

# Geophysical and Hydrology Investigation

Moody Air Force Base  
Privatized Housing  
Val Del Road Parcel

Prepared for:

ACC Group Housing LLC

Prepared by:

Woolpert, Inc.  
TTL, Inc.  
Geohazards, Inc.

November 15, 2013



HYDROLOGY AND CIVIL ENGINEERING  
(GEOLOGIST AND GEOTECHNICAL WORK  
SEAL/SIGNATURES INCLUDED SEPARATELY)

## **Executive Summary:**

This report addresses suitability of the proposed housing site on Val Del Road for development as a residential neighborhood. The scope of the investigation, analysis, and research performed for this report are based on addressing (1) the hydrology, underlying karst topography, and potential impact on the underlying aquifer; and (2) the geological stability of the site and geophysical investigation to identify any voids or anomalies in the subsurface strata.

**Hydrology** - Development of this site will not have a negative impact on stormwater runoff and the groundwater recharge zone. Existing drainage patterns within the site will be maintained after construction of the homes and roadways. Stormwater detention will be provided to limit the release rate of proposed conditions runoff to not exceed that of existing conditions.

In existing conditions stormwater runoff flows to wetlands within the site and then leaves the site via overland flow and culverts under Val Del Road. Stormwater discharge in proposed conditions will continue to flow to the same wetlands and leave the site in the same manner. By maintaining existing drainage patterns and providing stormwater detention, there will be no hydrological impact from development of the site.

**Geophysical** – Geophysical investigation of the site supports the conclusion that the site is suitable for residential development. No voids or areas of raveling soil were found beyond those identified with initial ERI surveys. As proposed in the scope for the additional geophysical testing, both GPR and ERI surveys were performed along the west property line and dense ERI studies were performed within the previously identified areas of geologic concern. As identified in the attached detailed geophysical reports, the anomalies previously identified with a relatively broad ERI survey have now been clarified with a more precise and detailed level of analysis. This allows placing the proposed homes comfortably away from anomalies and also enables placement of homes in areas previously avoided based on the more generalized identification of geological areas of concern.

Attached is a site plan of the property showing placement of the proposed homes relative to the detailed outlines of the identified anomalies. Each anomaly has been delineated and also surrounded with a buffer to provide an even more conservative approach to placement of buildings on the site. The buffer provided is at a 1V:1H inclination from the depth of the anomaly up to the ground surface. To continue a conservative approach, this is a larger buffer than if the traditional 2V:1H inclination used for determining structural bearing vertical stress influence was applied.

As anticipated, the GPR survey was limited to relatively shallow penetration due to relatively high surface moisture and heavy clays. Typical GPR readings

achieved a depth of six-eight feet. Three isolated and relatively small shallow anomalies were identified with the GPR survey. These anomalies are not likely a result of karst topography or sinkhole activity. These anomalies are shallow enough (seven to nine feet deep) that they could be removed and backfilled or avoided with siting of the proposed buildings. Given their small size, the easiest and least expensive course of action will be place buildings outside the anomalies and their 1:1 buffer.

The dense ERI survey identified four anomalies, all of which were within the previously identified broad area of concern. The ERI identified anomalies are also relatively isolated and limited in size. These anomalies are areas with differing soil conditions at 20 to 30 feet below the surface. Additional deep soil borings could be performed in these areas to help identify whether they are raveling soil zones or in-filled material from a relic paleo era sinkhole or channel. Or similar to the preferred method for avoiding the GPR identified anomalies – simply avoid the areas with placement of proposed homes. Because these areas are relatively small and isolated, avoiding these areas with placement of proposed homes can be accomplished and should be incorporated with development of the construction documents.

See the attached site plan showing location of the anomalies, 1:1 buffers, and proposed buildings.



Hydrology Study  
Val Del Road Site

The scope for the hydrology study addresses the following items:

- a. Review and analysis of existing State of Georgia Aquifer Recharge Maps.*
- b. Assessment of impact of Karst topography on groundwater recharge areas.*
- c. Hydrology study to evaluate potential impact of proposed residential construction on existing drainage and stormwater runoff paths and the aquifer recharge zone, including contamination in relation to ground water and subsurface water changes associated with the development (analysis to be consistent with the Lowndes County Unified Land Development Code, September 11, 2012, ground water recharge requirements for water resources runoff/recharge effects with limestone Karst formations).
  - i. Intent of the hydrology study is to gather data for the purpose of enabling an analysis of whether the planned residential construction activities would have a significant impact on the Floridan aquifer and/or sinkhole/ravine adjacent to the Site.*
  - ii. Karst formation, Site features, and nearby sinkhole/ravine should be considered in the analysis to the extent that surface drainage from the proposed development will reach the sinkhole/ravine.**

(a) Review and analysis of the existing State of Georgia Aquifer Recharge Maps showed that the maps do include Karst topography as one of the factors in identifying groundwater recharge zones. The State of Georgia prepared an Aquifer Recharge Map (1996) for the entire State of Georgia. Based on this map, the Val Del Road site is within the Groundwater Recharge Area for the Floridan and Jacksonian Aquifers.

The existing state maps were prepared as a supplement to the Georgia Environmental Protection District (EPD) Hydrologic Atlas 18. The Atlas 18 database identifies approximately 13,000 square miles (23 percent) of Georgia's land surface through which the most significant natural ground-water recharge occurs.

The original Georgia Geologic Survey Hydrologic Atlas 18: "Most Significant Ground-Water Recharge Areas of Georgia," was published in 1989 and included mapping of the groundwater recharge areas based on rock outcrop area, lithology, soil type/thickness, slope, density of lithologic contacts, geologic structure, presence of karst, and potentiometric surfaces.

(b) As identified in the Georgia Aquifer Recharge Maps and stated above; Karst topography is a factor in groundwater recharge areas.

(c) A hydrology study was performed for the proposed project relative “*to the potential impact of proposed residential construction on existing drainage and stormwater runoff paths and the aquifer recharge zone*”.

The hydrology study for this project focused on changes to surface drainage patterns between existing and proposed conditions. Under existing conditions stormwater runoff from this site drains to wetland within the site. The wetlands will continue to receive drainage from the same adjacent land areas under proposed conditions. With the exception of a minor roadway crossing impact, the existing wetlands within the site will not be disturbed from development of the proposed homes and infrastructure.

Stormwater runoff rates from the site will be limited to rates experienced during existing conditions. Discharge rates will be controlled with detention basins and discharge control structures (specifically sized pipes, weirs, orifice plates, etc). By not changing the runoff patterns and limiting discharge rates to those in existing conditions, function of the wetlands and drainage runoff to land adjacent to the project site will not be impacted by the development.

Since existing drainage patterns are being maintained, groundwater/aquifer recharge from wetlands within the site will continue under proposed conditions. By maintaining stormwater flow to the wetlands and eventually out of the wetlands to the adjacent properties; groundwater/aquifer recharge from land adjacent to the site will also continue to occur as it does in existing conditions.

Maintaining drainage patterns to the wetlands within the site under proposed conditions will also ensure long term viability of both the wetlands and any contribution they provide to the groundwater/aquifer recharge zone.

Further supporting that this project will not impact “*existing drainage and stormwater runoff paths and the aquifer recharge zone*” is the requirement for review, approval, and permitting of this project through Lowndes County. A Stormwater Management Plan will be prepared to support permitting of this site through the Lowndes County Engineering Department. One of the items required to be addressed with the Stormwater Management Plan is drainage patterns and maintaining existing drainage patterns in proposed conditions.

Outlined in the scope for the hydrology study was confirmation that the proposed development is “*consistent with the Lowndes County Unified Land Development Code (ULDC), September 11, 2012, ground water recharge requirements for water resources runoff/recharge effects with limestone Karst formations*” .

To address that the proposed development is consistent with the ULDC, below is an excerpt from the Lowndes County ULDC Groundwater Recharge Area Protection District Code and the corresponding applicability of the code to the proposed development:

**Lowndes County Unified Land Development Code**  
**3.03.00 Groundwater Recharge Area Protection District**

**Groundwater is susceptible to contamination when unrestricted development occurs within significant groundwater recharge areas.**

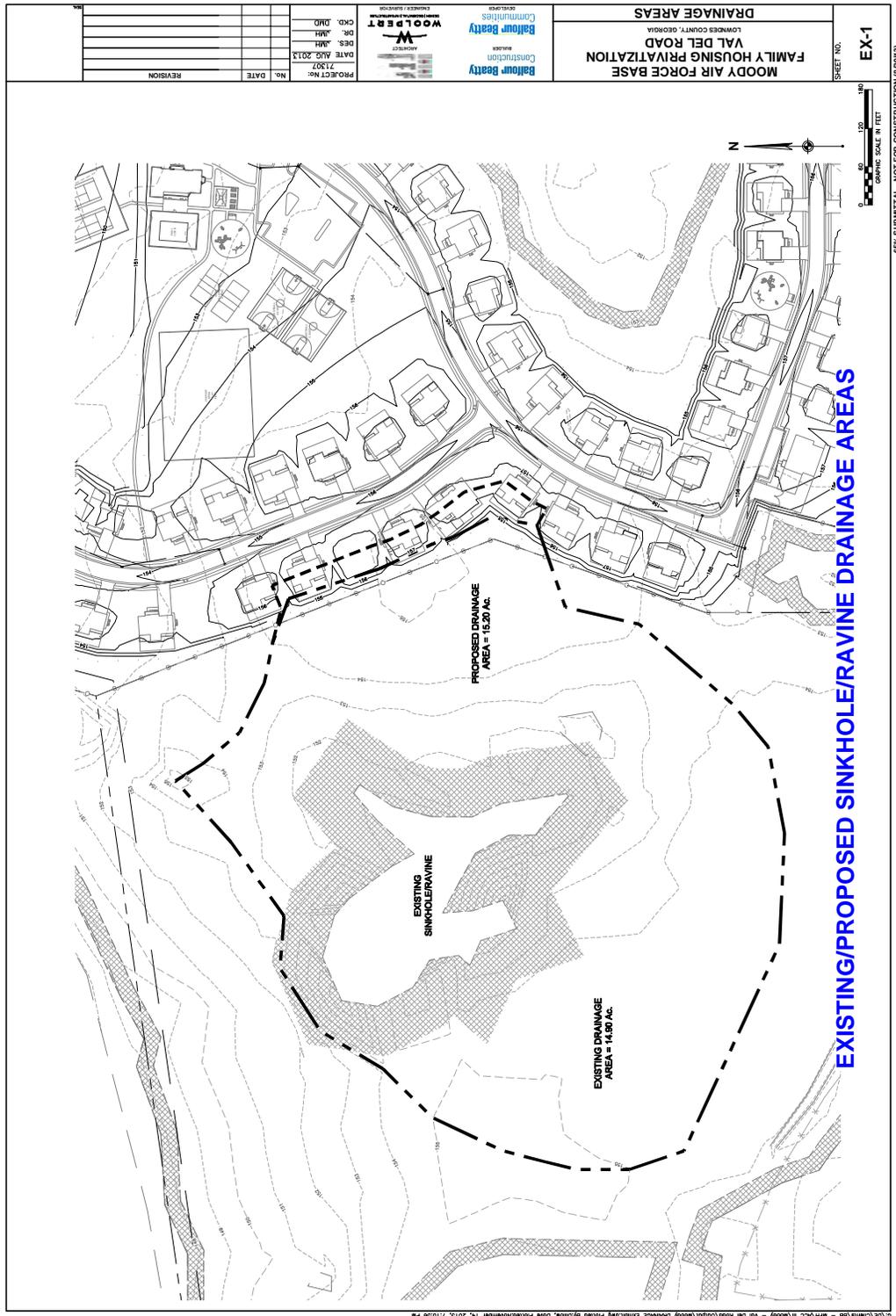
- a. **Excessive impervious surface can alter or impair their recharge characteristics thereby decreasing groundwater supplies. *(The Val Del Road project will not create excessive impervious surface).***
- b. **Pesticides, herbicides sprayed on crops, animal waste and septic tanks effluents contribute to deterioration in the groundwater quality and can threaten the health of residents relying on well water. *(The Val Del Road project will not include crops, animal waste, or septic tanks).***
- c. **Unregulated hazardous wastes. *(The Val Del Road project will not generate unregulated hazardous waste).***

The following land uses have specific development criteria required by the ULDC. The proposed Val Del Road housing consists of single family residential connected to a public sanitary sewer and is NOT subject to any of the specific proposed land uses listed in the ULDC. The land uses with development criteria listed in the ULDC are summarized below:

- a. **New agricultural waste impoundment sites – *not applicable.***
- b. **Homes served by septic tank/drain field systems – *not applicable***
- c. **New mobile home parks served by septic tank/drain fields – *not applicable.***
- d. **New above ground chemical or petroleum storage tanks having a minimum volume of 500 gallons. – *not applicable.***
- e. **New facilities which handle hazardous materials, of types and in amounts regulated by Georgia DNR – *not applicable.***
- f. **Permanent storm water infiltration basins – *All basins within the proposed development will be classified as stormwater retention or detention ponds.***
- g. **New wastewater Treatment Basins – *Not Applicable.***

The final scope item to be addressed relative to hydrology is any impact of surface drainage from the proposed development on the sinkhole/ravine located approximately 300 feet west of the proposed site. This is best demonstrated on the attached Sinkhole/Ravine Drainage Map. As shown on this map, the area contributing drainage to the sinkhole/ravine will be effectively unchanged with development of the proposed residential neighborhood.

A small increase in impervious area from roofs adjacent to the west property lines will be balanced by the reduced runoff from turf grass lawns relative to existing conditions ground cover. Based on these factors, the development of this site as a residential neighborhood will have no impact on the adjacent sinkhole/ravine.



ERI/GPR Geophysical Study and Analysis  
By TTL Inc. and Geohazards, Inc.

November 12, 2013



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Woolpert, Inc.  
Attn.: Mr. Dave Dillow, PE, LEED AP  
Vice President  
343 Fountains Parkway  
Fairview Heights, Illinois 62208

**RE:    *Final Report of Geophysical Findings***  
***MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE***  
***Valdosta, Georgia***  
***TTL Project Number 100712192***

Dear Dave:

The purpose of this report is to summarize the findings and results of the geophysical investigations performed by Geohazards, Inc. and the soil test borings performed by TTL at the above referenced project site. Previous reports submitted for the project include (in chronological order):

1. Geohazards Investigation No. 2012705 dated November 14, 2012.
2. Geohazards letter regarding review of SPT borings dated February 4, 2013.
3. TTL Summary Report of Geophysical Findings dated February 12, 2013.
4. TTL Report of Subsurface Exploration and Geotechnical Evaluation dated February 21, 2013 (Revised June 28, 2013).

Initially, Geohazards Investigation No. 2012705 was performed to determine if known karst conditions would significantly impact site development. After completing the initial geophysical investigation, Geohazards recommended seven (7) standard penetration test (SPT) borings in areas of representative anomalies to further investigate the possible existence of subsurface cavities and raveled zones. The seven borings were completed by TTL in January 2013 and subsequently submitted to Geohazards for their evaluation and review. As discussed in the Geohazards February 4, 2013 letter, five of the seven borings revealed no significant loose zones or cavities in limestone. Borings B-04 and B-06, however, contained zones of soft and loose materials, the most significant of which was boring B-04. According to Geohazards, these soft and loose zones may be interpreted as being indicative of raveling into deeper cavities within the underlying limestone. These "Areas of Geotechnical Concern" identified were isolated in the northwest and north central areas of the site. Consequently, the project design team chose not to construct housing units in these areas.

Subsequent to the work described above, additional electrical resistivity imaging (ERI) and ground penetrating radar (GPR) were performed by Geohazards to further characterize the site. The results of the additional work are presented in Geohazards Investigation No. 2013356 dated November 12, 2013 (attached as Appendix A). The scope of Geohazards investigation may be summarized as follows (reference pages 1 and 2 of Geohazards report):

- ***A review of available geologic maps, other published data, and previous boring logs provided by TTL to establish the general probable lithology for the site of investigation.***
- ***A reconnaissance of the site of investigation to recognize and identify surface conditions pertinent to the purpose of the investigation.***
- ***A Ground Penetrating Radar (GPR) investigation of the site to determine evidence for the presence of anomalous subsurface features or conditions.***
- ***An Electrical Resistivity Imaging (ERI) investigation of the site to assist in the recognition of site-specific geological conditions at the subject property and to determine evidence for the presence of anomalous subsurface features or conditions.***
- ***A final report summarizing results and conveying professional opinions.***

As anticipated, based on heavy clay soils and shallow groundwater, the GPR survey yielded limited results. With regard to the GPR signals, Geohazards indicated the depth capability at this site was variable, but was approximately 6 to 8 feet below ground based on the near surface materials (see page 4 paragraph 1).

To supplement the geophysical investigation, TTL prepared a comprehensive Geophysical Base Map showing the location of the GPR traverses, the ERI traverses (original and most recent) and soil test borings drilled at the site. Additionally, subsurface cross sections (A-A' and B-B') were prepared using the results of the seven (7) deep borings performed at the site. The base map and profiles are included in Appendix B. Detailed logs for all the borings drilled at the site by TTL have been included Appendix C for reference.

Based on the conclusions given on pages 7 and 8 of the Geohazards report, the results of the geophysical investigations may be summarized as follows:

- ***A large sinkhole feature and associated ravines was observed approximately one hundred yards to the west of the area surveyed. No additional geologically significant surface features were noted during our investigation.***
- ***TTL, Inc. conducted seven SPT borings in the anomalous areas indicated by Geohazards. In the opinion of Geohazards, the materials and N-values recorded in the SPT borings were found to be in agreement with the resistivity values indicated for the associated ERI traverses. Two of the seven SPT borings were found to indicate conditions that are indicative of raveling. These two areas were further investigated with 3-D electrical resistivity imaging surveys as part of the investigation reported herein.***
- ***Three anomalous GPR features were detected in our survey. As a group, these anomalies are relatively subtle, small in extent and isolated in***

- nature. GPR anomaly 1 consists of minor stacked reflectors at approximately 7 to 9 feet depth. This anomaly may possibly represent limestone rubble. GPR anomaly 1 did not correlate with any ERI anomalies.*
- *GPR anomaly 2 consists of disturbed sediments and dipping reflectors at approximately 0 to 9 feet depth. GPR anomaly 3 consists of stacked reflectors approximately 6 to 11 to feet depth. These two anomalies did not correlate with any ERI anomalies detected in this survey, likely due to the differences in depth and scale between the two methods, but are within the location of the eastern “area of geotechnical concern” (Area #2) based on prior investigation.*
  - *The 2-D ERI traverses (ERI traverses 13 and 14) both indicate a somewhat variable limestone surface with a total approximate range of 55 to 90 feet depth. A vertical zone of higher resistivity materials was detected along ERI traverse 14, above an area of apparent deeper limestone. This anomaly is interpreted as possibly indicative of a raveled zone. This anomaly did not align with any anomalous GPR signals, but did align with an ERI anomaly detected in the 2012 survey. The area of this anomaly was further investigated during the 3-D ERI survey. No other significant zones of raveling or possible voids/cavities in limestone were detected along ERI traverses 13 or 14.*
  - *The 3-D ERI data collection was oriented to further investigate portions of the western and eastern “areas of geotechnical concern” (referred to, respectively, as Areas #1 and Areas #2 in this report). The data were interpreted as generally indicative of near surface, more resistive sandy soils, overlying less resistive clayey soils. Higher resistivity values at depth in both Area #1 and Area #2 indicate a deeper upper limestone surface typically from at approximately 75 to 85 feet depth. Three anomalous areas were detected in or adjacent to the 3-D ERI Area #1, and one anomalous area was detected in or adjacent to the 3-D ERI Area #2. The three anomalies located in Area #1 consist of pockets of high resistivity materials to depths of 20 to 40 feet. These anomalies are also interpreted as zones of in-filled materials that may be indicative of a paleosink environment. The ERI anomaly associated with Area #2 consists of a linear N-S higher resistivity feature. This anomaly may be interpreted to be indicative of a paleosink feature but could also be interpreted as a possible in-filled paleo-channel. No other significant zones of raveling or possible voids/cavities in limestone were detected for the 3-D ERI blocks.*
  - *Based on the results of this investigation, Geohazards, Inc. recommends that if any building construction is planned for the areas of the detected anomalies (indicated on the Site Plans) SPT borings are warranted to further investigate the possible existence of subsurface cavities and raveled zones. The borings should be completed to competent limestone. The results of the SPT borings may warrant consideration of remediation programs for any areas where limestone cavities or raveled zones are*

***identified. In the areas outside of the detected anomalies the Val Del Road site appears suitable for normal residential development.***

In conclusion, ERI traverse 13 was conducted along the western boundary of the proposed development, between the proposed development and the existing sinkhole to the west. Per Geohazard's findings, no significant zones of raveling or possible voids/cavities in limestone were detected along ERI traverse 13. The two areas of geotechnical concern identified in the 2012 survey were further investigated with 3-D electrical resistivity imaging surveys. The Geophysical Base Map shows the anomalies as defined by the 3-D ERI blocks. Per Geohazard's report ***"No other significant zones of raveling or possible voids/cavities in limestone were detected for the 3-D ERI blocks"***.

Since correlation of the ERI data and deep SPT borings (B-01 through B-07) has been established, a significant number of ERI traverses have been completed across the site (reference Geophysical Base Map), 3-D ERI surveys have defined the anomalies in the areas of concern and structure siting is outside the identified anomalies, additional soil test borings and/or geophysical investigation are not warranted.

The construction proposed at the site is typical one and two story residential housing units. It is our understanding that construction of housing units at the site will be limited to areas outside the anomalies identified in the dense 3D ERI study noted above. An adequate buffer should be provided for building construction adjacent to the identified ERI anomalies. Based on our experience, establishing the buffer based on a 45 degree angle projected from the depth of the anomaly should be adequate. We recommend foundation design, general site preparation and site grading be performed in accordance with the recommendations presented in the geotechnical report previously submitted by TTL.

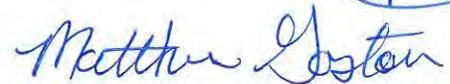
We appreciate the opportunity to work with you on this project. If you have any questions concerning this report, please do not hesitate to call.

Sincerely,

TTL, Inc.



Michael E. McNeal, P.E.  
Principal Engineer  
Georgia Reg. No. PE013133



Matthew L. Gaston, P.E.  
Geotechnical Group Leader  
GA Reg. No. PE034150

Attachments: Appendix A - Geohazards Investigation No. 2013356 Report  
Appendix B - Geophysical Base Map  
Subsurface Profiles A-A' and B-B'  
Appendix C - Field Testing Procedures  
Legend of Symbols  
Subsurface Cross-Sections  
Boring Logs (44)

Note: Bold italic text taken from November 12, 2013 Geohazards Report

November 12, 2013

Geohazards, Inc., Investigation No. 2013356

GEOPHYSICAL INVESTIGATION OF  
THE GEOLOGIC SUBSURFACE OF THE  
MOODY AIR FORCE BASE PRIVATIZED HOUSING  
VAL DEL ROAD, VALDOSTA, GEORGIA

## INTRODUCTION

### Purpose

Geohazards, Inc. was tasked by TTL, Inc. to conduct a geophysical investigation at the above referenced locality. This investigation was conducted to provide a geophysical characterization of the geological subsurface. In particular, efforts were designed to determine the presence of subsurface cavities and subsurface zones of disruption that might contribute to subsidence. Any of these conditions could be responsible for existing or potential subsidence at the site.

### Scope

The investigation conducted and reported herein included the following:

- A review of available geologic maps, other published data, and previous boring logs provided by TTL to establish the general probable lithology for the site of investigation.
- A reconnaissance of the site of investigation to recognize and identify surface conditions pertinent to the purpose of the investigation.
- A Ground Penetrating Radar (GPR) investigation of the site to determine evidence for the presence of anomalous subsurface features or conditions.

- An Electrical Resistivity Imaging (ERI) investigation of the site to assist in the recognition of site-specific geological conditions at the subject property and to determine evidence for the presence of anomalous subsurface features or conditions.
- A final report summarizing results and conveying professional opinions.

### Site Information

The geophysical field investigation was conducted on October 17-18, 21, and 23-24, 2013. The site of investigation is located west of Val Del Road, north of North Valdosta Road, Valdosta, Georgia. The area surveyed is the proposed site of a privatized housing development for Moody Air Force Base. The site is generally level and is covered in pine trees and other natural vegetation. A large sinkhole feature and associated ravines were observed approximately one hundred yards to the west of the area surveyed. No additional geologically significant surface features were noted during our investigation.

Geohazards, Inc. previously conducted a geophysical investigation at the Val Del Road property (Geohazards report #2012705, November 14, 2012) consisting of 19 electrical resistivity imaging (ERI) traverses. The ERI traverses generally indicated a level to somewhat variable layer of limestone underlying most of the surveyed areas of the site but some of the ERI traverses were indicative of a deeper or sloping limestone surface. Some of the areas interpreted as indicative of deeper limestone also involved shallower features with relatively higher resistivity materials that may be indicative of infilling. Geohazards recommended further investigation of these anomalous areas with standard penetration test (SPT) borings.

TTL, Inc. conducted seven SPT borings in anomalous areas indicated by Geohazards and then tasked Geohazards to review the results of the SPT borings. As related in a letter dated February 4, 2013, Geohazards opined that materials and N-values recorded in the SPT borings were found to be in agreement with the resistivity values indicated for the associated ERI traverses (see attached 2-D ERI profile/boring overlays). Two of the seven SPT borings were found to indicate conditions that are indicative of raveling.

TTL, Inc. further tasked Geohazards to conduct additional geophysical testing at the Val Del Road site. This further testing, detailed in this report, was designed to conduct both ground penetrating radar (GPR) and ERI along two transects on the western and northern areas of the property. In addition, two areas designated at "areas of geotechnical concern" were further investigated with quasi-3-dimensional ERI surveys in which dense parallel ERI traverses are combined into a single data block that may be processed as a 3-dimensional set of data points.

### Geology

Based on map consultations and personal inspection, the surficial geologic material at the study site is the Pliocene Miccosukee Formation overlain by a thin layer of undifferentiated

Quaternary sediments. The Miccosukee Formation is composed of grayish orange to grayish red, mottled, poorly to moderately consolidated, interbedded clay, sand and gravel of varying coarseness and admixtures.

The Miccosukee Formation unconformably overlies the Miocene Hawthorn group of geological formations. The Hawthorn group in this area includes the Coosawatchie, Marks Head, Parachucla, and Chattahoochee Formations. These generally consist of fine to medium grained, unconsolidated quartz sand, silt, and clay in varying proportions and thickness.

The Suwannee Limestone underlies the Hawthorn Group. The Oligocene Suwannee Limestone consists of a white to cream, poorly to well indurated, fossiliferous, vuggy to moldic limestone (grainstone and packstone). The dolomitized parts of the Suwannee Limestone are gray, tan, light brown to moderate brown, moderately to well indurated, finely to coarsely crystalline, dolostone with limited occurrences of fossiliferous (molds and casts) beds. Silicified limestone is common in the Suwannee Limestone. Fossils present in the Suwannee Limestone included mollusks, foraminifers, corals and echinoids. The Suwannee Limestone has experienced significant dissolution and the creation of an intricate cavernous system. Problems in the development of sinkholes are related to the size and proximity to the surface of cavities located within these two limestone formations. The upper surface of Suwannee Limestone is highly irregular.

## FIELD TEST METHODS: GEOPHYSICAL SURVEY

### Ground Penetrating Radar

Ground penetrating radar (GPR) is a geophysical procedure employed to detect and identify subsurface features and conditions characterized by a contrast in dielectric properties. This technique involves the transmission, from a receiver-transmitter antenna system that is pulled along the ground surface, of microwave radiation into the ground. Subsurface contrasts in the dielectric properties of varying materials present a surface from which reflections are generated. Accordingly, contacts between rock types, physical features such as cavities or disrupted sedimentary layers, and/or man-made objects such as metallic barrels or pipes cause reflections that are recorded at the surface.

The intensity of the reflected signal is affected by the contrast in dielectric properties of materials, the electromagnetic conductivity of the medium through which the waves traverse, and the frequency of the signal. Digital signals are recorded and stored in a recorder for on-site visual color display or subsequent transfer to a computer for analysis and printing. The radar survey was conducted in general accordance with ASTM Standard D6432.

A Geophysical Survey Systems, Inc., (GSSI) SIR-3000 radar system was used. This is a portable, digital radar signal recorder. A 200-megahertz transceiver antenna was used with a two-way travel time range of 200 nanoseconds. Data collection was continuous. Penetration

depths for GPR signals are a function of lithology type (greater signal attenuation in clayey materials or water saturated conditions) and frequency (greater signal attenuation in higher frequency antenna systems). Actual depths of penetration vary from site to site. Based on the near-surface materials, the depth capability at this site was approximately 6-8 feet, but actual penetration is variable.

Two GPR traverses were conducted at the Val Del Road property (see Survey Maps for locations, Table 1 for GPS coordinates). As shown on the GPR location map, these two GPR traverses followed transects cleared near the west and north boundaries of the site of investigation. GPR traverse 1 followed the western transect in a generally S-N pathway. This traverse was 1180 feet long. GPR traverse 2 followed the northern transect in a W-E pathway, across portions of the two geophysical areas of concern. This traverse was 900 feet long.

### Electrical Resistivity Imaging

An electrical resistivity imaging (ERI) survey was completed for the purpose of identifying possible subsurface anomalies which may be related to karst or sinkhole activity. Electrical resistivity measurements involve the passing of an electric current underground and measuring its resistance to flow. Different earth materials (e.g. clay, sand, limestone) and subsurface cavities resist the flow of electrical current differently. Substantially greater contrasts in the degree of resistance (anomalies) are used to identify and locate boundaries among different materials as well as the presence of cavities. The ERI survey was conducted in general accordance with ASTM D6431 "Standard Guide for Using Direct Current Resistivity Method for Subsurface Investigation," as applied to a multi-electrode resistivity system.

Measurements for ERI were made with Advanced Geosciences, Inc. SuperSting R8 8-channel Resistivity Meter with an incorporated switchbox and a passive electrode cable system. The resulting data were processed utilizing EarthImager 2D (a computer program that produces two-dimensional vertical cross section models of the subsurface) and EarthImager 3D (a computer program that produces a volume image displaying three-dimensional subsurface resistivity distribution). The quality of these models was assessed by root mean square (RMS) and L2 values. Color prints of the modeled ERI cross sections are included. The ERI data were collected using Dipole-Gradient and Dipole-Dipole array type sequencing. The depth limits of the modeled ERI data are primarily dependent on the type of array (Dipole-Dipole, Schlumberger, Wenner, etc.) and the total spread of the electrode array. In this case, the maximum depth is estimated at approximately 115 feet below ground surface for each of the individual traverses.

