

FDEP Waste Cleanup Workshop – Former Technitronics Site & Geophysics

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- Site Background
- Geology/Environmental Conditions
- Geophysical Studies: MERIT & SP
 - Methodology
 - Results
- Other MERIT Case Studies
- Q&A



Site Location

Casselberry, Florida



Site History

- Light industrial operations / circuit board manufacturer
- Late 1960's – 1997
- Commercial & residential properties surround facility
- Site identified as a likely source of the cis-1,2-DCE detected in the two production wells that serve Winter Springs Water Plant #3 in August 2002



Assessment Activities

- Majority of environmental assessment activities occurred after 2004.
- Identified comingled CVOCs and BTEX in the groundwater.
- BTEX associated with the upgradient Cumberland Farms Store #0980 (removed in 1996).
- Paleosink feature identified in northeastern portion (downgradient) of source area.
- Currently defining source area impacts in surficial and Hawthorn Group zones



Site Geology & Hydrogeology



BTEX – Surficial Aquifer



BTEX – Hawthorn / Floridan



CVOCs – Surficial Aquifer



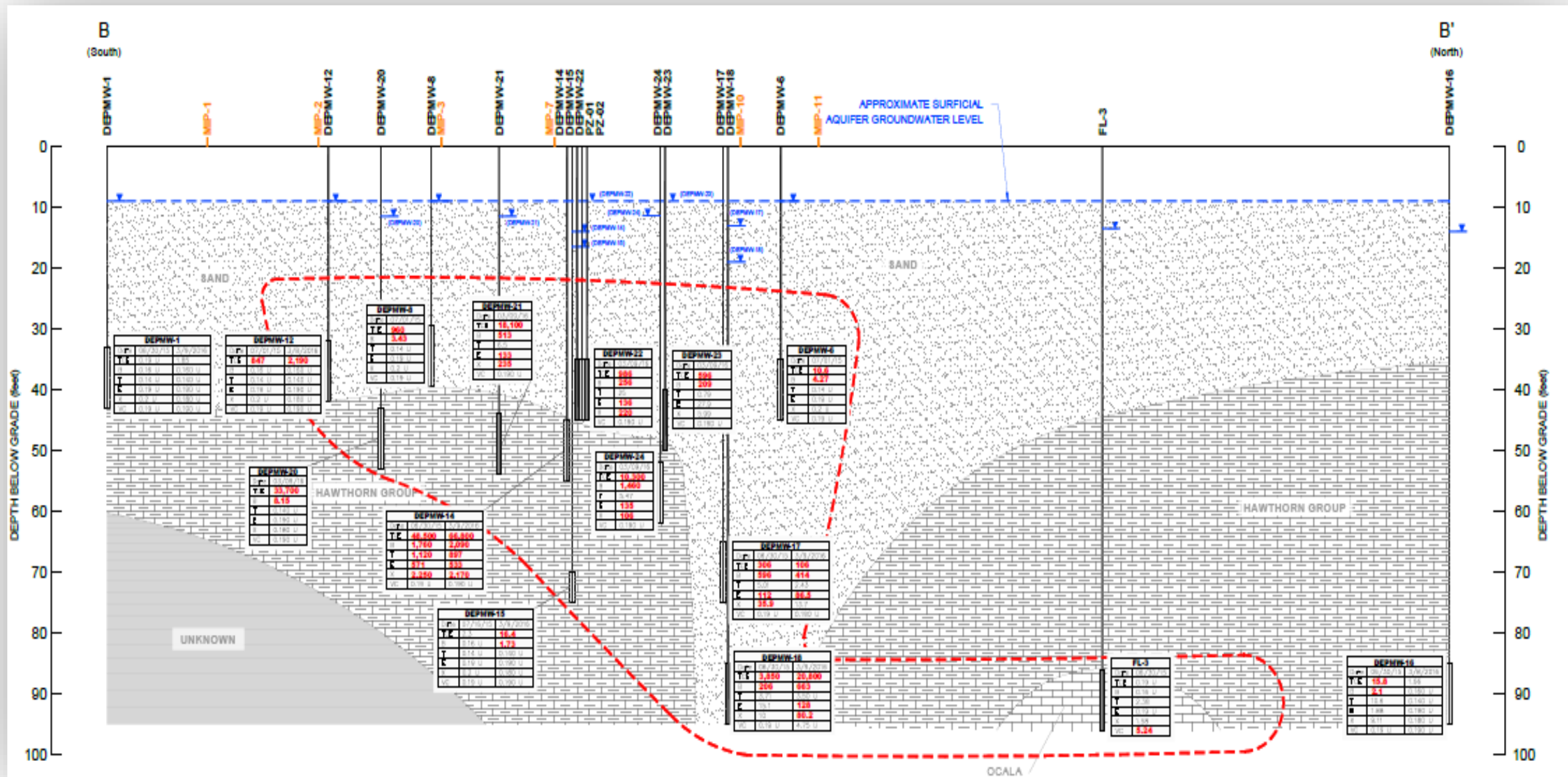
CVOCs – Hawthorn / Floridan



Top of Hawthorn (Elevation)

