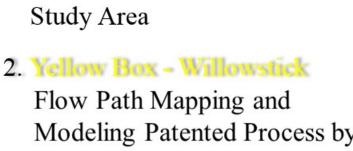
## Overview

The Nevada Gold Fields, Inc. - now closed Barite Hill Gold Mine Project site - was one of four major mines in the South Carolina Slate Belt. It produced gold, silver and other minerals from 1991 to 1999. Ore was extracted from an open pit, crushed, treated, spread on leach pads, then sprayed with a cyanide solution to dissolve the gold. Waste water was recycled in the process, however, by 1994, the adjacent stream was devoid of fish and macroinvertebrates. Reclamation was attempted from 1995 until 1999, Nevada Gold Fields declared bankruptcy and turned over the property to the SC Dept. of Health and Environmental Control. By 2006, the pH of the water in the main pit had fallen to 2, the approximate acidity of lemon juice. Contamination had spread into the Savannah River and sites down river. Sporadic testing and site studies accompanied remediation efforts. In 2008, EPA added 1300 tons of hydrated lime to neutralize the acidic water in the Pit Lake. However, contamination persisted in the ground water. EPA placed the former Barite Hill mine site on the National Priorities List (Superfund) in 2009. Chapman et. al. wrote a USGS geologic report (2015) on various studies of the site, including conductivity surveys. Willowstick, LLC conducted an EM Flow Path Study in 2016. Dynamic Measurement, LLC (DML) chose this old mine in 2017 as a comparative study site for lightning attribute correlation studies. This poster reviews some of the results of the recent DML study.

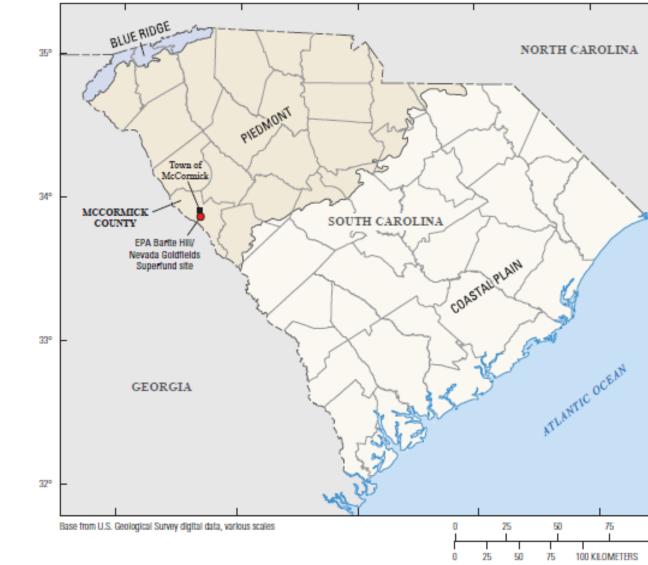
### **Index Maps**



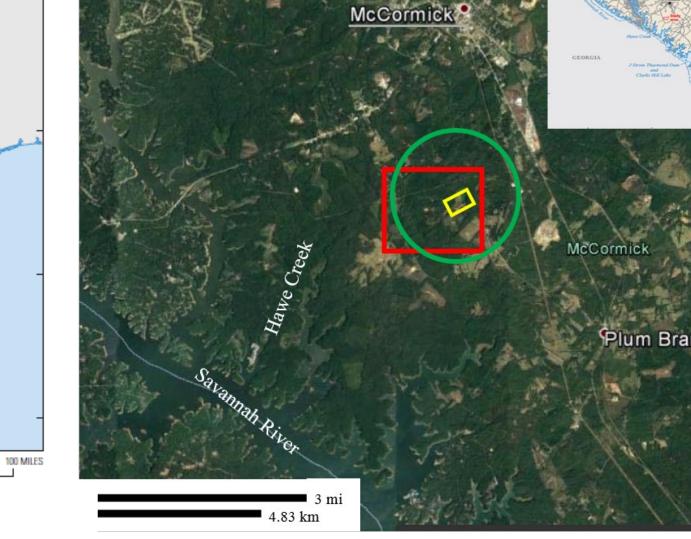


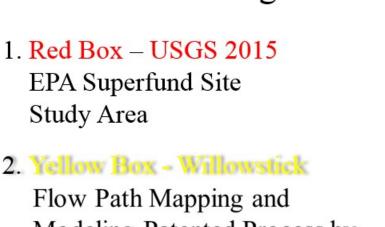
- ynamic Measure Remotely Sensed – Proc.
- Archived Lightning St Data Patented Process b Dynamic Measurement