Fourteen ERI traverses were measured during this investigation at the Val Del Road site. (see Survey Maps for locations, Table 1 for GPS coordinates). Traverses 1-6 and 7-12 were arranged 20 feet apart in parallel blocks in the two areas of geotechnical concern. These traverses were each 550 feet in length. Traverses 13 and 14 generally followed the cleared transects utilized by the GPR survey; however they did deviate from the cleared path to maintain the straightness requirements of the array type. Traverse 13 and 14 were 1110 and 830 feet in

length, respectively. The endpoints of each traverse were located and field checked using a Trimble Geo-XT GPS device.

## RESULTS

### Ground Penetrating Radar

1. Ground penetrating radar (GPR) signals were interpreted as generally horizontal to irregularly-layered reflectors extending to 6-11 feet depth. Variable attenuation of the radar signal occurred throughout the Val Del Road site. This attenuation is likely attributable to the presence of near surface clayey soils or near surface water saturated conditions.
2. Three anomalous GPR features were detected in our survey. As a group, these anomalies are relatively minor and isolated in nature. The locations of the anomalous features are marked on the site plan map.
3. GPR anomaly 1 was detected from the 730 to 740 feet marks along the GPR traverse 1. GPR anomaly 1 consists of minor stacked reflectors at approximately 7 to 9 feet depth.
4. GPR anomaly 2 was detected from the 570 to 590 feet marks along the GPR traverse 2. GPR anomaly 2 consists of disturbed sediments and dipping reflectors at approximately 0 to 9 feet depth.
5. GPR anomaly 3 was detected from the 730 to 740 feet marks along the GPR traverse 2. GPR anomaly 3 consists of stacked reflectors approximately 6 to 11 to feet depth.

### Electrical Resistivity

#### 2-Dimensional Surveys

1. Colored prints of the modeled 2-D ERI cross sections are included. The quality of the modeled ERI cross sections is evaluated using two statistical values, root mean squares (RMS) and L2. L2 values of traverses 13 and 14 are in the range considered to be excellent and the RMS values are also considered to be satisfactory.
2. Due to the number of data points collected, ERI traverse 13 was subdivided into two overlapping data subsets (0-830 feet and 280-1110 feet) to facilitate processing (see attached figures).
3. The data collected along ERI traverse 13 were interpreted as generally indicative of near surface, more resistive sandy soils, overlying less resistive clayey soils. Higher resistivity values at depth indicate a somewhat variable upper limestone surface typically ranging from

approximately 55 to 65 feet depth. A deeper limestone zone was detected from approximately 600 to 680 feet along traverse 13. No ERI values interpreted as indicative of raveling was associated with the deeper limestone zone detected on ERI traverse 13.

4. The data collected along ERI traverse 14 were also interpreted as generally indicative of near surface, more resistive sandy soils, overlying less resistive clayey soils. Higher resistivity values at depth indicate a variable but deeper upper limestone surface typically ranging from approximately 60 to 90 feet depth. Deeper limestone zones were detected from approximately 60 to 240 feet and east of 440 feet along traverse 14.
5. A vertical zone of higher resistivity materials was detected from approximately 710 to 730 feet along ERI traverse 14, above an area of apparent deeper limestone. This anomaly is interpreted as possibly indicative of a raveled zone. No other significant zones of raveling or possible voids/cavities in limestone were detected along ERI traverses 13 or 14.

### 3-Dimensional Surveys

6. The parallel ERI traverses 1 through 6 and 7 through 12 were combined into two blocks of data for 3-D processing. Colored prints of the 3-D ERI models (contour plots and horizontal sections) are included. The RMS and L2 values of the 3-D blocks are in the range considered to be very good to excellent.
7. Traverses 1 through 6 were conducted in the western “area of geotechnical concern” (Area #1) and traverses 7 through 12 were conducted in the eastern “area of geotechnical concern” (Area #2).
8. The data were interpreted as generally indicative of near surface, more resistive sandy soils, overlying less resistive clayey soils. Higher resistivity values at depth at both Area #1 and Area #2 indicate a deeper upper limestone surface typically from at approximately 75 to 85 feet depth.
9. Three anomalous areas were detected in the 3-D ERI Area #1, and one anomalous area was detected in the 3-D ERI Area #2 (see Site Plan).
10. ERI 3-D anomaly 1A is located in the northwest portion of Area #1. Anomaly 1A consists of a pocket of high resistivity materials to a depth of approximately 40 feet. This is interpreted as a zone of in-filled materials that may be indicative of a paleosink environment.
11. ERI 3-D anomalies 1B and 1C are located adjacent to the southeast and southwest portions of Area #1, respectively. Anomalies 1B and 1C consists of pockets of high resistivity materials to depths of 20 to 30 feet. These anomalies are also interpreted as zones of in-filled materials that may also be indicative of a paleosink environment.
12. ERI 3-D anomaly 2A is located adjacent to the eastern portion of Area #2. Anomaly 2A consists of a linear N-S higher resistivity feature. This anomaly may be interpreted to be

indicative of a paleosink feature but could also be interpreted as a possible in-filled paleo-channel.

13. No other significant zones of raveling or possible voids/cavities in limestone were detected for the 3-D ERI blocks.

## CONCLUSIONS

The site of investigation is located west of Val Del Road, north of North Valdosta Road, Valdosta, Georgia. The area surveyed is the proposed site of a privatized housing development for Moody Air Force Base. A large sinkhole feature and associated ravines was observed approximately one hundred yards to the west of the area surveyed. No additional geologically significant surface features were noted during our investigation.

Geohazards, Inc. conducted a previous geophysical investigation at the Val Del Road property (Geohazards report #2012705, November 14, 2012) consisting of 19 electrical resistivity imaging (ERI) traverses. Geohazards recommended further investigation of several anomalous areas with standard penetration test (SPT) borings. TTL, Inc. conducted seven SPT borings in the anomalous areas indicated by Geohazards. In the opinion of Geohazards, the materials and N-values recorded in the SPT borings were found to be in agreement with the resistivity values indicated for the associated ERI traverses. Two of the seven SPT borings were found to indicate conditions that are indicative of raveling. These two areas were further investigated with 3-D electrical resistivity imaging surveys as part of the investigation reported herein.

TTL, Inc. further tasked Geohazards to conduct additional geophysical testing at the Val Del Road site. This further testing, detailed in this report, was designed to conduct both ground penetrating radar (GPR) and 2-D and 3-D electrical resistivity imaging (ERI) surveys. This geophysical field investigation was conducted on October 17-18, 21, and 23-24, 2013.

Ground penetrating radar (GPR) signals were interpreted as generally horizontal to irregularly-layered reflectors extending to 6-11 feet depth. Variable attenuation of the radar signal occurred throughout the Val Del Road site. This attenuation is likely attributable to the presence of near surface clayey soils or near surface water saturated conditions. Three anomalous GPR features were detected in our survey. As a group, these anomalies are relatively subtle, small in extent and isolated in nature. GPR anomaly 1 consists of minor stacked reflectors at approximately 7 to 9 feet depth. This anomaly may possibly represent limestone rubble. GPR anomaly 1 did not correlate with any ERI anomalies.

GPR anomaly 2 consists of disturbed sediments and dipping reflectors at approximately 0 to 9 feet depth. GPR anomaly 3 consists of stacked reflectors approximately 6 to 11 to feet depth. These two anomalies did not correlate with any ERI anomalies detected in this survey,

likely due to the differences in depth and scale between the two methods, but are within the location of the eastern “area of geotechnical concern” (Area #2) based on prior investigation.

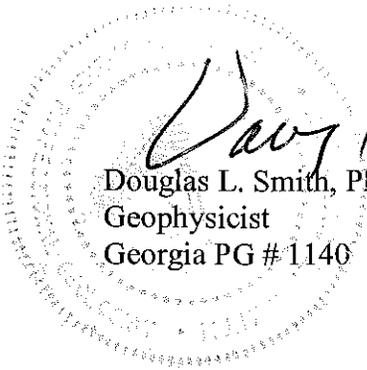
The 2-D ERI traverses (ERI traverses 13 and 14) both indicate a somewhat variable limestone surface with a total approximate range of 55 to 90 feet depth. A vertical zone of higher resistivity materials was detected along ERI traverse 14, above an area of apparent deeper limestone. This anomaly is interpreted as possibly indicative of a raveled zone. This anomaly did not align with any anomalous GPR signals, but did align with an ERI anomaly detected in the 2012 survey. The area of this anomaly was further investigated during the 3-D ERI survey. No other significant zones of raveling or possible voids/cavities in limestone were detected along ERI traverses 13 or 14.

The 3-D ERI data collection was oriented to further investigate portions of the western and eastern “areas of geotechnical concern” (referred to, respectively, as Areas #1 and Areas #2 in this report). The data were interpreted as generally indicative of near surface, more resistive sandy soils, overlying less resistive clayey soils. Higher resistivity values at depth in both Area #1 and Area #2 indicate a deeper upper limestone surface typically from at approximately 75 to 85 feet depth. Three anomalous areas were detected in or adjacent to the 3-D ERI Area #1, and one anomalous area was detected in or adjacent to the 3-D ERI Area #2. The three anomalies located in Area #1 consist of pockets of high resistivity materials to depths of 20 to 40 feet. These anomalies are also interpreted as zones of in-filled materials that may be indicative of a paleosink environment. The ERI anomaly associated with Area #2 consists of a linear N-S higher resistivity feature. This anomaly may be interpreted to be indicative of a paleosink feature but could also be interpreted as a possible in-filled paleo-channel. No other significant zones of raveling or possible voids/cavities in limestone were detected for the 3-D ERI blocks.

Based on the results of this investigation, Geohazards, Inc. recommends that if any building construction is planned for the areas of the detected anomalies (indicated on the Site Plans) SPT borings are warranted to further investigate the possible existence of subsurface cavities and raveled zones. The borings should be completed to competent limestone. The results of the SPT borings may warrant consideration of remediation programs for any areas where limestone cavities or raveled zones are identified. In the areas outside of the detected anomalies the Val Del Road site appears suitable for normal residential development.

LIMITATIONS

While due care has been exercised in the performance of these measurements and their interpretation, Geohazards, Inc. can make no representations, warranties, or guarantees with respect to latent or concealed conditions which may exist that may be beyond the limits of detection with the methodologies used.

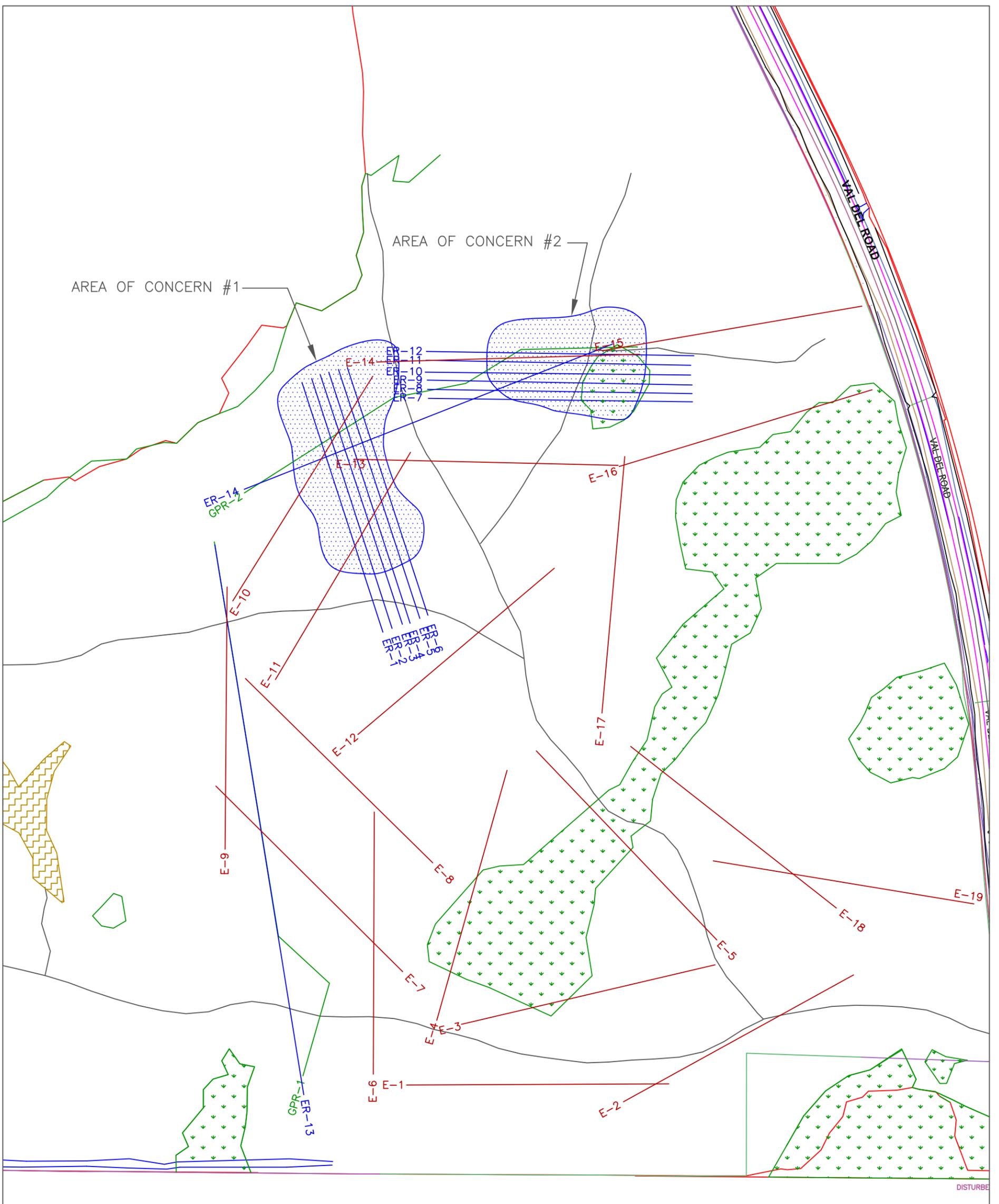


*Doug L. Smith*  
Douglas L. Smith, Ph.D., P.G. 11/12/13  
Geophysicist  
Georgia PG # 1140

*C. Brickman Way*  
C. Brickman Way  
Geologist

**Table 1: GPS coordinates (decimal degree format)**

GPR POINTS			ERI POINTS		
GPR 1 START (0')	30.906694719	-83.325898646	ER 1 START	30.909221987	-83.325348872
GPR 1 SECOND	30.907221603	-83.325719001	ER 1 END	30.910650414	-83.325879817
GPR 1 THIRD (345')	30.907492235	-83.326053090	ER 2 START	30.909243002	-83.325287938
GPR 1 END (1180')	30.909744615	-83.326456833	ER 2 END	30.910672464	-83.325806505
GPR 2 START (0')	30.910022639	-83.326256437	ER 3 START	30.909266503	-83.325219797
GPR 2 SECOND (370')	30.910560755	-83.325263196	ER 3 END	30.910693653	-83.325749492
GPR 2 THIRD (500')	30.910638086	-83.324789786	ER 4 START	30.909271582	-83.325168633
GPR 2 FOURTH (655')	30.910828734	-83.324423526	ER 4 END	30.910708164	-83.325693159
GPR 2 END (900')	30.910838816	-83.323654815	ER 5 START	30.909298671	-83.325104474
			ER 5 END	30.910723049	-83.325629147
			ER 6 START	30.909316870	-83.325051217
			ER 6 END	30.910734378	-83.325570645
			ER 7 START	30.910554232	-83.325037527
			ER 7 END	30.910523209	-83.323293912
			ER 8 START	30.910605879	-83.325042314
			ER 8 END	30.910570161	-83.323296250
			ER 9 START	30.910658259	-83.325044030
			ER 9 END	30.910618818	-83.323295711
			ER 10 START	30.910703727	-83.325057186
			ER 10 END	30.910675720	-83.323304704
			ER 11 START	30.910771699	-83.325050676
			ER 11 END	30.910731838	-83.323303627
			ER 12 START	30.910822066	-83.325047862
			ER 12 END	30.910786028	-83.323282270
			ER 13 START	30.906586721	-83.325894258
			ER 13 END	30.909728445	-83.326453393
			ER 14 START	30.910043613	-83.326256822
			ER 14 END	30.910856313	-83.323819113



- LEGEND**
- ER-1 — ERI LINE
  - GPR-1 — GPR LINE
  - E-1 — 2012 ERI LINE
  - [Hatched Box] — EXISTING SINKHOLE
  - [Green Hatched Box] — WETLAND



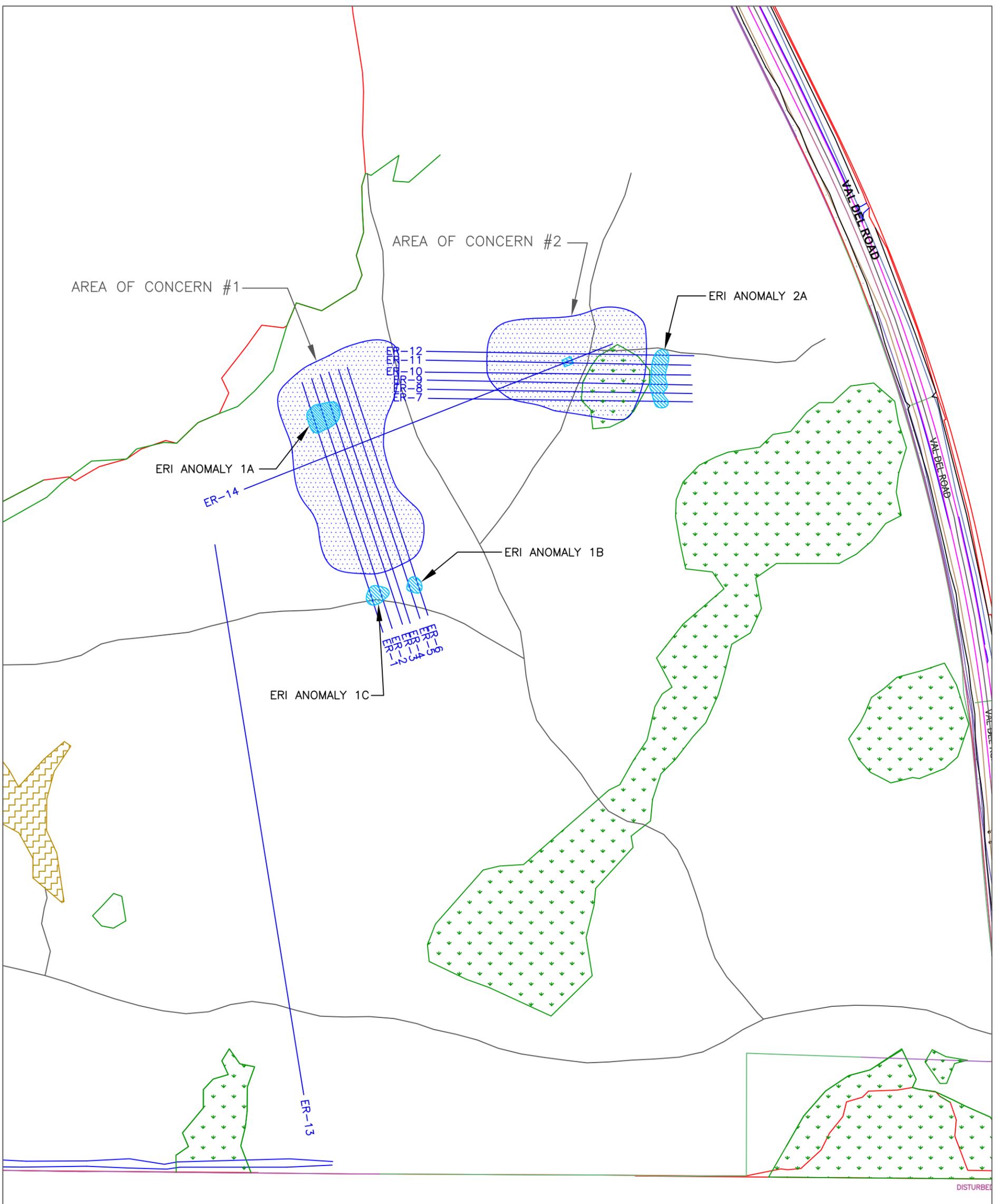
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SCALE: 1 INCH = 200 FT
PROJECT #: 2013356
DATE: 10-28-13
DRAWN: T.G.
FILENAME: Val Del ERI-GPR Maps.DWG
SHEET 1 OF 1

SITE PLAN SHOWING LOCATION  
 OF GEOPHYSICAL SURVEY TRAVERSES  
 PROPOSED MOODY AFB PRIVATIZED HOUSING  
 VAL DEL ROAD  
 VALDOSTA, GEORGIA



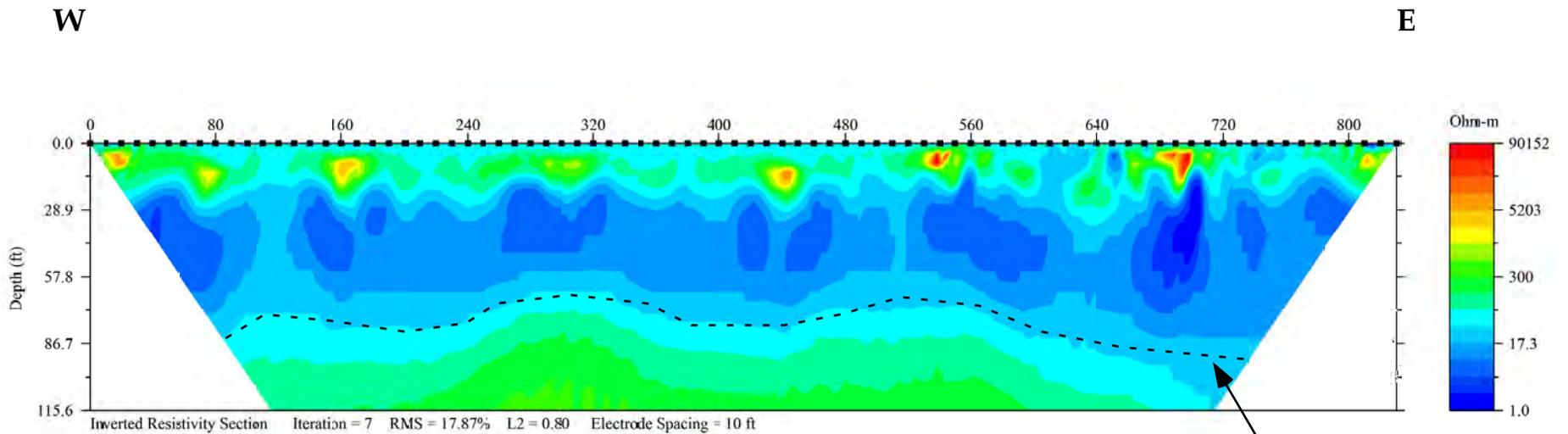
- LEGEND**
- ER-1 — ERI LINE
  - [Blue Hatched Box] — ERI ANOMALY
  - [Yellow Hatched Box] — EXISTING SINKHOLE
  - [Green Arrow Pattern Box] — WETLAND



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 SHEET 1 OF 1

ELECTRICAL RESISTIVITY  
 IMAGING SURVEY MAP  
 PROPOSED MOODY AFB PRIVATIZED HOUSING  
 VAL DEL ROAD  
 VALDOSTA, GEORGIA



Approximate upper limestone surface

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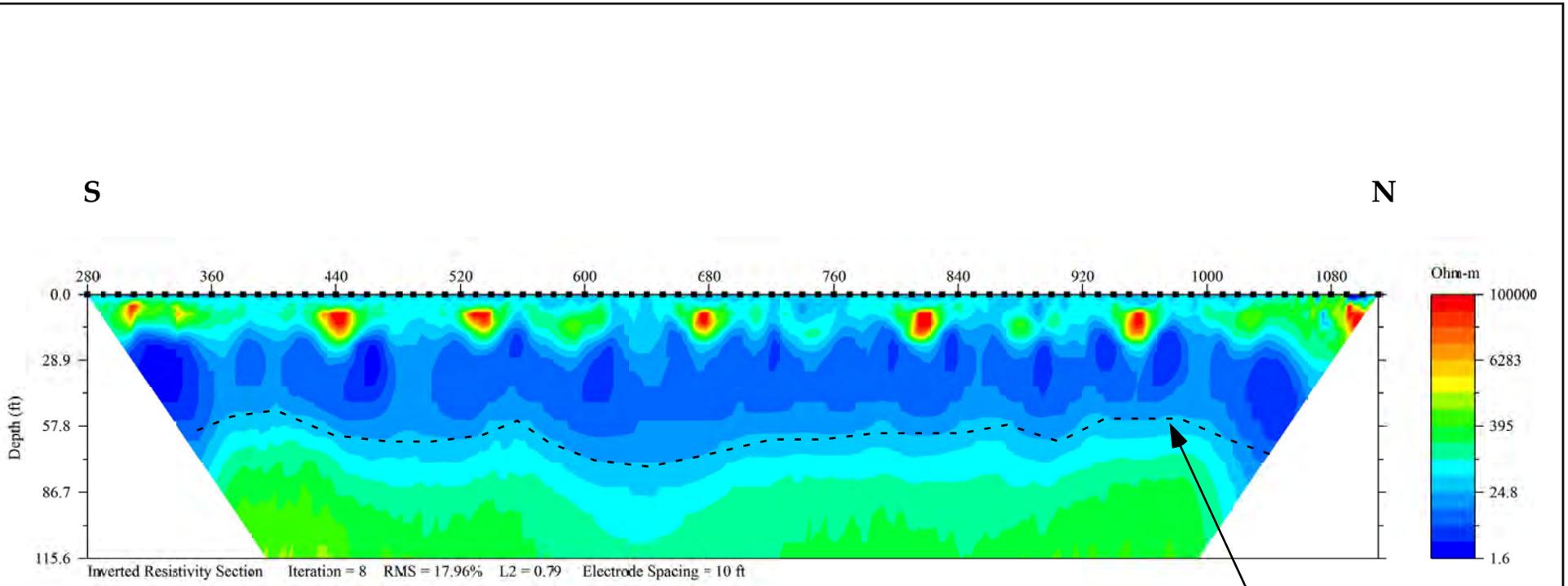
### TWO-DIMENSIONAL ELECTRICAL RESISTIVITY PROFILE TRAVERSE 13, 0-830 ft

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

FOR: TTL, Incorporated

DATE: 11-4-13

BY: C. B. Way, Geologist  
Investigation #2013356



Approximate upper limestone surface

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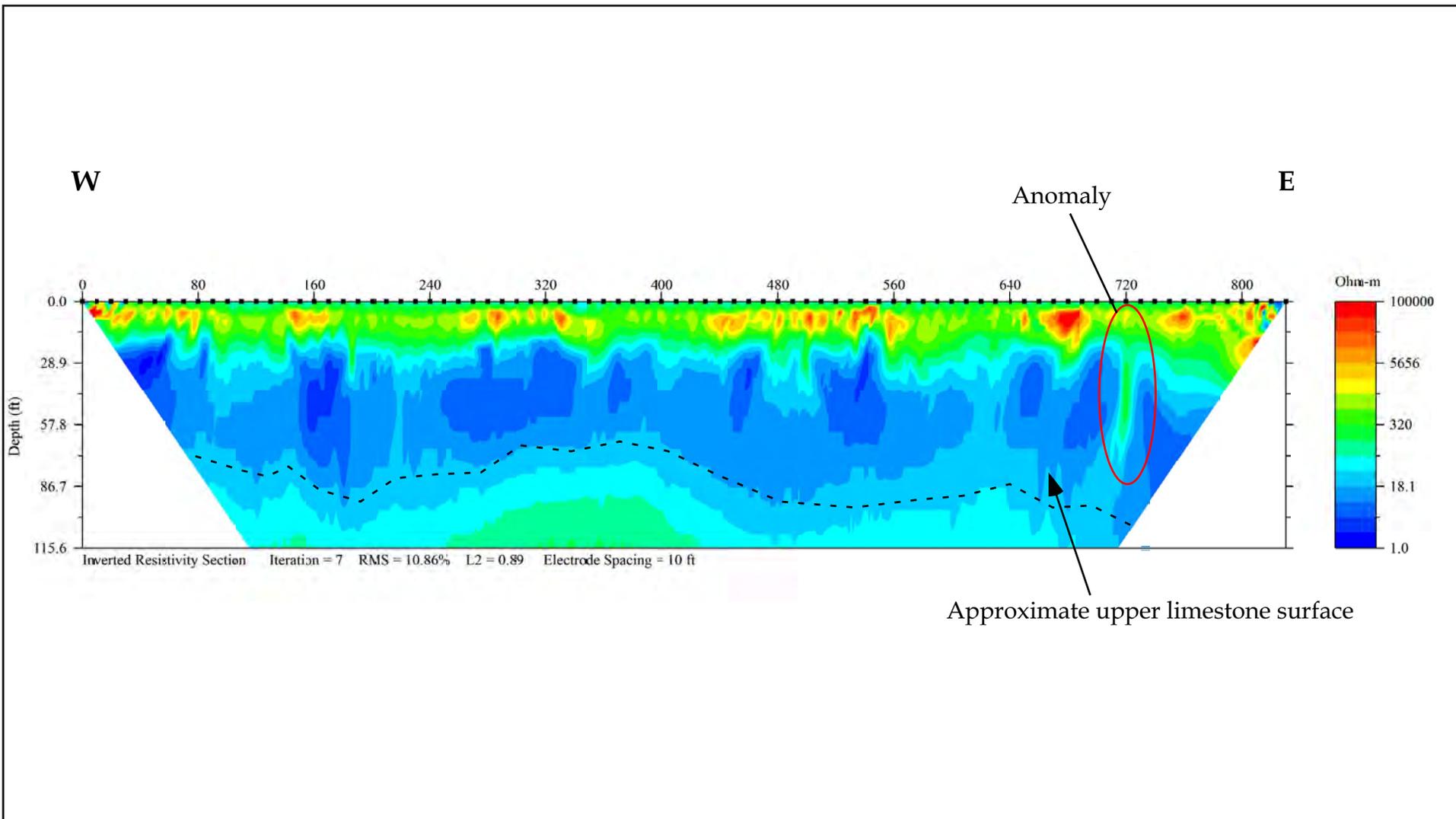
**TWO-DIMENSIONAL  
ELECTRICAL RESISTIVITY PROFILE  
TRAVERSE 13, 280-1110 ft**