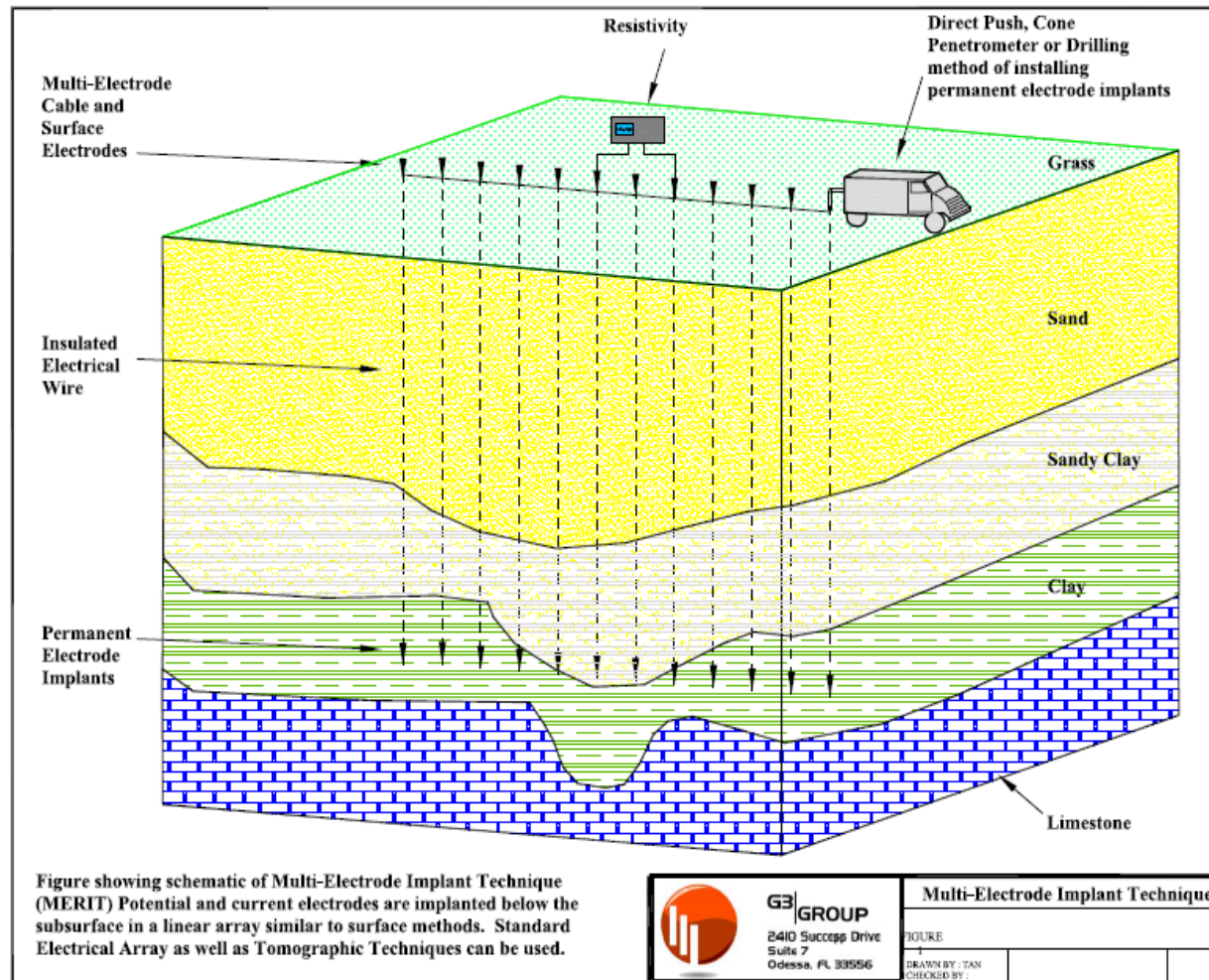


Cross Section



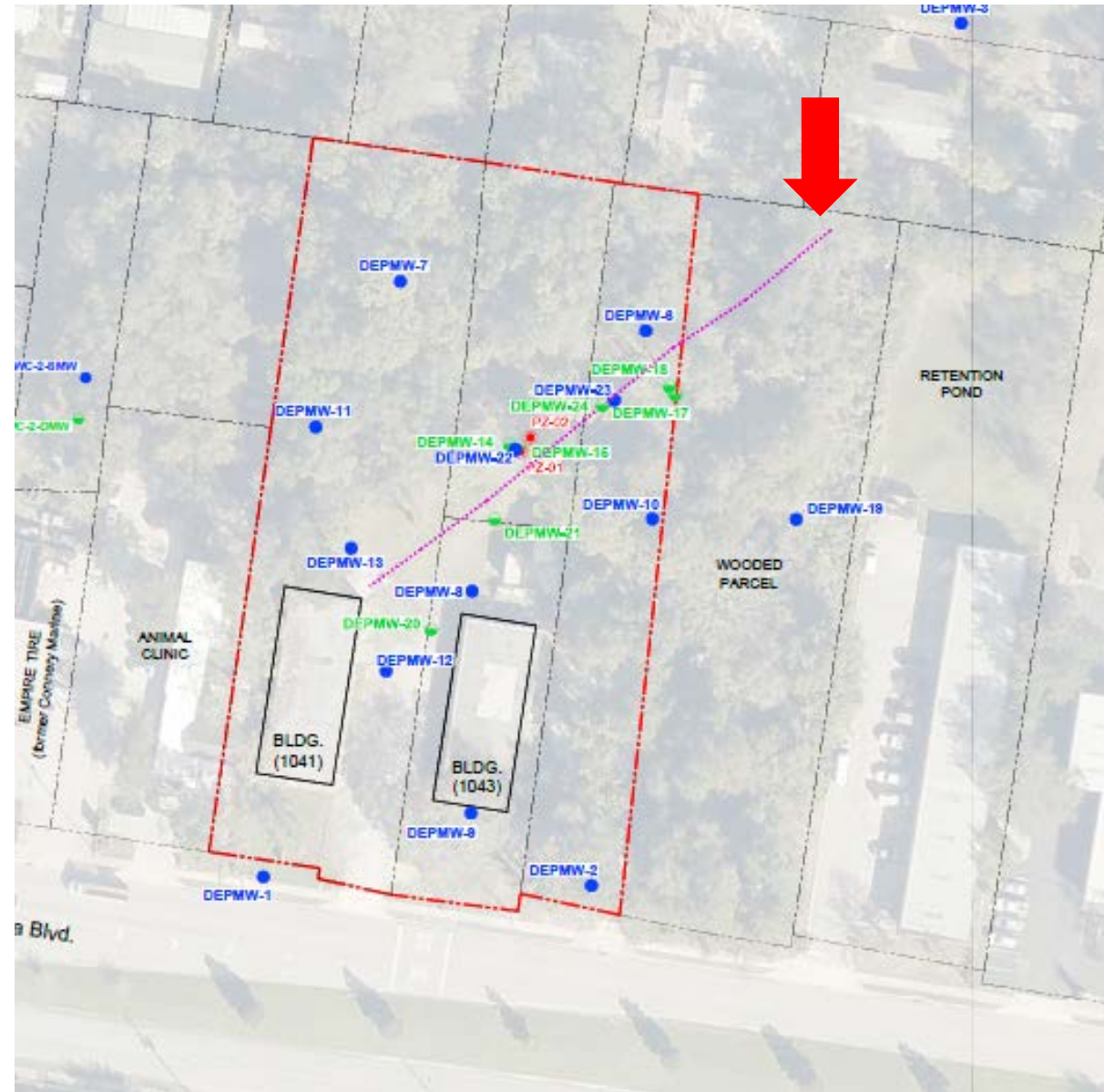
Geophysical Studies

Multi-Electrode Resistivity Implant Technique (MERIT) & Self Potential (SP)



MERIT Field Implementation

- Array spanning 324 feet
- 28 surface electrodes at 12-foot spacing
- 28 electrodes implanted at 45 feet below ground with DPT at 12-foot spacing