Three Stacked EM Studies

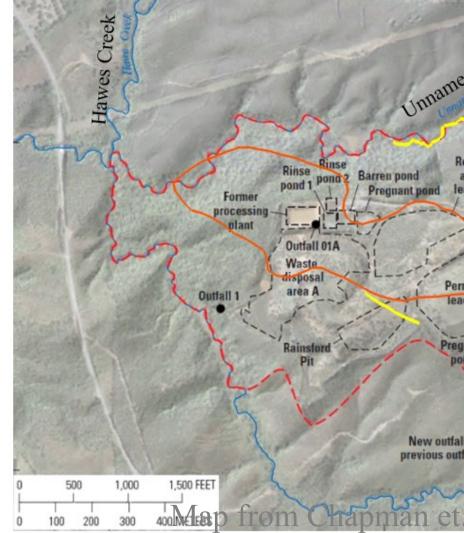


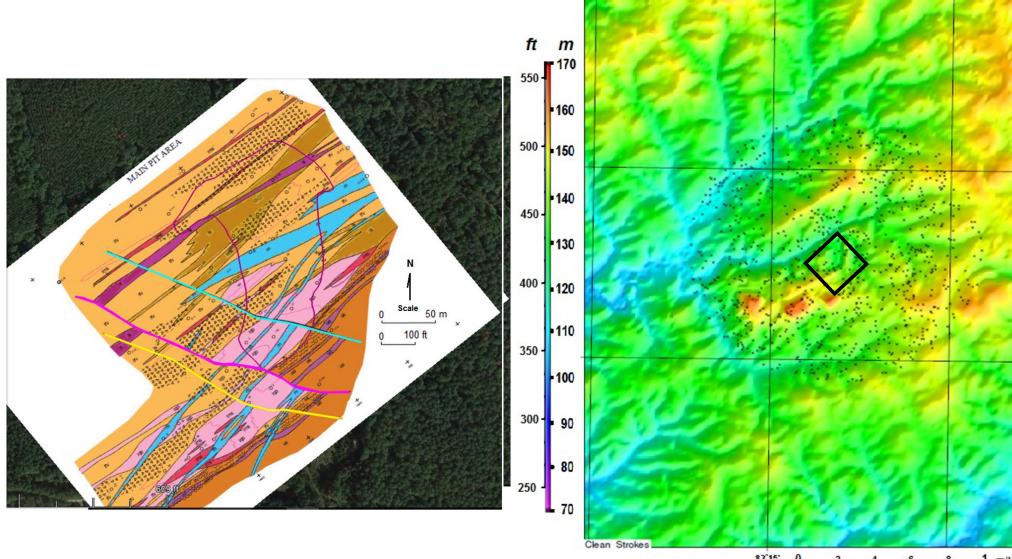
Map from Chapman et al., 2015





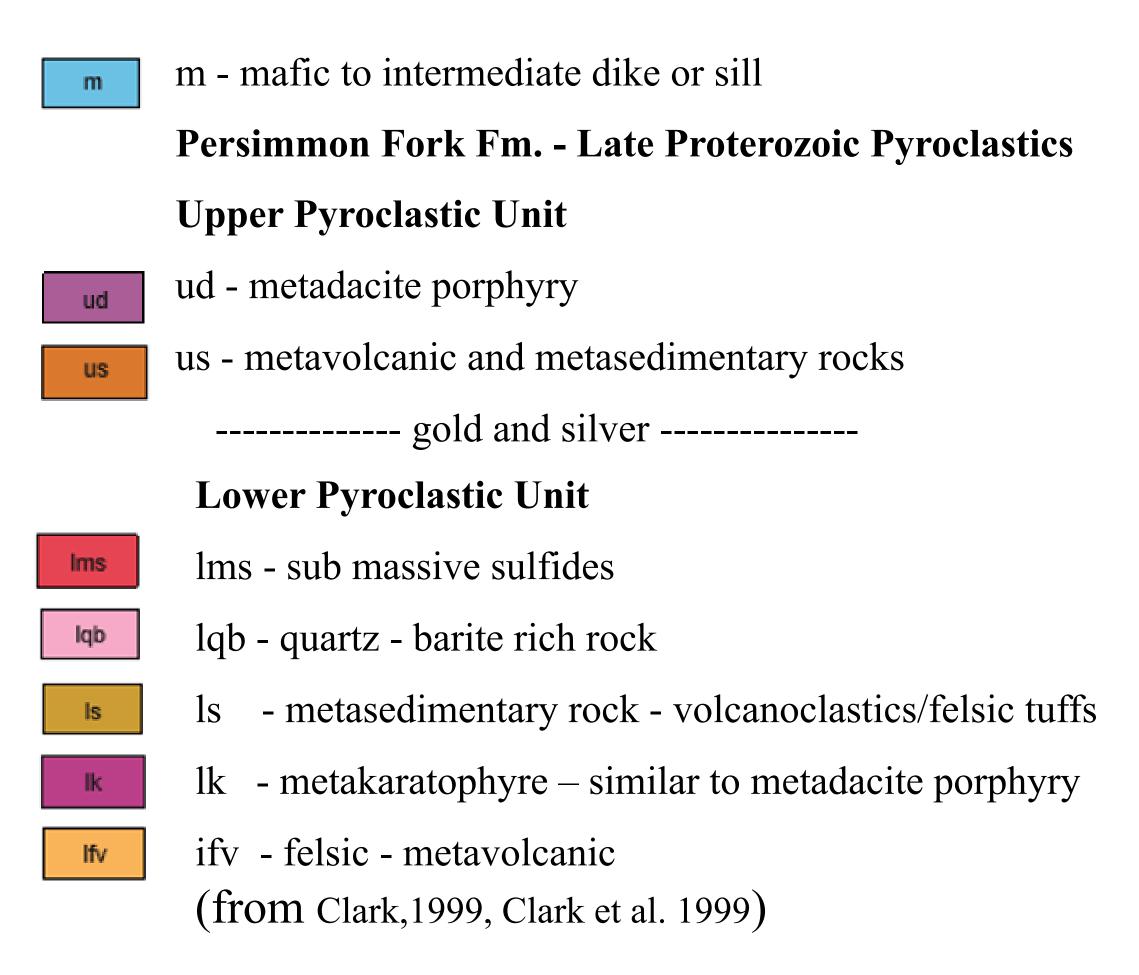






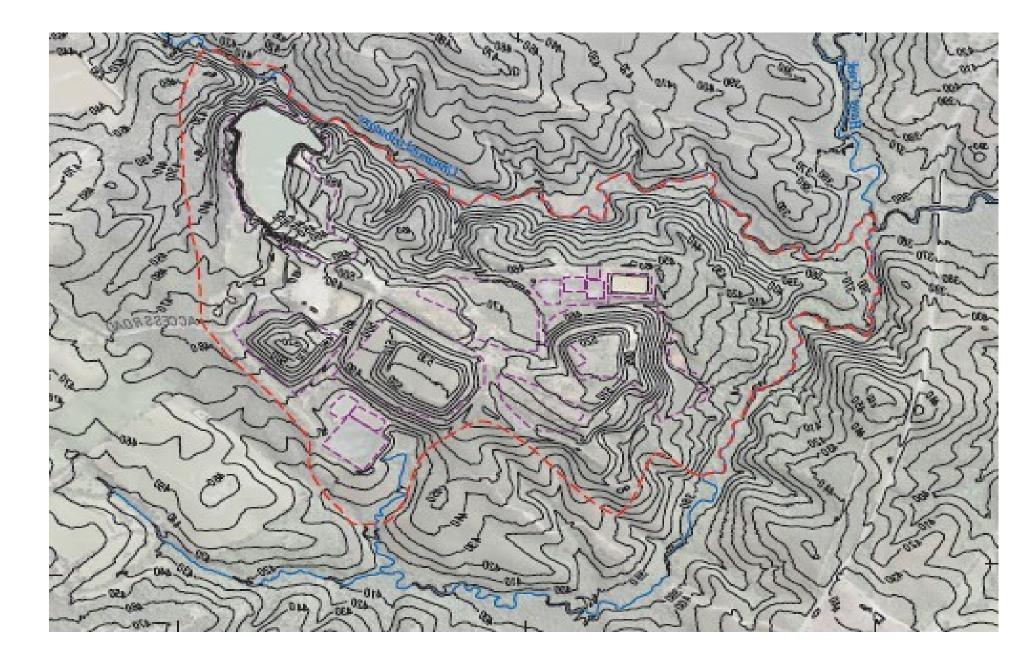
(15) 0 .2 .4 .6 .8 1 miles 0 250 500 750 1000 1250 1500 meters

Barite Hill Geology "Metavolcanic – rock-hosted, stratiform gold-silver Deposit." Barite Hill gold and silver mineralized zone consists of 4 layers in the Main Pit area between the Upper and Lower Units of the Persimmon Formation, Late Proterozoic Pyroclastics. (from Clark, 1999, Clark et al. 1999)





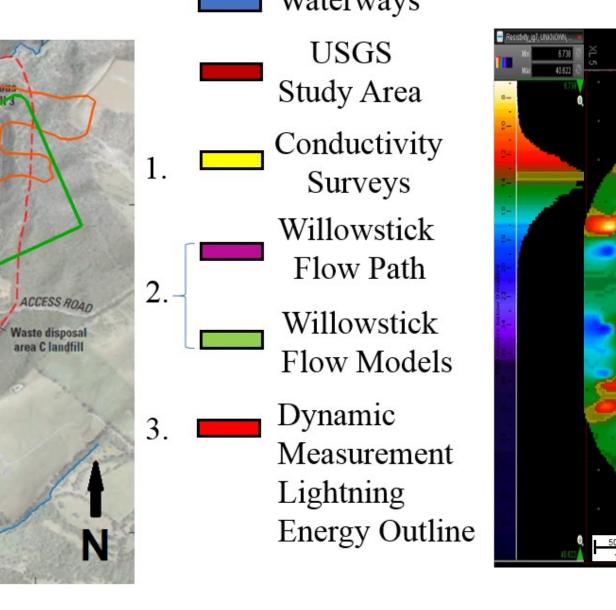
Historical Google Earth image from the USGS March 1994