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

FOR: TTL, Incorporated

DATE: 11-4-13

BY: C. B. Way, Geologist  
Investigation #2013356



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### TWO-DIMENSIONAL ELECTRICAL RESISTIVITY PROFILE TRAVERSE 14

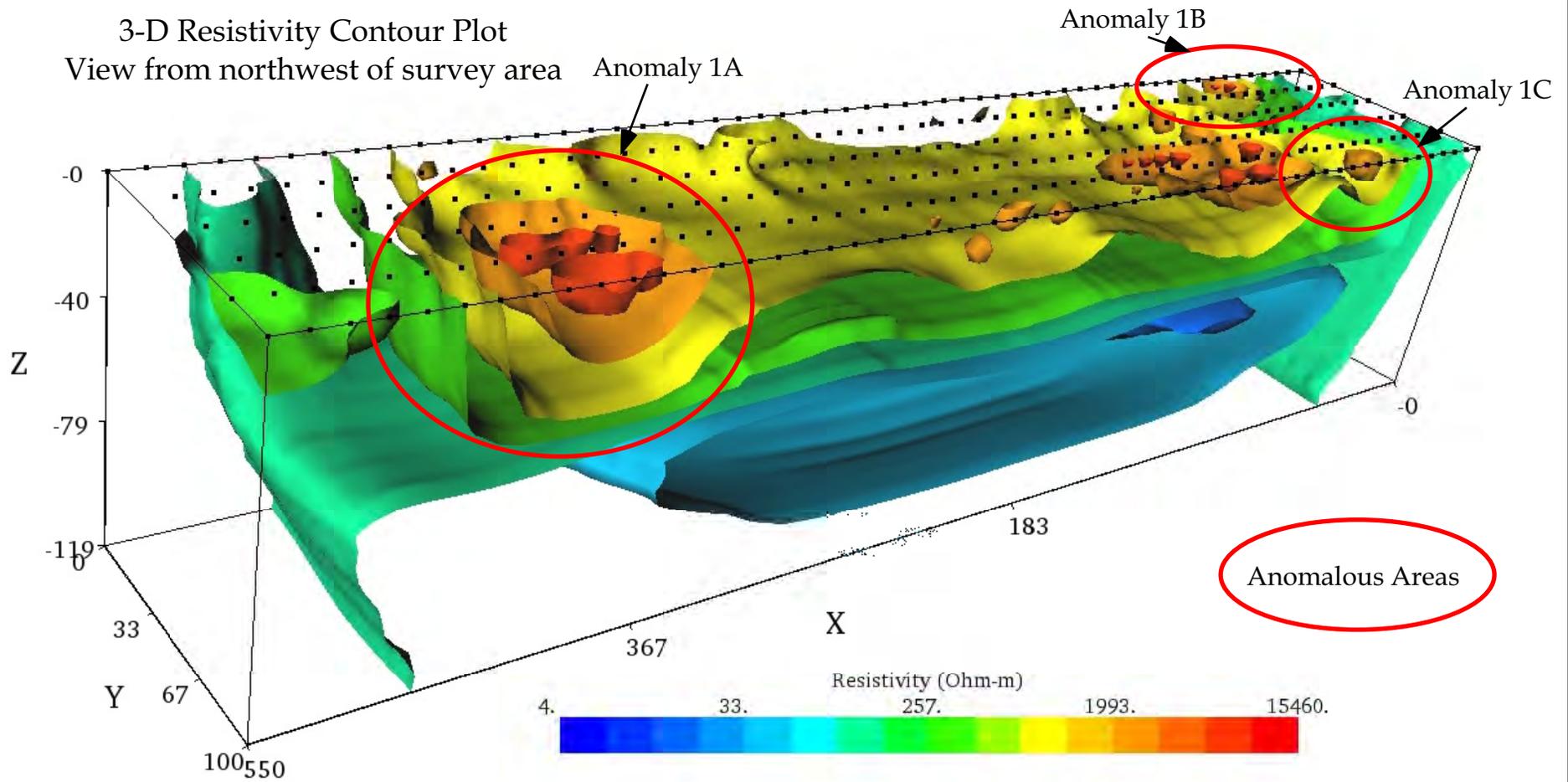
Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

FOR: TTL, Incorporated

DATE: 11-4-13

BY: C. B. Way, Geologist  
Investigation #2013356

3-D Resistivity Contour Plot  
View from northwest of survey area



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### RESISTIVITY CONTOURS OF THREE-DIMENSIONAL ELECTRICAL RESISTIVITY SURVEY AREA OF CONCERN #1

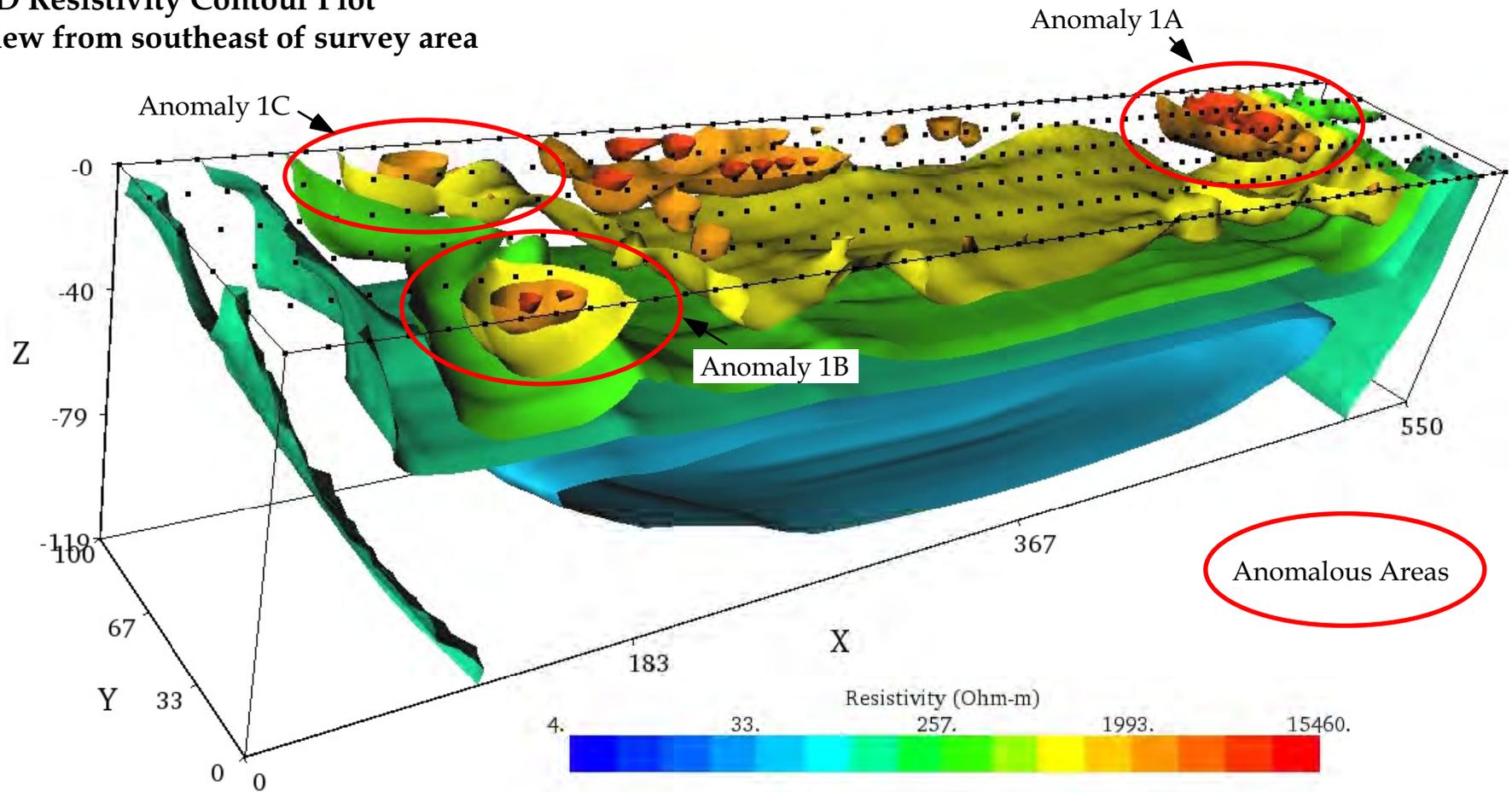
Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

FOR: TTL, Incorporated

DATE: 11-4-13

BY: C. B. Way, Geologist  
Investigation #2013356

**3-D Resistivity Contour Plot**  
**View from southeast of survey area**



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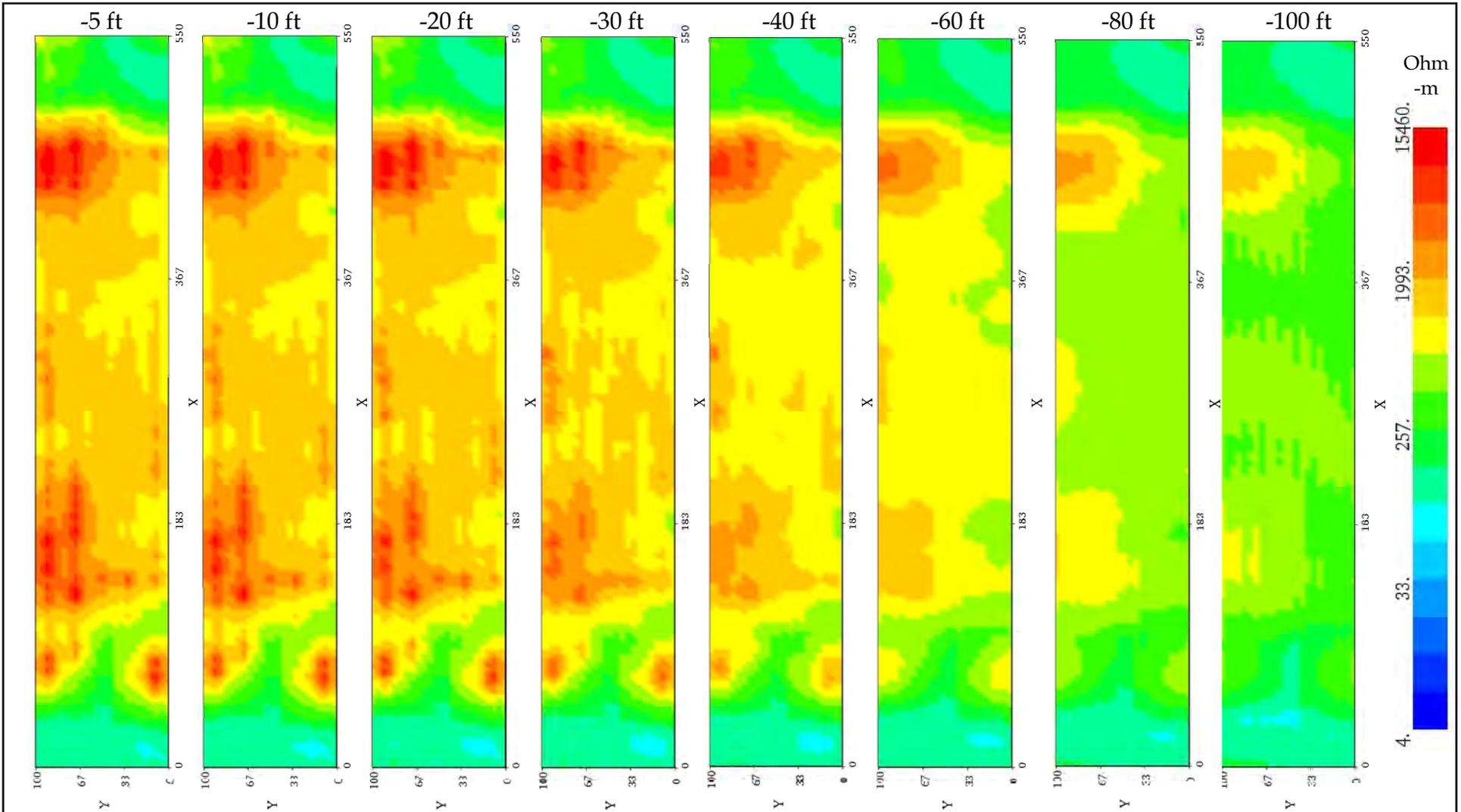
**RESISTIVITY CONTOURS OF  
 THREE-DIMENSIONAL  
 ELECTRICAL RESISTIVITY SURVEY  
 AREA OF CONCERN #1**

Proposed Moody AFB Privatized Housing  
 Val Del Road  
 Valdosta, Georgia

FOR: TTL, Incorporated

DATE: 11-4-13

BY: C. B. Way, Geologist  
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## HORIZONTAL SECTIONS OF THREE-DIMENSIONAL ELECTRICAL RESISTIVITY SURVEY AREA OF CONCERN #1

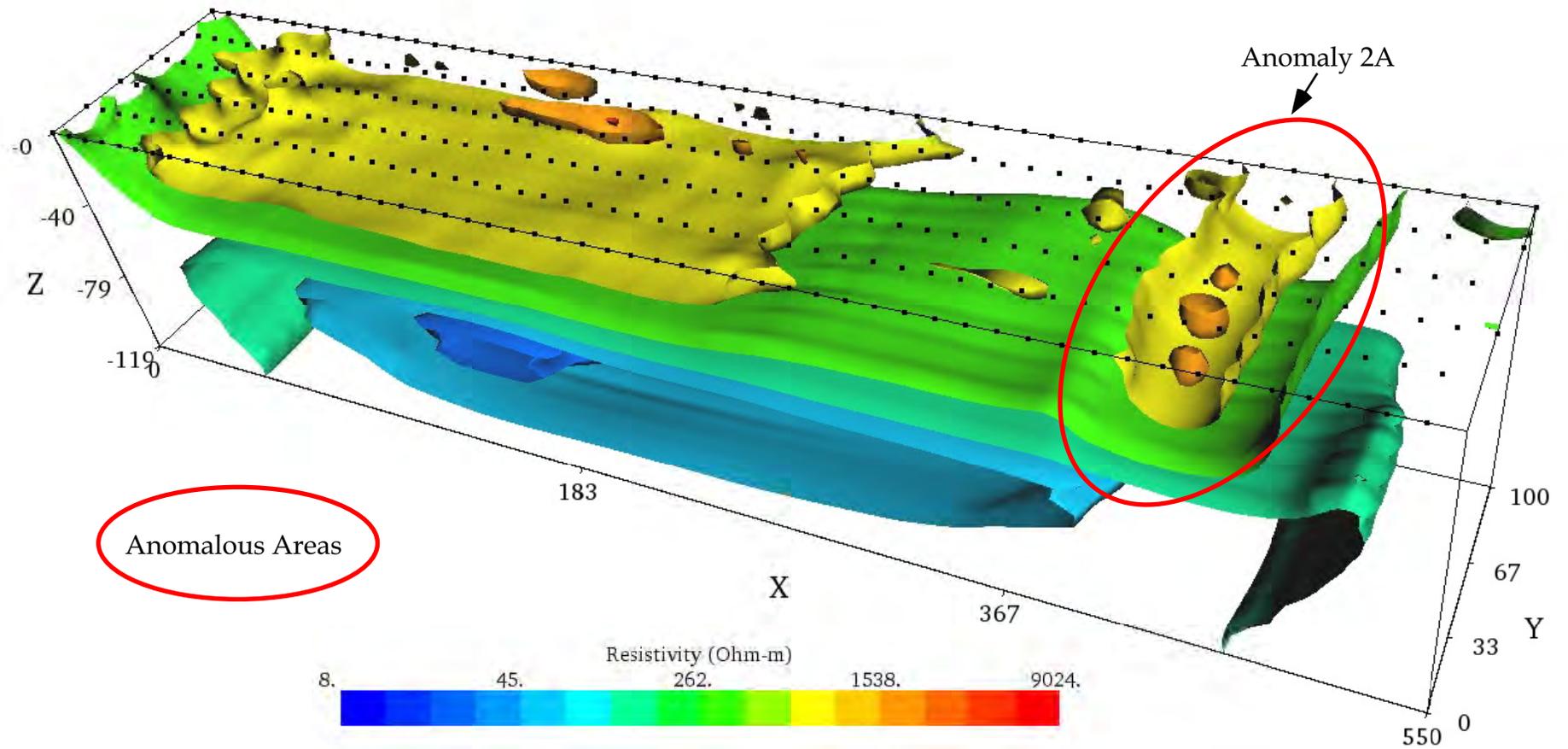
Proposed Moody AFB Privatized Housing  
 Val Del Road  
 Valdosta, Georgia

FOR: TTL, Incorporated

DATE: 10-31-13

BY: C. B. Way, Geologist  
 Investigation #2013356

**3-D Resistivity Contour Plot**  
**View from southeast of survey area**



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**RESISTIVITY CONTOURS OF  
 THREE-DIMENSIONAL  
 ELECTRICAL RESISTIVITY SURVEY  
 AREA OF CONCERN #2**

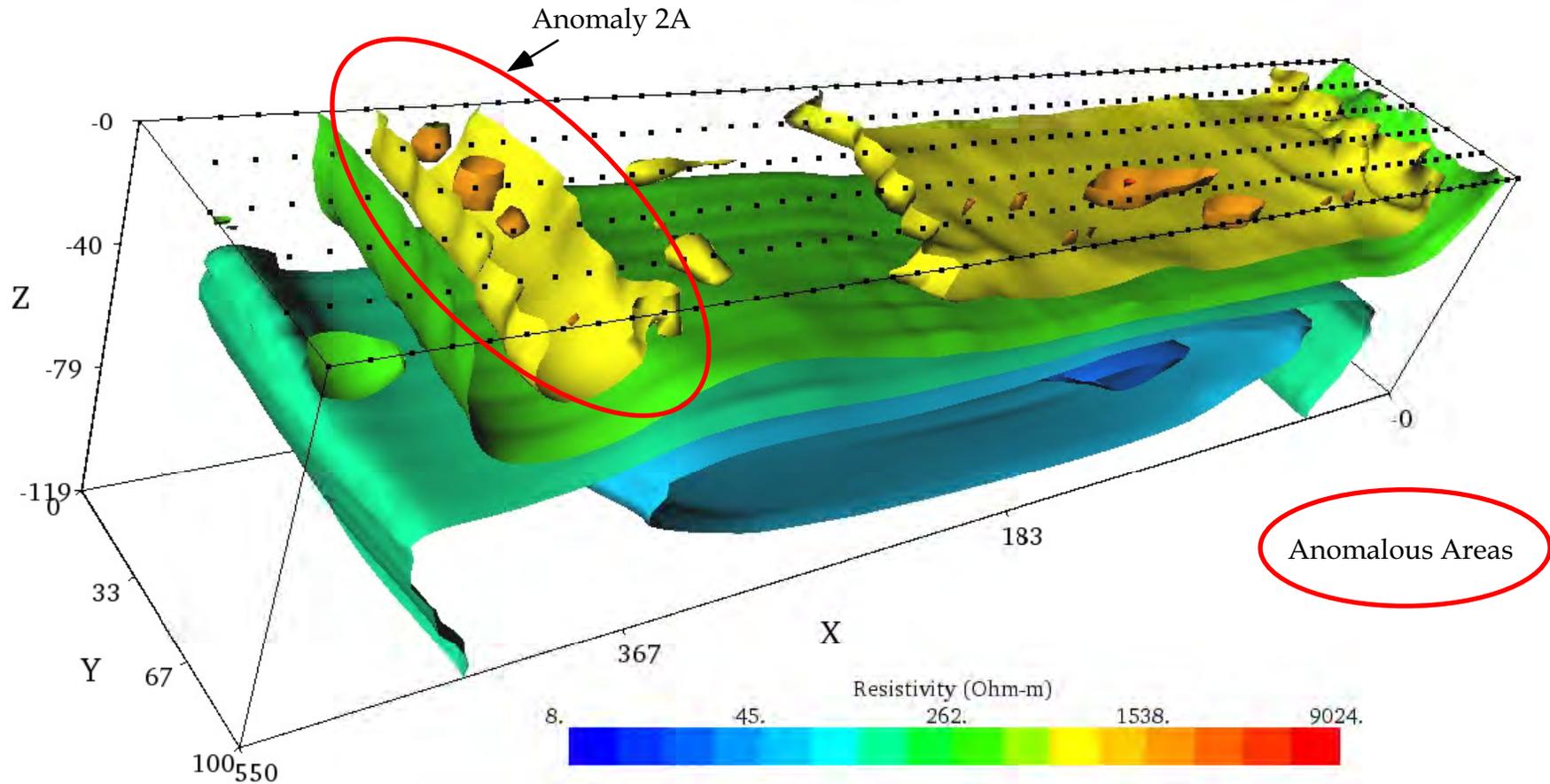
Proposed Moody AFB Privatized Housing  
 Val Del Road  
 Valdosta, Georgia

FOR: TTL, Incorporated

DATE: 11-4-13

BY: C. B. Way, Geologist  
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**3-D Resistivity Contour Plot**  
**View from northeast of survey area**



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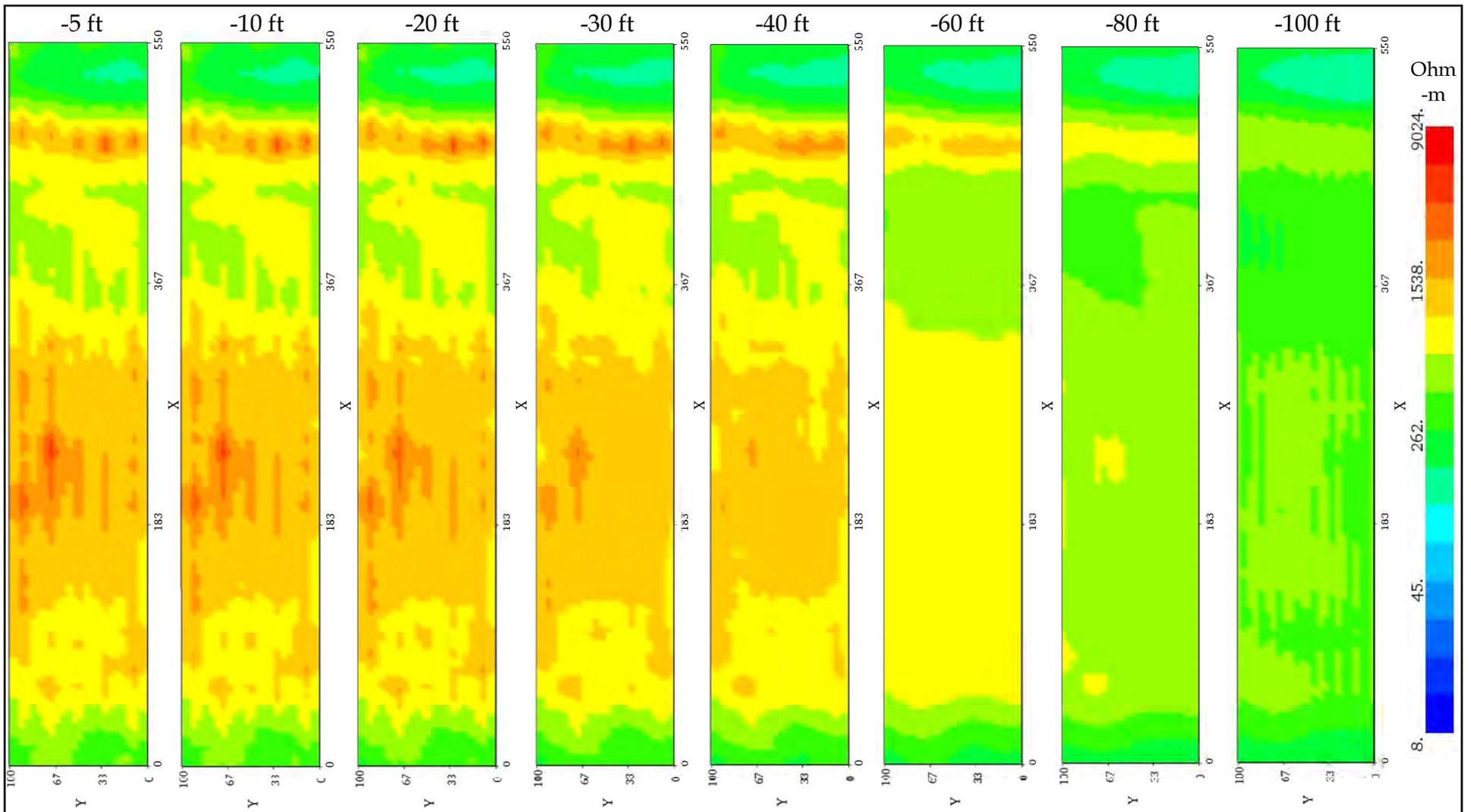
**RESISTIVITY CONTOURS OF  
 THREE-DIMENSIONAL  
 ELECTRICAL RESISTIVITY SURVEY  
 AREA OF CONCERN #2**

Proposed Moody AFB Privatized Housing  
 Val Del Road  
 Valdosta, Georgia

FOR: TTL, Incorporated

DATE: 11-4-13

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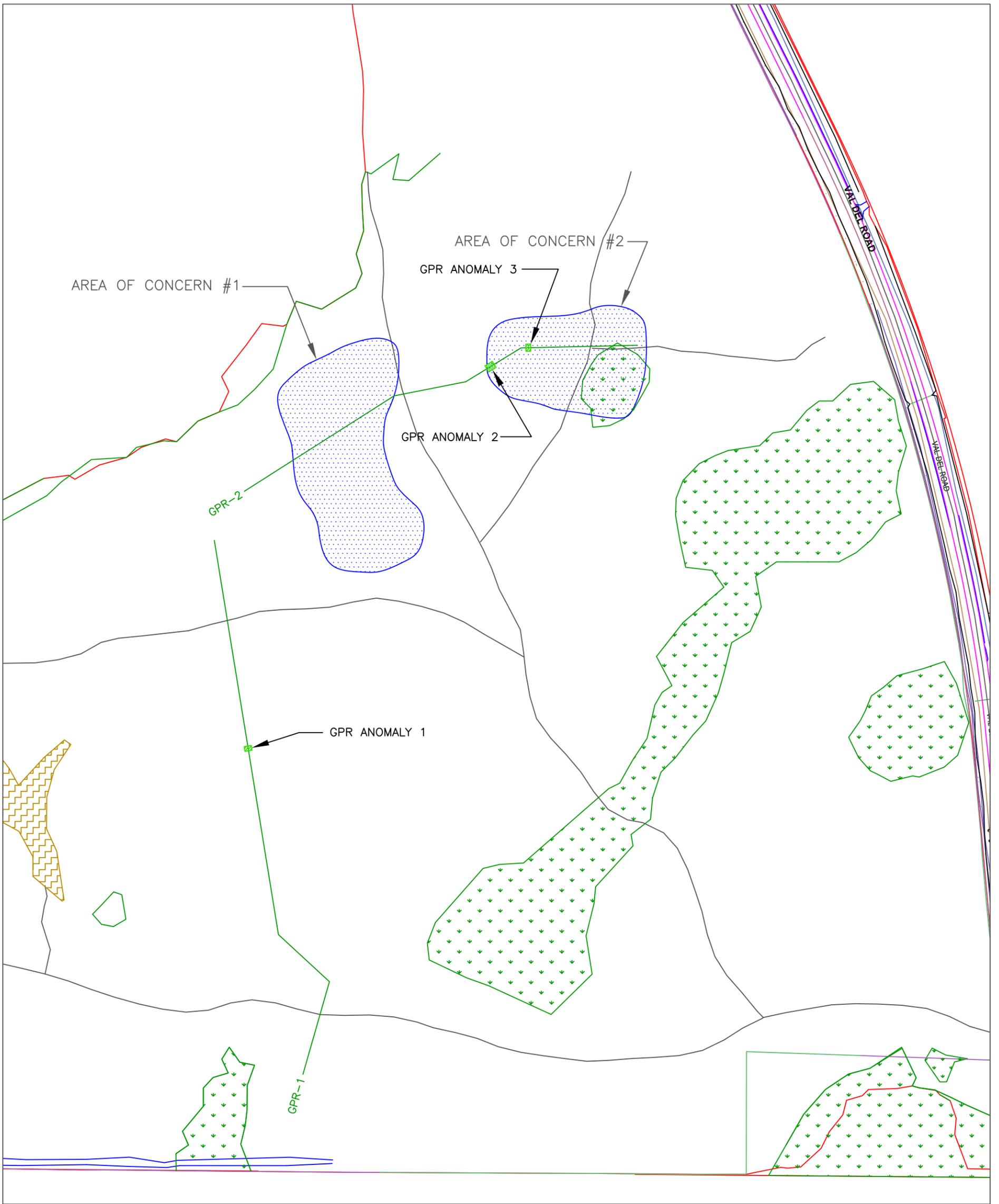
## HORIZONTAL SECTIONS OF THREE-DIMENSIONAL ELECTRICAL RESISTIVITY PROFILE AREA OF CONCERN #2

Proposed Moody AFB Privatized Housing  
 Val Del Road  
 Valdosta, Georgia

FOR: TTL, Incorporated

DATE: 10-31-13

BY: C. B. Way, Geologist  
 Investigation #2013356



- LEGEND**
- GPR-1 — GPR LINE
  -  — GPR ANOMALY
  -  — EXISTING SINKHOLE
  -  — WETLAND



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SCALE: 1 INCH = 200 FT
PROJECT #: 2013356
DATE: 10-28-13
DRAWN: T.G.
FILENAME: Val Del ERI-GPR Maps.DWG
SHEET 1 OF 1

GROUND PENETRATING RADAR  
 SURVEY MAP

PROPOSED MOODY AFB PRIVATIZED HOUSING  
 VAL DEL ROAD  
 VALDOSTA, GEORGIA

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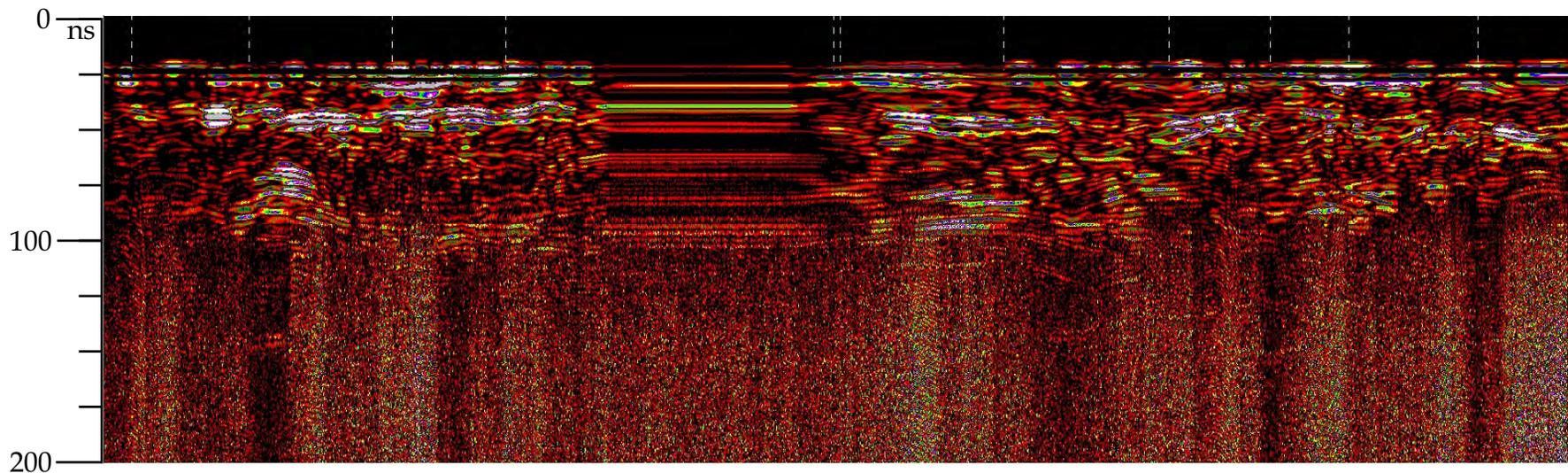
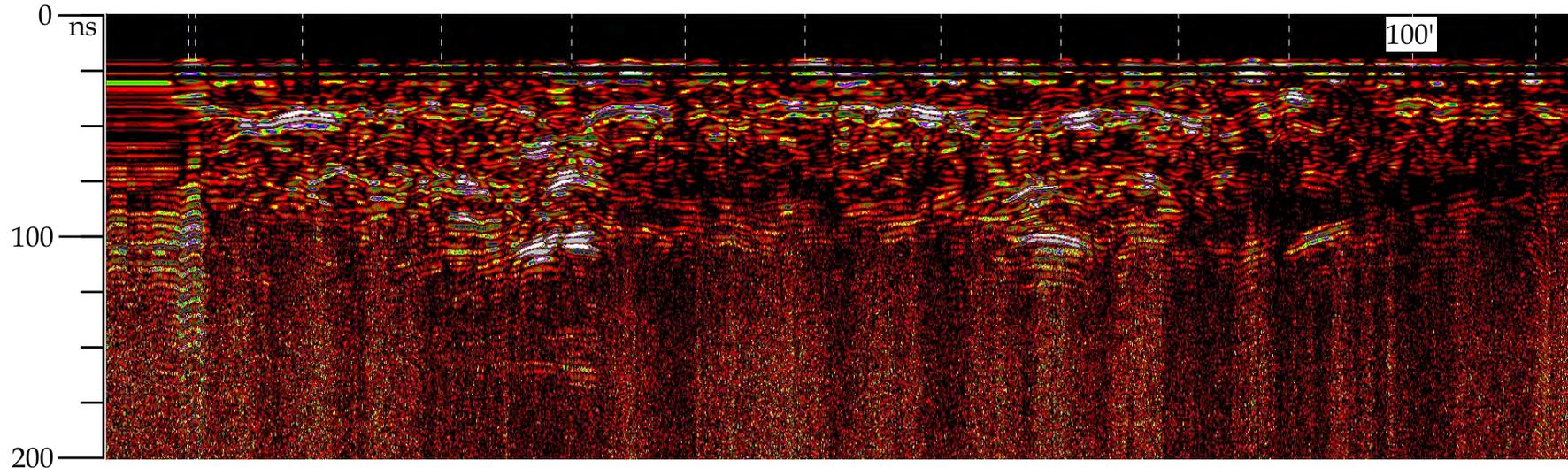
## GROUND PENETRATING RADAR TRAVERSE 1

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

Section of GPR traverse 1, from  
approximately 0 to 190 ft.