MERIT Field Photos



Geophysical Model for Florida

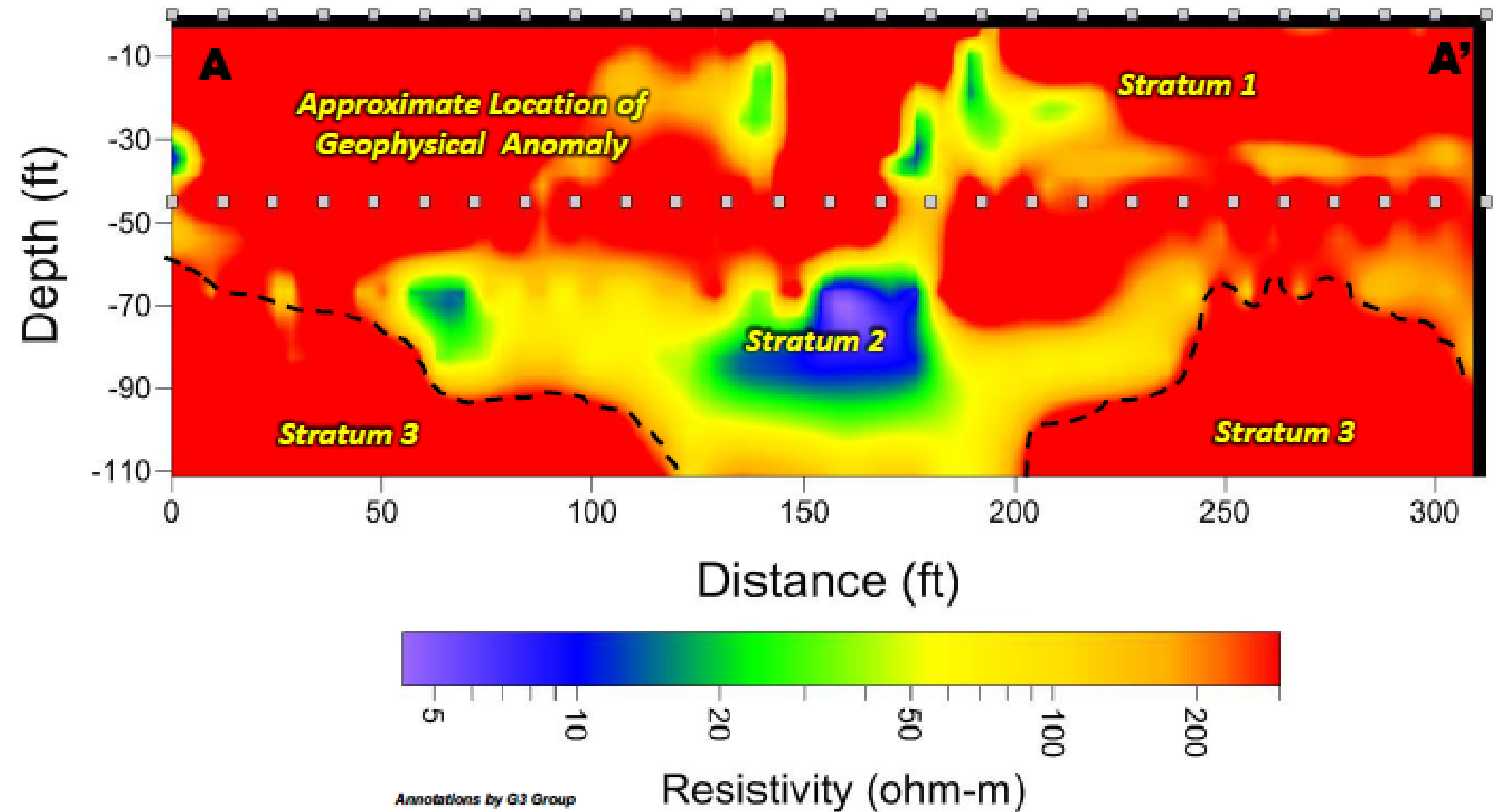
Standard Model



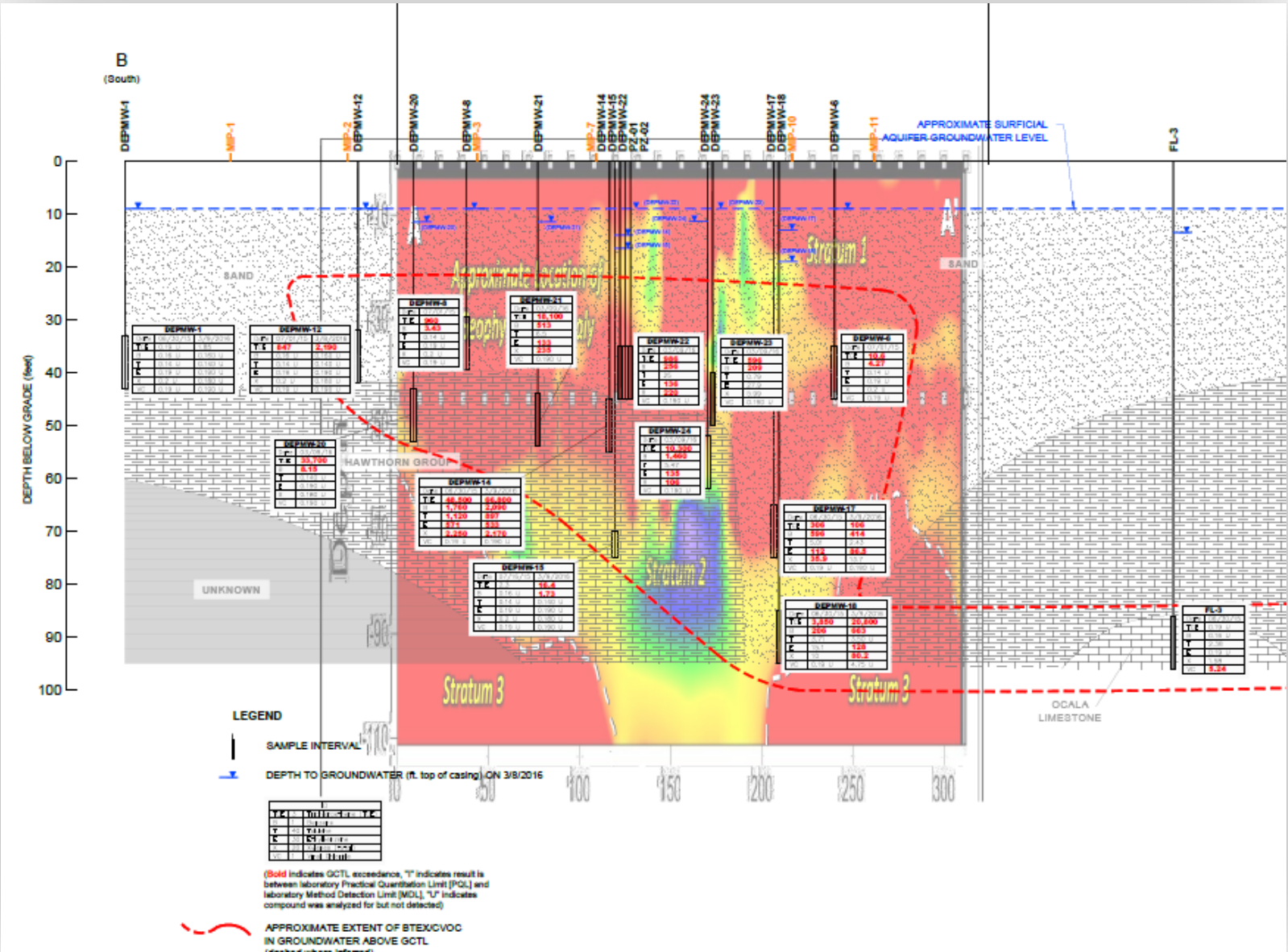
Site Model



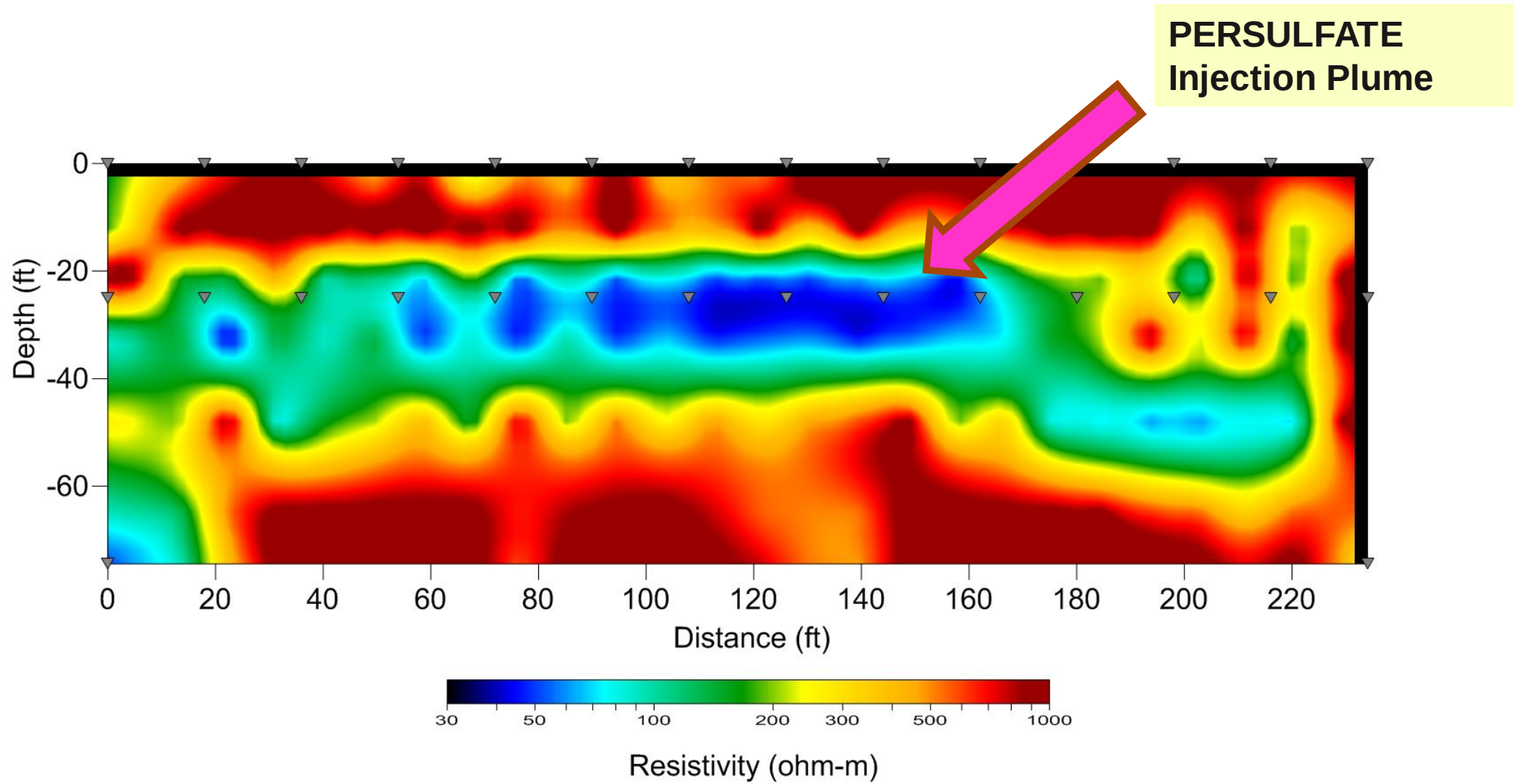
MERIT Results



MERIT Results



MERIT for Tracer Testing?



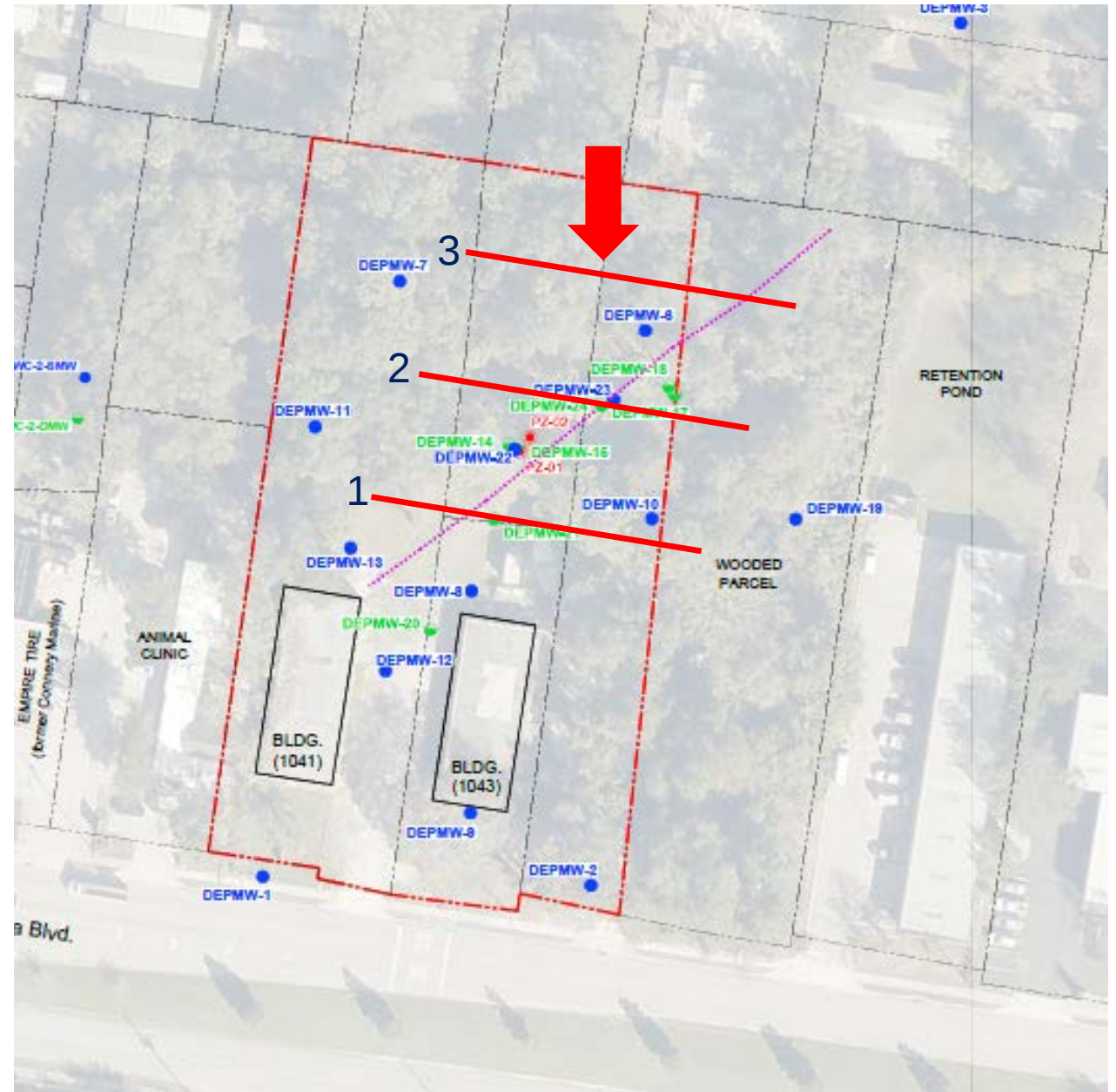
- Achieved significantly deeper and enhanced resolution at depth than just surface electrical resistivity.
- Three strata were labeled on the MERIT image. However, the upper and lower strata have relative similar resistivity values leading to consistent image with lower resolution than was anticipated.
- The MERIT survey also indicated the overall the total range of resistivity values were within 200 Ohm-m. Thus, the resistivity values of the materials were relatively close and thus difficult to distinguish variations.
- A complete MERIT profile of across the subject property identified one geophysical anomaly at approximate station 110 to station 200 which ranged from 50 to 90 feet below land surface (bls)

Self Potential – Field Methodology

Performed in an attempt to locate potential pathways of concentrated ground flow into the subsurface via potential karst features.