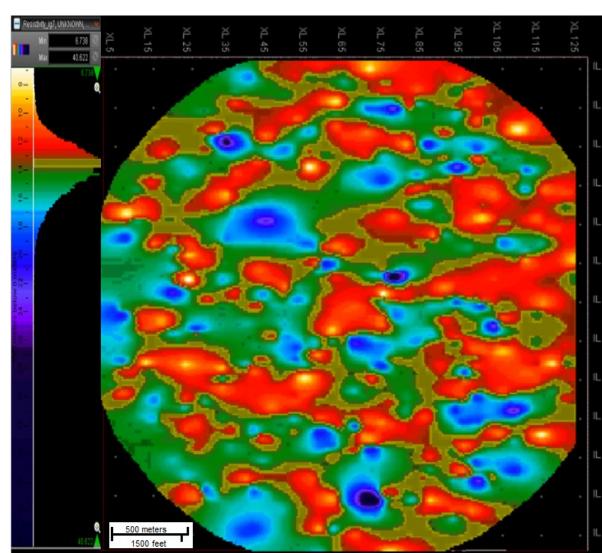


USGS Topo Contours—rolling forested hills reach to about 510ft along ridges. a (Chapman et al, 2015 and McBurney, 2007)

# Integrated EM technologies map contamination plumes, seeps, geohazards – faults and possible migration pathways at Barite Hills/Nevada Gold Fields EPA Superfund Site in South Carolina, USA.