System: SIR 3000  
Antenna: 200 MHz  
Range: 200 ns

Date: 10-28-13 Investigation #2013356



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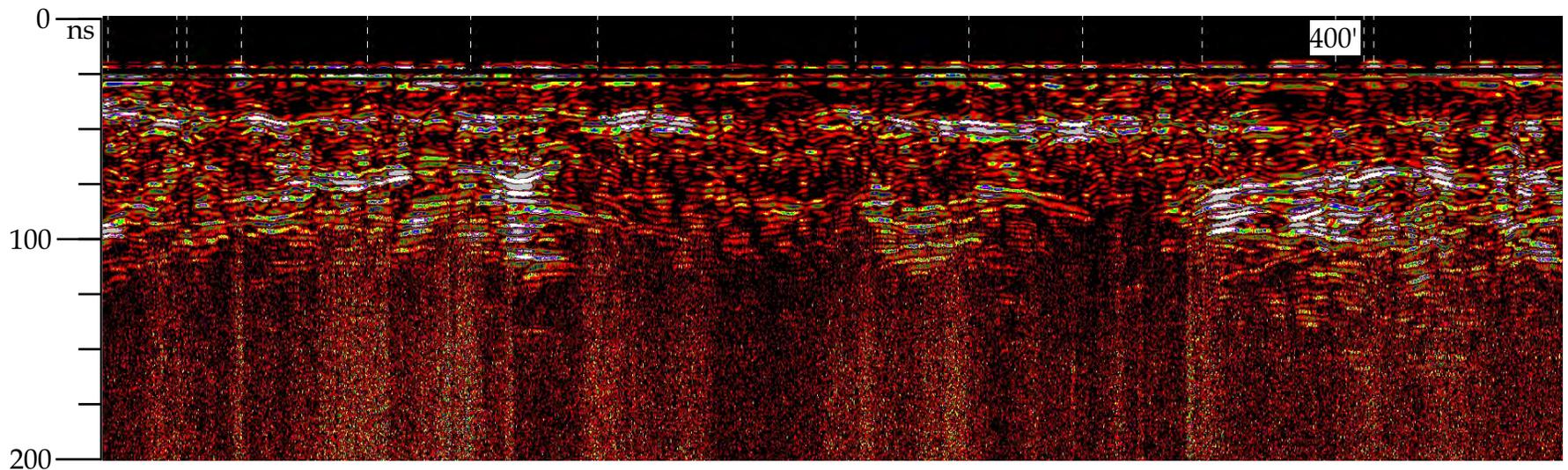
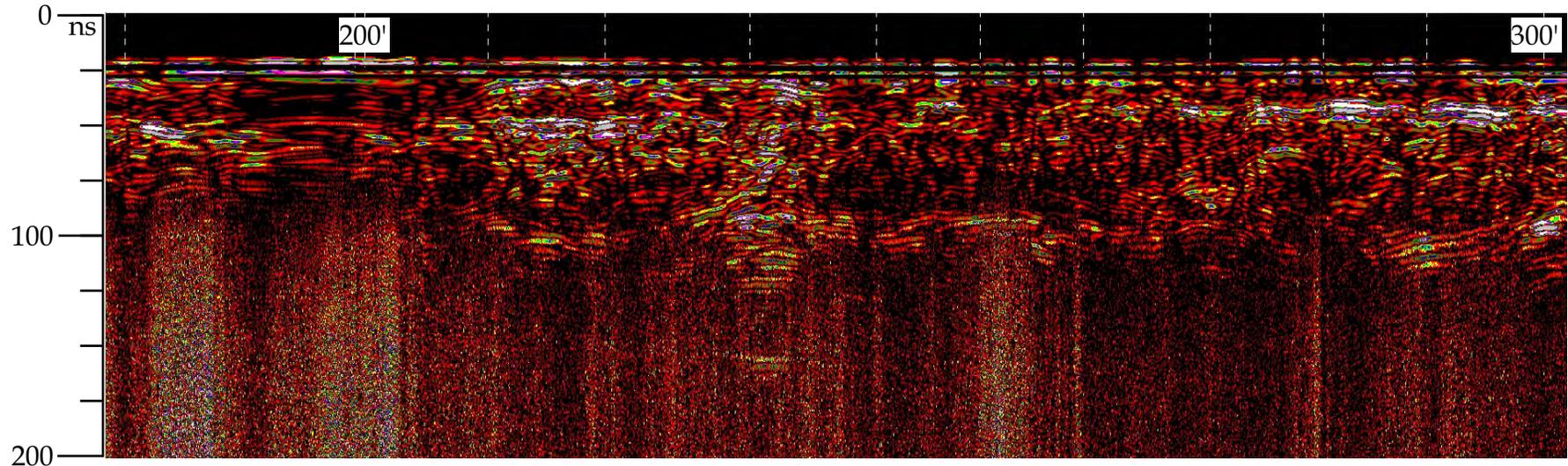
## GROUND PENETRATING RADAR TRAVERSE 1

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

Section of GPR traverse 1, from  
approximately 190 to 410 ft.

System: SIR 3000  
Antenna: 200 MHz  
Range: 200 ns

Date: 10-28-13 Investigation #2013356



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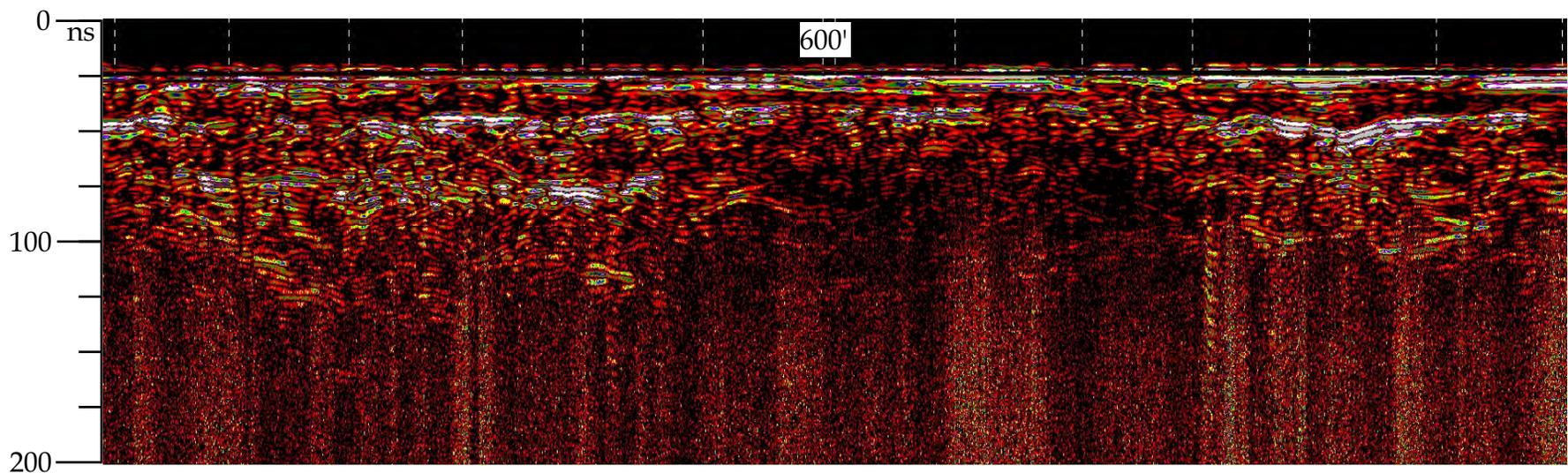
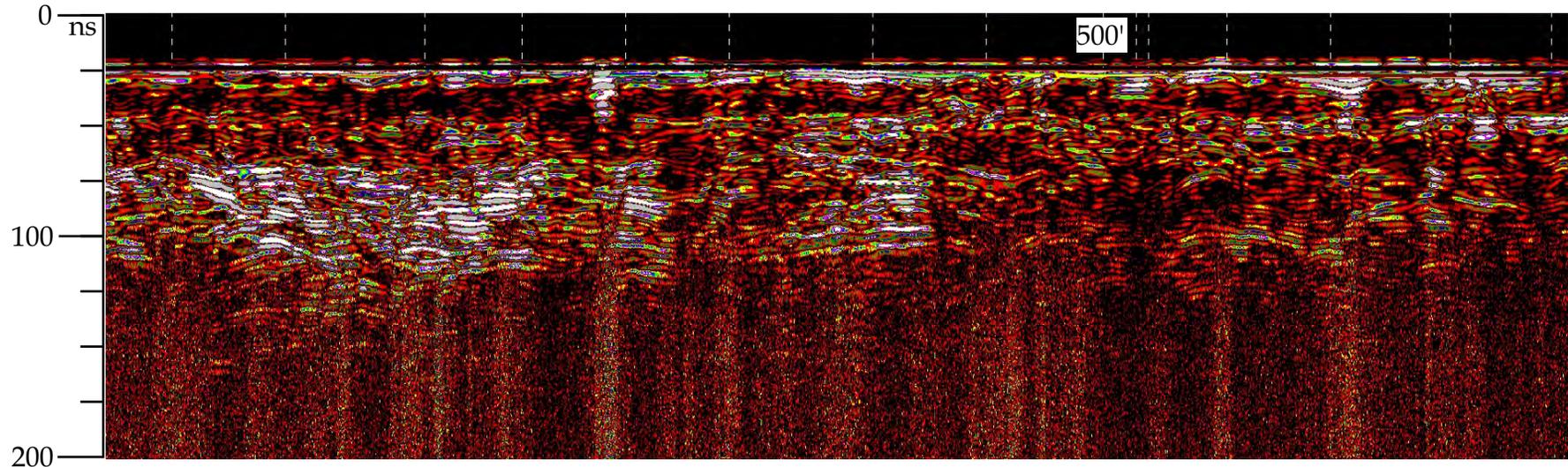
## GROUND PENETRATING RADAR TRAVERSE 1

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

Section of GPR traverse 1, from  
approximately 410 to 660 ft.

System: SIR 3000  
Antenna: 200 MHz  
Range: 200 ns

Date: 10-28-13 Investigation #2013356



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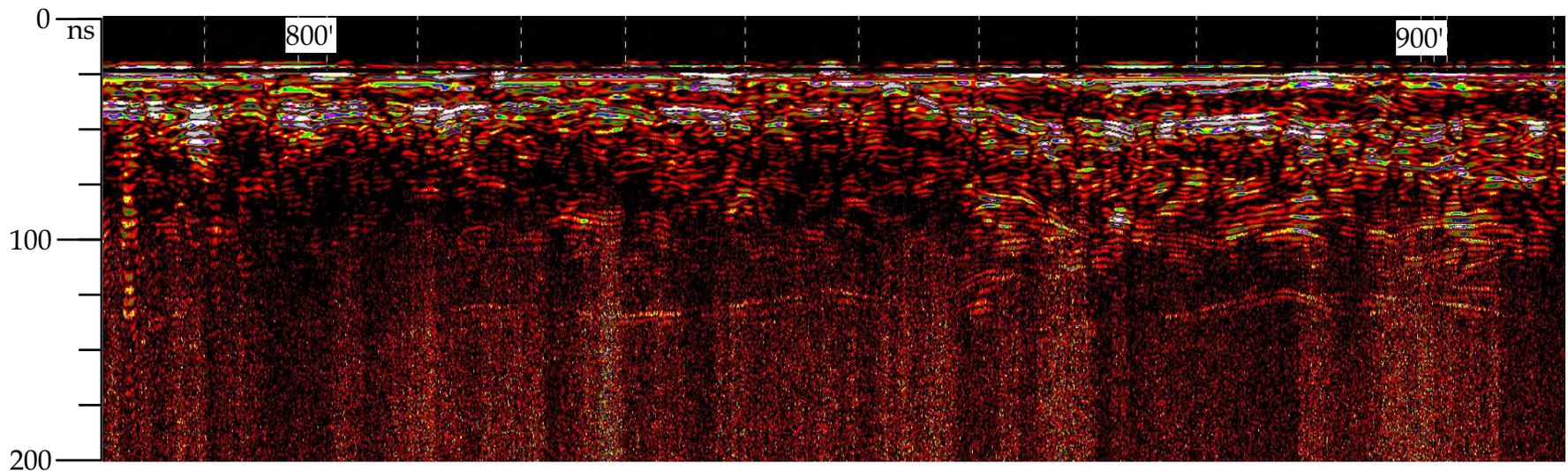
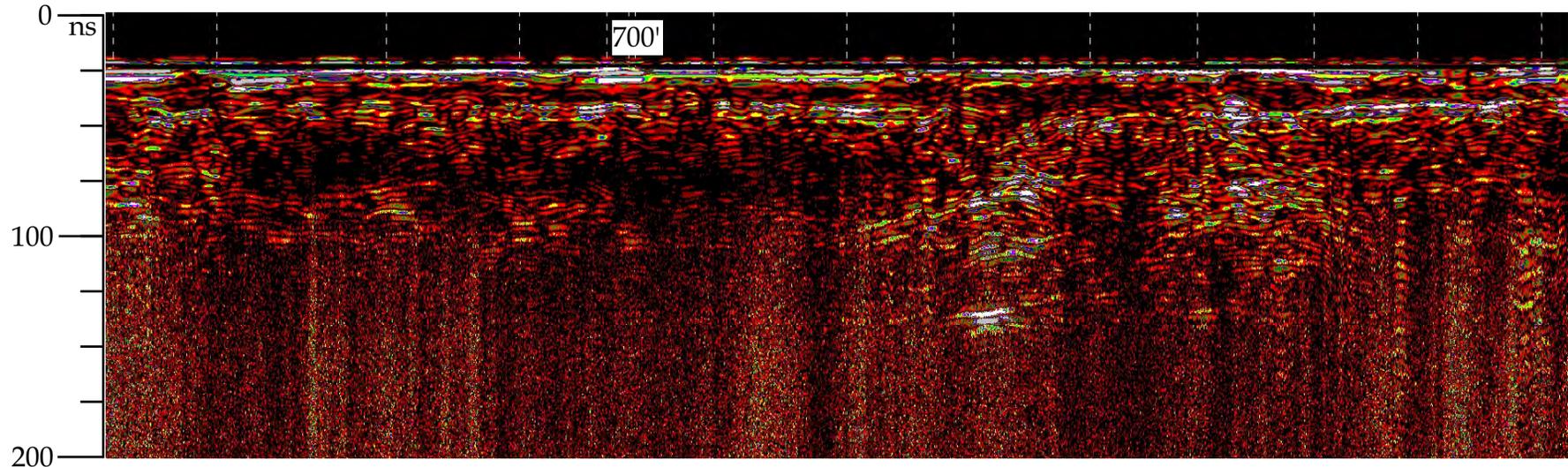
## GROUND PENETRATING RADAR TRAVERSE 1

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

Section of GPR traverse 1, from  
approximately 660 to 910 ft.

System: SIR 3000  
Antenna: 200 MHz  
Range: 200 ns

Date: 10-28-13 Investigation #2013356



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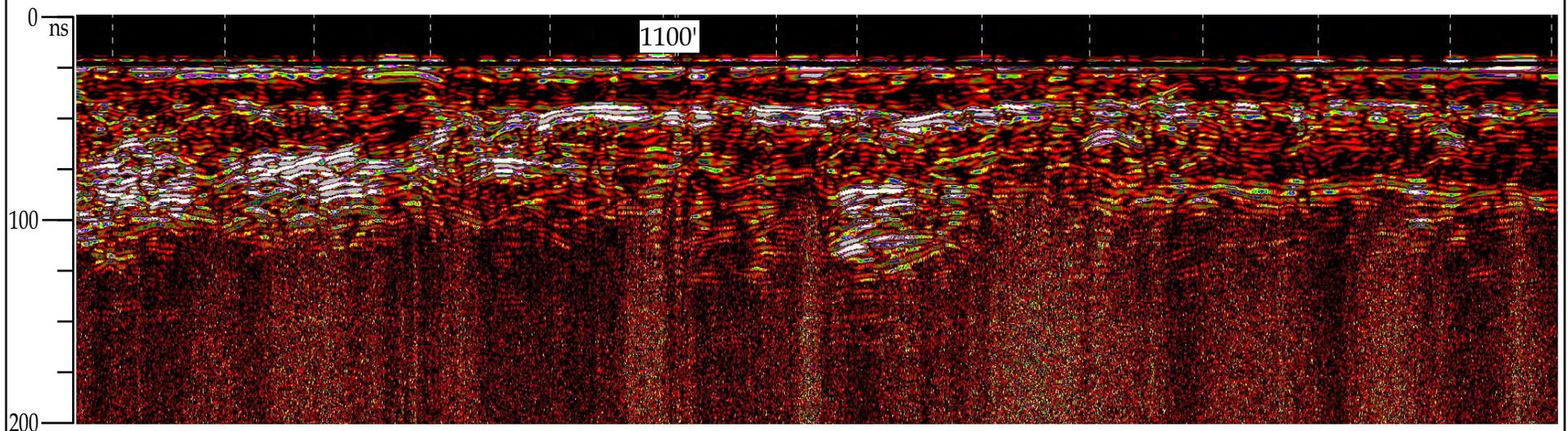
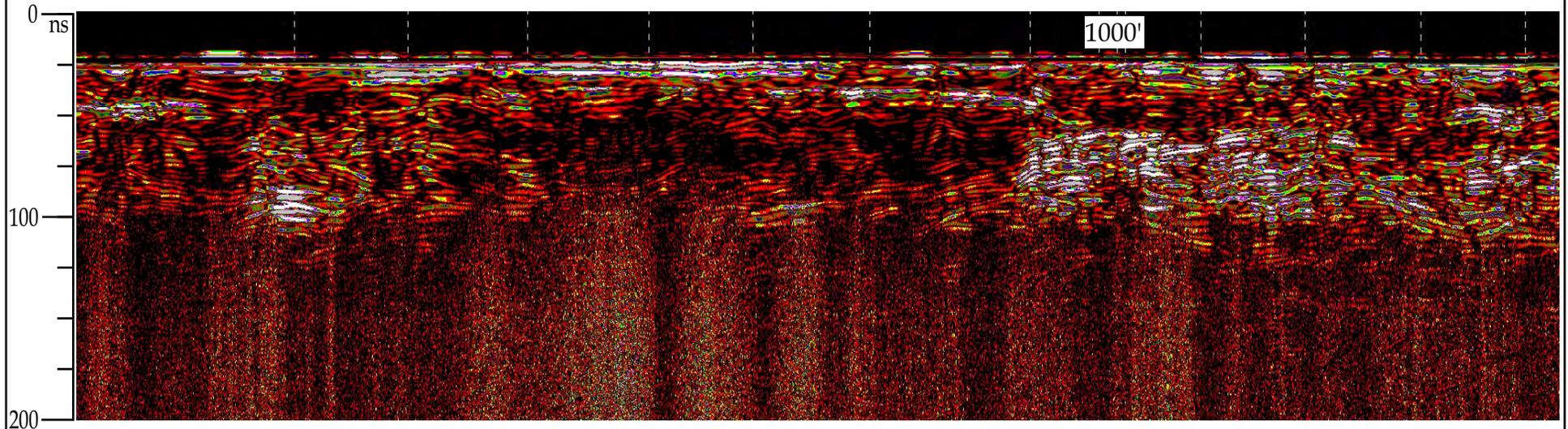
## GROUND PENETRATING RADAR TRAVERSE 1

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

Section of GPR traverse 1, from  
approximately 910 to 1180 ft.

System: SIR 3000  
Antenna: 200 MHz  
Range: 200 ns

Date: 10-28-13 Investigation #2013356



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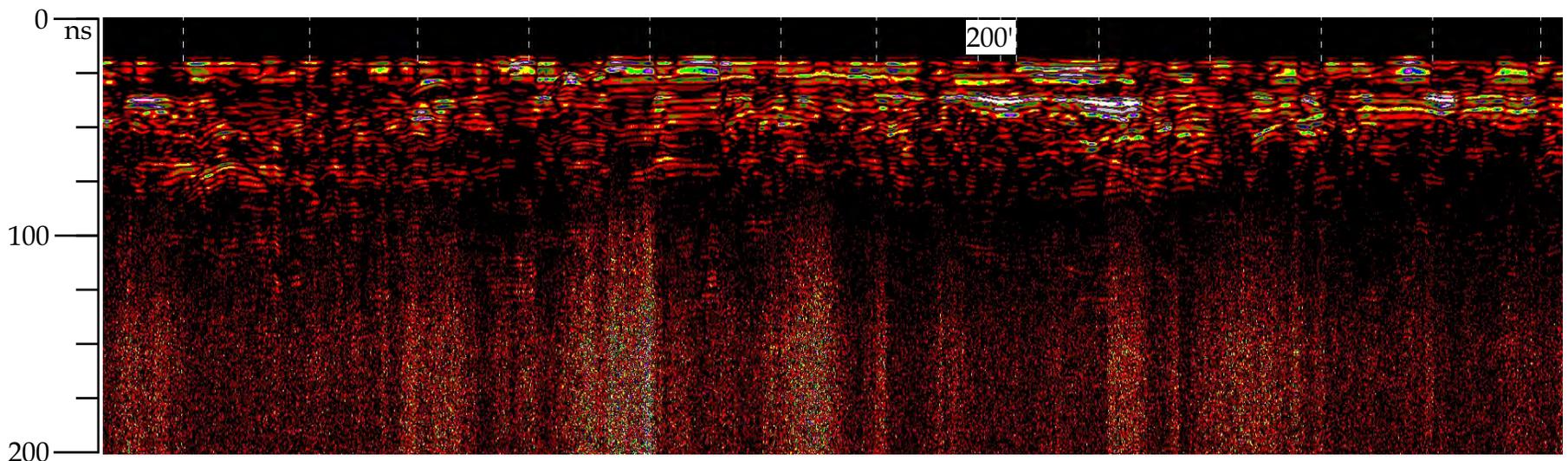
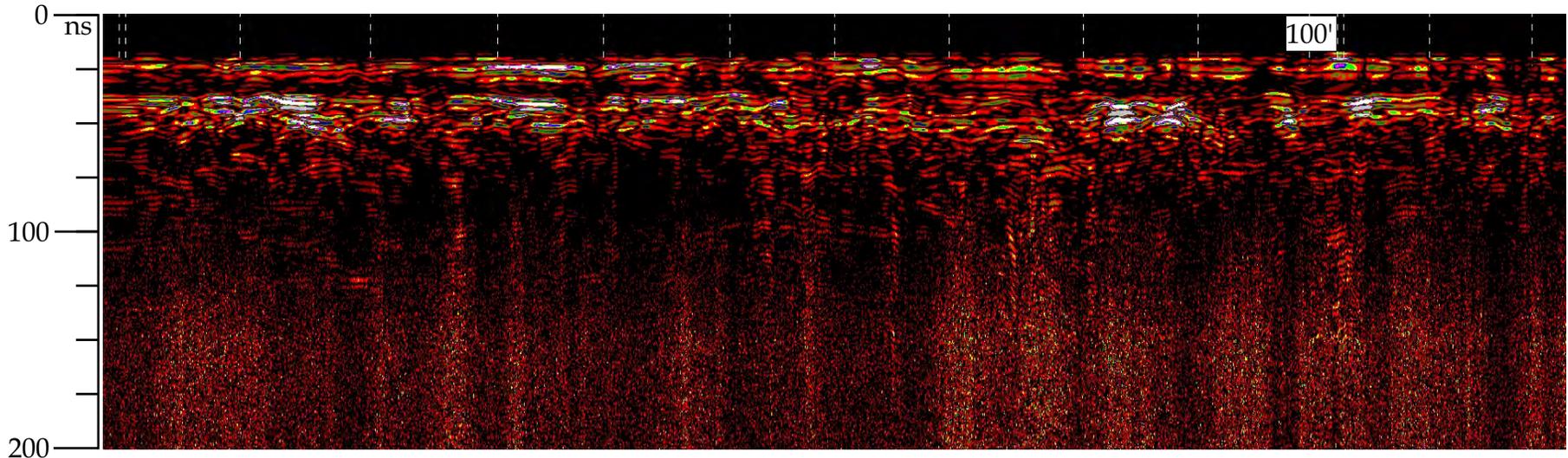
## GROUND PENETRATING RADAR TRAVERSE 2

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

Section of GPR traverse 2, from  
approximately 0 to 250 ft.

System: SIR 3000  
Antenna: 200 MHz  
Range: 200 ns

Date: 10-28-13 Investigation #2013356



# GEOHAZARDS, INC.

Sinkholes • Expansive Clays • Land Subsidence

P.O. Box 14566  
Gainesville, FL 32604  
(352) 371-7243 1-800-770-9990  
Fax: (352) 371-4410

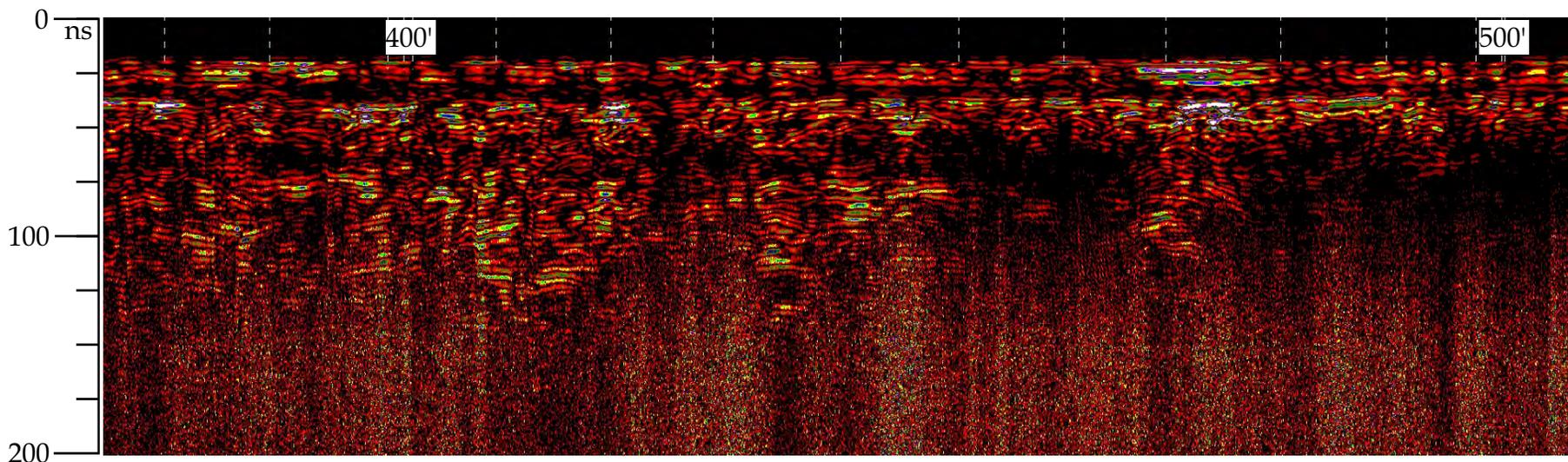
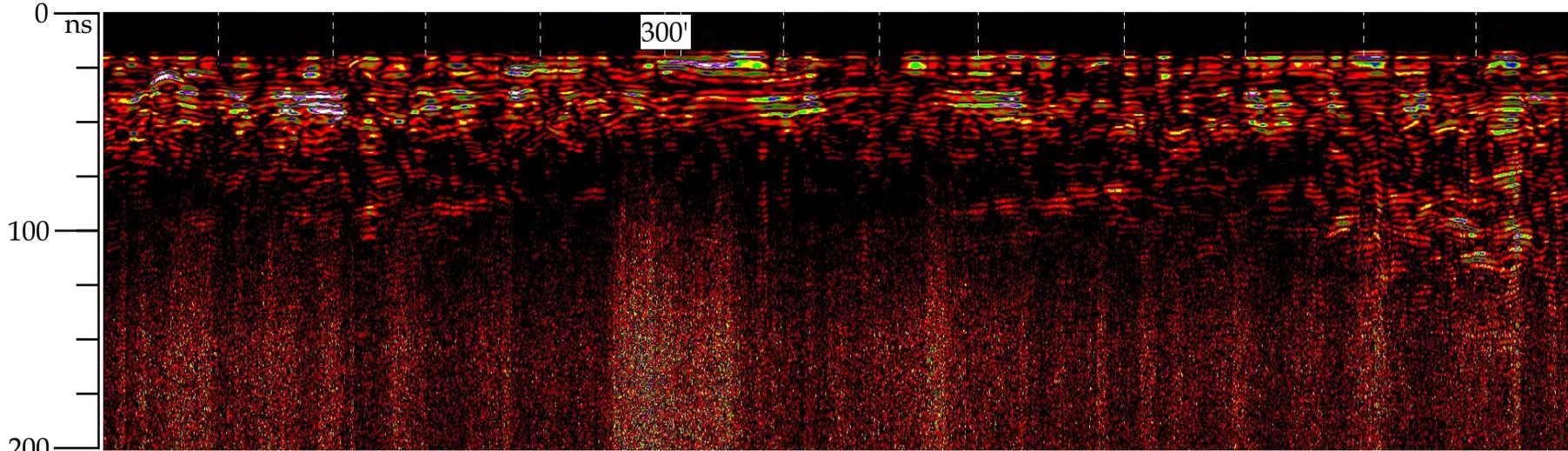
## GROUND PENETRATING RADAR TRAVERSE 2

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

Section of GPR traverse 2, from  
approximately 250 to 500 ft.