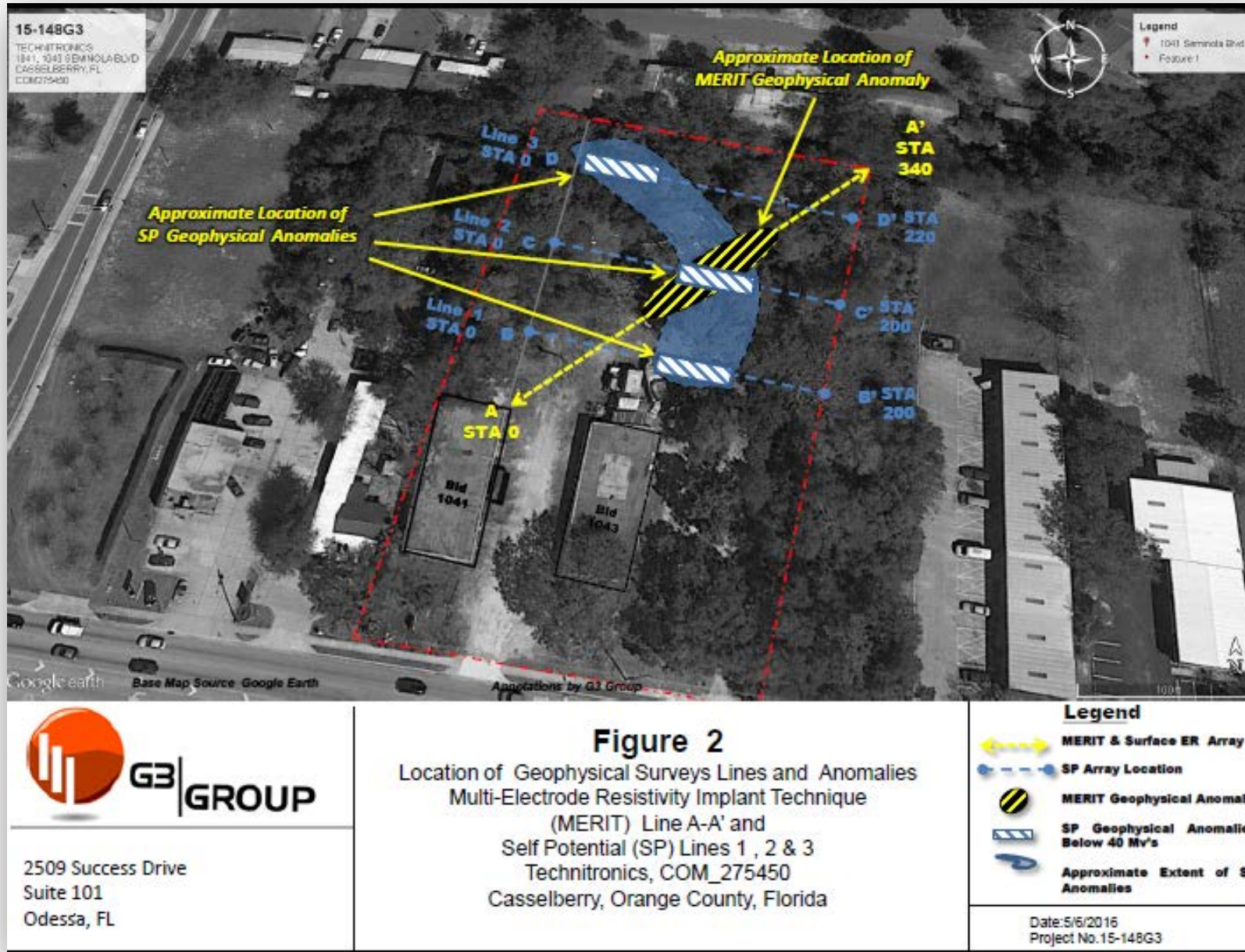
Bi-metal electrodes were driven into the upper soils.

The SP electrodes were spaced at 10 foot intervals along three (3) arrays running from west to east.



- Some repeated patterns of concentrated reversed curves with values below 40 Mv (Millivolts), and were identified as anomalies.
- Three (3) anomalies identified.
- SP anomalies appear to follow the trend of the top of the Hawthorn Group.
- May represent groundwater movement along the edge of the confining unit; however, the signal response was is low suggesting the concentration of flow is low or diffused.
- The entire SP response was relative low in magnitude with a significant amount of noise. In addition the repeatability of SP results was somewhat fluctuating.