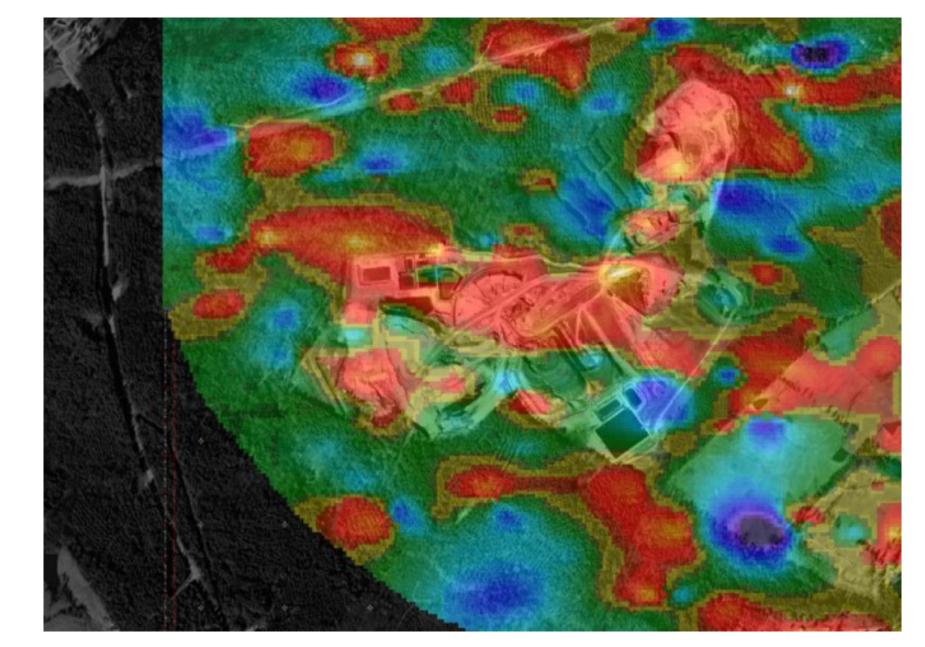




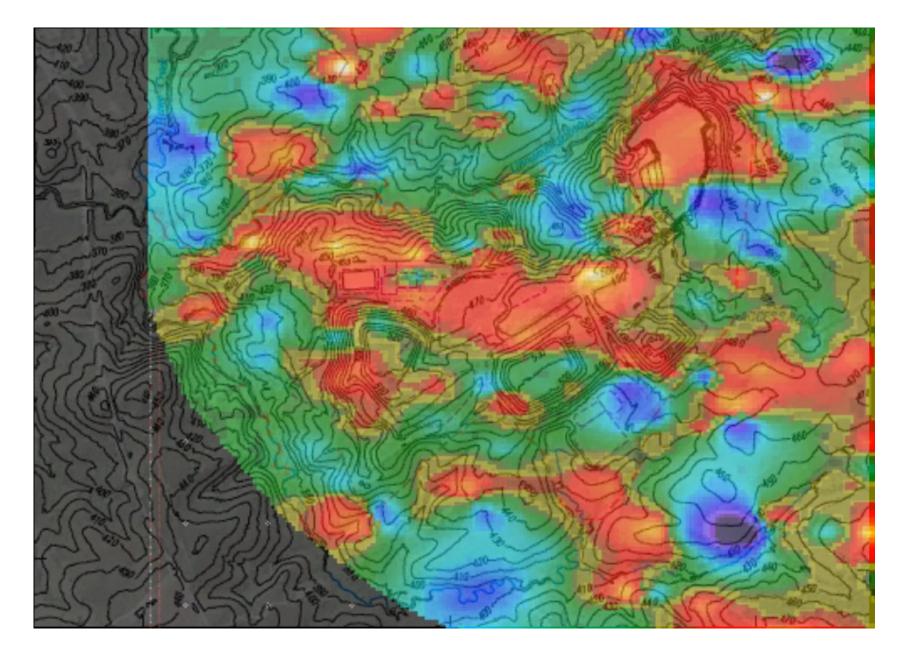
Sub-Regional Apparent Resistivity Map

Ore Bodies, Buried Waste Roc

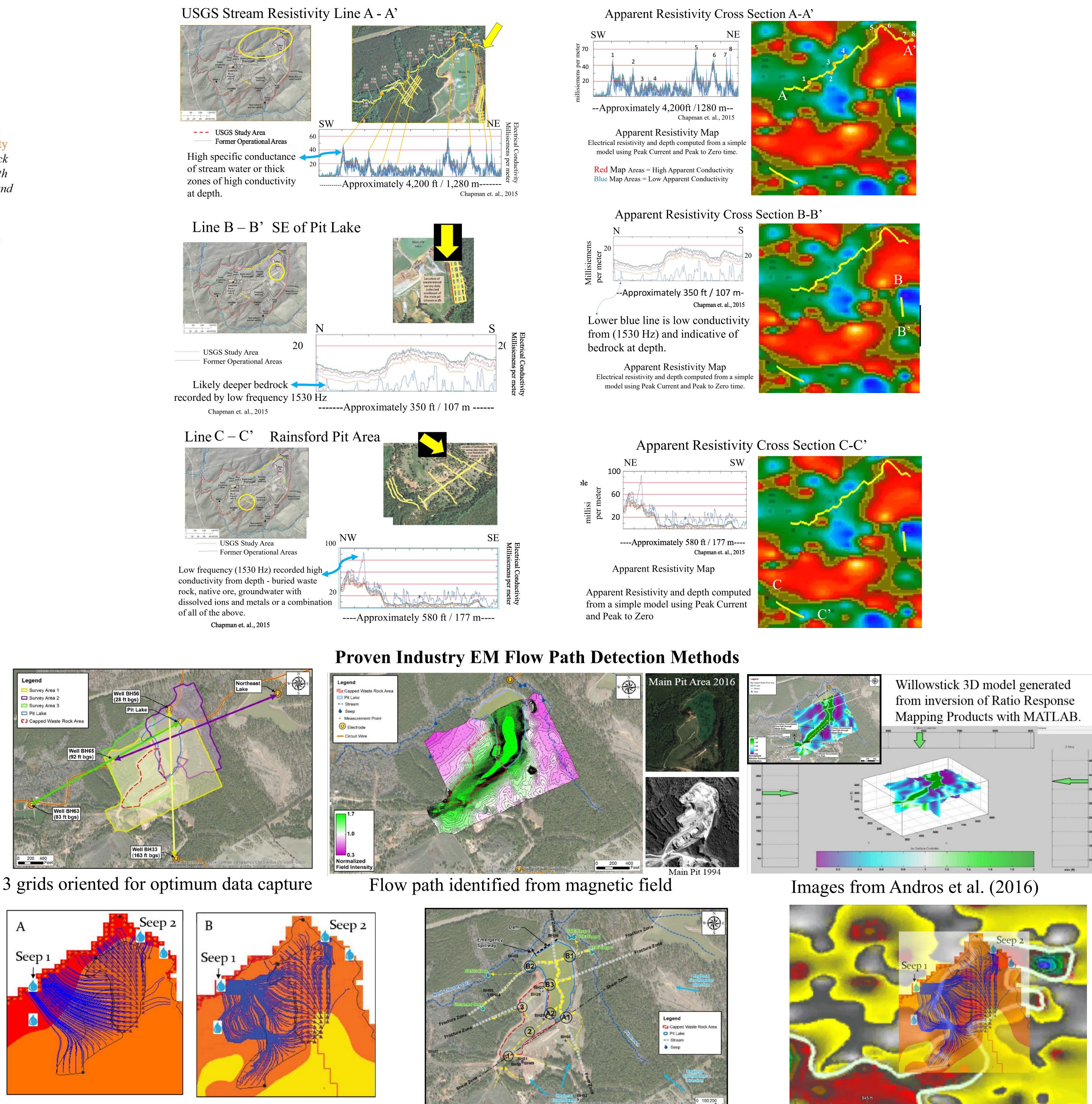


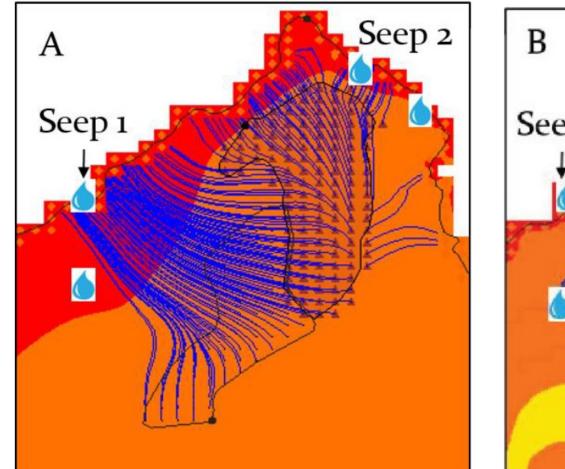


Apparent Resistivity Map over the former Barite Hill mine site



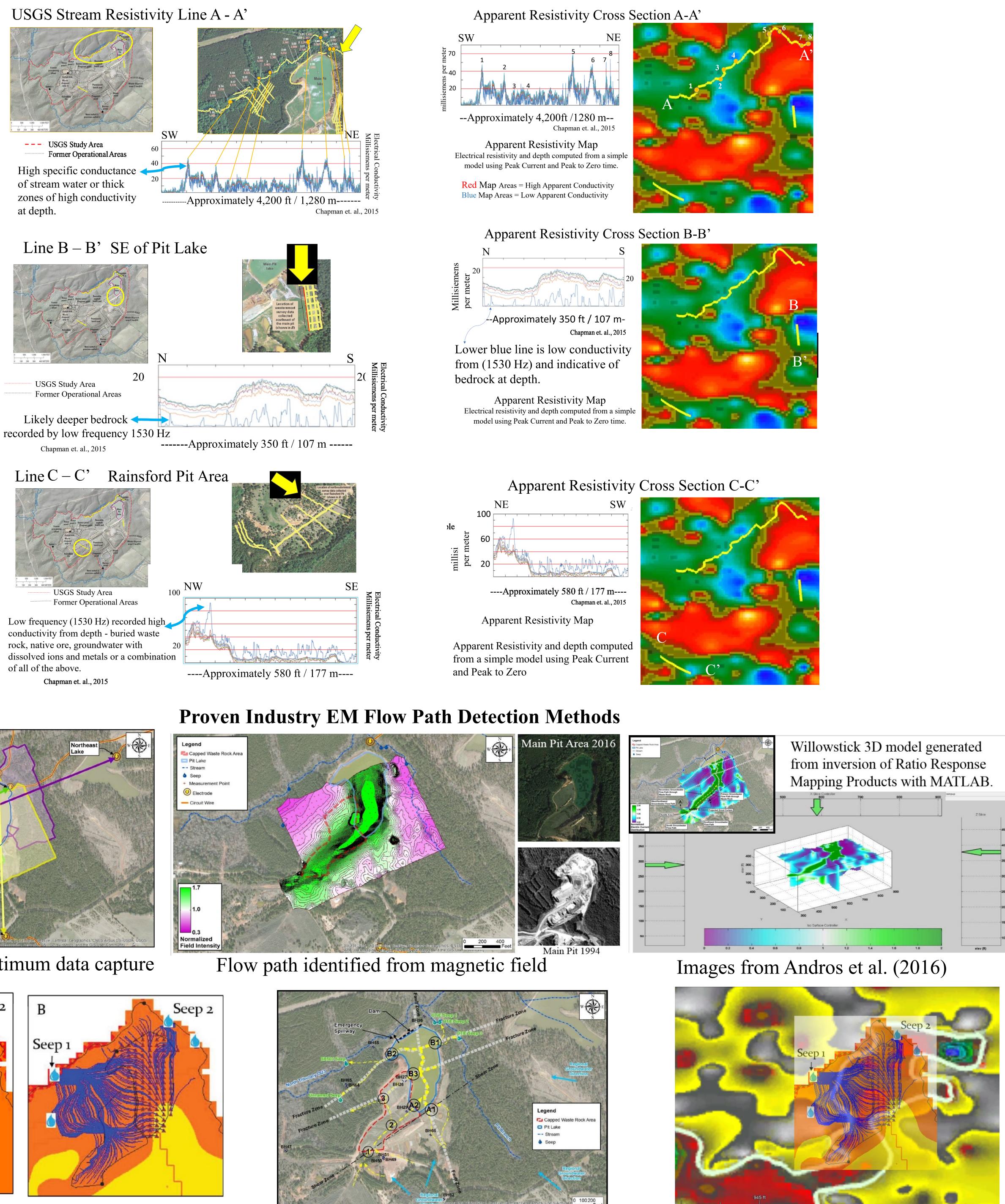
Apparent Resistivity Map over study area with USGS contours superimposed. (Chapman et al. 2015)