System: SIR 3000  
Antenna: 200 MHz  
Range: 200 ns

Date: 10-28-13 Investigation #2013356



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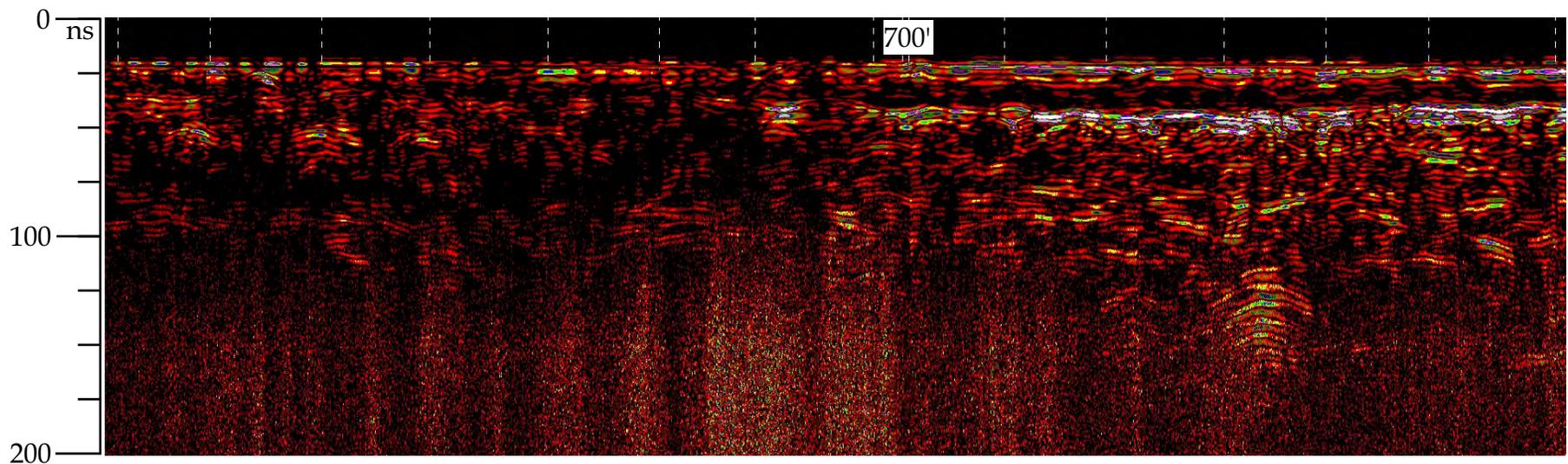
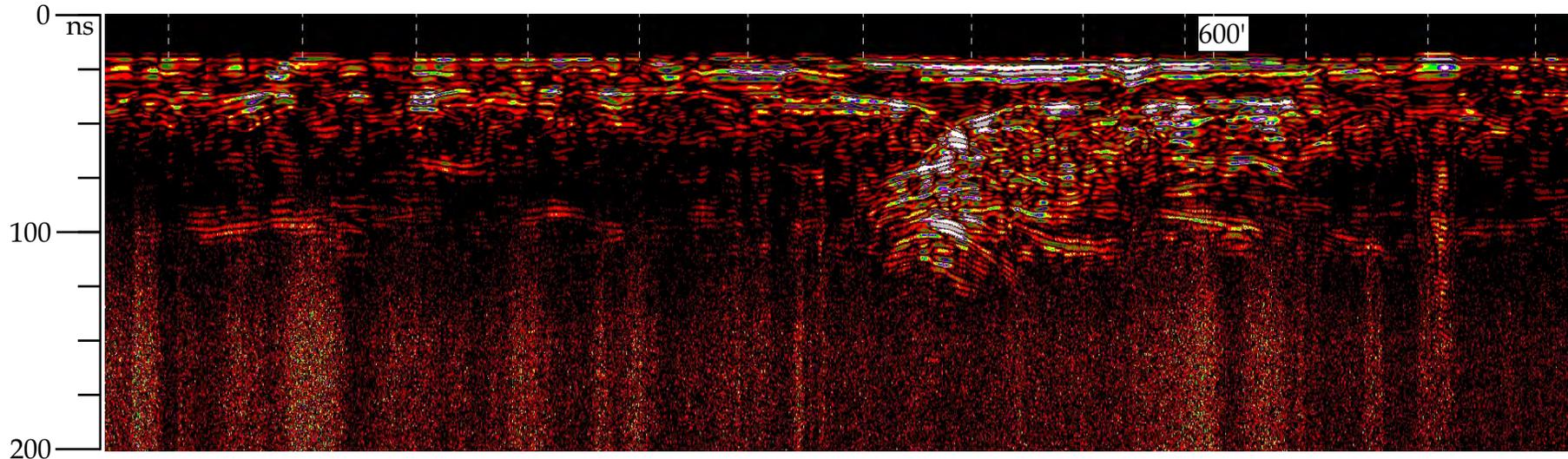
## GROUND PENETRATING RADAR TRAVERSE 2

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

Section of GPR traverse 2, from  
approximately 500 to 760 ft.

System: SIR 3000  
Antenna: 200 MHz  
Range: 200 ns

Date: 10-28-13 Investigation #2013356



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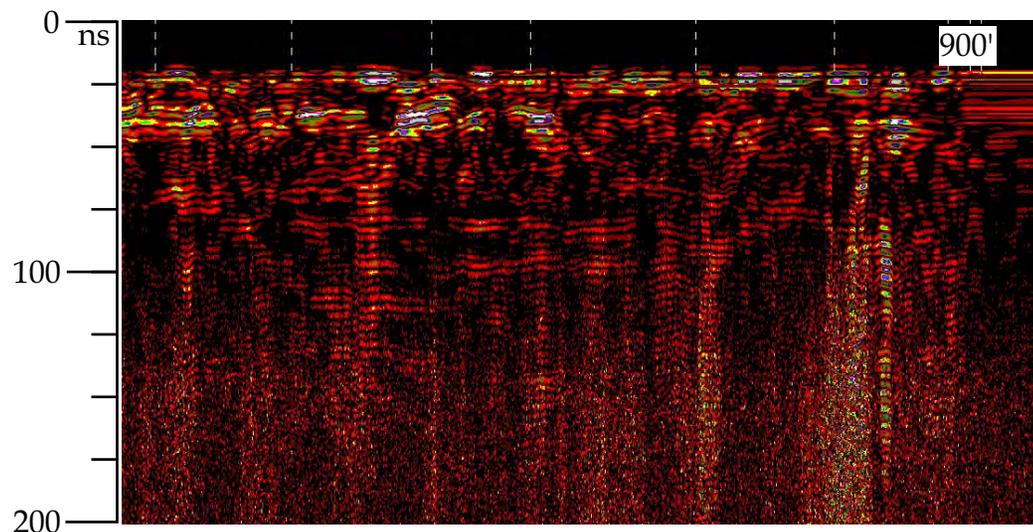
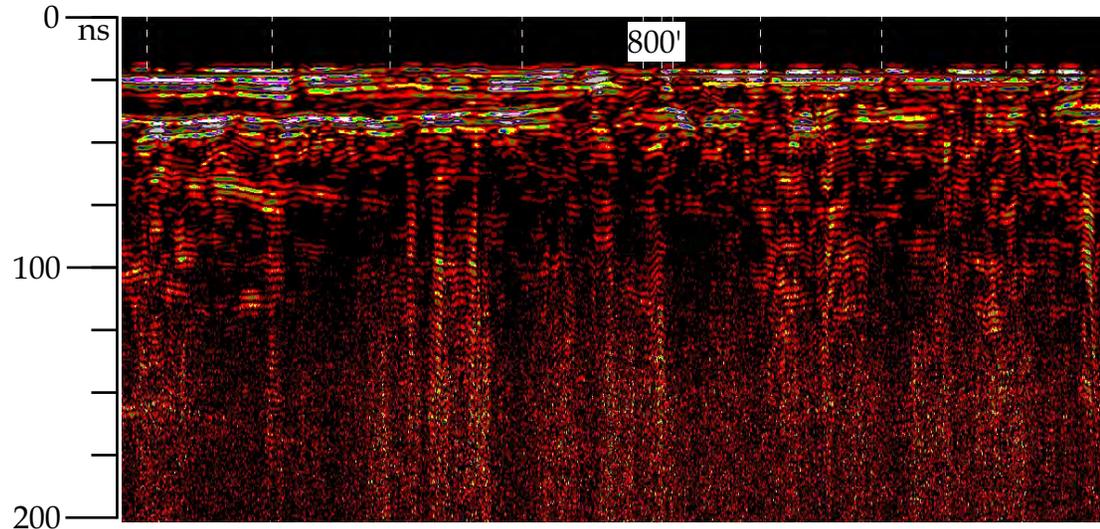
## GROUND PENETRATING RADAR TRAVERSE 2

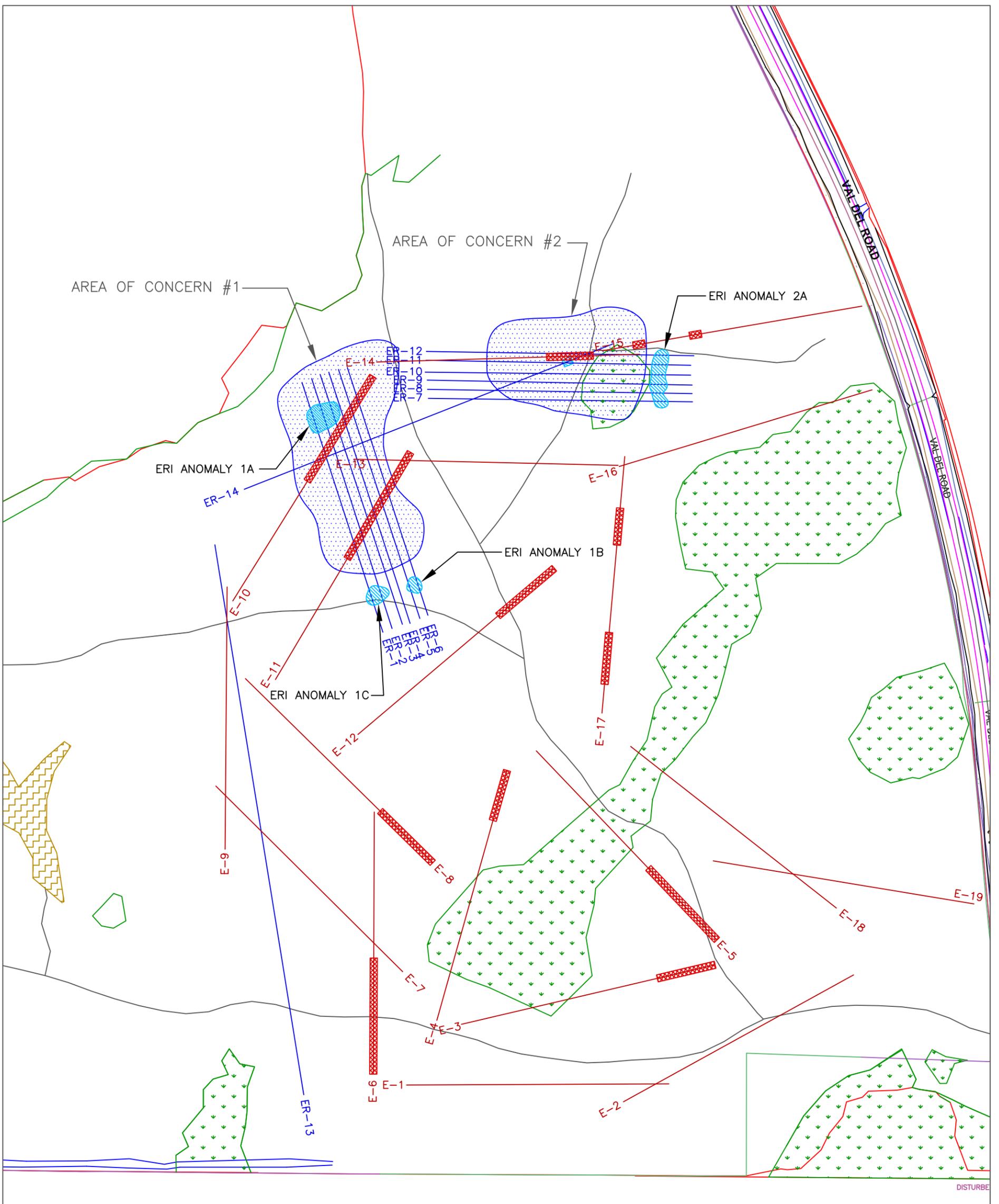
Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

Section of GPR traverse 2, from  
approximately 760 to 900 ft.

System: SIR 3000  
Antenna: 200 MHz  
Range: 200 ns

Date: 10-28-13 Investigation #2013356





- LEGEND**
- ER-1 — ERI LINE
  - ERI ANOMALY
  - E-1 — 2012 ERI LINE
  - 2012 ERI ANOMALY
  - EXISTING SINKHOLE
  - WETLAND



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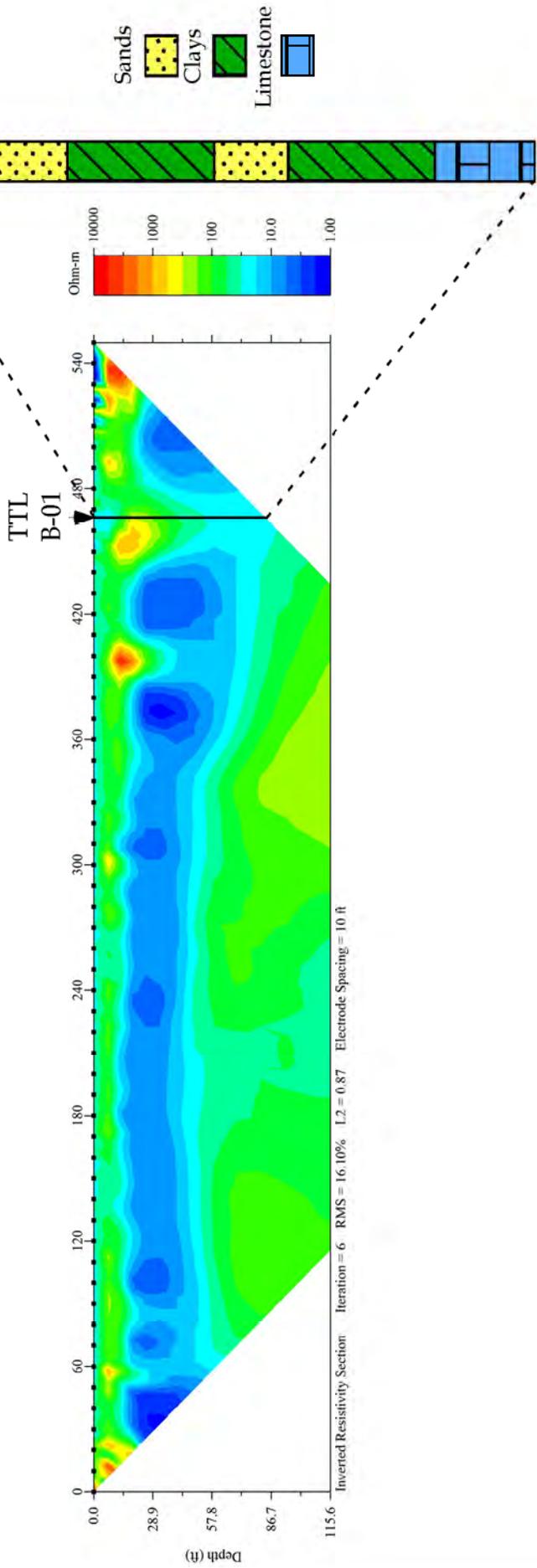
P.O. Box 14566  
 Gainesville, FL 32604  
 (352) 371-7243 1-800-770-9990  
 Fax: (352) 371-4410

SCALE: 1 INCH = 200 FT
PROJECT #: 2013356
DATE: 10-28-13
DRAWN: T.G.
FILENAME: Val Del ERI-GPR Maps.DWG
SHEET 1 OF 1

ELECTRICAL RESISTIVITY IMAGING SURVEY  
 MAP SHOWING 2012 & 2013 DATA

PROPOSED MOODY AFB PRIVATIZED HOUSING  
 VAL DEL ROAD  
 VALDOSTA, GEORGIA

3

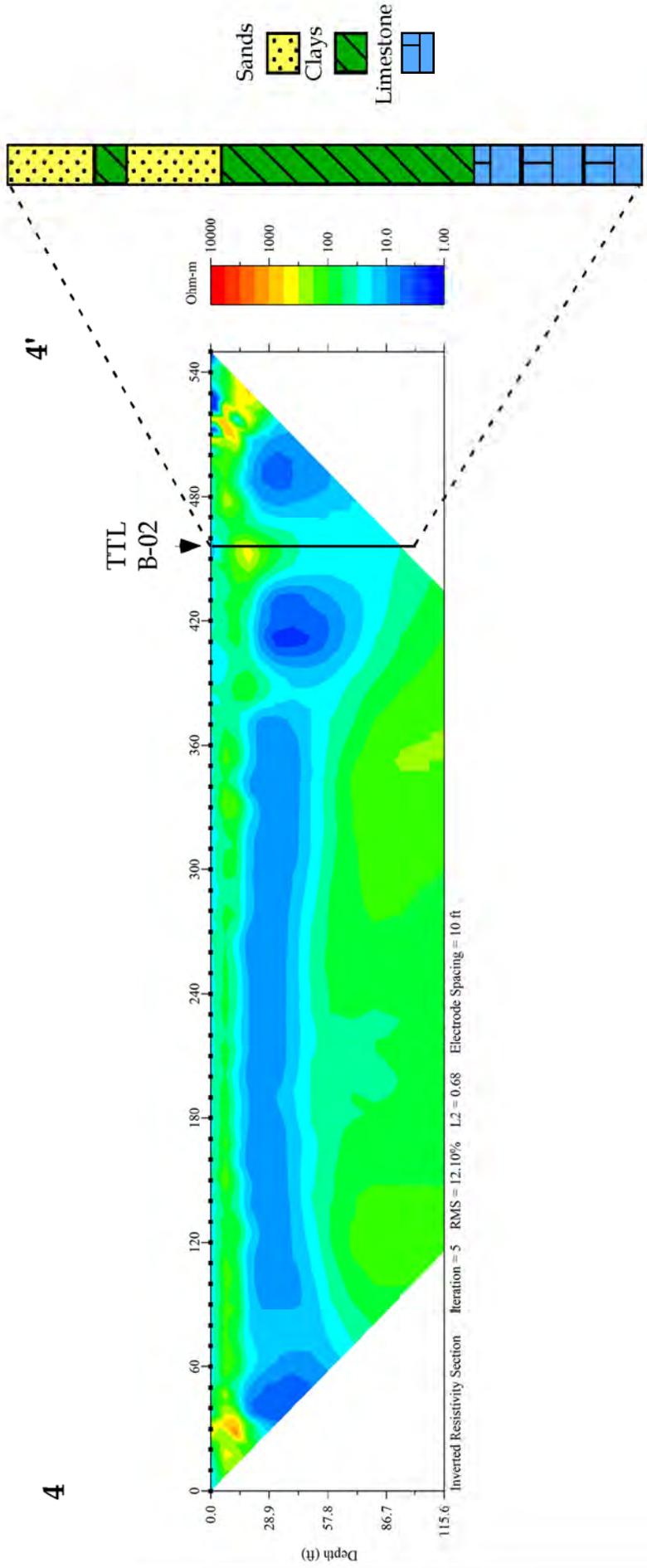


FOR: TTL, Inc.  
 DATE: 11-6-13  
 BY: C.B. Way, Geologist  
 Investigation #2013356

**2012 TWO-DIMENSIONAL  
 ELECTRICAL RESISTIVITY PROFILE  
 TRAVERSE 3/SPT B-01 OVERLAY**  
 Proposed Moody AFB Privatized Housing  
 Val Del Road  
 Valdosta, Georgia

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FOR: TTL, Inc.

DATE: 11-6-13

BY: C.B. Way, Geologist  
Investigation #2013356

**2012 TWO-DIMENSIONAL  
ELECTRICAL RESISTIVITY PROFILE  
TRAVERSE 4 / SPT B-02 OVERLAY**

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

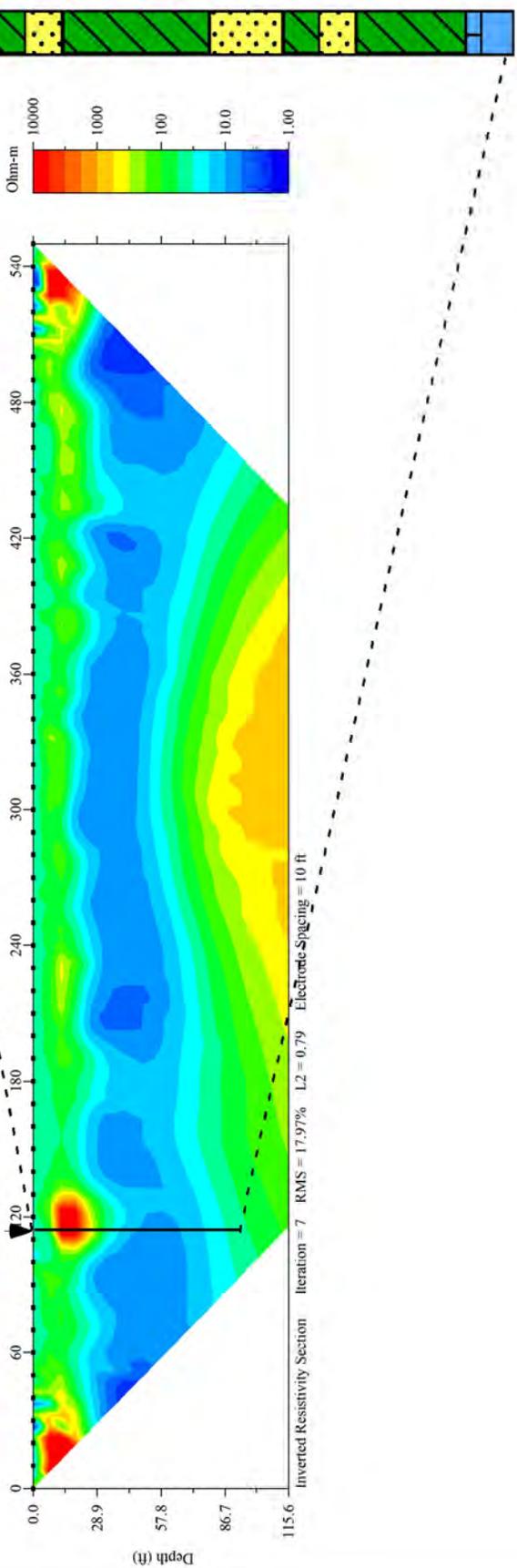


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8

TTL  
B-03



FOR: TTL, Inc.

DATE: 11-6-13

BY: C.B. Way, Geologist  
Investigation #2013356

**2012 TWO-DIMENSIONAL  
ELECTRICAL RESISTIVITY PROFILE  
TRAVERSE 8 / SPT B-03 OVERLAY**

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

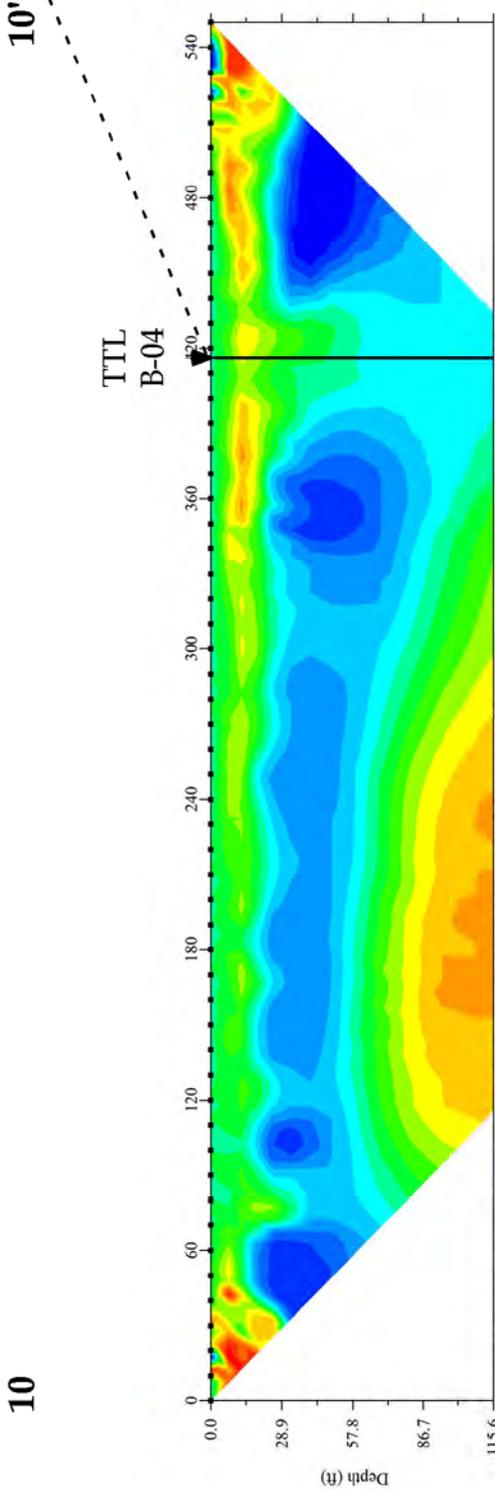


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10

TTL  
B-04



Inverted Resistivity Section Iteration = 7 RMS = 18.26% L2 = 0.98 Electrode Spacing = 10 ft

FOR: TTL, Inc.

DATE: 11-6-13

BY: C.B. Way, Geologist  
Investigation #2013356

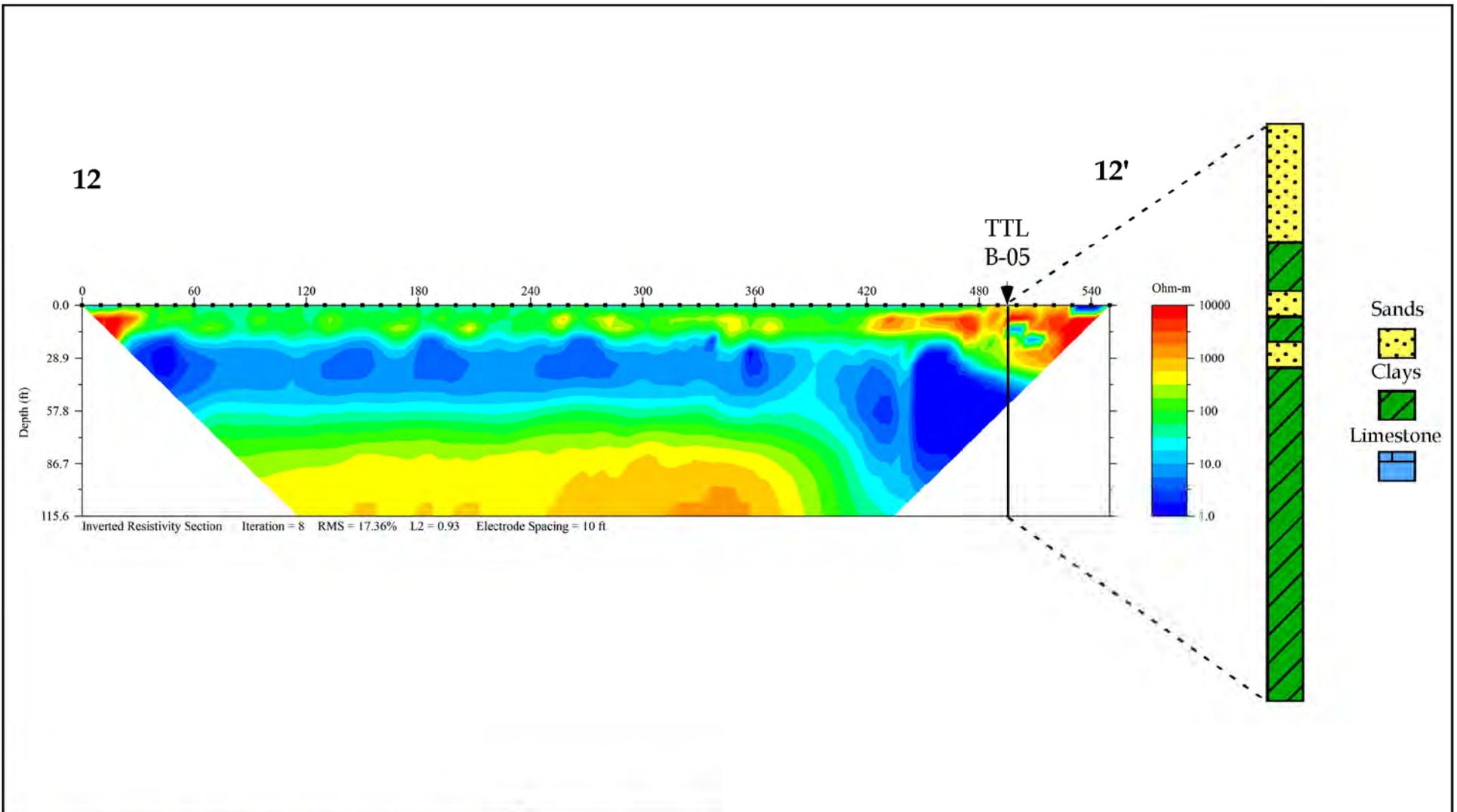
**2012 TWO-DIMENSIONAL  
ELECTRICAL RESISTIVITY PROFILE  
TRAVERSE 10/ SPT B-04 OVERLAY**

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia



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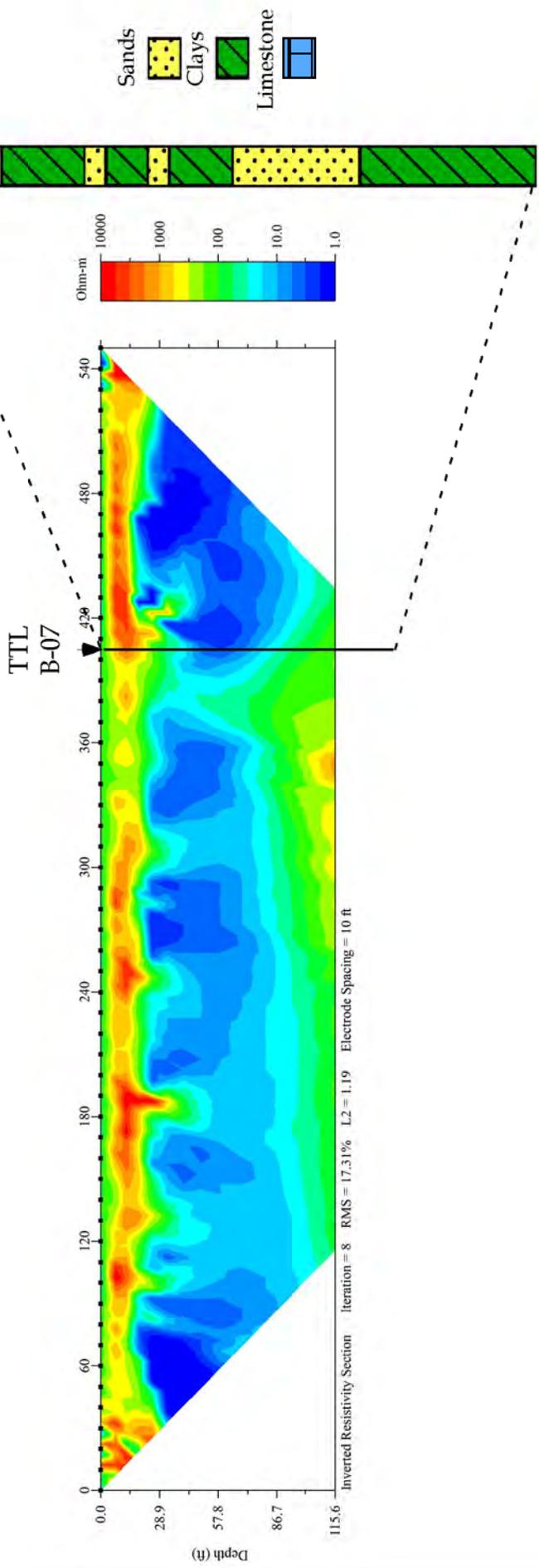
2012 TWO-DIMENSIONAL  
ELECTRICAL RESISTIVITY PROFILE  
TRAVERSE 12 / SPT B-05 OVERLAY  
Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia

FOR: TTL, Inc.