Self Potential – Results

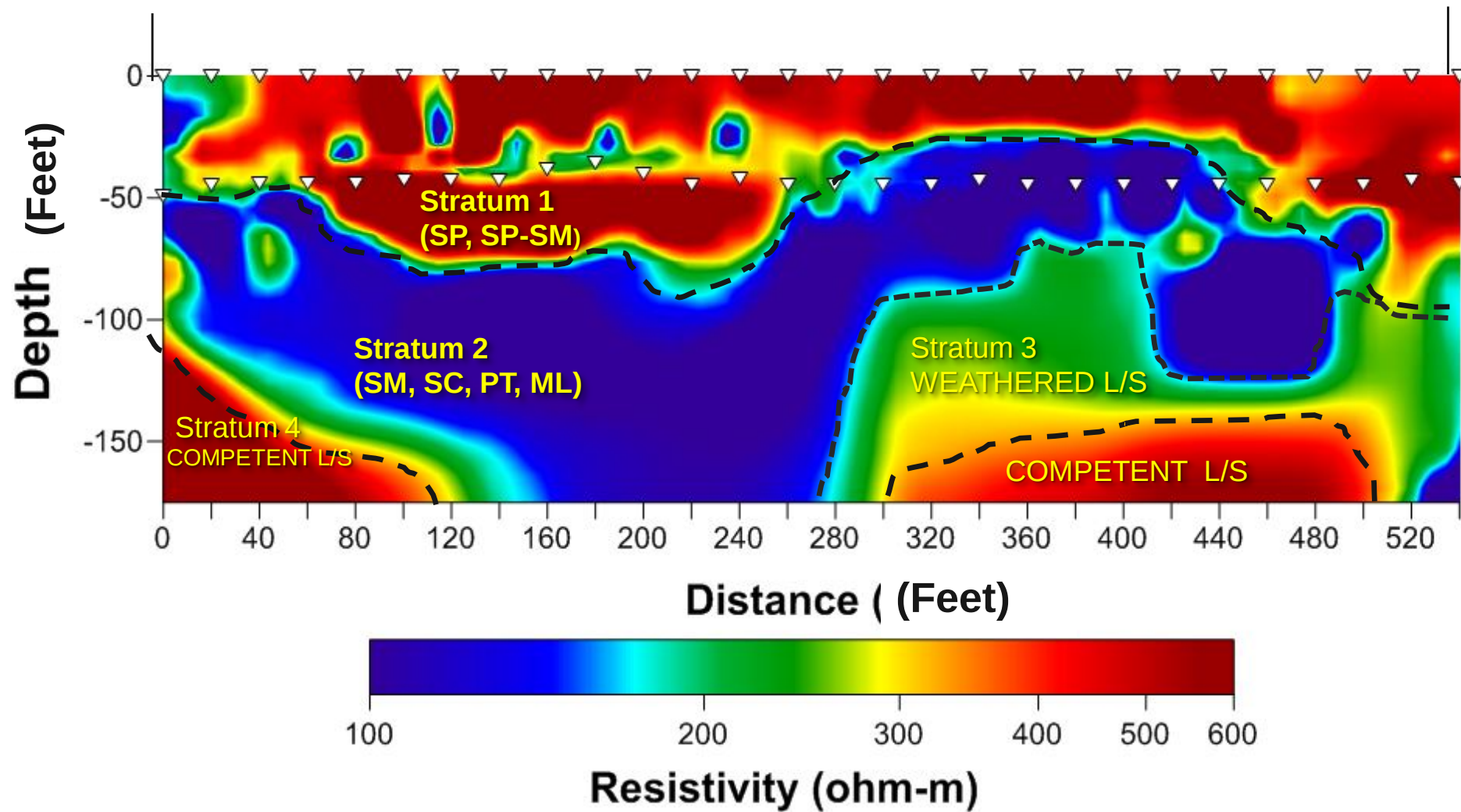


Other MERIT Site Examples

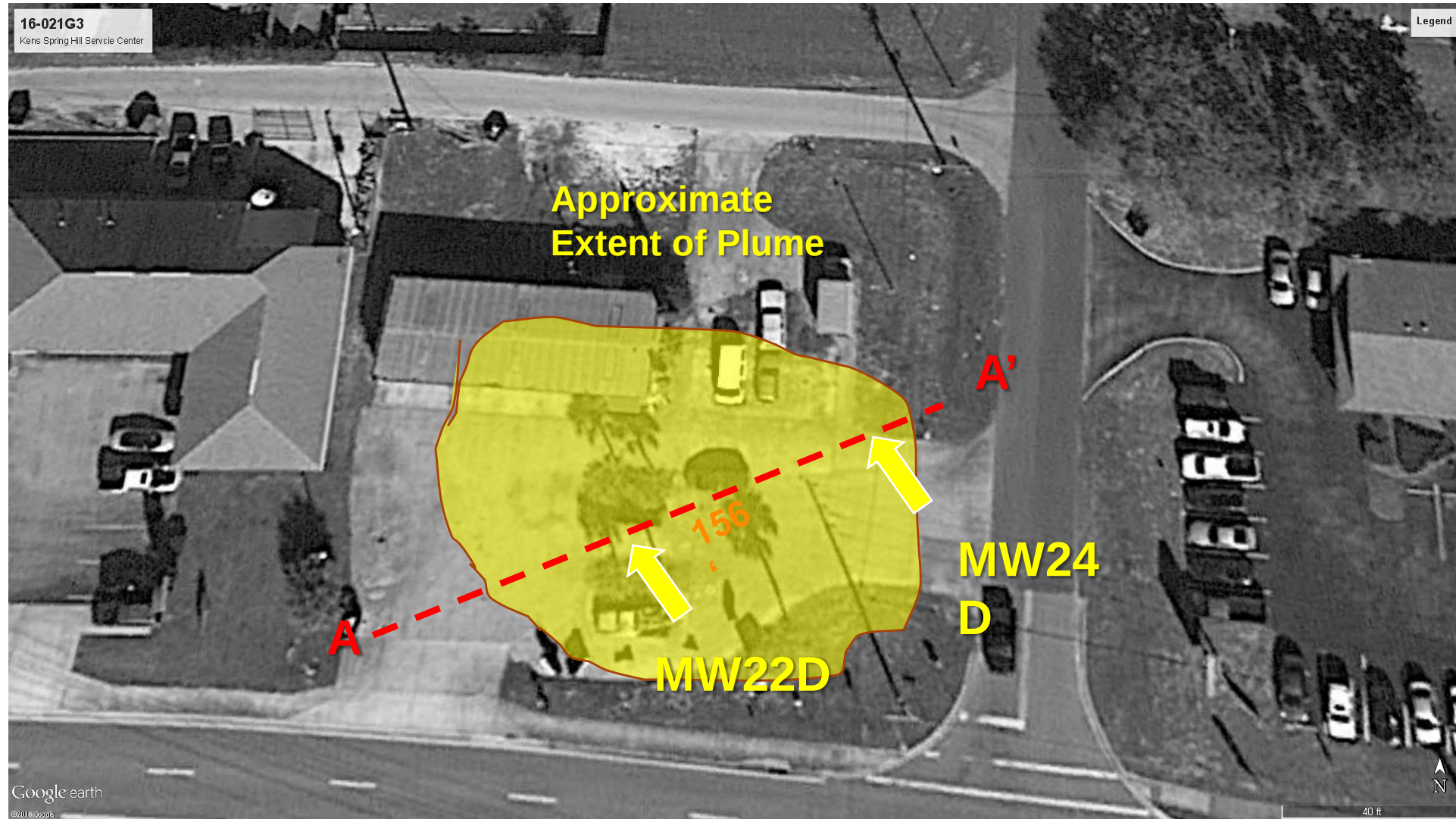
Wekiva Parkway Section – Lake County



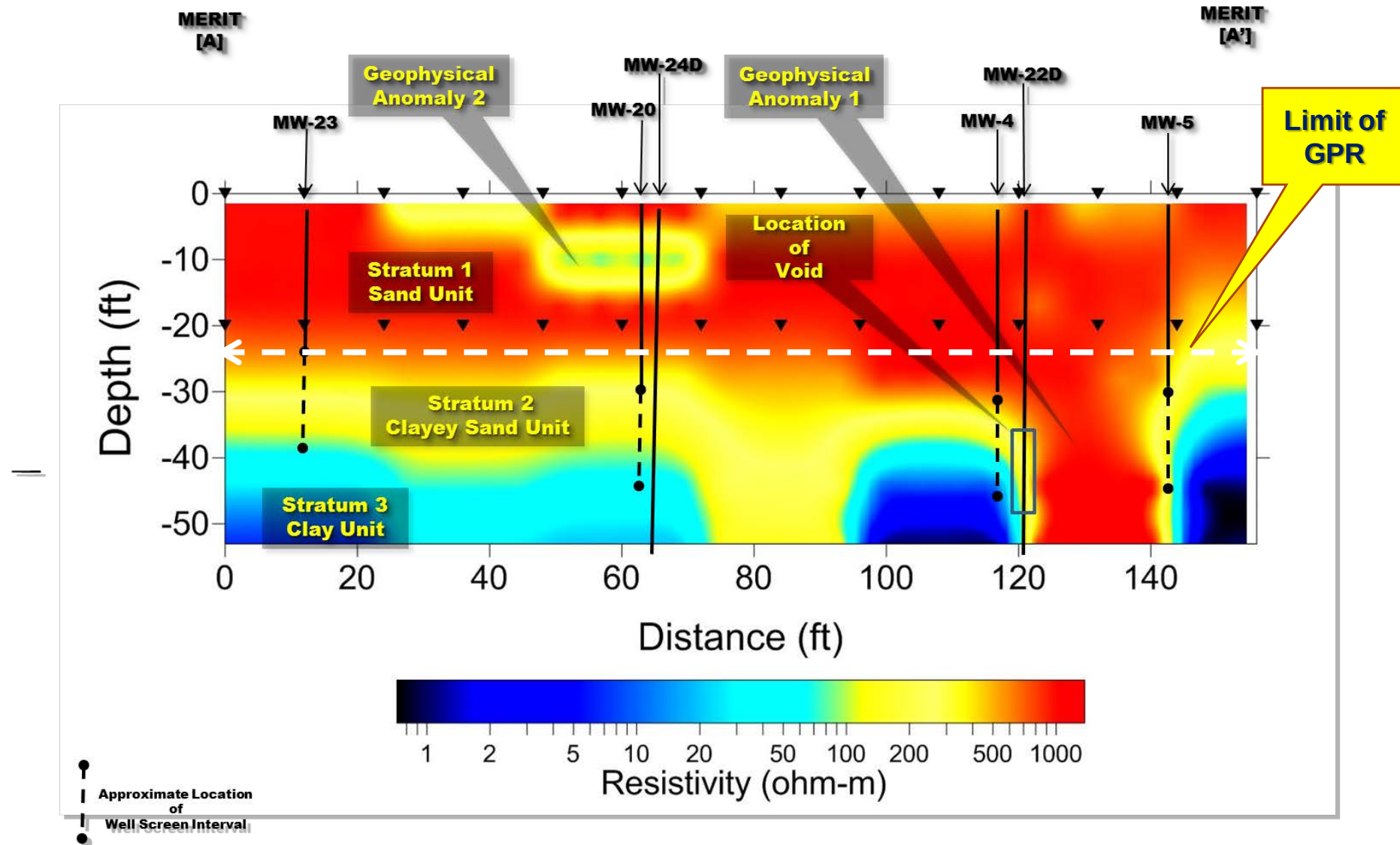
Wekiva Parkway Section – Lake County



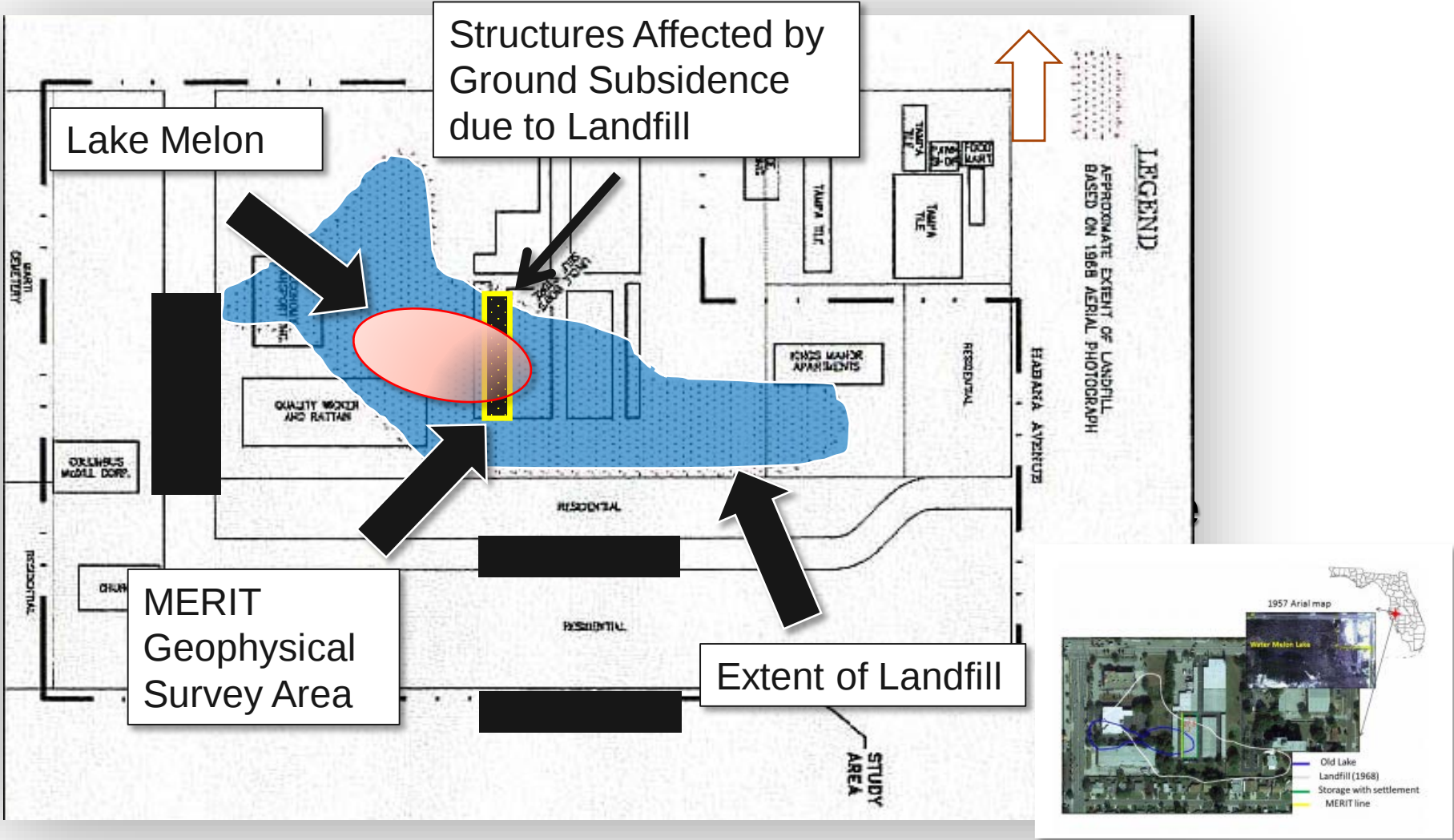
Former Gas Station – Hernando County



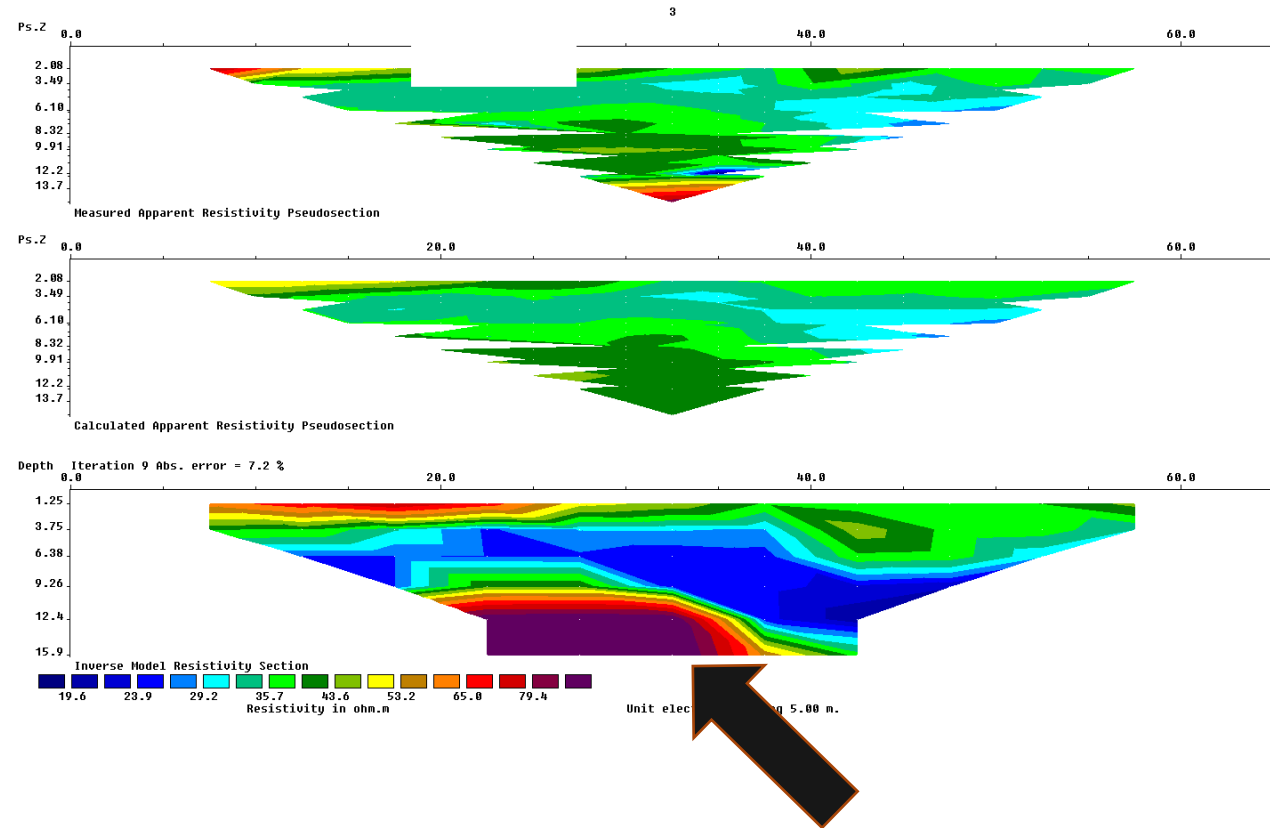