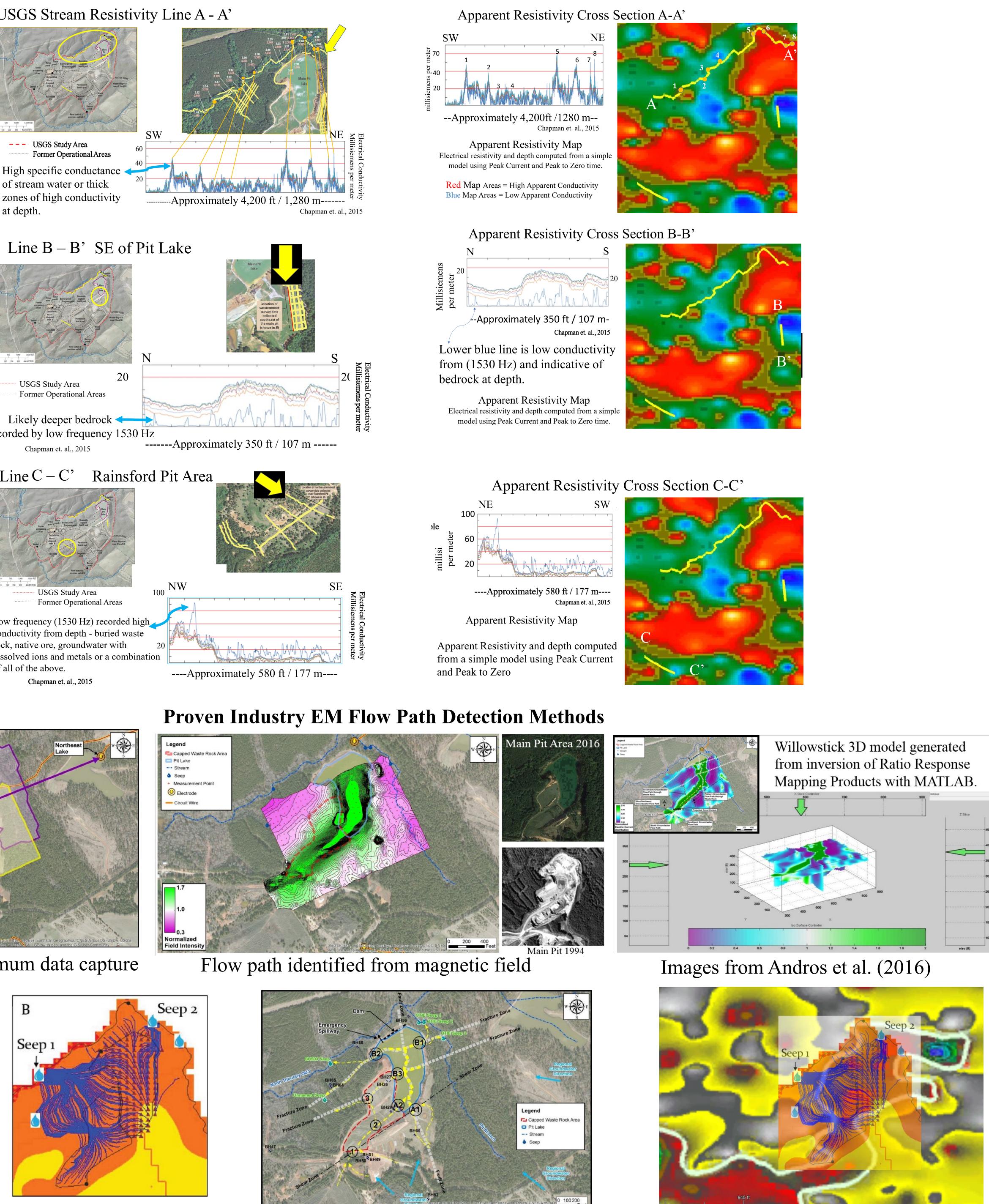


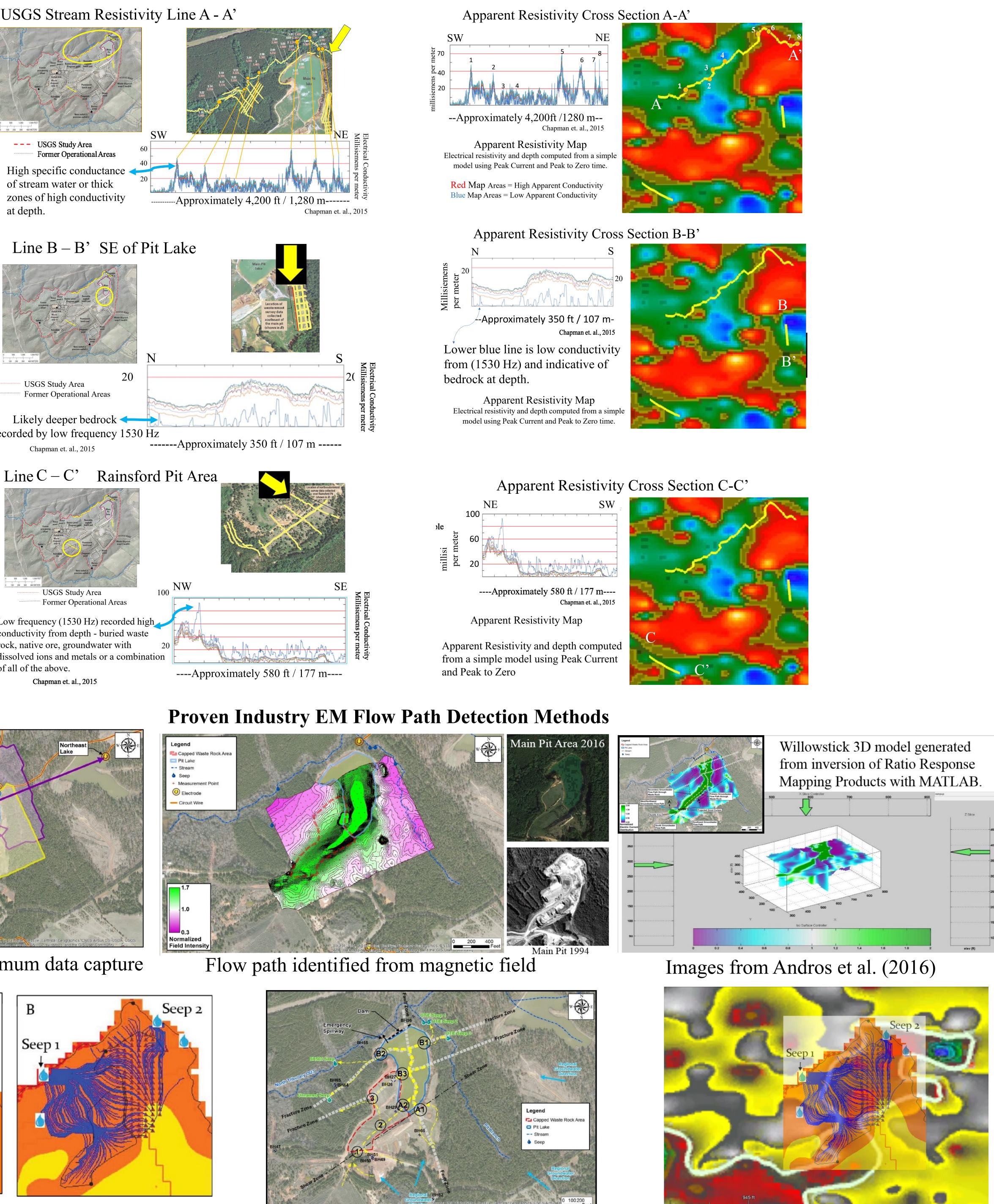


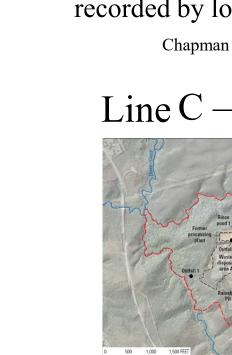
Flow Path Models: A - conventional model B - data enhanced model

## USGS Conductivity Surveys –20012-20013 comparison with Apparent Resistivity Map Locations at Barite Hill - along unnamed creek north of the Main Pit, SE of Main Pit, and over the Rainsford Pit





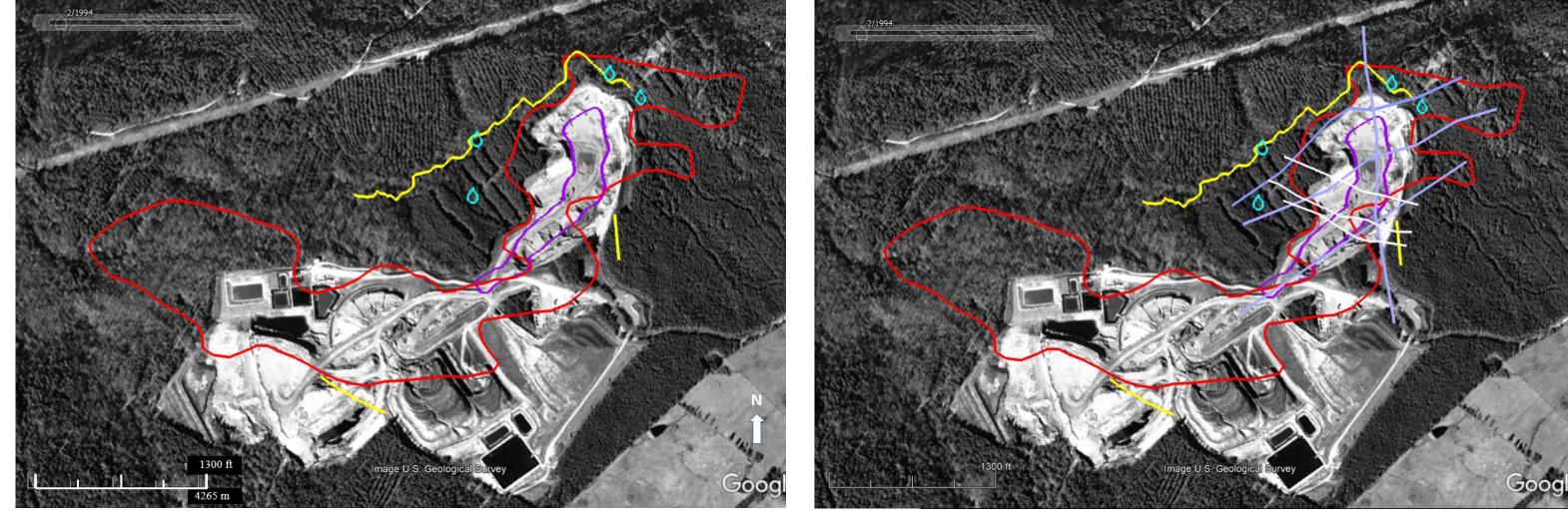