DATE: 11-6-13

BY: C.B. Way, Geologist  
Investigation #2013356

14



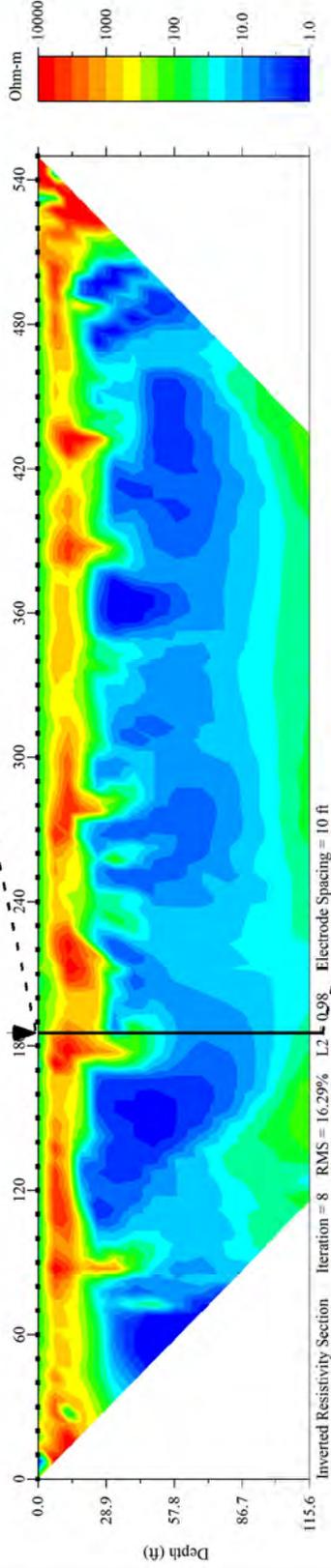
FOR: TTL, Inc.  
 DATE: 11-6-13  
 BY: C.B. Way, Geologist  
 Investigation #2013356

**2012 TWO-DIMENSIONAL  
 ELECTRICAL RESISTIVITY PROFILE  
 TRAVERSE 14 / SPT B-07 OVERLAY**  
 Proposed Moody AFB Privatized Housing  
 Val Del Road  
 Valdosta, Georgia

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15

TTL  
B-06



15'



Sands  
Clays  
Limestone

FOR: TTL, Inc.

DATE: 11-6-13

BY: C.B. Way, Geologist  
Investigation #2013356

**2012 TWO-DIMENSIONAL  
ELECTRICAL RESISTIVITY PROFILE  
TRAVERSE 15 / SPT B-06 OVERLAY**

Proposed Moody AFB Privatized Housing  
Val Del Road  
Valdosta, Georgia



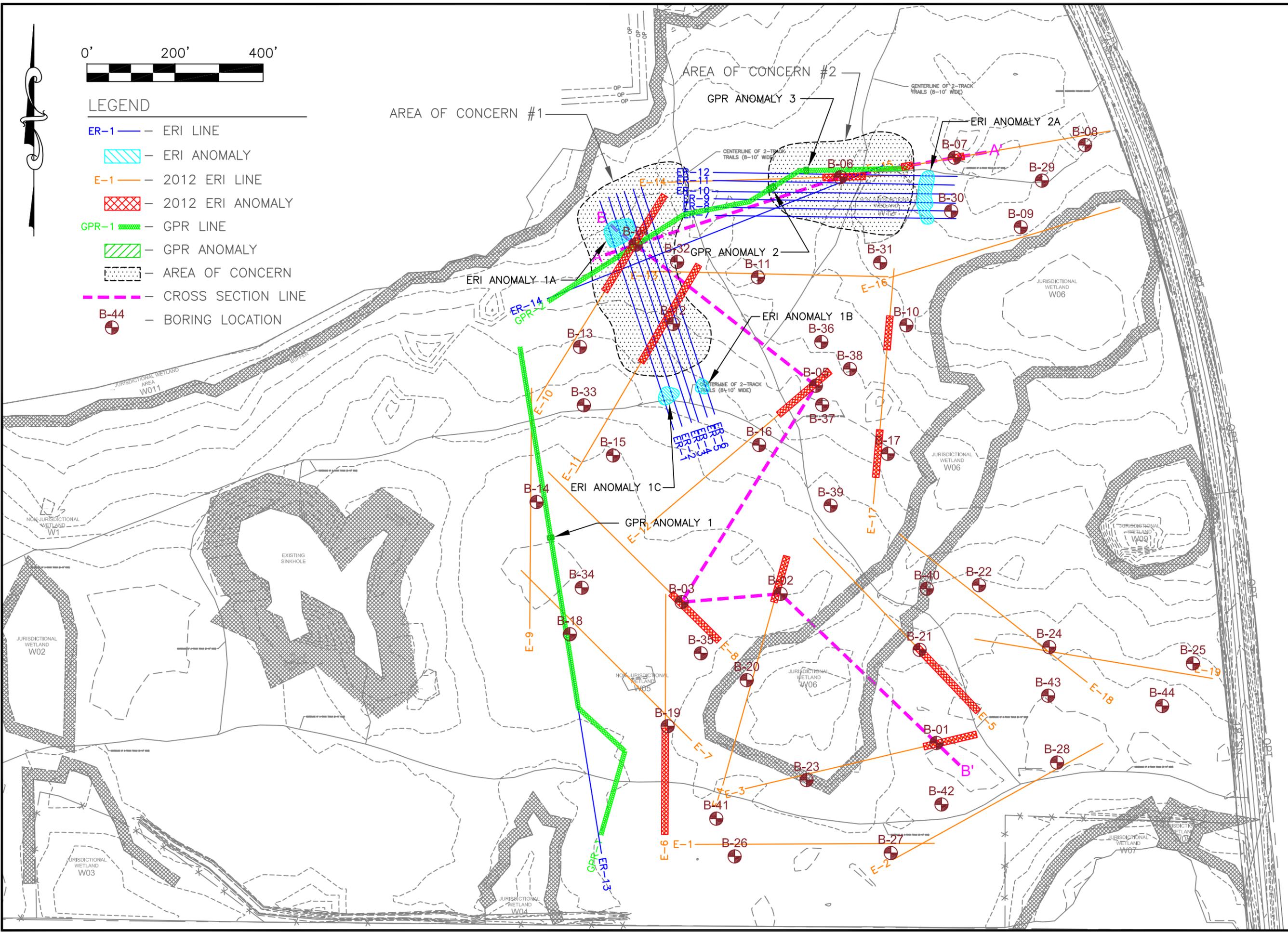
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LEGEND

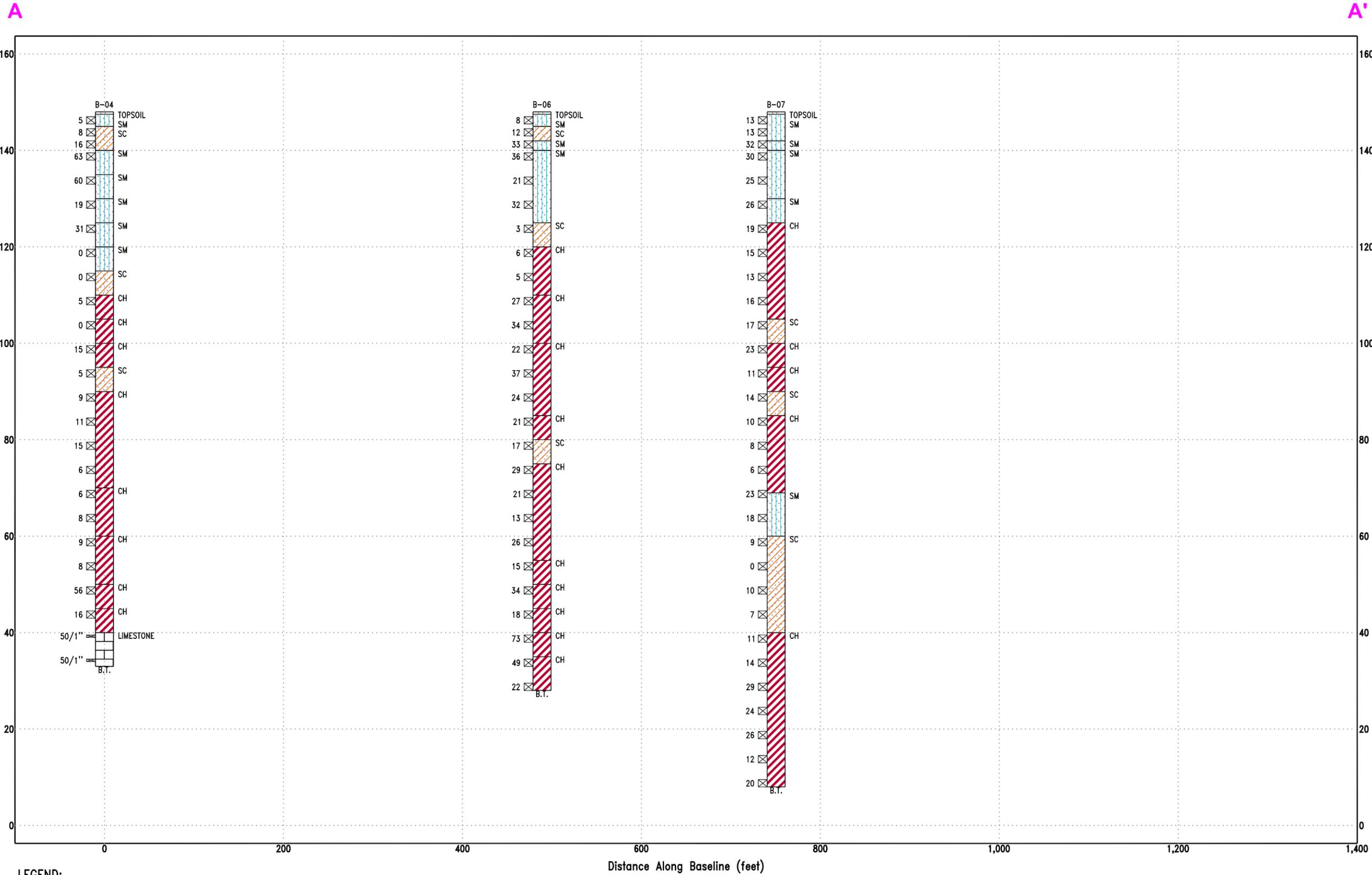
- ER-1 — ERI LINE
- ERI ANOMALY
- E-1 — 2012 ERI LINE
- 2012 ERI ANOMALY
- GPR-1 — GPR LINE
- GPR ANOMALY
- AREA OF CONCERN
- CROSS SECTION LINE
- B-44 — BORING LOCATION



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 4589 Val North Drive  
 Valdosta, GA 31602  
 Ph 229.244.8619  
 Fax 229.245.8170  
 www.ttlinc.com

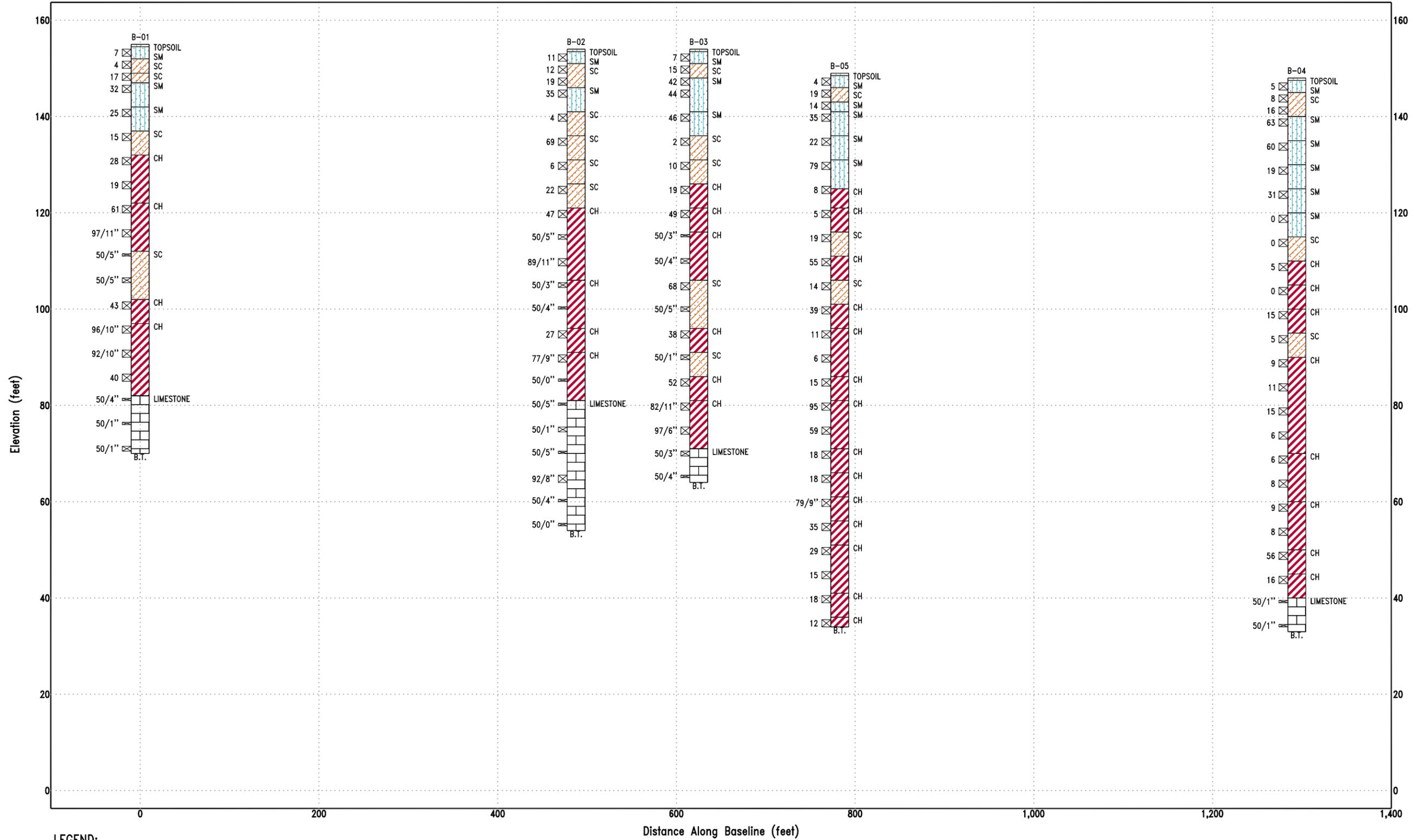
**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING**  
**VAL DEL ROAD SITE**  
**VALDOSTA, GEORGIA**

SCALE: 1" = 200'	TTL PROJECT NO: 100712192
DRAWING TITLE: Geophysical Base Map	REVISION NUMBER: N/A
DATE CREATED: 11/06/2013	DATE REVISED: N/A
DRAWN BY: mjc	CHECKED BY: MEM
APPROVED: Michael E. McNeal, P.E.	
SHEET NUMBER: 1 of 1	



B

B'



**LEGEND:**

N (BPF) CLASSIFICATION

RECOVERY% MATERIAL SYMBOL

CORE SIZE CLASSIFICATION

ROD# CLASSIFICATION

B.T. = BORING TERMINATED A.R. = AUGER REFUSAL



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**VAL DEL ROAD SITE**  
**VALDOSTA, GEORGIA**

SCALE: 1" = 200'	TTL PROJECT NO: 100712192
DRAWING TITLE: Cross Section B-B'	DATE REVISION: N/A
DATE CREATED: 11/06/2013	REVISION NUMBER: N/A
DRAWN BY: mjc	CHECKED BY: MEM
APPROVED: Michael E. McNeal, P.E.	
SHEET NUMBER: 2 of 2	

## FIELD TESTING PROCEDURES

### **Soil Test Borings (ASTM D 1586)**

The borings were advanced by hollow stem auger drilling methods. At the desired depths drilling was stopped and the kelly-drive was disconnected from the auger stems, leaving the stems in the borehole. The sampling tools were then inserted to the bottom of the hole through the hollow stem augers. Soil samples were obtained with a standard 1.4 inch I.D., 2.0 inch O.D., split-tube sampler.

Split-tube sampling operations and standard penetration tests were typically performed at 2½ foot intervals in the upper 10 feet and at 5 foot intervals thereafter. The sampler was first seated 6 inches to penetrate any loose cuttings and then driven an additional 12 inches with blows from a 140 pound hammer falling 30 inches. The number of blows required to drive the sampler the final 12 inches is designated as the standard penetration resistance (N-value). When properly evaluated it may be used as an index to the soil strength, density and ability to support foundations.

# LEGEND OF SYMBOLS

## Soil (USCS Classification)

	<b>GW</b>	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	<b>GP</b>	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	<b>GM</b>	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	<b>GC</b>	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	<b>SW</b>	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	<b>SP</b>	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	<b>SM</b>	SILTY SANDS, SAND - SILT MIXTURES
	<b>SC</b>	CLAYEY SANDS, SAND - CLAY MIXTURES
	<b>ML</b>	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
	<b>CL</b>	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
	<b>OL</b>	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	<b>MH</b>	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
	<b>CH</b>	INORGANIC CLAYS OF HIGH PLASTICITY
	<b>OH</b>	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
	<b>PT</b>	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

## Rock

	CHALK
	COAL
	DOLOMITE
	GNEISS
	GRANITE
	LIMESTONE
	QUARTZITE
	SANDSTONE
	SAPROLITE
	SCHIST
	SHALE
	INTERBEDDED SHALE / SANDSTONE
	SILTSTONE

## Other Materials

	ASPHALT
	CONCRETE
	DEBRIS
	FILL
	TOPSOIL

## Samplers

	AUGER CUTTINGS
	BULK SAMPLE
	CONTINUOUS SAMPLER
	DYNAMIC CONE PENETROMETER
	PITCHER SAMPLER or PRESSUREMETER
	ROCK CORE
	SHELBY TUBE
	SPLIT SPOON

## Water Level Symbols

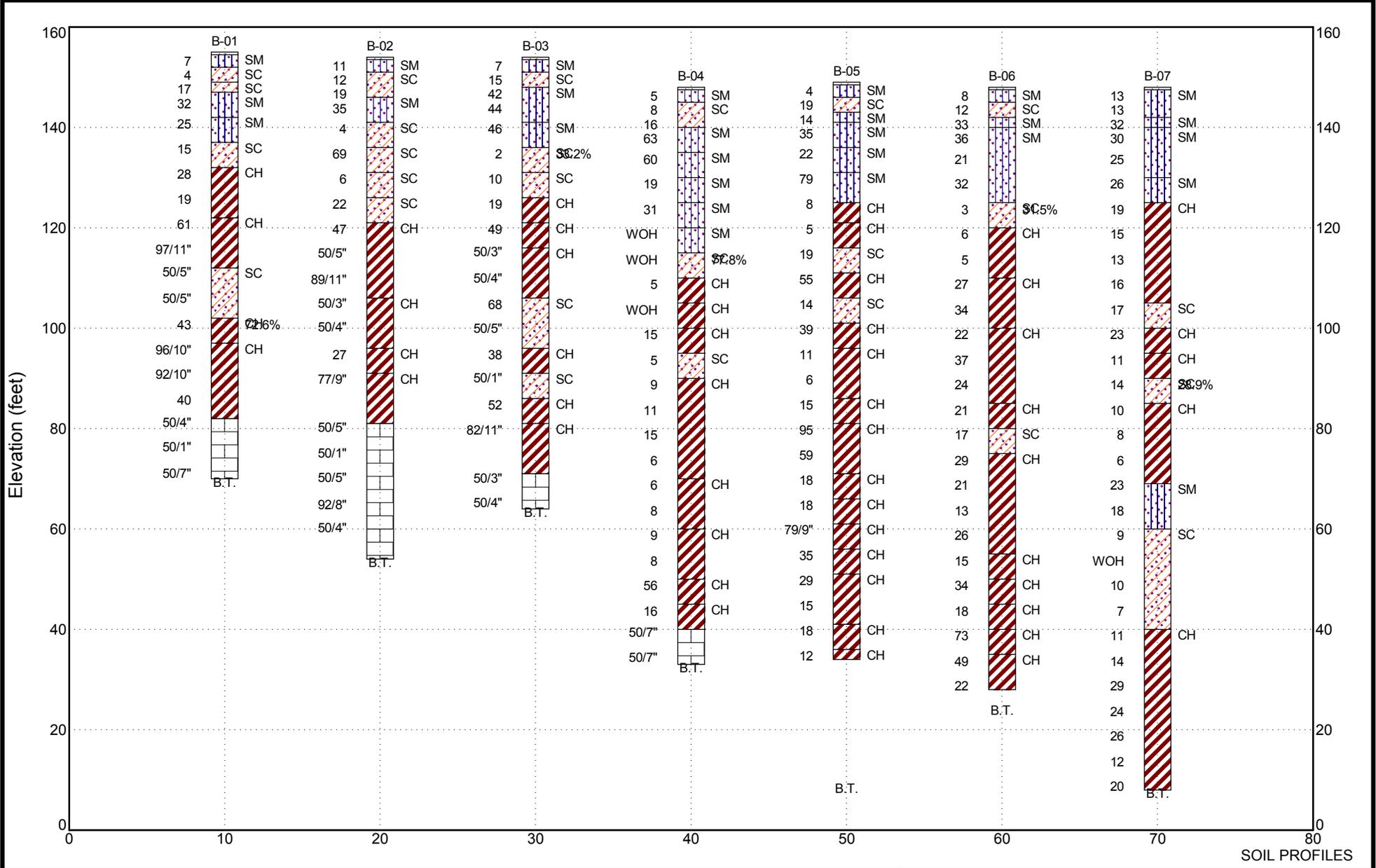
	WATER LEVEL AT TIME OF BORING
	DELAYED WATER LEVEL
	CAVE-IN DEPTH

# TTL

geotechnical - analytical - materials - environmental

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**SUBSURFACE CROSS-SECTION**

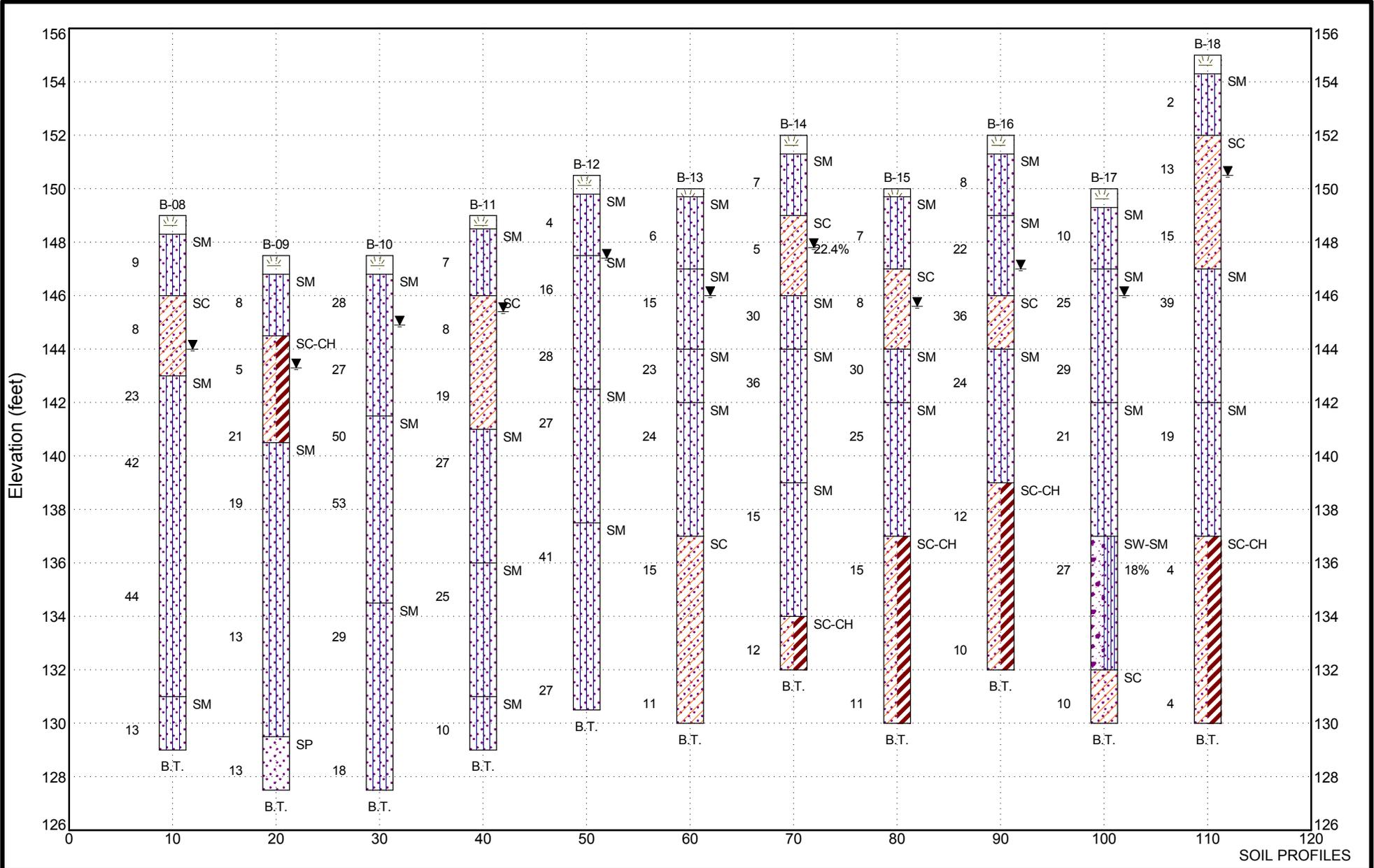
Client: Woolpert, Inc.  
 Project: Moody AFB - Privatized Housing Val Del Road Site  
 Location: Valdosta, GA  
 Project Number: 100712192

**LEGEND:** See Legend Key Sheet for explanation of symbols

N (bpf)		% Moisture Classification	
Recovery% Core Size RQD%			

B.T. = Boring Terminated    A.R. = Auger Refusal

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**SUBSURFACE CROSS-SECTION**

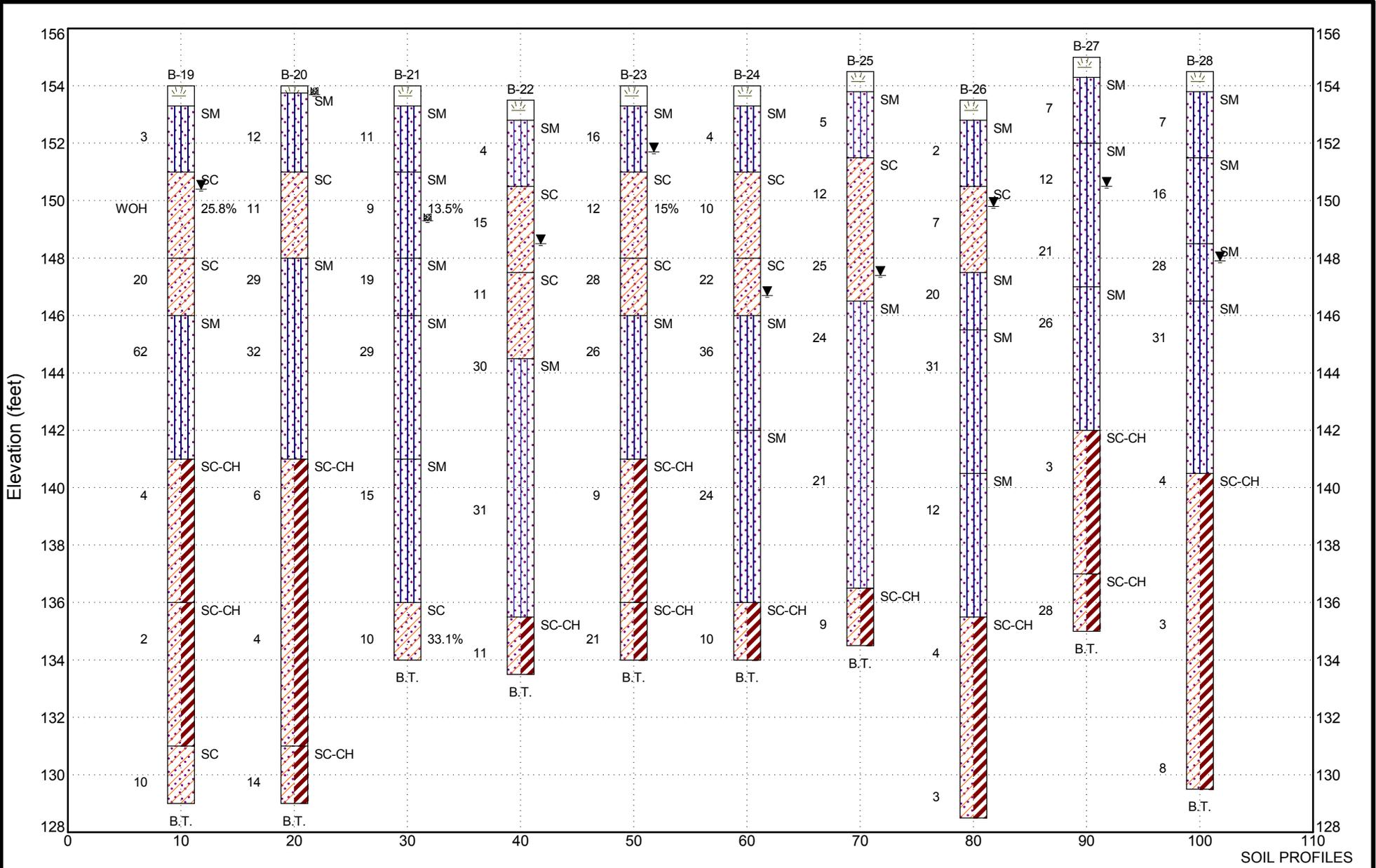
Client: Woolpert, Inc.  
 Project: Moody AFB - Privatized Housing Val Del Road Site  
 Location: Valdosta, GA  
 Project Number: 100712192

**LEGEND:** See Legend Key Sheet for explanation of symbols

N (bpf)		% Moisture Classification		Water level at time of boring
Recovery% Core Size RQD%		Material Symbol		Delayed water level
				Cave-in depth
				Perched water level.