Former Gas Station – Hernando County



Former Landfill - Tampa



Former Landfill - Tampa



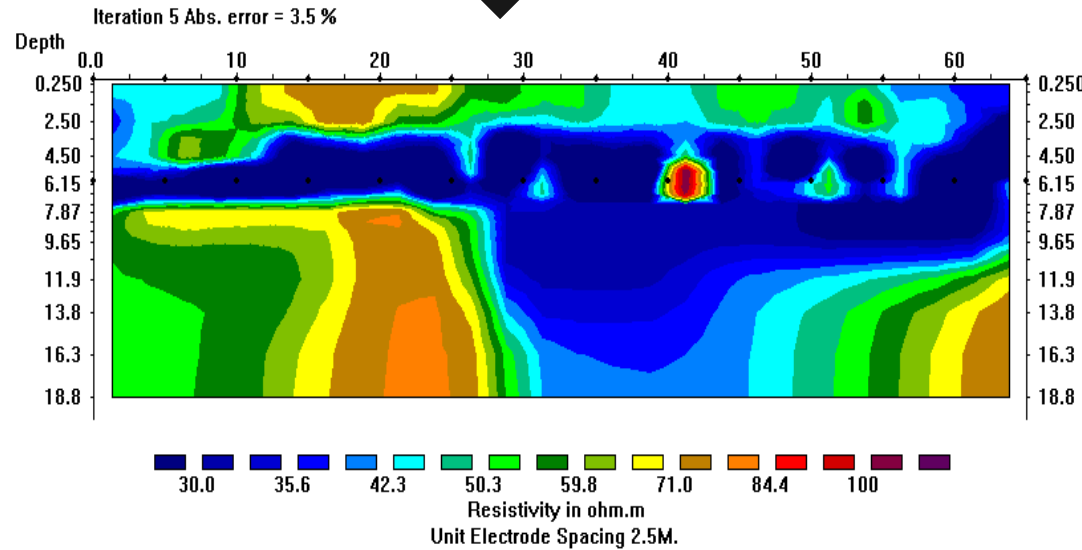
Only portion of limestone surface observed due to inverted triangular data from surface ER configuration

Surface Electrical Resistivity Results

- Surface of limestone seen at 9.26 meters (30 feet)
- Total depth 15.9 meters (52 feet)