Kathleen S. Haggar<sup>1</sup>, H. Roice Nelson<sup>2</sup>, Jr. Louis Berent1<sup>3</sup> <sup>1</sup>P.O. Box 40873 Old Hammond Hwy., Baton Rouge, LA 70835 <sup>2</sup>2155 W. 700 S. #31, Cedar City, UT 84720 <sup>3</sup>211 Baker Rd. #382 Barker, TX, 7741 http://www.dynamicmeasurement.com

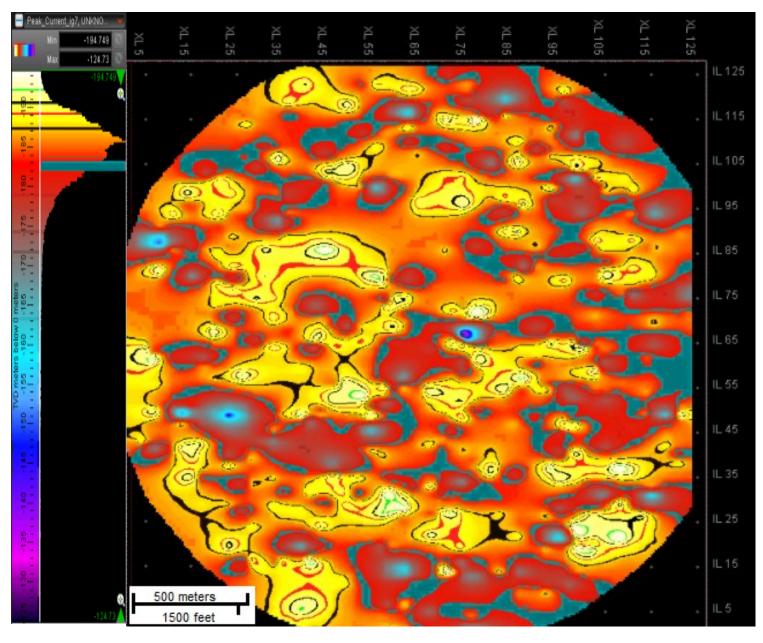
Fractures and Shear (bottom NE - SW)

