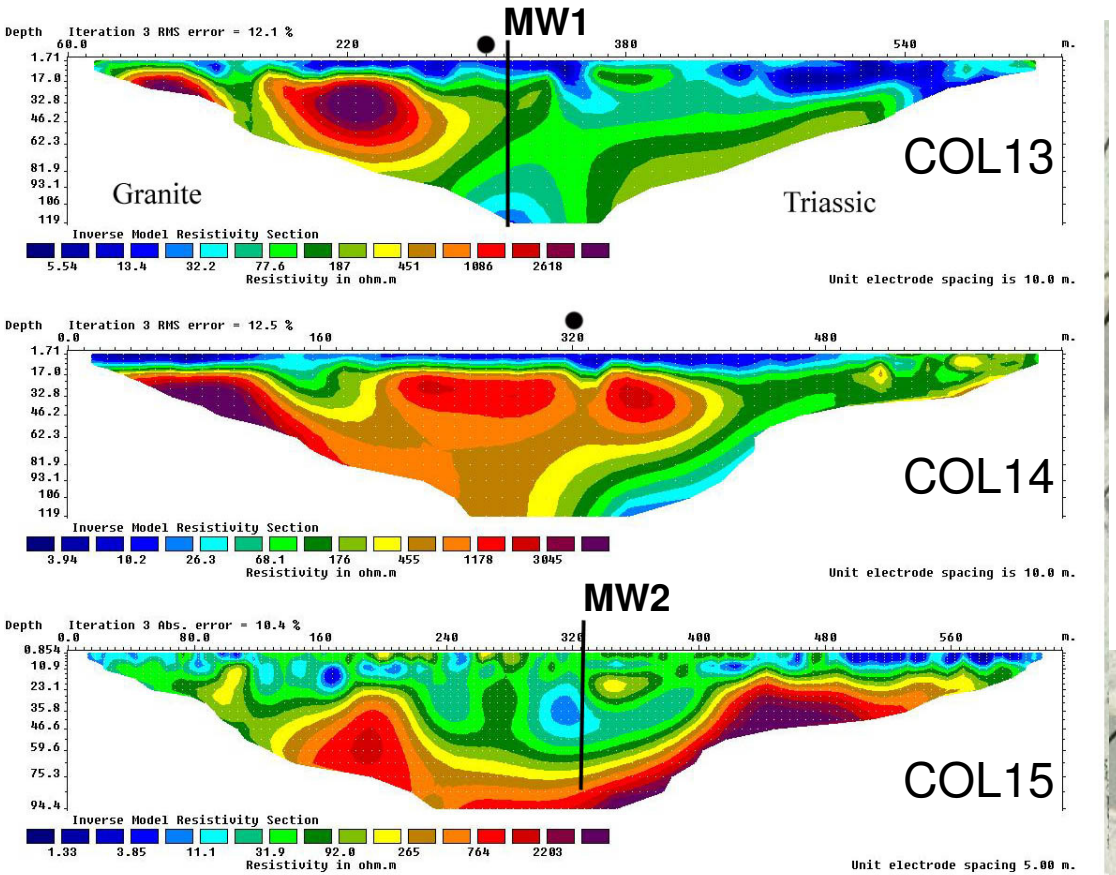
59

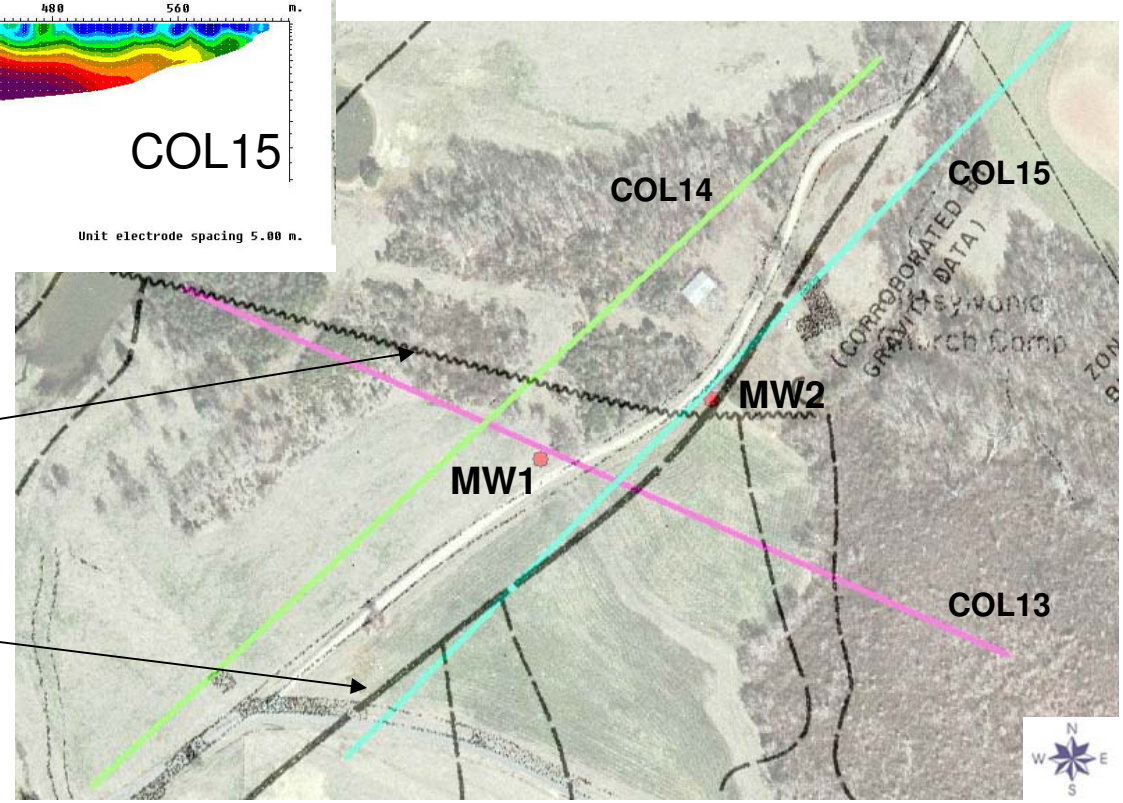
VAUTrail Log



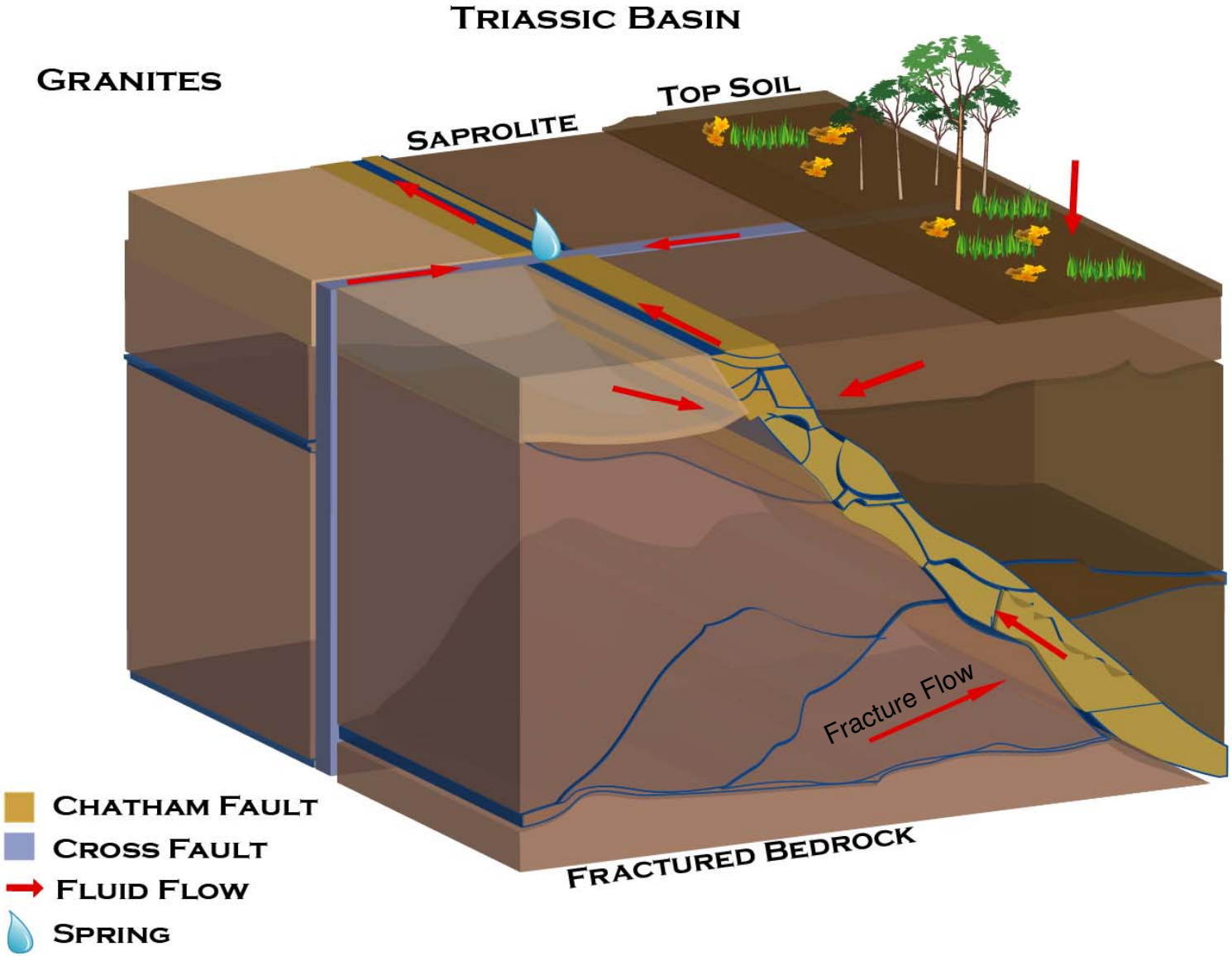




More Resistivity work further Defined the South Spring area And helped to find the best Locations for two monitoring wells