- Slight indication of down warping of limestone surface
- Identified landfill conductive material (Blue)

Former Landfill - Tampa

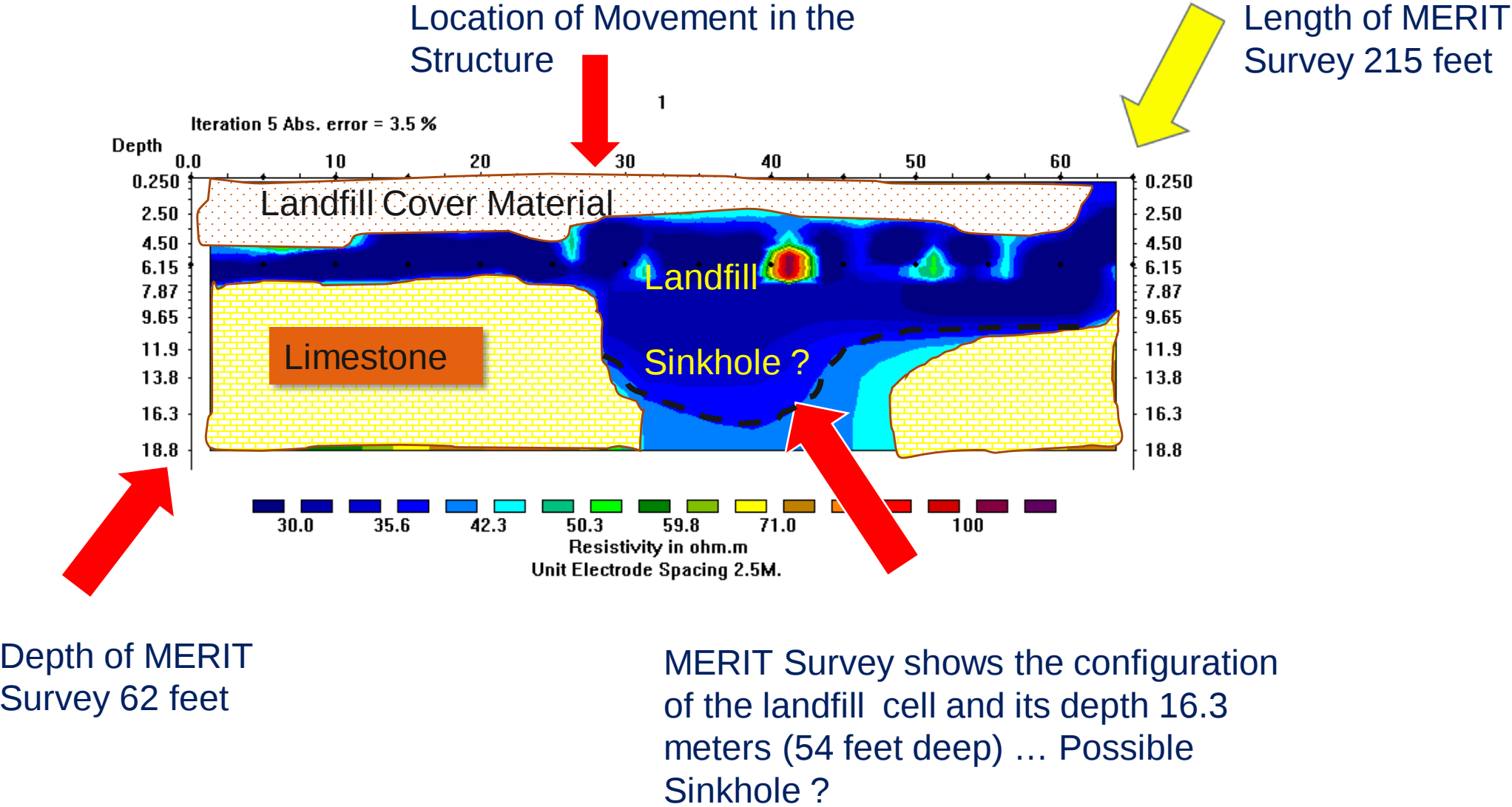
Standard Penetration
Test Location B-1



MERIT Survey Results

- Identified landfill material (Blue)
- Geometry of landfill cell
- Break in limestone
- Depth of landfill
- Possible Sinkhole Feature

Former Landfill - Tampa



Questions?