Enhanced Model overlay on Peak Current - Absolute

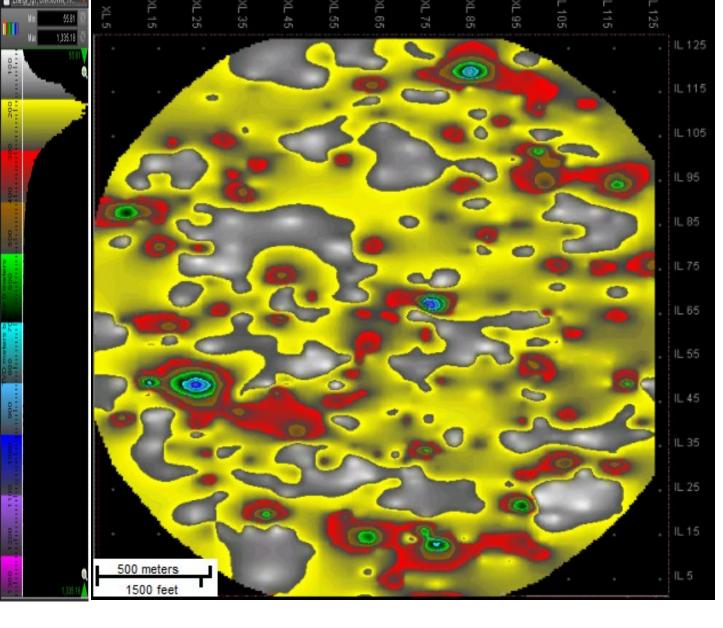


Red=Lightning Feature, Yellow=Conductivity Surveys, White=Faults, Blue= Fractures, Purple = Flow Path

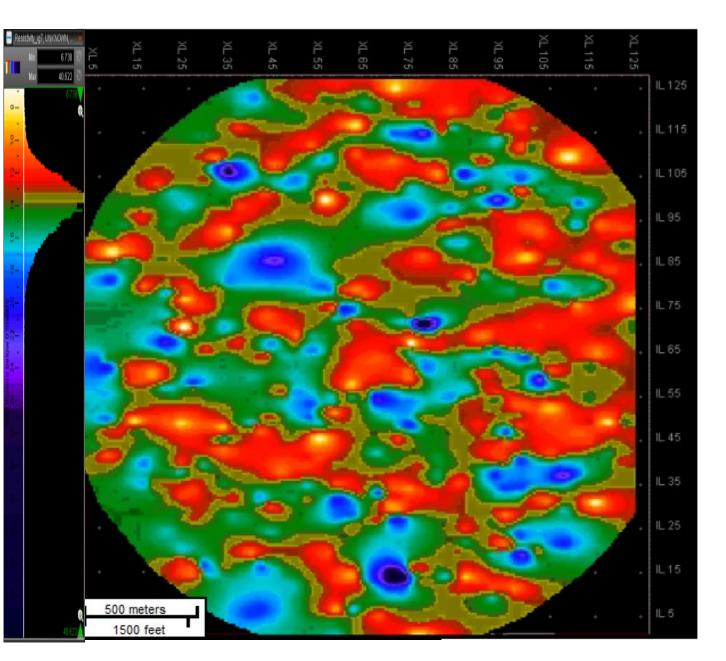
Lightning Attribute Data covers approximately 2 square miles



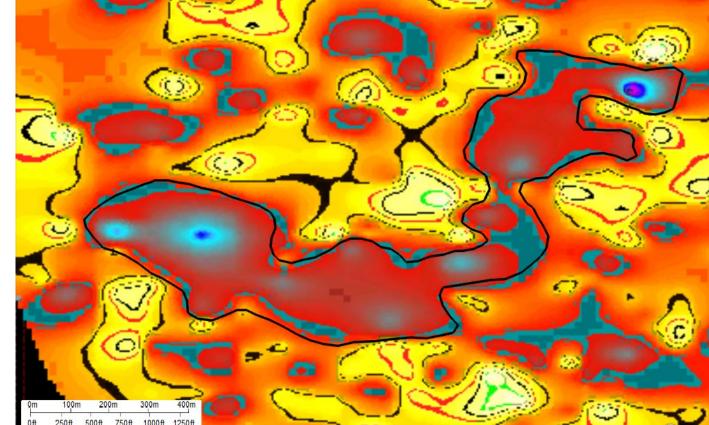
**Peak Current - Absolute** Peak current in kiloamperes

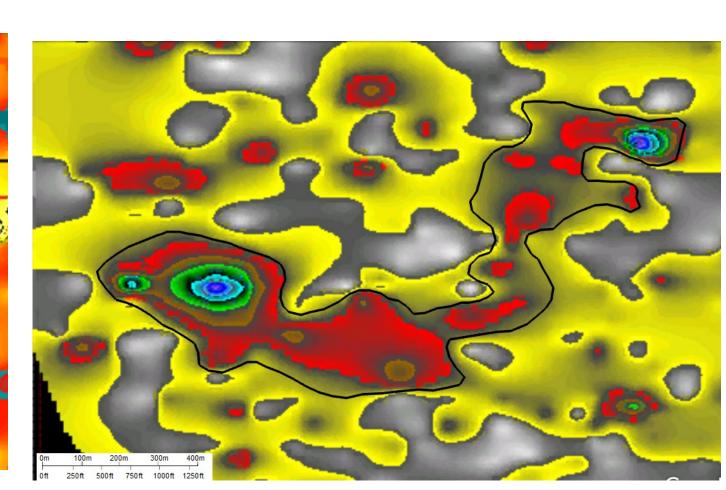


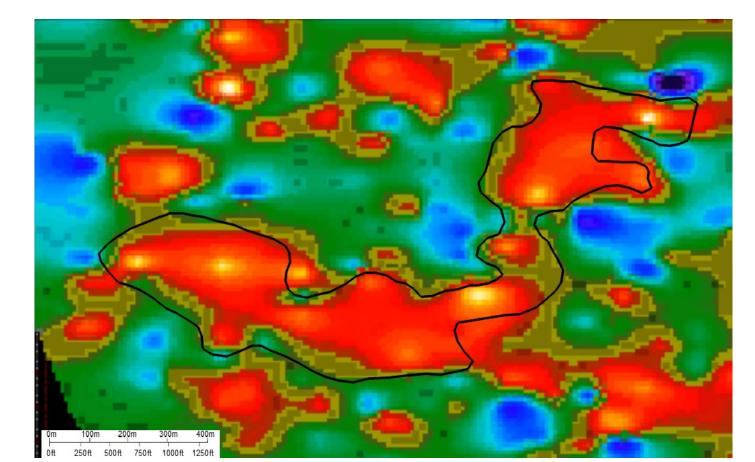
Energy [pc \* (rt+pz)/2] milliampere-seconds