Hypothesized Hydrogeology of Coles Hill, VA



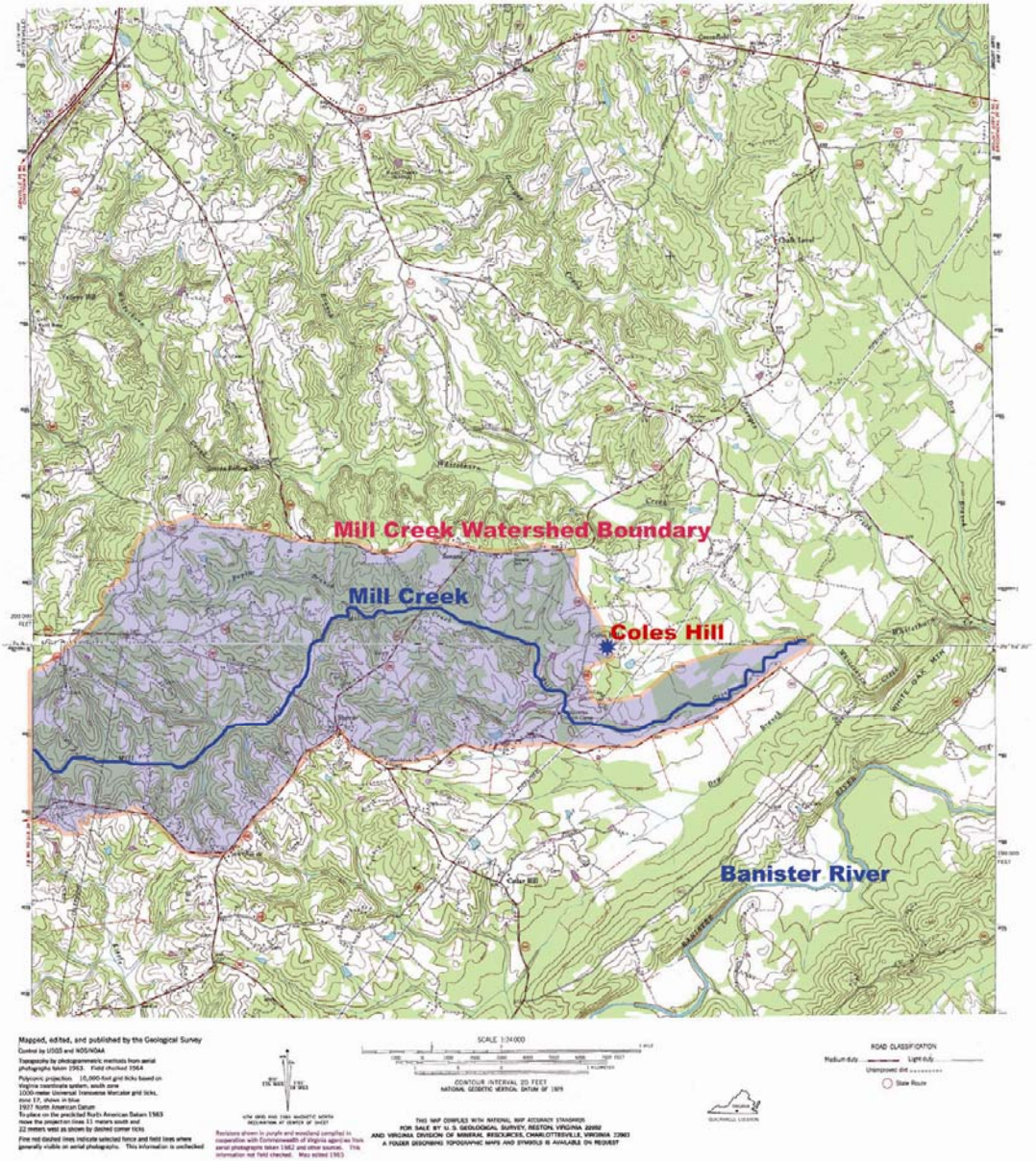
Future Work

- Drill two wells at South Spring Area
- Log Wells and Perform Pump Tests
- Age dating of water from 2 wells
  - Carbon 14
  - Tritium, He-4/Neon, He-3/He-4
  - CFCs

Questions?

Watershed Map for Mill Creek

Coles Hill

Pittsylvania County, Virginia

Blue shaded area represents area draining to Mill Creek.