B.T. = Boring Terminated    A.R. = Auger Refusal

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**SUBSURFACE CROSS-SECTION**

Client: Woolpert, Inc.  
 Project: Moody AFB - Privatized Housing Val Del Road Site  
 Location: Valdosta, GA  
 Project Number: 100712192

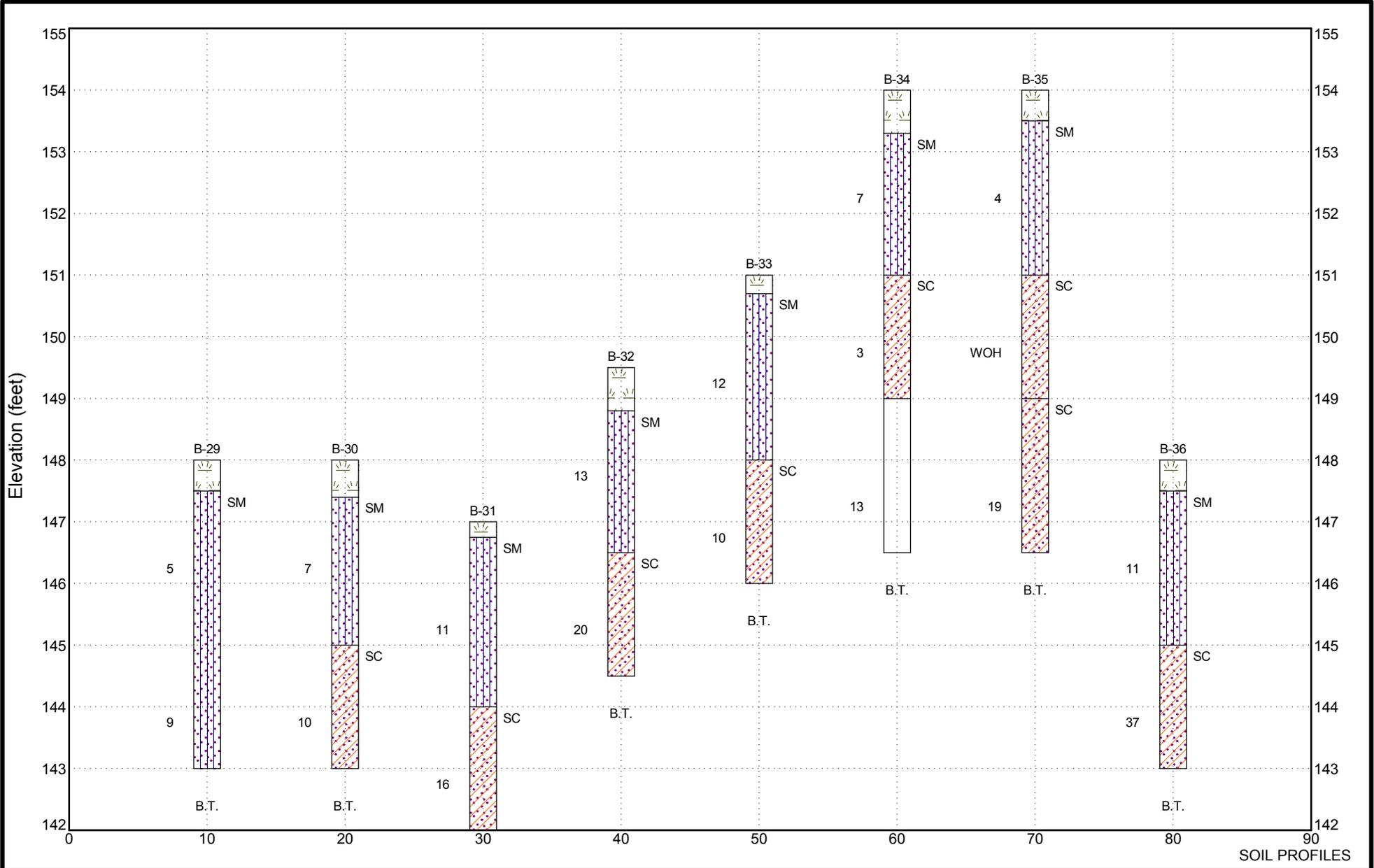
**LEGEND:** See Legend Key Sheet for explanation of symbols

N (bpf)		% Moisture Classification		Water level at time of boring
Recovery% Core Size RQD%		Material Symbol		Delayed water level
				Cave-in depth
				Perched water level.

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**SUBSURFACE CROSS-SECTION**

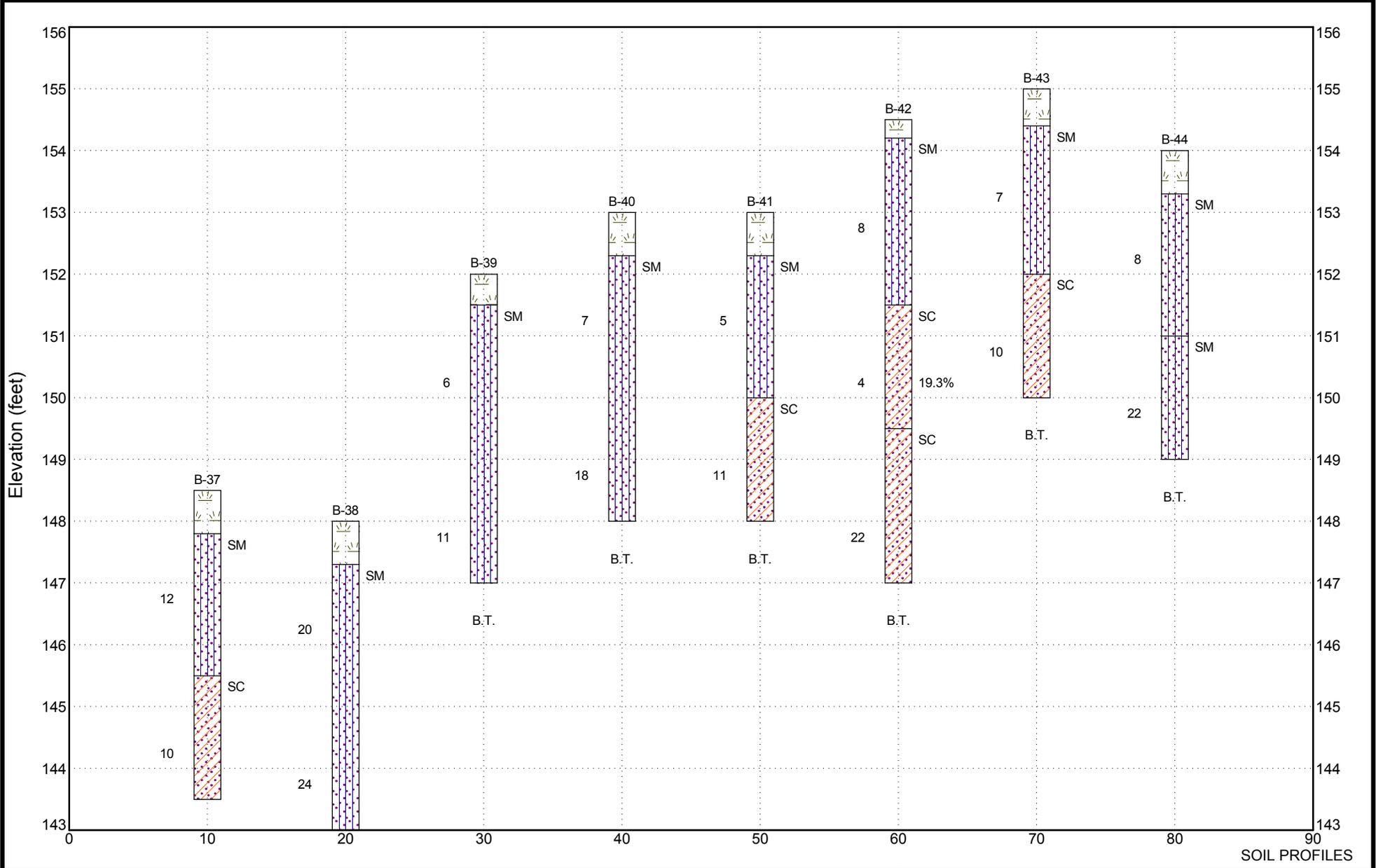
Client: Woolpert, Inc.  
 Project: Moody AFB - Privatized Housing Val Del Road Site  
 Location: Valdosta, GA  
 Project Number: 100712192

**LEGEND:** See Legend Key Sheet for explanation of symbols

N (bpf)		% Moisture Classification		Water level at time of boring
Recovery% Core Size RQD%		Material Symbol		Delayed water level
				Cave-in depth
				Perched water level.

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**SUBSURFACE CROSS-SECTION**

Client: Woolpert, Inc.  
 Project: Moody AFB - Privatized Housing Val Del Road Site  
 Location: Valdosta, GA  
 Project Number: 100712192

**LEGEND:** See Legend Key Sheet for explanation of symbols

N (bpf)		% Moisture Classification		Water level at time of boring
Recovery% Core Size RQD%				Delayed water level
Material Symbol				Cave-in depth
				Perched water level.

B.T. = Boring Terminated    A.R. = Auger Refusal



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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-01**

Page 1 of 1

Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/14/2013
Logged by:	J. Crosby	Boring Depth:	85 feet
Equipment:	CME 550X	Boring Elevation:	155 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Rotary Wash w/Mud		

Remarks:  
 Water not encountered at time of drilling.

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)
								1st 6"	2nd 6"	
								% REC		
155	155		SM	TOPSOIL: 6 Inches				2 - 2 - 5		
5	150		SC	COASTAL PLAIN: Loose brown tan silty medium to fine SAND				N = 7		
10	145		SC	Very loose orange gray clayey medium to fine SAND				2 - 1 - 3		
			SM					N = 4		
			SM					5 - 8 - 9		
15	140		SM	Firm gray clayey medium to fine SAND				N = 17		
20	135		SC	Dense orange tan silty medium to fine SAND				13 - 15 - 17		
			SC	Very firm gray silty medium to fine SAND				N = 32		
25	130		CH	Firm gray clayey medium to fine SAND with Weathered Limestone pieces				11 - 12 - 13		
			CH	Very stiff gray tan fine sandy FAT CLAY				N = 25		
30	125		CH	Very hard green gray sandy silty FAT CLAY				3 - 9 - 6		
			CH					N = 15		
35	120		CH	Very hard green gray sandy silty FAT CLAY				10 - 13 - 15		
			CH					N = 28		
40	115		CH	Very hard green gray sandy silty FAT CLAY				7 - 8 - 11		
			CH					N = 19		
45	110		SC	Very dense green clayey medium to fine SAND				18 - 30 - 31		61
			SC					N = 61		
50	105		SC	Very dense green clayey medium to fine SAND				28 - 47 - 50/5"		97/11"
			SC					N = 97/11"		
55	100		CH	Very stiff green gray silty FAT CLAY	73			50/5"		50/5"
			CH					N = 50/5"		
60	95		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces				29 - 50/5"		50/5"
			CH					N = 50/5"		
65	90		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces				35 - 14 - 29		
			CH					N = 43		
70	85		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces				28 - 46 - 50/4"		96/10"
			CH					N = 96/10"		
75	80		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces				36 - 42 - 50/4"		92/10"
			CH					N = 92/10"		
80	75		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces				15 - 17 - 23		
			CH					N = 40		
85	70		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces				50/4"		50/4"
			CH					N = 50/4"		
90	65		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces				50/1"		50/1"
			CH					N = 50/1"		
95	60		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces				50 - 50/1"		50/7"
			CH					N = 50/7"		
100	55		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces						
105	50		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces						
110	45		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces						
115	40		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces						
120	35		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces						
125	30		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces						
130	25		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces						
135	20		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces						
140	15		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces						
145	10		CH	Hard to very hard green gray sandy silty FAT CLAY with Weathered Limestone pieces						
				Boring terminated at 85.0 feet.						

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-02**

Page 1 of 1

Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/15/2013
Logged by:	J. Crosby	Boring Depth:	100 feet
Equipment:	CME 550X	Boring Elevation:	154 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Rotary Wash w/Mud		

Remarks:  
 Water not encountered at time of drilling.

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)
								1st 6"	2nd 6"	
								ROD % REC		
5	150		SM	TOPSOIL: 6 Inches				4 - 5 - 6		
			SC	COASTAL PLAIN: Firm brown tan silty medium to fine SAND				N = 11		
10	145		SM	Firm orange gray clayey medium to fine SAND				3 - 5 - 7		
								N = 12		
								4 - 9 - 10		
								N = 19		
15	140		SC	Dense gray tan clayey silty medium to fine SAND				12 - 18 - 17		
								N = 35		
20	135		SC	Very loose gray clayey medium to fine SAND with Weathered Limestone pieces				4 - 2 - 2		69
								N = 4		
25	130		SC	Very dense green gray clayey medium to fine SAND with Weathered Limestone pieces				29 - 30 - 39		
								N = 69		
30	125		SC	Very dense green gray clayey medium to fine SAND with Weathered Limestone pieces				2 - 4 - 2		
								N = 6		
35	120		CH	Loose green gray clayey medium to fine SAND				3 - 10 - 12		
								N = 22		
40	115		CH	Very firm green gray clayey medium to fine SAND				15 - 21 - 26		
								N = 47		
45	110		CH	Hard to very hard green gray silty FAT CLAY				22 - 50/5"		50/5"
								N = 50/5"		
50	105		CH	Very hard green gray silty FAT CLAY				23 - 39 - 50/5"		89/11"
								N = 89/11"		
55	100		CH	Very stiff green gray silty FAT CLAY				24 - 50/3"		50/3"
								N = 50/3"		
60	95		CH	Very stiff green gray silty FAT CLAY				50/4"		50/4"
								N = 50/4"		
65	90		CH	Very hard green gray silty FAT CLAY				7 - 10 - 17		
								N = 27		
70	85		CH	Very hard green gray silty FAT CLAY				8 - 27 - 50/3"		77/9"
								N = 77/9"		
75	80			WEATHERED LIMESTONE				50/0"		
								N =		
80	75							50/5"		50/5"
								N = 50/5"		
85	70							24 - 50/1"		50/1"
								N = 50/1"		
90	65							50/5"		50/5"
								N = 50/5"		
95	60							12 - 42 - 50/2"		92/8"
								N = 92/8"		
100	55							50/4"		50/4"
								N = 50/4"		
105	50			Boring terminated at 100.0 feet.				50/0"		
								N =		

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-03**

Page 1 of 1

Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/16/2013
Logged by:	J. Crosby	Boring Depth:	90 feet
Equipment:	CME 550X	Boring Elevation:	154 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Rotary Wash w/Mud		

Remarks:  
 Water not encountered at time of drilling.  
  
 Lost drilling mud temporarily at 20'.

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)
								1st 6"	2nd 6"	
								ROD % REC		
5	150		SM	TOPSOIL: 6 Inches				2 - 3 - 4 N = 7		
10	145		SC	COASTAL PLAIN: Loose brown silty medium to fine SAND				5 - 6 - 9 N = 15		
15	140		SM	Firm tan gray clayey medium to fine SAND				17 - 20 - 22 N = 42		
20	135		SC	Dense tan gray silty medium to fine SAND				14 - 19 - 25 N = 44		
25	130		SC	Dense gray silty medium to fine SAND	33			18 - 20 - 26 N = 46		
30	125		CH	Very loose gray clayey medium to fine SAND				WOH - WOH - 2 N = 2		
35	120		CH	Loose gray clayey medium to fine SAND				4 - 5 - 5 N = 10		
40	115		CH	Very stiff gray silty FAT CLAY				7 - 9 - 10 N = 19		
45	110		CH	Hard gray green silty FAT CLAY				12 - 24 - 25 N = 49		
50	105		SC	Very hard gray green silty FAT CLAY with Weathered Limestone pieces				50/3" N = 50/3"		50/3"
55	100		SC	Very dense green gray clayey medium to fine SAND				44 - 50/4" N = 50/4"		50/4"
60	95		CH	Very dense green gray clayey medium to fine SAND				16 - 21 - 47 N = 68		68
65	90		CH	Hard green gray silty FAT CLAY				20 - 50/5" N = 50/5"		50/5"
70	85		SC	Hard green gray silty FAT CLAY				13 - 17 - 21 N = 38		
75	80		CH	Very dense green gray clayey medium to fine SAND with Weathered Limestone pieces				45 - 50/1" N = 50/1"		50/1"
80	75		CH	Very hard green gray silty FAT CLAY				7 - 18 - 34 N = 52		
85	70		CH	Very hard green gray silty FAT CLAY				12 - 32 - 50/5" N = 82/11"		82/11"
90	65			WEATHERED LIMESTONE				16 - 47 - 50/0" N =		
95	60			Boring terminated at 90.0 feet.				27 - 50/3" N = 50/3"		50/3"
100	55							50/4" N = 50/4"		50/4"

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

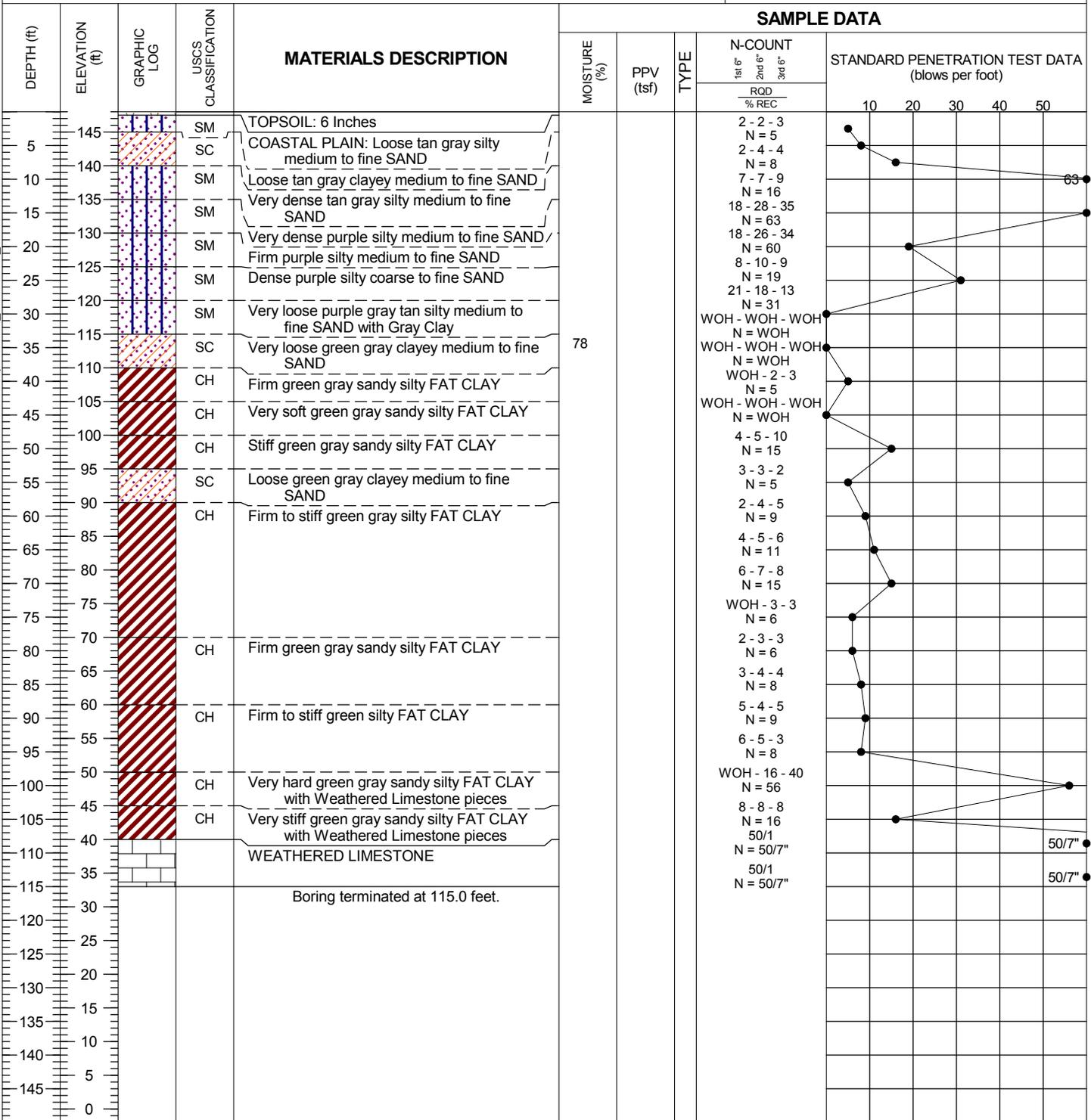
**LOG OF BORING**  
**B-04**

Page 1 of 1

Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/22/2013
Logged by:	J. Crosby	Boring Depth:	115 feet
Equipment:	CME 550X	Boring Elevation:	148 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Rotary Wash w/Mud		

Remarks:  
 Water not encountered at time of drilling.

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Valdosta, GA

**LOG OF BORING**  
**B-05**

Page 1 of 1

Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/17/2013
Logged by:	J. Crosby	Boring Depth:	140 feet
Equipment:	CME 550X	Boring Elevation:	149 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Rotary Wash w/Mud		

Remarks:  
 Water not encountered at time of drilling.  
  
 Lost 100% of drilling mud at 115'.  
  
 Borehole would not stay open after drilling mud lost. Driller attempted to extend boring to competent Limestone without SPT sampling. The boring was extended to a depth of 140' with intermittent harder layers being encountered. A definitive competent Limestone layer was not apparent to this depth.

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)
								1st 6"	2nd 6"	
								ROD % REC		
5	145		SM	TOPSOIL: 6 Inches				2 - 1 - 3		
5	145		SC	COASTAL PLAIN: Very loose gray silty medium to fine SAND				N = 4		
10	140		SM	Firm tan gray clayey medium to fine SAND				6 - 9 - 10		
10	140		SM	Firm gray silty medium to fine SAND				N = 19		
15	135		SM	Dense gray silty medium to fine SAND				10 - 8 - 6		
15	135		SM	Dense gray silty medium to fine SAND				N = 14		
20	130		SM	Very firm purple silty medium to fine SAND				14 - 18 - 17		
20	130		SM	Very firm purple silty medium to fine SAND				N = 35		
25	125		CH	Firm gray silty FAT CLAY				10 - 13 - 9		79
25	125		CH	Firm gray silty FAT CLAY				N = 22		
30	120		CH	Firm gray silty FAT CLAY				20 - 37 - 42		
30	120		CH	Firm gray silty FAT CLAY				N = 79		
35	115		SC	Firm gray clayey medium to fine SAND				7 - 6 - 2		
35	115		SC	Firm gray clayey medium to fine SAND				N = 8		
40	110		CH	Very hard green gray silty FAT CLAY				2 - 2 - 3		
40	110		CH	Very hard green gray silty FAT CLAY				N = 5		
45	105		SC	Firm gray clayey medium to fine SAND				2 - 8 - 11		
45	105		SC	Firm gray clayey medium to fine SAND				N = 19		
50	100		CH	Hard green gray silty FAT CLAY				12 - 26 - 29		
50	100		CH	Hard green gray silty FAT CLAY				N = 55		
55	95		CH	Firm to stiff green gray silty FAT CLAY				6 - 7 - 7		
55	95		CH	Firm to stiff green gray silty FAT CLAY				N = 14		
60	90		CH	Stiff green gray silty FAT CLAY				6 - 18 - 21		
60	90		CH	Stiff green gray silty FAT CLAY				N = 39		
65	85		CH	Stiff green gray silty FAT CLAY				3 - 5 - 6		
65	85		CH	Stiff green gray silty FAT CLAY				N = 11		
70	80		CH	Very hard green gray silty FAT CLAY				2 - 3 - 3		
70	80		CH	Very hard green gray silty FAT CLAY				N = 6		
75	75		CH	Stiff green gray silty FAT CLAY				2 - 3 - 12		
75	75		CH	Stiff green gray silty FAT CLAY				N = 15		
80	70		CH	Very stiff green gray silty FAT CLAY				13 - 45 - 50		95
80	70		CH	Very stiff green gray silty FAT CLAY				N = 95		
85	65		CH	Very stiff green gray silty FAT CLAY with Weathered Limestone pieces				16 - 27 - 32		
85	65		CH	Very stiff green gray silty FAT CLAY with Weathered Limestone pieces				N = 59		
90	60		CH	Very hard green gray silty FAT CLAY with Weathered Limestone pieces				9 - 9 - 9		
90	60		CH	Very hard green gray silty FAT CLAY with Weathered Limestone pieces				N = 18		
95	55		CH	Hard green gray sandy silty FAT CLAY				8 - 9 - 9		
95	55		CH	Hard green gray sandy silty FAT CLAY				N = 18		
100	50		CH	Stiff to very stiff green gray sandy silty FAT CLAY with Weathered Limestone pieces				23 - 29 - 50/3"		79/9"
100	50		CH	Stiff to very stiff green gray sandy silty FAT CLAY with Weathered Limestone pieces				N = 79/9"		
105	45		CH	Very stiff green gray sandy silty FAT CLAY				6 - 17 - 18		
105	45		CH	Very stiff green gray sandy silty FAT CLAY				N = 35		
110	40		CH	Very stiff green gray sandy silty FAT CLAY				6 - 10 - 19		
110	40		CH	Very stiff green gray sandy silty FAT CLAY				N = 29		
115	35		CH	Stiff green gray silty FAT CLAY with balck and tan Sand				4 - 6 - 9		
115	35		CH	Stiff green gray silty FAT CLAY with balck and tan Sand				N = 15		
120	30							3 - 7 - 11		
120	30							N = 18		
125	25							4 - 7 - 5		
125	25							N = 12		
130	20									
135	15									
140	10									
145	5									
145	5									

Boring terminated at 140.0 feet.

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

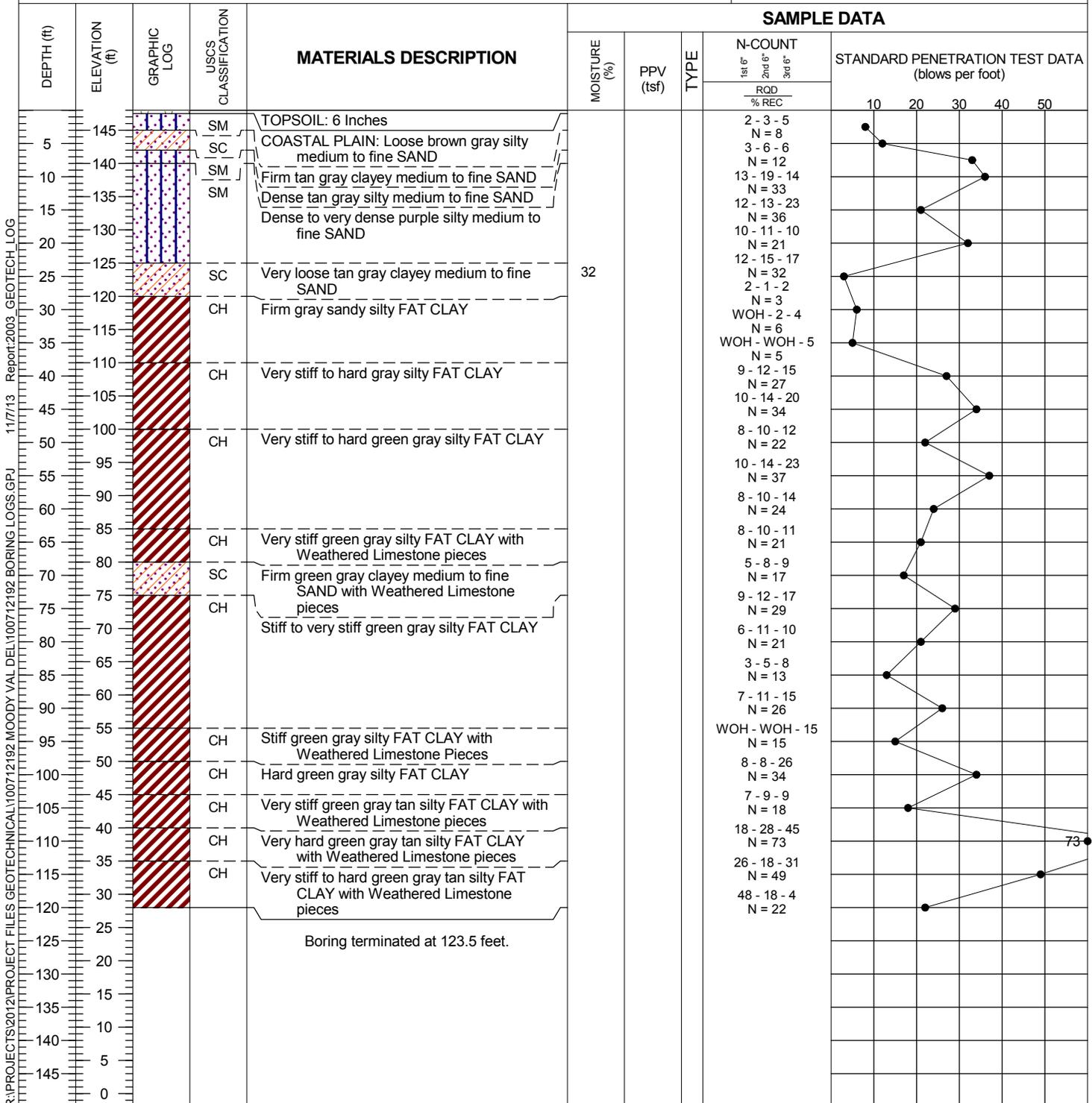
Valdosta, GA

**LOG OF BORING**  
**B-06**

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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/21/2013
Logged by:	J. Crosby	Boring Depth:	123.5 feet
Equipment:	CME 550X	Boring Elevation:	148 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Rotary Wash w/Mud		

Remarks:  
 Water not encountered at time of drilling.  
  