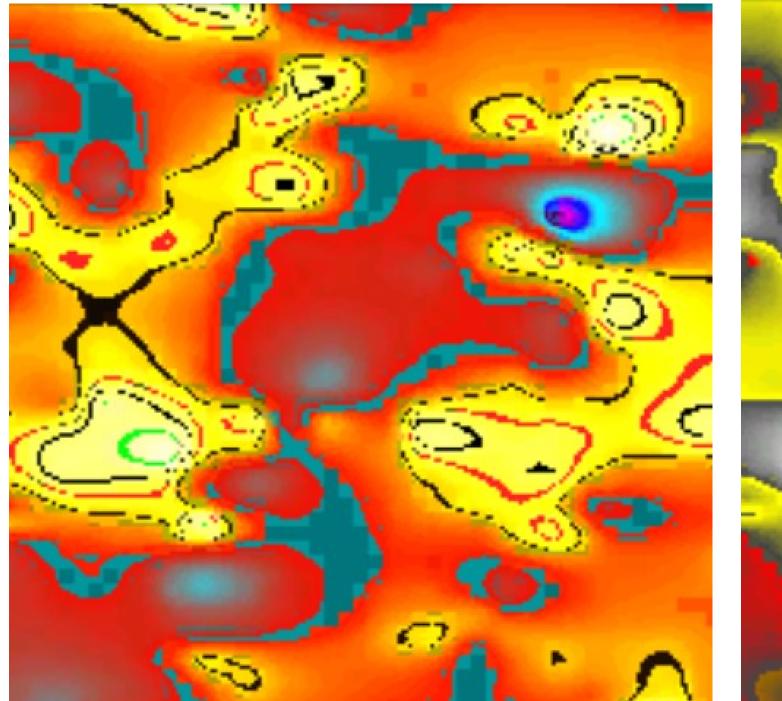


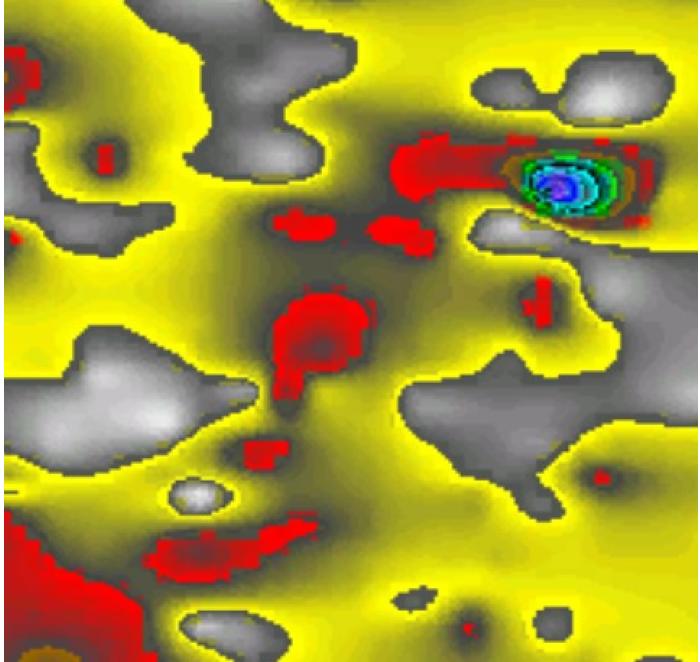
**Apparent Resistivity** Scale in ohm-meters

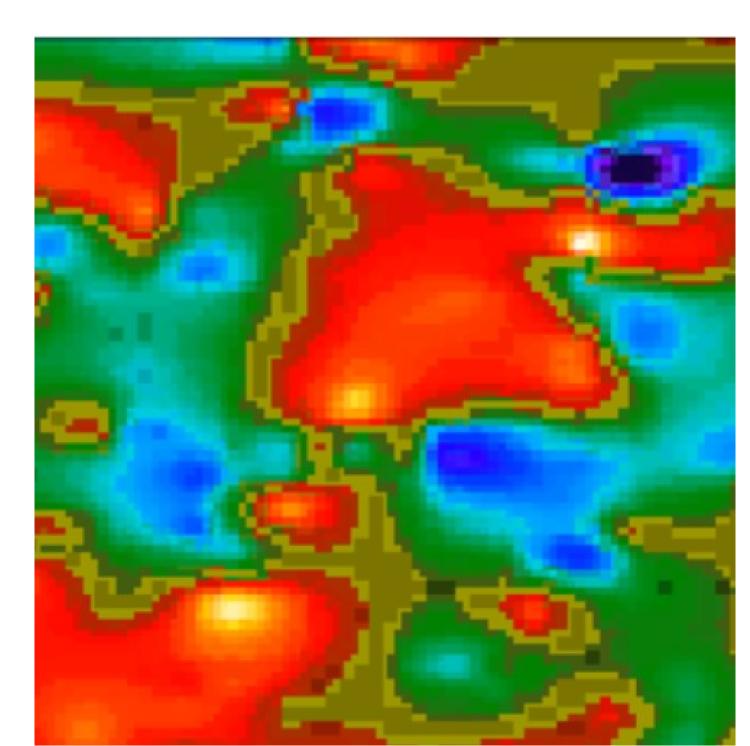


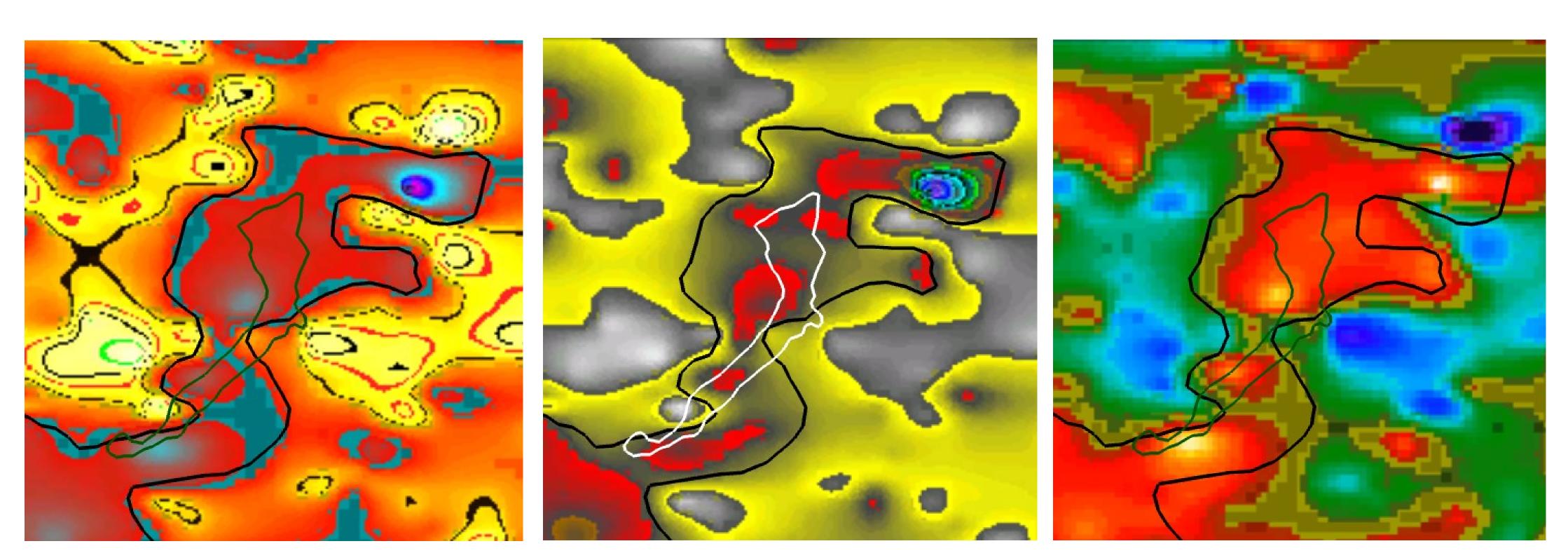












Similar patterns in 3 lightning attributes: Energy, Peak Current Absolute, and Apparent Resistivity Note location of Flow Path. High Apparent Conductivity (Right – Red areas) could indicate areas with contaminated ground water, conductive minerals/gold ore, or waste rock. Basement is high resistivity.