 Lost 100% of drilling mud at 120'.  
  
 Borehole would not stay open after drilling mud lost.  
 Boring terminated at 123.5'. Competant Limestone not encountered to this depth.



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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-07**

Page 1 of 1

Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/19/2013
Logged by:	J. Crosby	Boring Depth:	140 feet
Equipment:	CME 550X	Boring Elevation:	148 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Rotary Wash w/Mud		

Remarks:  
 Water not encountered at time of drilling.  
 Competant limestone not encountered to 140'

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DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	ROD								
								% REC		10	20	30	40	50				
5	145		SM	TOPSOIL: 6 Inches				3 - 4 - 9										
10	140		SM	COASTAL PLAIN: Firm brown tan silty medium to fine SAND				N = 13										
15	135		SM	Very firm gray silty SAND				N = 13										
20	130		SM	Very firm purple silty medium to fine SAND				N = 32										
25	125		SM	Very firm purple tan silty coarse to fine SAND				N = 30										
30	120		CH	Stiff to very stiff gray sandy silty FAT CLAY				N = 25										
35	115							13 - 13 - 13										
40	110							N = 26										
45	105		SC	Firm gray clayey medium to fine SAND				5 - 8 - 11										
50	100		CH	Very stiff green sandy silty FAT CLAY				N = 19										
55	95		CH	Stiff green sandy silty CLAY				5 - 6 - 9										
60	90		SC	Firm green clayey medium to fine SAND	29			N = 15										
65	85		CH	Stiff to firm green sandy silty CLAY				5 - 6 - 7										
70	80							N = 13										
75	75							4 - 6 - 10										
80	70		SM	Firm to very firm gray silty SAND with Clay				N = 16										
85	65							5 - 7 - 10										
90	60		SC	Very loose to loose gray green clayey medium to fine SAND				N = 17										
95	55							8 - 10 - 13										
100	50							N = 23										
105	45							3 - 5 - 6										
110	40		CH	Firm to stiff green gray sandy silty FAT CLAY				N = 11										
115	35							4 - 6 - 8										
120	30							N = 14										
125	25							2 - 5 - 5										
130	20							N = 10										
135	15							3 - 3 - 5										
140	10							N = 8										
145	5							3 - 3 - 3										
								N = 6										
								5 - 10 - 13										
								N = 23										
								7 - 8 - 10										
								N = 18										
								4 - 4 - 5										
								N = 9										
								WOH - WOH - WOH										
								N = WOH										
								4 - 5 - 5										
								N = 10										
								3 - 4 - 3										
								N = 7										
								3 - 5 - 6										
								N = 11										
								5 - 7 - 7										
								N = 14										
								9 - 13 - 16										
								N = 29										
								7 - 10 - 14										
								N = 24										
								9 - 10 - 16										
								N = 26										
								7 - 5 - 7										
								N = 12										
								5 - 8 - 12										
								N = 20										

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-09**

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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/25/2013
Logged by:	J. Crosby	Boring Depth:	20 feet
Equipment:	CME 550X	Boring Elevation:	147.5 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 143.3 feet on 1/28/2013.

▼ Delayed water level.

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DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	10	20	30	40	50				
				TOPSOIL: 8 Inches															
			SM	COASTAL PLAIN: Loose brown gray silty medium to fine SAND				2 - 4 - 4 N = 8											
5			SC-CH	Loose gray purple tan clayey medium to fine SAND, Wet				1 - 2 - 3 N = 5											
			SM	Firm to very firm gray silty medium to fine SAND, Wet				6 - 9 - 12 N = 21											
10								6 - 10 - 9 N = 19											
15								7 - 8 - 5 N = 13											
20			SP	Firm gray silty medium to fine SAND				5 - 7 - 6 N = 13											
				Boring terminated at 20.0 feet.															

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**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-11**

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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/25/2013
Logged by:	J. Crosby	Boring Depth:	20 feet
Equipment:	CME 550X	Boring Elevation:	149 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 145.4 feet on 1/28/2013.

▼ Delayed water level.

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DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	ROD % REC	10	20	30	40	50			
				TOPSOIL: 6 Inches															
			SM	COASTAL PLAIN: Loose tan gray silty medium to fine SAND				3 - 3 - 4 N = 7											
5	145		SC	Loose to firm tan gray clayey medium to fine SAND	▼			3 - 3 - 5 N = 8											
10	140		SM	Very firm gray silty medium to fine SAND				3 - 7 - 12 N = 19											
15	135		SM	Very firm purple silty medium to fine SAND				9 - 12 - 15 N = 27											
20	130		SM	Loose purple silty medium to fine SAND, Wet				9 - 13 - 12 N = 25											
				Boring terminated at 20.0 feet.				2 - 4 - 6 N = 10											

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**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-12**

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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/23/2013
Logged by:	J. Crosby	Boring Depth:	20 feet
Equipment:	CME 550X	Boring Elevation:	150.5 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 147.4 feet on 1/28/2013.

▼ Delayed water level.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	10	20	30	40	50			
								ROD % REC										
	150			TOPSOIL: 8 Inches														
			SM	COASTAL PLAIN: Very loose gray silty medium to fine SAND				3 - 3 - 1 N = 4										
			SM	Firm to very firm tan gray orange silty medium to fine SAND				3 - 6 - 10 N = 16										
5	145							4 - 11 - 17 N = 28										
			SM	Very firm gray silty medium to fine SAND				11 - 13 - 14 N = 27										
10	140							17 - 19 - 22 N = 41										
			SM	Very firm to dense purple silty medium to fine SAND, Wet				9 - 13 - 14 N = 27										
15	135																	
20	130			Boring terminated at 20.0 feet.														
25	125																	

This boring log shall not be separated from the corresponding Instrument of Service; no third party may rely upon this well log or the corresponding Instrument of Service absent a written TTL Secondary Client Agreement.





geotechnical - analytical - materials - environmental

**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-14**

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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/23/2013
Logged by:	J. Crosby	Boring Depth:	20 feet
Equipment:	CME 550X	Boring Elevation:	152 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 147.8 feet on 1/28/2013.

▼ Delayed water level.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	ROD % REC	10	20	30	40	50			
				TOPSOIL: 8 Inches															
150			SM	COASTAL PLAIN: Loose brown silty medium to fine SAND				1 - 3 - 4 N = 7											
5			SC	Loose gray red orange clayey medium to fine SAND	22			1 - 2 - 3 N = 5											
145			SM	Dense gray red orange silty medium to fine SAND				11 - 13 - 17 N = 30											
10			SM	Dense red gray silty medium to fine SAND				13 - 18 - 18 N = 36											
140			SM	Firm purple gray silty medium to fine SAND, Wet				6 - 10 - 5 N = 15											
15			SC-CH	Firm tan gray clayey medium to fine SAND				4 - 5 - 7 N = 12											
20				Boring terminated at 20.0 feet.															
130																			
25																			
125																			



geotechnical - analytical - materials - environmental

**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-15**

Page 1 of 1

Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/23/2013
Logged by:	J. Crosby	Boring Depth:	20 feet
Equipment:	CME 550X	Boring Elevation:	150 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 145.6 feet on 1/28/2013.

▼ Delayed water level.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEO TECH LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA										
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)							
								1st 6"	2nd 6"	3rd 6"	ROD % REC	10	20	30	40	50		
	150		SM	TOPSOIL: 4 Inches COASTAL PLAIN: Loose brown tan gray silty medium to fine SAND				2 - 2 - 5 N = 7										
			SC	Loose tan gray clayey medium to fine SAND				5 - 4 - 4 N = 8										
5	145		SM	Very firm red gray orange clayey silty medium to fine SAND				7 - 15 - 15 N = 30										
			SM	Very firm purple gray silty medium to fine SAND				8 - 12 - 13 N = 25										
10	140		SC-CH	Firm gray tan clayey medium to fine SAND				6 - 7 - 8 N = 15										
15	135							4 - 5 - 6 N = 11										
20	130			Boring terminated at 20.0 feet.														
25	125																	

This boring log shall not be separated from the corresponding Instrument of Service; no third party may rely upon this well log or the corresponding Instrument of Service absent a written TTL Secondary Client Agreement.



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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-16**

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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/25/2013
Logged by:	J. Crosby	Boring Depth:	20 feet
Equipment:	CME 550X	Boring Elevation:	152 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 147 feet on  
 1/28/2013.

▼ Delayed water level.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	10	20	30	40	50				
				TOPSOIL: 8 Inches															
150			SM	COASTAL PLAIN: Loose gray silty medium to fine SAND				6 - 3 - 5 N = 8											
5			SM	Very firm gray silty medium to fine SAND				9 - 10 - 12 N = 22											
145			SC	Dense tan gray clayey medium to fine SAND				11 - 19 - 17 N = 36											
10			SM	Very firm gray silty medium to fine SAND				11 - 11 - 13 N = 24											
140			SC-CH	Loose to firm gray tan clayey medium to fine SAND				3 - 5 - 7 N = 12											
15								4 - 5 - 5 N = 10											
20				Boring terminated at 20.0 feet.															
130																			
25																			
125																			

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-17**

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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/25/2013
Logged by:	J. Crosby	Boring Depth:	20 feet
Equipment:	CME 550X	Boring Elevation:	150 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 146 feet on  
 1/28/2013.

▼ Delayed water level.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	10	20	30	40	50				
								ROD % REC										
	150			TOPSOIL: 8 Inches														
			SM	COASTAL PLAIN: Loose gray silty medium to fine SAND				2 - 4 - 6 N = 10										
			SM	Very firm tan gray silty medium to fine SAND	▼			4 - 10 - 15 N = 25										
5	145							10 - 12 - 17 N = 29										
			SM	Very firm tan gray silty medium to fine SAND, Wet				10 - 11 - 10 N = 21										
10	140																	
			SW-SM	Very firm purple gray well graded SAND with Silt, Wet				9 - 13 - 14 N = 27										
15	135				18													
			SC	Loose purple tan silty clayey fine SAND				2 - 4 - 6 N = 10										
20	130			Boring terminated at 20.0 feet.														
25	125																	

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/23/2013
Logged by:	J. Crosby	Boring Depth:	25 feet
Equipment:	CME 550X	Boring Elevation:	155 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 150.5 feet on 1/28/2013.

▼ Delayed water level.

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DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)									
								1st 6"	2nd 6"	3rd 6"	10	20	30	40	50				
								ROD % REC											
	155			TOPSOIL: 8 Inches															
			SM	COASTAL PLAIN: Very loose gray silty medium to fine SAND				3 - 1 - 1											
			SC	Firm gray orange clayey medium to fine SAND															
5	150							3 - 7 - 6											
			SM	Dense purple gray silty medium to fine SAND															
10	145																		
			SM	Firm purple gray silty coarse to fine SAND, Wet															
15	140																		
			SC-CH	Very loose gray clayey medium to fine SAND															
20	135																		
								2 - 2 - 2											
25	130																		
				Boring terminated at 25.0 feet.				2 - 2 - 2											

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/23/2013
Logged by:	J. Crosby	Boring Depth:	25 feet
Equipment:	CME 550X	Boring Elevation:	154 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 150.4 feet on 1/28/2013.

▼ Delayed water level.

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DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)									
								1st 6"	2nd 6"	3rd 6"	10	20	30	40	50				
								ROD % REC											
				TOPSOIL: 8 Inches															
			SM	COASTAL PLAIN: Very loose brown silty medium to fine SAND				2 - 1 - 2 N = 3											
5	150		SC	Very loose gray orange clayey medium to fine SAND, Wet	26			WOH - WOH - WOH N = WOH											
			SC	Firm tan gray clayey medium to fine SAND				5 - 9 - 11 N = 20											
10	145		SM	Very dense gray silty medium to fine SAND, Wet				19 - 30 - 32 N = 62											
15	140		SC-CH	Very loose gray clayey medium to fine SAND, Wet				6 - 1 - 3 N = 4											
20	135		SC-CH	Very loose gray clayey medium to fine SAND with Limestone pieces				WOH - WOH - 2 N = 2											
25	130		SC	Loose gray silty clayey medium to fine SAND				2 - 4 - 6 N = 10											
				Boring terminated at 25.0 feet.															

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-20**

Page 1 of 1

Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/23/2013
Logged by:	J. Crosby	Boring Depth:	25 feet
Equipment:	CME 550X	Boring Elevation:	154 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Cave-in recorded at an elevation of 153.7 feet on 1/28/2013.

Cave-in depth.

R:\PROJECTS\2012\PROJECT FILES GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	10	20	30	40	50			
								ROD % REC										
			SM	TOPSOIL: 3 Inches COASTAL PLAIN: Firm gray silty medium to fine SAND														
	150		SC	Firm gray orange clayey medium to fine SAND				10 - 9 - 3 N = 12										
5			SM	Very firm to dense purple gray silty medium to fine SAND, Wet				3 - 5 - 6 N = 11										
	145		SM	Very firm to dense purple gray silty medium to fine SAND, Wet				11 - 14 - 15 N = 29										
10			SC-CH	Very loose to loose green gray clayey medium to fine SAND				10 - 15 - 17 N = 32										
	140		SC-CH	Very loose to loose green gray clayey medium to fine SAND				2 - 3 - 3 N = 6										
15			SC-CH	Firm green gray clayey medium to fine SAND				WOH - 2 - 2 N = 4										
	135		SC-CH	Firm green gray clayey medium to fine SAND				4 - 6 - 8 N = 14										
20																		
	130																	
25				Boring terminated at 25.0 feet.														
	125																	



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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/24/2013
Logged by:	J. Crosby	Boring Depth:	20 feet
Equipment:	CME 550X	Boring Elevation:	154 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Cave-in recorded at an elevation of 149.3 feet on 1/28/2013.

Cave-in depth.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH.LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	10	20	30	40	50			
								ROD % REC										
				TOPSOIL: 8 Inches														
			SM	COASTAL PLAIN: Firm gray silty medium to fine SAND				3 - 4 - 7 N = 11										
5	150		SM	Loose gray orange silty medium to fine SAND	14			3 - 4 - 5 N = 9										
			SM	Firm gray tan silty medium to fine SAND				6 - 7 - 12 N = 19										
10	145		SM	Very firm gray tan silty medium to fine SAND, Wet				9 - 14 - 15 N = 29										
15	140		SM	Firm purple gray silty coarse to fine SAND, Wet				7 - 10 - 5 N = 15										
20	135		SC	Loose gray clayey medium to fine SAND	33			3 - 5 - 5 N = 10										
				Boring terminated at 20.0 feet.														



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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/24/2013
Logged by:	J. Crosby	Boring Depth:	20 feet
Equipment:	CME 550X	Boring Elevation:	153.5 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 148.5 feet on 1/28/2013.

▼ Delayed water level.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	ROD	10	20	30	40	50			
				TOPSOIL: 8 Inches															
			SM	COASTAL PLAIN: Very loose gray silty medium to fine SAND				2 - 2 - 2 N = 4											
5	150		SC	Firm orange tan clayey medium to fine SAND				6 - 7 - 8 N = 15											
			SC	Firm orange gray clayey medium to fine SAND				3 - 5 - 6 N = 11											
10	145		SM	Very firm to dense purple gray silty medium to fine SAND, Wet				9 - 14 - 16 N = 30											
15	140							12 - 14 - 17 N = 31											
20	135		SC-CH	Firm gray clayey medium to fine SAND				2 - 6 - 5 N = 11											
				Boring terminated at 20.0 feet.															

This boring log shall not be separated from the corresponding Instrument of Service; no third party may rely upon this well log or the corresponding Instrument of Service absent a written TTL Secondary Client Agreement.



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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-23**

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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/24/2013
Logged by:	J. Crosby	Boring Depth:	20 feet
Equipment:	CME 550X	Boring Elevation:	154 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 151.7 feet on 1/28/2013.

▼ Delayed water level.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	ROD % REC	10	20	30	40	50			
				TOPSOIL: 9 Inches															
			SM	COASTAL PLAIN: Firm gray silty medium to fine SAND				5 - 6 - 10 N = 16											
5	150		SC	Firm gray clayey medium to fine SAND	15			3 - 4 - 8 N = 12											
			SC	Very firm gray clayey medium to fine SAND				6 - 12 - 16 N = 28											
10	145		SM	Very firm purple gray silty medium to fine SAND				10 - 14 - 12 N = 26											
15	140		SC-CH	Loose gray green clayey medium to fine SAND				3 - 3 - 6 N = 9											
20	135		SC-CH	Very firm gray green clayey medium to fine SAND				4 - 9 - 12 N = 21											
				Boring terminated at 20.0 feet.															

This boring log shall not be separated from the corresponding Instrument of Service; no third party may rely upon this well log or the corresponding Instrument of Service absent a written TTL Secondary Client Agreement.



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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-24**

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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/24/2013
Logged by:	J. Crosby	Boring Depth:	20 feet
Equipment:	CME 550X	Boring Elevation:	154 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 146.7 feet on 1/28/2013.

▼ Delayed water level.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEO TECH LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	10	20	30	40	50			
								ROD % REC										
				TOPSOIL: 8 Inches														
			SM	COASTAL PLAIN: Very loose tan silty medium to fine SAND				2 - 1 - 3 N = 4										
5	150		SC	Loose red orange gray clayey medium to fine SAND				2 - 4 - 6 N = 10										
			SC	Very firm red orange gray clayey medium to fine SAND				4 - 7 - 15 N = 22										
10	145		SM	Dense orange tan silty medium to fine SAND				11 - 18 - 18 N = 36										
15	140		SM	Very firm purple gray silty medium to fine SAND				6 - 11 - 13 N = 24										
20	135		SC-CH	Loose gray clayey medium to fine SAND				3 - 4 - 6 N = 10										
				Boring terminated at 20.0 feet.														

This boring log shall not be separated from the corresponding Instrument of Service; no third party may rely upon this well log or the corresponding Instrument of Service absent a written TTL Secondary Client Agreement.





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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-26**

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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/24/2013
Logged by:	J. Crosby	Boring Depth:	25 feet
Equipment:	CME 550X	Boring Elevation:	153.5 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 149.8 feet on 1/28/2013.

▼ Delayed water level.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	10	20	30	40	50			
								ROD % REC										
				TOPSOIL: 8 Inches														
			SM	COASTAL PLAIN: Very loose brown silty medium to fine SAND				2 - 1 - 1 N = 2										
5	150		SC	Loose gray orange clayey medium to fine SAND	▼			3 - 3 - 4 N = 7										
			SM	Firm gray tan silty medium to fine SAND				7 - 9 - 11 N = 20										
10	145		SM	Dense purple gray silty medium to fine SAND				8 - 16 - 15 N = 31										
15	140		SM	Firm purple gray silty coarse to fine SAND, Wet				5 - 7 - 5 N = 12										
20	135		SC-CH	Very loose gray clayey medium to fine SAND				WOH - 2 - 2 N = 4										
25	130			Boring terminated at 25.0 feet.				WOH - WOH - 3 N = 3										
	125																	

This boring log shall not be separated from the corresponding Instrument of Service; no third party may rely upon this well log or the corresponding Instrument of Service absent a written TTL Secondary Client Agreement.



geotechnical - analytical - materials - environmental

**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-27**

Page 1 of 1

Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/24/2013
Logged by:	J. Crosby	Boring Depth:	20 feet
Equipment:	CME 550X	Boring Elevation:	155 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.  
 Water recorded at an elevation of 150.5 feet on 1/28/2013.

▼ Delayed water level.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	N-COUNT		STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	10	20	30	40	50			
								ROD % REC										
	155			TOPSOIL: 8 Inches														
			SM	COASTAL PLAIN: Loose gray silty medium to fine SAND				4 - 5 - 2 N = 7										
			SM	Firm gray tan silty medium to fine SAND				4 - 6 - 6 N = 12										
5	150							7 - 10 - 11 N = 21										
			SM	Very firm purple gray silty medium to fine SAND, Wet				9 - 13 - 13 N = 26										
10	145																	
			SC-CH	Very loose gray clayey medium to fine SAND				WOH - WOH - 3 N = 3										
15	140																	
			SC-CH	Very firm gray clayey medium to fine SAND				8 - 12 - 16 N = 28										
20	135			Boring terminated at 20.0 feet.														
25	130																	

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
**B-29**

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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/25/2013
Logged by:	J. Crosby	Boring Depth:	5 feet
Equipment:	CME 550X	Boring Elevation:	148 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA										
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)							
								1st 6"	2nd 6"	3rd 6"	ROD % REC	10	20	30	40	50		
			SM	TOPSOIL: 6 Inches COASTAL PLAIN: Loose brown tan gray silty medium to fine SAND				2 - 2 - 3 N = 5										
5				Boring terminated at 5.0 feet.				2 - 4 - 5 N = 9										
	145																	
	140																	
	135																	
	130																	
	125																	
	120																	

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Page 1 of 1

Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/25/2013
Logged by:	J. Crosby	Boring Depth:	5 feet
Equipment:	CME 550X	Boring Elevation:	148 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	ROD	10	20	30	40	50			
				TOPSOIL: 7 Inches															
			SM	COASTAL PLAIN: Loose tan gray silty medium to fine SAND				2 - 3 - 4 N = 7											
	145		SC	Loose gray clayey medium to fine SAND				5 - 4 - 6 N = 10											
5				Boring terminated at 5.0 feet.															
	140																		
10																			
	135																		
15																			
	130																		
20																			
	125																		
25																			
	120																		

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/25/2013
Logged by:	J. Crosby	Boring Depth:	5 feet
Equipment:	CME 550X	Boring Elevation:	147 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

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DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA										
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)							
								1st 6"	2nd 6"	3rd 6"	ROD	10	20	30	40	50		
			SM	TOPSOIL: 3 Inches COASTAL PLAIN: Firm tan silty medium to fine SAND				6 - 7 - 4 N = 11										
			SC	Firm gray tan clayey medium to fine SAND				5 - 7 - 9 N = 16										
5				Boring terminated at 5.0 feet.														
145																		
140																		
10																		
135																		
15																		
130																		
20																		
125																		
25																		
120																		

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/23/2013
Logged by:	J. Crosby	Boring Depth:	5 feet
Equipment:	CME 550X	Boring Elevation:	149.5 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	ROD	10	20	30	40	50			
				TOPSOIL: 8 Inches															
			SM	COASTAL PLAIN: Firm brown gray silty medium to fine SAND				3 - 5 - 8 N = 13											
			SC	Loose orange gray clayey medium to fine SAND				8 - 10 - 10 N = 20											
5	145			Boring terminated at 5.0 feet.															
10	140																		
15	135																		
20	130																		
25	125																		
	120																		

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

**LOG OF BORING**  
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Valdosta, GA

Page 1 of 1

Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/23/2013
Logged by:	J. Crosby	Boring Depth:	5 feet
Equipment:	CME 550X	Boring Elevation:	151 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA										
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)							
								1st 6"	2nd 6"	3rd 6"	ROD % REC	10	20	30	40	50		
	150		SM	TOPSOIL: 4 Inches COASTAL PLAIN: Firm brown gray silty medium to fine SAND				3 - 4 - 8 N = 12										
	5		SC	Loose orange tan gray clayey medium to fine SAND				4 - 5 - 5 N = 10										
	145			Boring terminated at 5.0 feet.														
	10																	
	140																	
	15																	
	135																	
	20																	
	130																	
	25																	
	125																	

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/23/2013
Logged by:	J. Crosby	Boring Depth:	7.5 feet
Equipment:	CME 550X	Boring Elevation:	154 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

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DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA												
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)									
								1st 6"	2nd 6"	3rd 6"	ROD % REC	10	20	30	40	50				
				TOPSOIL: 8 Inches																
			SM	COASTAL PLAIN: Loose brown gray silty medium to fine SAND, Wet				1 - 3 - 4 N = 7												
5	150		SC	Very loose orange tan gray clayey medium to fine SAND				2 - 1 - 2 N = 3												
				NO RECOVERY				3 - 4 - 9 N = 13												
				Boring terminated at 7.5 feet.																



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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/23/2013
Logged by:	J. Crosby	Boring Depth:	7.5 feet
Equipment:	CME 550X	Boring Elevation:	154 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	ROD	10	20	30	40	50			
				TOPSOIL: 6 Inches															
			SM	COASTAL PLAIN: Very loose brown gray silty medium to fine SAND, Wet				1 - 1 - 3 N = 4											
	150		SC	Very loose orange gray clayey medium to fine SAND, Wet				WOH - WOH - WOH N = WOH											
5			SC	Firm gray clayey medium to fine SAND				6 - 9 - 10 N = 19											
				Boring terminated at 7.5 feet.															
	145																		
10																			
	140																		
15																			
	135																		
20																			
	130																		
25																			
	125																		

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/25/2013
Logged by:	J. Crosby	Boring Depth:	5 feet
Equipment:	CME 550X	Boring Elevation:	148 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH.LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	ROD	10	20	30	40	50			
				TOPSOIL: 6 Inches															
			SM	COASTAL PLAIN: Firm gray silty medium to fine SAND				5 - 6 - 5 N = 11											
	145		SC	Dense gray clayey medium to fine SAND				8 - 16 - 21 N = 37											
5				Boring terminated at 5.0 feet.															
	140																		
10																			
	135																		
15																			
	130																		
20																			
	125																		
25																			
	120																		

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/25/2013
Logged by:	J. Crosby	Boring Depth:	5 feet
Equipment:	CME 550X	Boring Elevation:	148.5 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	ROD	10	20	30	40	50			
				TOPSOIL: 8 Inches															
			SM	COASTAL PLAIN: Firm brown gray silty medium to fine SAND, Wet				4 - 5 - 7 N = 12											
	145		SC	Loose orange gray clayey medium to fine SAND				3 - 6 - 4 N = 10											
5				Boring terminated at 5.0 feet.															
	140																		
10																			
	135																		
15																			
	130																		
20																			
	125																		
25																			
	120																		

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/25/2013
Logged by:	J. Crosby	Boring Depth:	5 feet
Equipment:	CME 550X	Boring Elevation:	148 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

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DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	ROD	10	20	30	40	50			
				TOPSOIL: 8 Inches															
			SM	COASTAL PLAIN: Firm to very firm tan gray silty medium to fine SAND				4 - 8 - 12 N = 20											
5				Boring terminated at 5.0 feet.				8 - 11 - 13 N = 24											
	145																		
	140																		
	135																		
	130																		
	125																		
	120																		

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/24/2013
Logged by:	J. Crosby	Boring Depth:	5 feet
Equipment:	CME 550X	Boring Elevation:	153 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	ROD	10	20	30	40	50			
				TOPSOIL: 8 Inches															
			SM	COASTAL PLAIN: Loose brown gray silty medium to fine SAND, Wet				2 - 2 - 3 N = 5											
	150		SC	Firm orange gray clayey medium to fine SAND				2 - 3 - 8 N = 11											
5				Boring terminated at 5.0 feet.															
	145																		
10																			
	140																		
15																			
	135																		
20																			
	130																		
25																			
	125																		

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/24/2013
Logged by:	J. Crosby	Boring Depth:	7.5 feet
Equipment:	CME 550X	Boring Elevation:	154.5 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA												
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)									
								1st 6"	2nd 6"	3rd 6"	ROD	10	20	30	40	50				
			SM	TOPSOIL: 4 Inches																
			SC	COASTAL PLAIN: Loose tan gray silty medium to fine SAND				3 - 4 - 4 N = 8												
5	150		SC	Very soft tan gray clayey medium to fine SAND	19			1 - 2 - 2 N = 4												
			SC	Very firm tan gray clayey medium to fine SAND				7 - 10 - 12 N = 22												
				Boring terminated at 7.5 feet.																

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/24/2013
Logged by:	J. Crosby	Boring Depth:	5 feet
Equipment:	CME 550X	Boring Elevation:	155 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	ROD	10	20	30	40	50			
	155			TOPSOIL: 7 Inches															
			SM	COASTAL PLAIN: Loose brown silty medium to fine SAND				1 - 4 - 3 N = 7											
			SC	Loose orange gray clayey medium to fine SAND				2 - 5 - 5 N = 10											
5	150			Boring terminated at 5.0 feet.															
10	145																		
15	140																		
20	135																		
25	130																		

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**WOOLPERT, INC.**  
**MOODY AFB - PRIVATIZED HOUSING VAL DEL ROAD SITE**

Valdosta, GA

**LOG OF BORING**  
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Drilling Co.:	TTL, Inc.	TTL Project No.:	100712192
Driller:	R. Bell	Date Drilled:	1/24/2013
Logged by:	J. Crosby	Boring Depth:	5 feet
Equipment:	CME 550X	Boring Elevation:	154 feet
Hammer Type:	Automatic	Coordinates:	Not Available
Drilling Method:	Hollow Stem Auger		

Remarks:  
 Water not encountered at time of drilling.

R:\PROJECTS\2012\PROJECT FILES\GEOTECHNICAL\100712192 MOODY VAL DEL\100712192 BORING LOGS.GPJ 11/7/13 Report:2003\_GEOTECH\_LOG

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SAMPLE DATA											
								N-COUNT			STANDARD PENETRATION TEST DATA (blows per foot)								
								1st 6"	2nd 6"	3rd 6"	ROD	10	20	30	40	50			
				TOPSOIL: 8 Inches															
			SM	COASTAL PLAIN: Loose gray silty medium to fine SAND				2 - 4 - 4 N = 8											
	150		SM	Very firm gray silty medium to fine SAND				6 - 11 - 11 N = 22											
5				Boring terminated at 5.0 feet.															
	145																		
10																			
	140																		
15																			
	135																		
20																			
	130																		
25																			
	125																		

This boring log shall not be separated from the corresponding Instrument of Service; no third party may rely upon this well log or the corresponding Instrument of Service absent a written TTL Secondary Client Agreement.